

Natural History Museum
Unlocked Thames Valley Science Park
CLIENT: Natural History Museum

SPECIFICATION FOR HARD & SOFT LANDSCAPE WORKS



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A01

Introduction

Clauses

10 Project background

1. The RIBA Stage 4 Landscape for NHM Unlocked has been prepared by Grant Associates on behalf of FCBS. The following section sets out the overall Stage 4 landscape and public realm design strategy set against an appraisal of the landscape constraints of the site within Thames Valley Science Park for the NHM facility.

The site is set within a predominantly agricultural landscape, bordered on the east and western boundaries by woodland. The site is agricultural and currently being farmed under an arable regime as part of the University of Reading's Farm Estate. The southern area of the field is a pheasantry with a scattering of individual tree specimens of varying ages and species. The western boundary of the site is enclosed by St John's Copse, an area of Ancient Semi Natural Woodland (ASNW) that is listed on the Natural England's Provisional Ancient Woodland Inventory (PAWI) appears on the early maps of the area including the Earl of Fingal's 1756 Estate Map. To the east of this is New Covert, an area of more recent Victorian Woodland. The northern boundary is currently undefined and open but will be an estate road with a roundabout for the entrance to the NHM site. The southern boundary of the site is hedgerow and individual specimen trees of varying age and includes two veteran trees and one high-quality tree (T39, T40 & T41) which will need to be retained and protected.

20 Core values

1. The landscape strategy is an integral part of the vision for NHM Unlocked to create a sense of place which connects people and nature as well as promoting a healthy and curious working community. The following design principles inform the landscape vision:

- To establish a landscape setting for the new building which is sensitive to the Thames Valley context and, with the architecture, expresses the identity of NHM Unlocked;
- To create a place which has attractive public spaces and landscapes, which supports staff and users' wellbeing, amenity and productivity;
- To develop an environment which builds on NHM's vision of a future where both people and the planet thrive.

The overall approach will establish a site master plan which responds positively to the sensitive landscape context, the ancient woodland and local natural and cultural heritage. The site organisation creates a clear hierarchy of public and private space, so that the site is connected, accessible and a fully integrated part of the Thames Valley campus and wider community.

The overriding aim of the external environment is to make people feel good about the place in which they work and to help inspire wonder and curiosity in the natural world, where the landscape spaces support opportunities for people and nature.

An integrated approach to the proposed Surface Water Drainage Strategy is proposed to help structure the landscape of the site.

Sustainable urban drainage (SuDS) techniques will be adopted to attenuate water flow, help treat drainage runoff and provide onsite storage and attenuation which are soft, nature-based solutions such as the attenuation pond at the entrance space; rain gardens and swales around the perimeter of the building; together with porous paving in the car park.

30 Description of the works

1. Scope of Works

- Asphalt, concrete block paving and natural stone paving to carriageway and footways;
- Exposed aggregate concrete kerbs and edgings;
- Metalwork boundary railings to varying heights with soft close gates to match;
- Steps with tactile paving and handrails;
- Anti-ram bollards;
- Visitor cycle stands;
- Hostile Vehicle Mitigation;
- Bench seating;
- Resin bound gravel to pathway;
- Permeable block paving to car park;
- Metalwork planter edges;
- Timber deck and seating to pond edge;
- 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, grasses, mulches to all planted beds;
- Aquatic marginal planting to pond edge;
- Topsoil and associated ameliorants;
- Free draining subsoil;

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.

Specification of pond liner system, its testing and commissioning is outside of Landscape Architect's scope.

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:
 - Material selection
 - Energy Use
 - Transport
 - Maintenance

20 Material selection

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

30 Energy use

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

40 Transport

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

50 Maintenance

1. Critical issues are:
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30-04-2025

- Maximise life expectancy of components
- Clear maintenance instructions provided to optimise performance of fixings and reduce the need for replacements
- Use of low energy maintenance materials and processes
- Use of non-toxic maintenance materials
- 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.

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.

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.

2. A copy of all suppliers' biosecurity policies and stock quality assurances must be supplied with the tender return
3. 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:
 - Forestry Commission (FC)
 - Royal Horticultural Society (RHS)
 - Horticultural Trades Association (HTA)
 - International Association of Horticultural Producers (AIPH)
 - Arboricultural Association (ARB)
 - 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.

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:
 1. Comprehensive awareness of biosecurity issues and all associated guidance, restrictions and notifications.
 2. Documented input and review in respect of the tendered plant schedule and drawings and associated biosecurity statements and observations.
 3. Methodology for plant monitoring process for present and new "at risk species" as per government updates.
 4. Confirmation on origin / propagation of all tendered plants and methodology for monitoring sub suppliers' protocols
 5. Where necessary quarantine holding policies including incoming and outgoing plant control, internal and field inspections and associated traceability.
 6. Working methodology with landscape contractors and in particular all associated required notifications on call up and transportation and local regional restrictions.
 7. Sustainable production statement & policy
 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. 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:

https://ec.europa.eu/food/plant/plant_health_biosecurity/legislation/emergency_measures/xylella-fastidiosa/susceptible_en

www.gov.uk/government/organisations/animal-and-plant-health-agency

<https://www.gov.uk/guidance/plant-health-controls>

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:
 - 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*)
3. 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.

It has also been found on various types of:

- 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
3. *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.

OPM is subject to regulations intended to minimise the risk of further introductions to the UK and spread to new areas.

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. 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.

<https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/oak-processionary-moth-thaumetopoea-processionea/>

<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.

The disease is now considered to be one of the most important diseases of natural ecosystems in Europe for the last twenty years.

3. Disease management:
 - Evaluate nursery stock for infection before purchase
 - Ensure good practice in nurseries to prevent infection
 - 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:
 - Asphalt, natural stone 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;
 - Gabion walls and seats;
 - Timber deck;
 - Steps with tactile paving and handrails;
 - Hostile Vehicle Mitigation including bollards;
 - Visitor cycle stands;
 - Benches;
 - 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;
 - 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
 - Soil strategy

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 **REVISED**

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:

"BS" shall mean British Standard
"CP" shall mean British Standard Code of Practice
"mm" shall mean millimetre
"cm" shall mean centimetre
"m" shall mean metre
"m²" or "m²" shall mean square metre
"m³" or "m³" shall mean cubic metre
"L" or "ltr" shall mean litre
"ml" shall mean millilitre
"t" or "T" shall mean tonne (metric)
"BR" shall mean bare root
"RB" shall mean rootballed
"Tr" shall mean transplant
"C" shall mean containerised
"Weeds" shall mean all plants not within the design

20 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, defined as follows: 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 Regulations
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 Regulations

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 Architect in writing

4. "Accepted" or acceptance shall mean accepted by or acceptance of the: CA/Landscape Architect in 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 Architect in writing
7. "Authorised"/"Authority" shall mean authorised by/authority of the: CA/Landscape Architect in writing
8. "Required" shall mean "required" by the: CA/Landscape Architect in 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. The landscape soft works shall only be carried out by full, current members of BALI (British Association of Landscape Industries) . Any Subcontractor carrying out hard and/or soft landscape works as defined on the Contract drawings must be approved by the 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 agree with, the CA/Landscape Architect a 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 REVISED

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. The method of construction must be consistent with good and proven practice and shall be in accordance with applicable BS/CP recommended procedures.
8. 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 Architect may, 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 Architect of 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.

Deleted clauses

210 Sub-letting DELETED

Ω End of Section

A15

Materials and workmanship **REVISED**

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 for 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 prior 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 CA/Landscape Architect

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 CA to 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 **REVISED**

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.

Element: Clause: Sample Type:

Concrete block paving PT01 Q25/315C RS

Resin bound gravel PT02 Q23/225 RS

Hardwood timber deck boards PT04 Q50/380 RS

Timber sleeper PT05 Q50/373 RS

Self binding gravel PT06 Q23/160 RS

Permeable concrete block paving PT07 Q25/315 RS

Concrete block paving PT08 Q25/315A RS

Resin bound gravel PT12 Q23/225A RS

Wall Type 01& 02 WT01 & WT02 D41/210 (facing stone for gabion) RS, SD

Timber bench ST01 Q50/220B SD, RS

Timber bench ST02 Q50/220C SD, RS

Pergola PG Q50/ 390 RS, SD

Feature boulders DR01 Q50/210B RS

Large seating rocks ST05 Q50/ 210C SD

Imported Topsoils and Subsoils Q28

Note: Provide physical and chemical properties of soil types

Sample Types Are Abbreviated as follows:

RS = Representative Sample

SD = Shop Drawings (For specialist design items)

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.

Element / Clause

1.1. Frost susceptibility: D20/520

1.2. Fill: D20/616

234 Fabrication drawing requirements **REVISED**

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.

Metalwork balustrade BA01 Q41/130

Metalwork balustrade BA01 Q41/130A

Handrail HR02 Q41/241

Handrail HR02 Q41/241B

Handrail HR02 Q41/241C

Pedestrian barrier PB Q41/242

Security fence FE01 Q40/126

Timber post and rail fence FE02 Q40/210

Timber post and wire fence FE03 Q40/210A

Vehicular high security double leaf swing gate G01 Q40/ 560
Pedestrian single leaf timber swing gate G03 Q40/ 550
Vehicular high security sliding gate G04 Q40/ 560B
Wall Type 01 WT01 D41/210
Wall Type 03 WT03 E41/110
In-situ concrete step SP02 E10 & E41/110B
Hardwood timber deck boards PT04 Q50/380
Pergola PG Q50/ 390
Manual Gate MG Q50/190E
Cycle shelter Q50/210E
In-situ concrete terrace with timber cladding ST04 Q50/225
Bench ST06 Q50/220A

235 Contractor design items **REVISED**

1. The following is a list of all Contractor Design items. Full proposals, including detailed drawings and specification(s), are to be provided by the Contractor for approval before proceeding with the 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 Contract Drawings and Landscape Specification for details of all Contractor Design Items.

Metalwork balustrade BA01 Q41/130
Metalwork balustrade BA02 Q41/130A
Handrail HR02 Q41/241
Handrail HR03 Q41/241B
Handrail HR04 Q41/241C
Pedestrian barrier PB Q41/242
Security fence FE01 Q40/126
Timber post and rail fence FE02 Q40/210
Timber post and wire fence FE03 Q40/210A
Vehicular high security double leaf swing gate G01 Q40/ 560
Pedestrian single leaf timber swing gate G03 Q40/ 550
Vehicular high security sliding gate G04 Q40/560B
Manual Gate MG Q50/190E

Wall Type 01 WT01 D41/210
Wall Type 03 WT03 E41/110
In-situ concrete step SP02 E41/110B
Timber bench ST01 Q50/220B
Timber bench with backrest & armrest ST02 Q50/220C
Hardwood timber deck boards PT04 Q50/380
Picnic set ST03 Q50/ 220D
Pergola PG Q50/ 390
In-situ concrete terrace with timber cladding ST04 Q50/225
Bench ST06 Q50/220A
Large seating rocks ST05 Q50/ 210C
Cycle stand CS02 Q50/210D
Cycle shelter Q50/210E
Cycle stand for disabled Q50/210F

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.

Element / Clause:

- 1.1. Contractor Environmental Policy : A02/10
- 1.2. Landscape Works Program: A14/50
- 1.3. Contractor Design Items: A14/80
- 1.4. Supervision: A14/100
- 1.5. Supplier List : A14/180
- 1.6. Temporary Works : A15/30
- 1.7. Protection of the Works : A15/150
- 1.8. Herbicide Application: A15/200
- 1.9. Proposed Fill Materials: D20/500

239 Requirements for CA/landscape architect approval

1. The following is a list of items that require approval by the CA/Landscape Architect 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.

Element / Clause:

- 1.1. Setting Out: A15/120
- 1.2. 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 CA any 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)

REVISED

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. 12 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

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 reseeded or turfed 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. The Contractor shall determine, in liaison with the Contract manager, the size and detailed nature of this area in terms of security, etc., and in accordance with the Contractor's programme.

310 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 stone and clay pavers
 - 1.9. Stone clad walls
 - 1.10. Work to the subsoil
 - 1.11. Topsoil supply & spreading
 - 1.12. Grass and wildflower seeding & turfing and planting works
 - 1.13. Support for excavations & setting out
 - 1.14. Works within protected tree zones
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.

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 CA 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.
4. Where the Landscape Architect is 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 Architect shall 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

Deleted clauses

~~220 Water for the works~~ **DELETED**

~~320 Tests~~ **DELETED**

Ω End of Section

C11 Site investigation

General requirements

001 Scope

1. Refer also to engineers specification
2. Clause C11 of the landscape specification refers only to investigating the suitability of existing soils for horticulture. All other aspects of the site investigation should be covered in the engineers specification.
3. It is the contractors responsibility to determine what soil is suitable for reuse and any amelioration necessary to meet the standards set out in this specification

Investigation

243 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:
3. Soil analyst: Tim O'Hare Associates or equal and approved

Tim O'Hare Associates, Howberry Park, Wallingford, Oxfordshire, OX10 8BA
T: 01491 822653
W: www.timohare-associates.com

Test laboratory to be accredited to BS EN ISO/IEC 17025 by a recognised national or international accreditation body.

4. Samples: Collect in accordance with: BS3882:2015
5. Testing/Analysis: In accordance with: BS3882:2015
6. Submit:
 - 6.1. Declaration of analysis:
 - Visual description
 - Soil texture
 - Particle size analysis (clay/silt/sand ratio)
 - Stone/coarse fragment content by % weight (>2mm, >20mm, >50mm)
 - pH value
 - Electrical conductivity (1:2.5 soil/water extract)
 - Total Nitrogen and carbon (C):nitrogen (N) ratio
 - Extractable phosphorus (P), potassium (K) & magnesium (Mg)
 - Microbial activity
 - Mass loss on ignition/organic content
 - Potentially phytotoxic contaminants - zinc (Zn), copper (Cu) & nickel (Ni)
 - Zootoxic contaminants - refer to BS3882 for guidance.
 - Evidence of physical contaminants or sharps
 - Evidence of pernicious weeds
 - Depth of topsoil at each survey location
 - 6.2. Soil Survey Plan clearly showing test sample locations and their corresponding reference numbers in dwg and pdf format
7. The results of the analysis should be presented in an interpretive report, to include the following:

- 7.1. 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
- 7.2. 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 establishment 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..
- 7.3. Assessment of quantity/depth of insitu site topsoil suitable for reuse, including a clear plan indicating location and corresponding depths
- 7.4. Assessment of soil permeability and general site drainage conditions
- 7.5. Certificate of analysis (clearly dated and referencing site/sample)
8. 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..
9. The completed report and test results should be provided as a digital data file with an accompanying hard copy. The Soil Survey Plan should be provided in AutoCAD format - a clear and accurate system of AutoCAD layering should be developed when producing the survey.

244 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
3. **Soil analyst:** Test laboratory to be accredited to BS EN ISO/IEC 17025 by a recognised national or international accreditation body.
4. **Samples:** Collect in accordance with BS8601:2013
5. **Testing/Analysis:** In accordance with BS8601:2013
6. Submit
 - 6.1. Declaration of analysis:
 - Visual description
 - Soil texture
 - Particle size analysis (clay/silt/sand ratio)
 - Stone/coarse fragment content by % weight (>2mm, >20mm, >75mm)
 - pH value
 - Electrical conductivity
 - Exchangeable Sodium percentage (ESP), if applicable
 - Carbonate content (%)
 - Mass loss on ignition/organic content
 - Potentially phytotoxic contaminants - zinc (Zn), copper (Cu) & nickel (Ni)
 - Zootoxic contaminants - refer to BS3882 for guidance.
 - Evidence of physical contaminants or sharps
 - Evidence of pernicious weeds
 - Depth of subsoil at each survey location
 - 6.2. Soil Survey Plan clearly showing test sample locations and their corresponding reference numbers in dwg and pdf format
7. The results of the analysis should be presented in an interpretive report, to include the following:
 - 7.1. Assessment of the subsoil's suitability for reuse within the proposed scheme, e.g. as a component within a manufactured topsoil and/or as subsoil
 - 7.2. Recommendations for treatment and/or additives to ameliorate the site-won subsoil to suit its intended use
 - 7.3. Assessment of quantity/depth of insitu site subsoil suitable for reuse, including a clear plan indicating locations and corresponding depths

- 7.4. Assessment of soil permeability and general site drainage conditions
- 7.5. Certificate of analysis (clearly dated and referencing site/sample)
- 8. 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..
- 9. The completed report and test results should be provided as a digital data file with an accompanying hard copy. The Soil Survey Plan should be provided in AutoCAD format - a clear and accurate system of AutoCAD layering should be developed when producing the survey.
- 10. Additional Requirements:

Field tests - Not Used

Sampling - Not Used

Laboratory tests - Not Used

Ω End of Section

D20

Excavating and filling

To be read with preliminaries/general conditions

4 Section index

1. 10 - 99: GENERAL
2. 100 - 159: EXISTING SITE & SITE INVESTIGATIONS
3. 160 - 199: EXISTING TREES & VEGETATION
4. 200 - 399: SITE CLEARANCE & EXCAVATION
5. 400 - 429: TOPSOIL STRIPPING, STORAGE, REUSE & DISPOSAL
6. 430 - 449: SUBSOIL STRIPPING, STORAGE, REUSE & DISPOSAL
7. 450 - 499: GROUND WATER, DRAINAGE, ETC.
8. 500 - 549: FILLING - GENERAL
9. 550 - 600: FILLING - ACCESSORIES, GEOTEXTILES, ETC.
10. 605 - 615: FILLING - LANDSCAPE AREAS
11. 616 - 770: FILLING - GENERAL CONT.
12. 790 - 799: LANDSCAPE SUBSOIL GRADING & CULTIVATION
13. 800 - 849: BIOREMEDIATION
14. 900 - 960: HIGHWAYS AGENCY EARTHWORKS SPECIFICATION APPENDICES:

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 groundworks contractor
2. It is assumed that the formation levels/bulk subsoil placement will be carried out by the groundworks contractor
3. It is assumed that the fine grading works, including ripping in preparation to receive topsoil, will be carried out by the landscape contractor
. The '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: by the landscape contractor
5. The Main Contractor is to submit proposed Contractor responsibilities for the groundworks packages noted above to the CA for approval
6. Much of the site is on steep slopes exceeding 1 in 3 gradients. The contractor must submit a method statement demonstrating how subsoil preparation and topsoil placement will meet engineering requirements to be checked by the engineers.

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

110 Site investigation

1. **Report:** Refer to relevant engineers site investigation report(s)

111 Description of existing soils on site

1. For full analysis of site won soils refer to the soil report - refer to relevant engineers site investigation report(s)

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.

150 Existing services, features and structures

1. **Services:** See section A12 for locations.
2. **Site features to be retained:** See section A12 for details.
3. **Structures:** See section A34 for details of protection.

Existing site & site investigations

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 and/or as a benchmark for the importation of topsoil and/or subsoil proposed for the works.
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.

150 Existing services, features and structures

1. Refer to survey information. Protection of existing services, feature and structures should be in accordance with engineers specification

155 Existing site features

1. Verify with: which 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.

161 Existing trees to be removed

1. Verify with: 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 CA/Arboriculturalist: prior to their removal.
 - 4.2. Check for below and above ground services in the vicinity. Inform the CA: 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 CA/arboricultural consultant: 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: client's/arboricultural consultants approval prior to construction work commencing. The contractor shall refer to the arboricultural consultants method statement(s) for tree removal and protection.

Clearance/excavating

162 Protection of vegetation retained

1. Several existing trees: . The Contractor may be liable for any damage to the trees which may result in prosecution from
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: by arboriculturallist requirements as set out on the tree protection drawings and specification and Arboricultural Impact Assessment and Method Statement(s).
9. Do not cut roots within a Protected Area
10. Excavation in a Protected Area:
 - 10.1. Method: The Contractor shall refer to the Arboriculturalists Impact Assessment and site specific Method Statements.
 - 10.2. Guidance Notes: The Contractor shall refer to The Arboricultural Association's Guidance Note 12 (The Use of Cellular Confinement Systems Near Trees: A Guide to Good Practice). Reference should also be made to The Department for Communities and Local Government's 'Tree Roots in the Built Environment' (in particular Chapter 8 - Protecting Trees During Excavation).
 - 10.3. 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: CA/Arboriculturalist/Landscape Architect
 - 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: as recommended by Arboriculturalist
 - 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 by Arboriculturalist
13. Backfill: as recommended by Arboriculturalist

163 Special tree protection measures

1. Certain trees require special protection measures during the construction of adjacent walls, surfaces and edges. These are identified on the Tree Protection Plan, and works in the vicinity of affected trees should comply with the following: arboriculturalist requirements as set out on the tree protection drawings and specification and Arboricultural Impact Assessment and Method Statement(s)
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/Arboriculturalist** : if roots exceeding 40mm Ø are exposed by excavations
13. **Do not cut roots in the protected area without approval of the: CA/Arboriculturalist**
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/Arboriculturalist/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) unless the arboricultural method statement(s) recommends/sets out alternative backfill. The contractor shall also refer to section Q28. The contractor shall provide site specific method statements for any works to be undertaken within existing trees RPA's for CA/Landscape Architect/Arboricultural approval
17. **Guidance -** : The Contractor shall refer to The Arboricultural Association's Guidance Note 12 (The Use of Cellular Confinement Systems Near Trees: A Guide to Good Practice). Reference should also be made to The Department for Communities and Local Government's 'Tree Roots in the Built Environment' (in particular Chapter 8 - Protecting Trees During Excavation).

164 Tree roots

1. **Protected area:** Do not cut roots within precautionary protection area.
 - 1.1. **Size of area:** as per arboricultural consultants recommendations
2. **Excavation in protected area**
 - 2.1. **Method:** By hand
 - 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: Not required
- 5. Backfill: As dug material, enriched with amelioration as section Q31

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: the local authority
- 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: 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: , 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

166 Tree root barriers

- 1. Trench: Refer to arboriculturalists method statement for trenching in close proximity to existing trees (outside RPA's). Cross refer to engineering services specification P30 and/or drainage R12 for any root barriers to line service/drainage trenches. The strategy is to line the utility trenches and not individual tree pits.
 - 1.1. Depth: Generally 2m. Refer to arboriculturalists method statement for trenching and contract drawings for specific requirements/applications.
- 2. Root barrier: Greentech root barrier 360 (2m Depth x 0.71mm Thickness) or equal and approved
- 3. Cutting roots: As clause 164.
- 4. Root barrier installation: Full depth of excavation. Fit closely to trench wall nearest the tree.
- 5. Backfill material: As dug material excavated from trench or ameliorated topsoil as required as part of proposals. Refer to relevant engineering and landscape contract drawings.
- 6. Backfilling: Lay and compact thoroughly in layers not more than 300 mm thick. Contractor to follow manufacturers installation recommendations and instructions.

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 Forest Industry Safety Accord safety leaflets.

175 Felling large trees

1. Definition: Girth over 600 mm.
2. Identification: Clearly mark trees to be removed.
3. Safety: Comply with Forest Industry Safety Accord safety leaflets.
4. Felling: As close to the ground as possible.
5. Stumps: Obtain approval from the CA/University as may be deemed ecological value. If stump removal is approved remove by stump grinding where possible.
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: Obtain approval from the CA/University as might be suitable as part of University's green waste strategy/policy. Preference is for material to be chipped and used on site as per University maintenance teams requirements e.g. chipped and spread insitu or chipped and stored on campus for future use.

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: Deadwood strategy prepared as part of the Habit Creation and Landscape Management Plan in collaboration with the University. The University to have the final say on suitable location(s) and sizes of logs.
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.

Site clearance & excavation

200 Site clearance

1. Timing: Before topsoil stripping, if any.
2. General: Clear site of rubbish, debris and vegetation. Do not compact topsoil.

210 Stripping topsoil

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

215 Stripping subsoil

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

225 Handling topsoil

1. Standard: To BS 3882.
2. Aggressive weeds:
 - 2.1. **Species:** Notify the presence of 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.

240 Adjacent excavations

1. **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:** Refer to engineers details and specification
3. **Backfill material:** Refer to engineers details and specification

242 Excavations adjacent to existing backfilled trenches

1. **Proximity:** When width of undisturbed ground between the two excavations will be less than: Refer to engineers details and specification
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: Refer to engineers details and specification
 - 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: .Refer to engineers details and specification
2. **Backfill material to new excavation:** Refer to engineers details and specification

246 Excavations adjacent to pile supported structures

1. **Proximity:** When the formation level of an excavation will be lower than the pile cut off level and the distance between the near faces of the pile cap/ ground beam and the excavation is less than: Refer to engineers details and specification
 - 1.1. For all work within the excavation and backfilling refer to engineers details and specification
 - 1.2. Delay the adjacent excavation until: Refer to engineers details and specification

248 Backfill to excavations lower than foundation formation level

1. **Critical level:** Refer to engineers details and specification

- 1.1. Distance between near faces of foundation and lower excavation less than 1 m: Refer to engineers details and specification
- 1.2. Otherwise: Refer to engineers details and specification
2. Backfill material: Refer to engineers details and specification
 - 2.1. Below critical level: Refer to engineers details and specification
 - 2.2. Above critical level: Refer to engineers details and specification

260 Inspecting formations

1. Give notice: Make advance arrangements for inspection of formations for: Refer to engineers details and specification
 - 1.1. Notice (minimum): Refer to engineers details and specification
2. Preparation: Refer to engineers details and specification
3. Trim to required profiles and levels. Refer to engineers details and specification
 - 3.1. Loose material: Refer to engineers details and specification
4. Seal: Within 4 hours of inspection, seal formations with: Refer to engineers details and specification

265 Inspecting formations in sand and gravel

1. Notice for inspection (minimum): Refer to engineers details and specification
2. Preparation: Refer to engineers details and specification
3. Seal: Within 4 hours of inspection, seal formations with: Refer to engineers details and specification

267 Inspection of formations in shrinkable soils

1. Inspect formation: For signs of conducting and fine moisture absorbing roots. Refer to engineers details and specification
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. Refer to engineers details and specification

370 Underground structures in landscape areas

1. Generally: Refer to engineers details and specification
2. Minimum depth below finished levels: Refer to engineers details and specification
 - 2.1. Grass, ground cover and perennial planting:
 - 2.2. Shrub planting: 750 mm.
 - 2.3. Within 2 m of tree planting: 1000 mm.
3. Walls and slabs remaining: For drainage requirements refer to engineers details and specification

Disposal of materials

400E Reuse of site-won topsoil

1. It has been assumed that there will be insufficient suitable existing site topsoil available to complete the proposed soft landscape works due to the likelihood that there will be limitations on space to store the excavated topsoil. Whilst every effort is to be made to find space for storage it is likely the volume will be insufficient for what is required as part of the permanent works.
2. A chemical, horticultural and physical analysis of the existing site topsoil is required in order to establish its suitability for reuse as a planting medium within the Contract Works
 - 2.1. Refer to: **Q28/280** for requirements
3. Any shortfall in suitable existing site topsoil for use within soft landscape areas: shall be made up using imported topsoil in accordance with Section **Q28** of this specification

4. The Contractor is responsible for ascertaining accurate quantities of both suitable existing site topsoil and imported topsoil necessary for the execution of the works
 - 4.1. Quantities to be confirmed, and agreed, with the CA/Landscape Architect: prior to the landscape soiling works being undertaken i.e. end of RIBA stage 4/early RIBA stage 5
5. Any deficiency in suitable existing site topsoil (as agreed at: stage 4/5) shall be imported by the Contractor to fulfil the requirements of the Contract
6. All imported topsoil to be in accordance with the relevant clauses of Section: **Q28** of this specification
7. Refer to Q28, Q30 and Q31: for requirements for amelioration of existing site topsoil to be reused
8. All suitable on-site topsoil, within areas to be stripped as defined on: the Contract Drawings, to be stripped in accordance with Section **D20** of this specification
9. All existing site topsoil deemed acceptable for reuse within the proposed soft landscape works to be ameliorated in accordance with the soil analyst's recommendations in the soil analyst report (: **Q28/280**)
10. All existing site topsoil deemed unsuitable for reuse within the proposed soft landscape works, as defined by the soil analyst's recommendations in the soil analyst report: , to be stripped in accordance with Section **D20** of this specification and disposed of off site unless otherwise instructed by the University
11. Existing Trees: The contractor shall refer to the arboricultural consultants method statement(s) for tree removal and protection.

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 unless otherwise instructed by the University.
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 CA/Landscape Architect: , 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/Soil Specialist/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 than 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 CA/Landscape Architect/Arboriculturalist/University: approval
 - 15.3. No mechanical stripping is to be carried out within the branch spread of any tree to be retained. Refer to arboriculturalists tree protection plans and associated survey, method statements and Arboricultural Impact Assessment.
 - 15.4. Allow for handworks/approved mechanical works only within a Protected Area e.g. Existing Trees RPA's
16. Topsoil must not be buried by subsequent operations.

412 Topsoil storage

1. Whilst every effort shall be made to store existing topsoil and/or subsoil on site for re-use this may not be possible due to physical site constraints. Contractor to confirm soiling strategy to determine whether topsoil stripping, storage and re-use is feasible. Any shortfall of topsoil/subsoil shall be made up by importation at the contractors expense.
2. 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.
3. 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.
4. Topsoil stockpiles shall be kept free of pollutants and other materials at all times.
5. Topsoil shall not be stored with subsoil.
6. Topsoil to be free of vegetation (either present at time of original stripping or subsequent growth on stockpile), at time of spreading.
7. 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: 6 months and shall be re-seeded with green manures as required.
8. The spoil heaps are not to exceed: 2m high
9. Vehicles used to transport the topsoil, or any other vehicle, must not be allowed to run over the heaps at any time.
10. 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.
11. Topsoil shall not be allowed to be contaminated with subsoil or any other unsuitable materials.
12. Subsoil storage heaps shall not be formed on areas until underlying topsoil has been stripped.

415 Excavated topsoil removal

1. **General:** Any excess topsoil or topsoil deemed unsuitable (as set out in soil analyst's report) shall be removed from site unless otherwise agreed with the University.

422 Management of topsoil heaps

1. **Topsoil Quantities:** Contractor to confirm quantity required. Whilst every effort is to be made to find space for storage it is likely the volume will be insufficient for what is required as part of the permanent works.
 - 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. Exception is soils to be reused for low fertile calcareous grasslands should not be sown but kept weed free :

- 2.1. Prior to seeding of green manures, the Contractor shall shallow cultivate to produce a fine seed bed to: CA/Landscape Architects approval and apply 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. Agreement with CA/Landscape Architect/University shall be agreed prior to application of any organic fertiliser to confirm strategy for topsoil reuse i.e. if to be used for calcareous grasslands low fertile topsoil is preferred. If to be used for herbaceous planting areas a higher level of fertility is preferred.
- 2.2. Sow topsoil heaps with Native Red 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 hand only
- 2.5. Prior to the spreading of topsoil, all green manures shall be turned in unless otherwise instructed by CA/Landscape Architect
3. Maintenance & Handling:
 - 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 Soil Specialists report and recommendations*

435 Management of subsoil heaps

1. **Subsoil Quantities:** Contractor to confirm quantity required. Whilst every effort is to be made to find space for storage it is likely the volume will be insufficient for what is required as part of the permanent works. Contractor to confirm soiling strategy to determine whether subsoil stripping, storage and re-use is feasible. Any shortfall of subsoil shall be made up by importation at the contractors expense.
 - 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: '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. Agreement with CA/Landscape Architect/University shall be agreed prior to application of any organic fertiliser to confirm strategy for subsoil reuse i.e. if to be used for calcareous grasslands low fertile topsoil is preferred. If to be used for herbaceous planting areas a higher level of fertility is preferred.
 - 2.2. Sow subsoil heaps with the following seed mixture at: 10g/m²: The Contractor shall agree the final seed mix for subsoil heaps with the CA/Landscape Architect/University in line with University's Biodiversity Policy.
 - 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:
 - 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 if sufficient space is available. Contractor to agree strategy with University/Landscape Architect to ensure reuse of subsoil is optimised as required. This may include potentially retaining some for reuse as part of the proposals and removing surplus from site and/or spread and level surplus subsoil on site where possible and in full agreement with CA/Landscape Architect/University.
- 2. **Retained material:** Spread and level surplus subsoil on site if appropriate. Contractor to agree strategy with University/Landscape Architect
 - 2.1. **Locations:** Contractor to agree strategy with University/Landscape Architect
 - 2.2. **Protected areas:** Do not raise soil level within root spread of trees that are to be retained.
- 3. **Remaining material:** Remove from site. Contractor to agree strategy with University/Landscape Architect

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:** As identified by the contractor/engineers

Filling

500 Proposed fill materials

1. **Details:** Submit full details of proposed fill materials to demonstrate compliance with specification, including: Refer to engineers details and specification
 - 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:** Refer to engineers details and specification

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 'Specification for highway works', clause 601.

512 Limitation of sulfate content in fill materials

1. Test specification: To Refer to engineers details and specification.
2. Sulfate content: Expressed as Refer to engineers details and specification
 - 2.1. **Water soluble sulfate (maximum):** Refer to engineers details and specification
 - 2.2. **Total potential sulfate (maximum):** Refer to engineers details and specification
 - 2.3. **Oxidizable sulfides (maximum):** Refer to engineers details and specification
3. Certificates of test result: Refer to engineers details and specification

520 Frost susceptibility

1. **General:** Except as allowed below, fill must be non frost-susceptible as defined in the '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:** Refer to engineers details and specification

- 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.

525 Testing of suitability of fill materials before start of filling

1. **Laboratory:** Refer to engineers details and specification
2. **Submit report to:** Refer to engineers details and specification
 - 2.1. **Timing:** Refer to engineers details and specification
3. **Samples:** Refer to engineers details and specification
 - 3.1. **Additional requirements:** Refer to engineers details and specification
4. **Tests:** Refer to engineers details and specification
5. **Frequency:** Refer to engineers details and specification

530 Placing fill

1. **Surfaces of excavations and areas to be filled:** Free from loose soil, topsoil, organic material, rubbish and standing water. Refer to engineers details and specification
2. **Freezing conditions:** Do not place fill on frozen surfaces. Remove material affected by frost. Replace and recompact if not damaged after thawing. Refer to engineers details and specification
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. Refer to engineers details and specification
5. **Earthmoving equipment:** Vary route to avoid rutting. Refer to engineers details and specification

535 Compaction generally

1. **General:** Compact fill not specified to be left loose as soon as possible after placing. Refer to engineers details and specification
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. Refer to engineers details and specification
3. **Defective areas:** Remove and recompact to full thickness of layer using new material. Refer to engineers details and specification

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. Refer to engineers details and specification
2. **New filling:** Spread and compact to ensure maximum continuity with previous filling. Refer to engineers details and specification

550 Geotextile sheet

1. **Manufacturer:** Refer to engineers details and specification
 - 1.1. **Product reference:** Refer to engineers details and specification
2. **Type:** Refer to engineers details and specification
3. **Polymer type:** Refer to engineers details and specification
4. **Recycled content:** Refer to engineers details and specification

5. **Jointing:** Refer to engineers details and specification
6. **Preparation of subgrade:** Refer to engineers details and specification
7. **Protect from**
 - 7.1. Exposure to light.
 - 7.2. Contaminants.
 - 7.3. Materials listed as potentially deleterious by geotextile manufacturer.
 - 7.4. Wind uplift.

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:** Refer to engineers details and specification

3. Provide daily records of testing of the material placed to show compliance with the specification.
The minimum requirements are: Refer to engineers details and specification
 - 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

621 Subgrade improvement layer (capping)

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

627 Compacted general filling

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

701 Backfilling around foundations

1. Under oversite concrete and pavings: In accordance with: the Engineer's drawings & 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's drawings & specification

731 Blinding

1. In accordance with: the Engineer's drawings & 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 earthworks and/or landscape 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 CA/Landscape Architect: if 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: . 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

D20

Excavating and filling

Generally/the site

1 General

1. To be read in conjunction with the Engineer's Specification. Where relevant, the engineers specification includes but is not limited to clauses relating to:
 - 1.1. Excavations and safe working practices when carrying out excavations, including but not limited to:
 - Adjacent excavations
 - Excavations adjacent to existing backfilled trenches
 - Excavations adjacent to existing foundations
 - Excavations adjacent to pile supported structures
 - Excess excavations
 - Backfill to excavations lower than foundation formation level
 - 1.2. Permissible deviations from formation levels
 - 1.3. Accuracy – linear dimensions
 - 1.4. Inspecting formations
 - 1.5. Anything relating to foundations and pile supported structures
 - 1.6. Unstable Ground
 - 1.7. Recorded and unrecorded features
 - 1.8. Existing watercourses
 - 1.9. Water
 - 1.10. Ground water level, springs or running water
 - 1.11. Pumping
 - 1.12. Permanent Drainage Systems
 - 1.13. Engineering fills and subgrade improvement layers, including but not limited to:
 - Proposed fill materials
 - Hazardous, aggressive or unstable materials
 - Limitation of sulfate content in fill materials
 - Frost susceptibility
 - Testing of suitability of fill materials before start of filling
 - Placing fill
 - Compacting fill that is not specified to be left loose
 - Benching in fill
 - Geotextile sheets, Geogrids, Geonets, Geocells, Buried erosion control geomats
 - Any unbound mixtures, subgrade improvement layers or compacted fill materials, capping layers (also see landscape specification clause **D20/620A**)
 - Protection of compacted filling
 - Backfilling around foundations
 - Hardcore filling
 - 1.14. Contaminated soils and their remediation or environmental controls such as gas venting layers and contaminant barriers.
 - 1.15. Any specification for highway works

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 that 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: Groundworks Contractor
2. It is assumed that the formation levels/bulk subsoil placement will be carried out by: Groundworks Contractor
3. It is assumed that the fine grading works, including ripping in preparation to receive topsoil, will be carried out by: Landscape Contractor
 - 3.1. 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 Q28/55 will be carried out by: Landscape Contractor
5. The Main Contractor is to submit proposed Contractor responsibilities for the groundworks packages noted above to the: CA/Landscape Architect

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.

110 Site investigation

1. **Report:** Refer to CA

115 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. Refer to relevant clauses within Section **C11** of this specification for further details/requirements.
3. For Topsoil refer to clause **C11/243** of this specification for further details/requirements.
4. For Subsoil refer to clause **C11/244** 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.

150 Existing services, features and structures

1. **Services:** Refer to Engineer's drawings
2. **Site features to be retained:** For existing trees refer to retained trees plan
3. **Structures:** Refer to Engineer's drawings
4. Verify with CA/landscape architect which 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.

Clearance/excavating

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 Landscape Architect/Arboriculturalist prior to their removal.
 - 4.2. Check for below and above ground services in the vicinity. Inform CA 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 CA/Landscape Architect 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 CA/Landscape Architect 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's approval prior to construction work commencing.

162 Protection of vegetation retained

1. **Existing trees:** Trees remain on site are to be retained in accordance with the approved planning drawings. The Contractor may be liable for any damage to the trees which may result in prosecution from the Local Authority
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 CA 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 CA/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 within the Arboricultural Impact Assessment (AIA) Do not cut roots within a Protected Area
9. Excavation in a Protected Area:
 - 9.1. Method: In accordance with the AIA and subject to approval of method statement by the Arboricultural Consultant
 - 9.2. Backfill as soon as possible or temporarily line with polyethylene sheet to reduce evaporation.
10. Cutting exposed/damaged roots:
 - 10.1. Do not cut roots within a Protected Area without approval by the Arboricultural Consultant
 - 10.2. Make clean smooth oblique cuts, with no ragged edges, to good arboricultural practice
 - 10.3. Pare cut surfaces smooth with a sharp knife
 - 10.4. Treatment of cut roots: In accordance with the AIA
 - 10.5. Keep exposed roots moist (by covering with damp Hessian sacking) until covered by new construction works
11. **Outside Protected Area(s):** Give notice of roots exceeding 25mm and do not cut without approval
12. **Backfill:** In accordance with the AIA

163 Special tree protection measures

1. Certain trees require special protection measures during the construction of adjacent walls, surfaces and edges. These are identified on the Tree Protection Plan, and works in the vicinity of affected trees should comply with the following:
2. **Construction of Roadways/ Paths/ Kerbs Above Existing Tree Roots**
 - Submit a Method Statement for all works within the tree protection zones
 - Allow for carrying out all works within the tree protection zone by hand

- 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.
- Excavate to required formation level between protected roots ensuring that smaller roots are clean cut at end closest to tree trunk.
- Form clean smooth cuts with a hand saw, minimising the wound area and avoiding ragged edges.
- Place load bearing geotextile mat to Engineer's Specification.
- Carefully backfill between roots with approved sub base material avoiding damage to protected roots.

3. **New Walls/ Earthworks Cutting into Existing Tree Root Zones**

- Where proposed walls or earthworks cut into ground around existing tree take necessary measures to minimise impact on existing roots
- Notify the CA/Landscape Architect if roots exceeding 40mm Ø are exposed by excavations
- Do not cut roots in the protected area without approval of the CA
- 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
- 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
- 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:** as per arboricultural consultants recommendations
2. **Excavation in protected area**
 - 2.1. **Method:** By hand Contractor's choice
 - 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:** Not required
5. **Backfill:** As dug material, enriched with amelioration as section Q31

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 the local authority
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 local authorities' Tree Officer/Landscape Architect 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 the local authorities' 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 the local authorities' 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 the CA/Landscape Architect following inspection, including subsoil decompaction, topsoil depths, and seeding and turfing as appropriate. Seed mix or type of turf shall be instructed by CA/Landscape Architect

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 Forest Industry Safety Accord safety leaflets.

175 Felling large trees

1. **Definition:** Girth over 600 mm.
2. **Identification:** Clearly mark trees to be removed.
3. **Safety:** Comply with Forest Industry Safety Accord safety leaflets.
4. **Felling:** As close to the ground as possible.
5. **Stumps:** Obtain approval before removing by winching. Do not use other trees as supports or anchors
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. 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. 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
3. Materials arising from the excavations, and surplus to requirements for filling or reuse, are to be removed from site
4. 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
5. Before beginning general excavation or filling, excavate topsoil from areas where there will be regrading, building works, paving/roads, site compounds and other areas, as specified
6. Clearly mark out on site the extent of all areas to be stripped as defined on the Contract Drawings
7. No topsoil stripping shall take place when, in the opinion of CA, conditions are wet, frozen or such that soil structure damage may occur, especially following prolonged rainfall
8. Excavate trial holes (min 500x500x500mm) prior to stripping in order to confirm topsoil and subsoil depths (in locations as requested by CA). Give notice where the depth of topsoil is difficult to determine.
9. Topsoil stripping shall be carried out using the most appropriate machinery in order to avoid compaction and soil structure damage
10. Machine movement over the unstripped topsoil shall avoided
11. Stripped topsoil shall be transported, whenever possible, directly to its final location and evenly spread to specified depths in order to prevent more handling than necessary
12. 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.
13. Allow for making adjustments to setting out as directed on site
14. Collect and dispose of all loose rubbish, metal, stones, etc., lying on the areas to be stripped
15. Carefully strip to the full depth of organic topsoil over any areas to be stripped
16. Protected Area(s):
 - Refer to Clause D20/162 - 165
 - Do not remove topsoil from within a Protected Area without CA/Arboricultural Consultant approval
 - No mechanical stripping is to be carried out within the branch spread of any tree to be retained
 - Allow for handworks/approved mechanical works only within a Protected Area
17. Handle topsoil for reuse or sale in accordance with clause 225.
18. Topsoil must not be buried by subsequent operations
19. [Site storage](#): Keep separate from excavated sub-soil

221 Treating topsoil

1. **Treatment:** Apply a suitable translocated nonresidual herbicide.
2. **Timing:** Not less than two weeks before excavating topsoil.

225 Handling topsoil

1. **Standard:** To BS 3882.
2. **Aggressive weeds**
 - 2.1. **Species:** Notify the presence of 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.

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

400 Reuse of site-won topsoil

1. Preliminary site investigations to be undertaken to establish the suitability of existing site topsoil for re-use within the proposed landscape works.
2. The Contractor is responsible for ascertaining accurate quantities necessary for the execution of the works, including confirming that there is sufficient quantity of suitable site-won topsoil available to complete the works or, if applicable, any deficiency in available on-site topsoil
 - 2.1. Quantities to be confirmed, and agreed, with CA at Tender stage
3. Any deficiency of suitable existing site topsoil, as agreed at Tender stage, shall be imported by the Contractor to fulfil the requirements of the Contract
4. Any deficiency in topsoil supply (additional to that agreed at Tender stage) shall be imported by the Contractor at no additional cost to the Contract
5. All imported topsoil to be in accordance with the relevant clauses of Section **Q28** of this specification
6. All suitable on-site topsoil, within areas to be stripped as defined on the Contract Drawings, to be stripped in accordance with Section **D20** of this specification
test

401 Disposal 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 CA for 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 the contract drawings, 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 Tender stage
5. Any deficiency in topsoil supply (additional to that agreed at Tender stage) shall be imported by the Contractor at no additional cost to the Contract

410 Excavated topsoil storage

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

420 Topsoil storage

1. **Location:** Refer to CA
2. **Standard:** To BS 3882.
3. **Height (maximum):** not to exceed more than 2m unless otherwise authorised by the CA/landscape architect
4. **Protection**
 - 4.1. Do not place any other material on top of storage heaps.
 - 4.2. Do not allow construction plant to pass over storage heaps.
 - 4.3. Prevent compaction and contamination.
 - 4.4. Stockpiles shall be kept free of pernicious weeds. All arisings consequent upon this operation shall be removed off site to tip.
 - 4.5. 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. Areas designated for topsoil storage shall be stripped of topsoil first
 - 4.6. Topsoil stockpiles shall be kept free of pollutants and other materials at all times.
 - 4.7. Topsoil shall not be stored with subsoil.
 - 4.8. Topsoil to be free of vegetation (either present at time of original stripping or subsequent growth on stockpile), at time of spreading.
 - 4.9. 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 6 months and shall be re-seeded with green manures as required.
 - 4.10. Vehicles used to transport the topsoil, or any other vehicle, must not be allowed to run over the heaps at any time.
 - 4.11. 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.
 - 4.12. Topsoil shall not be allowed to be contaminated with subsoil or any other unsuitable materials.
 - 4.13. Subsoil storage heaps shall not be formed on areas until underlying topsoil has been stripped.

422 Management of topsoil heaps

1. Topsoil Quantities:
 - 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 '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):
Kings Seeds
Monks Farm, Pantlings Lane
Coggeshall Road
Kelvedon, Colchester CO5 9PG
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: No heavy machinery shall be used on topsoil stores

430 Subsoil stripping, storage, reuse & disposal - 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:
 - 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 architect'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:
25% Italian Perennial Rye Grass
15% Chewings Fescue
10% Hard Fescue
20% Slender Creeping Red Fescue
15% Highland Browntop Bent
5% Hula White Clover
10% Common Vetch
 - 2.3. Seeds may be obtained from (or equal & approved):
Kings Seeds
Monks Farm, Pantling Lane
Coggeshall Road
Kelvedon, Colchester CO5 9PG
T: 01376 570 000
 - 2.4. Sowing to be carried out by approved lightweight machinery or hand only
3. Maintenance & Handling:

- 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:** Locations TBC with CA
 - 2.2. **Protected areas:** Do not raise soil level within root spread of trees that are to be retained.
3. **Remaining material:** Remove from site.

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.

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 before starting filling

520 Frost susceptibility

1. **General:** Except as allowed below, fill must be non frost-susceptible as defined in the '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:
 - 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.

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:
 - Material from marshes or bogs
 - Peat, logs, stumps, slurry, mud and/or perishable material
 - Material susceptible to spontaneous combustion
 - Material in a frozen condition
 - Clay in liquid limit exceeding 80 and/or plasticity index exceeding 55
 - Material with excessive moisture content
 - 2.2. Subsoil should have a pH within the range: 5.5 - 8.5
 - 2.3. Phytotoxic contaminant levels should meet the requirements for imported topsoil -: **Q28**
 - 2.4. Zootoxic contaminant levels should meet the requirements for imported topsoil -: **Q28**
 - 2.5. Subsoil should be excavated natural subsoil having a proportion of organic matter

610 Compacted filling for landscape areas

1. **General:** Compact fill not specified to be left loose as soon as possible after placing.
2. **Fill:** Material capable of compaction by light earthmoving plant.
3. **Filling:** Layers not more than 200 mm thick. Lightly compact each layer to produce a stable soil structure.
4. **Surface preparation:** The top surface of the fill (or existing substratum) should be broken up to allow roots to penetrate and restrain topsoil slip on sloping ground - refer to **D20/790** and section **Q28**

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 with 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

620 Subgrade improvement layer (capping)

1. **Fill:** To Engineer's details and specification

620A Stabilized capping layers using either lime, or cement, or lime and cement

1. Do not use below areas of soft landscape

- 1.1. Stabilized capping layers using either lime, or cement, or lime and cement change the pH of the soil and impair drainage. They are therefore detrimental to plant health. Any stabilised capping layers that have been installed or spread into areas below soft landscape must be broken out.

750A Pond liner

1. **Description:** To Engineer's specification. Installation to specialist contractor/ Engineer's details
2. **Note:** The Trade contractor is to ensure a minimum depth of topsoil is provided over the liner as detailed. The Trade Contractor shall ensure topsoil profiles are carefully placed avoiding potential damage to the liner and geo textile. Methodology to be submitted for CA/ Landscape Architect's approval.

790 Subsoil preparation

1. Formation levels /bulk subsoil levels are to be placed by the Groundworks 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 CA if 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. Decompress 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 CA/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

D41

Crib walls, gabions and other gravity retaining walls

To be read with preliminaries/ general conditions.

1 Scope of Landscape specification section D41

1. Note the following specification for *D41 gabions walls* is to inform the architectural look / visual appearance of the gabion. For structural performance/ requirements refer to Engineer's details and specification

10 Reference documents

1. BS8002:1994: *Code of Practice for earth retaining structures* + AMD8851, AMD12062, AMD13386
2. C516 Modular gravity retaining walls: Design Guidance: , CIRIA, 2000
3. BS EN ISO 1461:2009: *Hot dip galvanized coatings on fabricated iron and steel articles. Specification and test methods.*
4. BS EN ISO 9001:2000: *Quality Systems - Model for Quality Assurance in production, design and development installation and servicing*
5. BS EN ISO 10244-2:2009: *Steel wire and wire products. Non-ferrous metallic coatings on steel wire. Zinc or zinc alloy coatings.*
6. BS EN ISO 13431: 1999: *Geotextiles and geotextile-related products - Determination of tensile creep and creep rupture behaviour*
7. BS1052:1980: *Specification for mild steel wire for general engineering purposes* + AMD6530
8. BS3882:2015: *Specification for topsoil*
9. BS4483:2005: *Steel fabric for the reinforcement of concrete. Specification.*
10. BS8006-1:2010: *Code of practice for strengthened/reinforced soils and other fills* + A1:2016

210 Gabion to Wall Type 01 (WT01) & (WT02)

1. Manufacturer: **Enviromesh or equal & approved**

Enviromesh, Unit 4, Cartwright Ind Est, Spring Garden Road, Longton, Staffordshire, ST3 2TE
Telephone: +44 (0)1782 692310
Email: enquiries@enviro-mesh.com
Online: www.enviro-mesh.com

- 1.1. **Product reference:** Bi-axial welded mesh gabions or equal & approved, To be read in conjunction with Engineer's specification
2. **Configuration:** Supplier to site measure and submit shop drawings for approval
 - 2.1. **Sizes:** 975mm(L)x 450/675mm(W)x Varies(D), to be read in conjunction with Engineer's specification. Gabions to be modified to suit site dimensions by cutting the mesh back to the next transverse mesh wire.
 - 2.2. **Mesh:** To Architectural finish, example Galfan coating.
Mesh size: 75mmx75mm,
Nominal wire diameter shall be 4.0mm for the body of the gabion and 5.0mm for the facing mesh panels
 - 2.3. **Diaphragm:** 4 mm galvanized 75mm x 75mm weldmesh, subject to review by Engineer and meeting structural performance/requirements specified by Engineer.
 - 2.4. **Notes:** Gabion units to be supplied with helical connectors for exposed vertical joints between gabions and lacing wire for horizontal joints.
 - 2.5. **Jointing:** Gabions shall be provided with locking pins for assembly and with lacing wire of 2.5mm nominal wire diameter (all in accordance with the corrosion specified) for final jointing.

All joints on the facing panels are to be secured with helical wire connectors to approval. Units are to be supplied with loose helicals of length 25mm less than the height of the inclined panel for jointing.

- 2.6. **Special pre-formed units:** Pre-formed units in the sections defined on the overall general arrangement plan are required at the corners. These gabion units shall be pre-formed in accordance with the dimensions on the setting out plans.
3. **Fill to units**
 - 3.1. **Material:** Natural stone sourced from a local quarry - To be hard, durable and frost resistant (rock or stone type), suitable for use in gabion structure. Contractor to submit proposal. Confirmation of source and sample of stone in advance of installation.
 - 3.2. **Size/ grading:** Fill to have a minimum dimension not less than the mesh opening and a maximum dimension of 150mm and be well graded (anticipated sizes 80 - 150mm)
4. **Substrate:** To Engineer's detail and specification
5. **Batter of wall face:** To Engineer's detail and specification
6. **Geotextile:** To Engineer's detail and specification
7. **Other requirements:** - Fill to be packed tightly to minimise voids and the rockfill on the exposed face of the gabion is to be handpacked.

-Units shall be filled such that the mesh lid bears onto the rock fill. The lid shall be wired down on all joints and across the diaphragms.

- Particular attention shall be paid to the selection and packing of the outer rockfill to achieve consisting in colour, texture, durability and finish, within parameters established by the control sample panel.

- Inclined faces to be smooth and free from steps or abrupt irregularities.

- Lids to be wired down on all joints and across the diaphragms

- The finished work to satisfactory appearance, uniform, regular, true to line, level and plane with a satisfactory fit at all junctions, all in accordance with the approved sample panel section.

-Internal preformed cross bracing ties minimum 4, per 1sqm at 1/3rd points vertically and horizontally on 1m deep units and 2 at mid height at 1/3rd points horizontally on 0.5m deep units.

-Adjacent units to be jointed by interlinking vertical spirals and inserting locking pin and lacing at the front and rear faces on horizontal joints.

-The exposed face is to be smooth and free from steps or abrupt irregularities. Angle of inclination to be in accordance with the engineers' drawings.

-The helical wires to be supplied in addition to the lacing wires to encompass the cut ends of the mesh wires and reduces the probability of catching/snagging.

-Gabions to be of architectural quality. Poor quality gabions shall not be accepted.

8. **Tolerance:** The gabions are to be placed and fixed within 25mm of the defined position on the general arrangement plan. No steps, irregularities or deviations from line are permissible.

The gabion system must accommodate any given tolerances and for differences between actual site dimensions and drawing dimensions and for ensuring that repetitive units can be accurately located in relation to gridlines.

No effects of settlement deflection, expansion or contraction to which the gabion structures are normally subjected, shall be permitted to affect the appearance or functioning of the gabion walls. The gabion wall shall remain rigid and free from undue play and measurable permanent

deformation caused by their self-weight, wind load or the normal use to which they will be subjected

250 Assembling and installing

1. **Description:** Gabions to Wall type 01 and Seat type 04
2. **Fixings:** To manufacturer's recommendation
 - 2.1. **Individual ties of lacing wire:** Gabion units to be supplied with helical connectors for exposed vertical joints between gabions and lacing wire for horizontal joints.
3. **Assembly**
 - 3.1. Starting from top corner join edges of adjacent panels together in a continuous operation.
 - 3.2. Join to adjacent units, above, below and on all sides.
 - 3.3. **Internal bracing:** To supplier and engineer's details and specification
4. **Installation**
 - 4.1. **Vertical joints:** Staggered in adjacent courses.
 - 4.2. **Stepped constructions:** Align bottom edge wire of upper baskets with a longitudinal wire of mesh of lower baskets. Provide continuous lacing along all horizontal joints at front and rear of wall.
5. **Filling**
 - 5.1. Maintain shape of basket during filling.
 - 5.2. Fill to full height in sequence recommended by manufacturer.
 - 5.3. **Top mesh:** To bear upon fill.
 - 5.4. **Lid:** Fix securely.
6. **Backfill:** Place and compact at each course as work proceeds.

610 Working drawings

1. Provide working drawings showing the following: the gabion walls
2. - All formwork and temporary works details- Details of all ties, fittings, features, associated formwork and temporary works shall be included- All interfaces, particularly in respect of corner junctions, services and interfaces with other elements such as pond inlet and outfalls- Geogrid reinforcement arrangement- Steel mesh facing panels- Cross sections through Gabion wall and seat- Elevation of Gabion wall and seat
3. Working drawings to be submitted to the prior to commencement of:
4. Typical details will not be accepted

615A Submittals

1. Provide tender submittals in accordance with the requirements of this Specification
2. Submit a response with the Tender proposal to demonstrate ability to provide the required surface finishes, appearance and structural performance
3. The Tender response shall include the following:
Proposals indicating how the specified surface finishes & appearance will be achieved- A method statement describing the construction of the Gabion Wall and Seats(s), including fill, surface finishes and appearance- Details of previous project quality benchmarks- Samples (where specified)- QA/QC procedures- A copy of the current BBA certificate- Confirmation of the Professional Indemnity and Product Liability insurance cover - Sample design calculations for the proposed walls in compliance with HA68/94 or BS8006 as appropriate- List of proposed Working Drawings- Summary of proposed deviations from the Specification- Outline Technical Specification(s) reflecting proposed methodology, including any requirements for, or limitations on, the backfill used in the structure to ensure the design life.- Evidence of previous experience for design and construction of gabion walls with a minimum height of 3m and a minimum in-service life of 20 years- List of previous projects where similar high quality surface finishes, appearance and

structural performance have been achieved. - Sample of fill stone, comply with engineer's requirements for structural performance - Details of integration of pond inlets and outfall on gabion walls. - Photographic samples of proposed fill material.

617A Notice of intentions

1. The Contractor shall give: notice to the of the intention to commence any of the following works/operations:
2. - Gabion wall setting out- Installation of gabion wall- Approval of outer face of gabion fill.
- Control sample to be approved by Landscape Architect and Engineer prior to installation of the wall.

620 Contractor's benchmarks from previous projects

1. Provide the following details of benchmarks from previous projects;
 - Type of public area, e.g. park, public realm, streetscape, infrastructure, etc.
 - Location
 - Date work carried out
 - Name of Architect/Landscape Architect and/or Engineer
 - Name of Client

630 Foundations

1. Gabion structure to be constructed on a firm base
 - 1.1. any soft spots to be removed and replaced with well compacted granular material to Engineer's details and specification
2. In accordance with Engineer's details and specification

635A Drainage

1. The Contractor is to ensure that the gabion wall is free draining and/so that there is no adverse build up of pore pressures.
2. For all drainage requirements refer to Engineer drawings/ details and specification

Ω End of Section

E10

In situ concrete **REVISED**

Clauses

11 Generally

1. To be read in conjunction with Preliminaries/General Conditions
2. To be in accordance with the Engineer's: Specification.
3. This section of the Specification, when read in conjunction with the Design Drawings, provides particular requirements with respect to the following:
 - a) Insitu concrete finishes to Walls (WT03 and WT04); and Steps (SP02).

Refer to Section E41 for details of exposed concrete finish requirements.

12 Descriptive Works

1.
 - a) This section specifies requirements for the landscape architectural finishes for Insitu concrete elements where exposed to view.
 - b) All Insitu concrete shall 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. All materials and methods selected by the Contractor shall be made so as to ensure the specified finishes.
 - c) Comply with the requirements for samples, benchmarks, etc., as specified for the proposed finishes and co-ordinate the work accordingly.
 - d) The client shall be allowed access to the Contractor's place of manufacture, finishing and off-site storage
 - e) The Contractor is to produce details / shop drawings as required to be submitted for approval. Such drawings will be reviewed for compliance with the design requirements shown on the contract drawings. The contractor shall be responsible for all dimensions shown on his drawings and schedules.
 - f) Complete the Detailed Design of all interfaces with adjoining trades prior to commencement of manufacture. All interfaces shall be fully co-ordinated prior to commencement.
 - g) Contractor should note the requirements for lighting / integrated ducting to the face of the RC walls are to be confirmed by the appointed Lighting supplier once details are known.

15 Specification

1. Concrete generally: To BS EN 206-1 and BS 8500-2.

17 Structural Requirements

1. General: For all structural performance requirements, refer to the Structural Engineer's Specification.

18 Quality Control

1. General: Accurate weight batching and control of aggregate moisture content is essential in the production of good visual concrete. The Contractor is required to monitor the moisture content of the aggregates regularly and adjust free water content to maintain the correct total water- cement ratio. Wet batched or pre-batched concrete is required for visual concrete production. In this instance truck mixers shall only be used to agitate the mix.

Truck delivery tickets must show clearly the batch weights of all mix constituents, including the free water content and water-cement ratio. The mix constituents, especially the cement content and water content must not vary between batches, as this will change the surface colour of the compacted concrete.

At the start of operations the concrete shall be sampled from the truck mixer before discharge and

slump tested to check the uniformity of the mix. The loss of slump shall be checked for the journey time from the batching plant to the site and adjusted by retardation or the like to ensure there is only minimal loss of slump.

It is essential that the Contractor ensures that the concrete supplier puts in place quality control checks on each concrete load before dispatching it to the site – the concrete supplier must state what controls and procedures will be in place to ensure consistency of supply. Written evidence of this process will be required to be submitted for approval and random checks will be undertaken to ensure that these control procedures are in place.

Truck mixers shall be thoroughly cleaned at the batching plant, particularly the rim of the entry hopper of the drum and delivery chute, prior to loading of wet- batched concrete. There should be no traces of previous concrete or marks on the truck mixer or the wet batched pan or whatsoever that might discolour the mix.

19 In-situ Concrete Workmanship REVISED

1. **Planning the Concrete Placing :** a) The Contractor is to ensure consistent supply of all materials and concrete, good workmanship and best curing conditions for the concrete. Formwork must be completed and fully in position the day before to permit inspection and approval, including concrete platforms and compaction equipment.

b) For successful placing and finishing it is necessary to have operatives ready and briefed about their tasks before the concrete arrives on site and with all appropriate equipment and tools in place.

c) Have all the formwork completed and approved and equipment in place ready to receive the concrete well before it is due to arrive.
2. **Formwork Generally:** a) Formwork shall be of such construction that casting deviations can be readily controlled to give compliance with the Specification.

b) Formwork shall be maintained in clean, sound condition and inspected carefully for defects before each reuse. Damaged formwork shall not be repaired and reused if this would impair the surface appearance of the units.

c) Where applicable, formwork shall be coated evenly with a suitable release agent, which shall not be allowed to touch the reinforcement. Application shall be such as to prevent puddling or concentrations in corners, etc.

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

e) Any joints and fixings in formwork 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.

f) The formwork shall have no variations in stiffness that may produce differences in vibration across the surface.

g) The formwork shall be replaced after the agreed maximum number of casts, or upon discovery of damage or defects whichever is the sooner.

h) Before casting, ensure that formwork has been checked to be free of all dirt, reinforcement clippings or other debris.

i) Formwork for features, etc. shall not have any splits, cracks or other defects.

j) Formwork shall be cut in such a manner that reinforcement and built-in components passing through the Formwork are maintained in position; the joint shall be tight and shall not permit grout loss.

k) 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.

l) 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 Landscape Architect.

m) Unless otherwise indicated on the Design Drawings, 15mm pencil round shall be provided for all external angles of 90° or less in concrete surfaces with plain or fine finishes.

20A Working Drawings

1. **General** : a) The Contractor is to provide workshop drawings showing all concrete works/ joints; formwork and temporary works details.

b) Details of all fittings, features, associated formwork and temporary works for installation shall be included.

c) Typical details will not be accepted.

20B Quality Control/ Monitoring Requirements

1. **General** : a) Proposals shall be submitted for ongoing monitoring and quality control of the concrete with the Tender submission.

b) Set up a system of "Hold" and "Monitor" points in the works to ensure that the quality achieved is accepted prior to further pours proceeding.

c) As soon as possible after any concrete has been deemed as unacceptable within the requirements of the Specification, submit proposals for the removal and reconstruction of that section of the works. This requirement applies to all elements of the works.

20C Batching, Mixing and Transport

1. **General** : a) 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.

b) 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 the full size quality-control mock up.

c) Consideration shall be given to the use of a dedicated main mixing and batching plant to avoid contamination of the mix. A stand-by back-up plant shall also be available that is capable of providing equivalent mix and batching facilities. The use or otherwise of such a plant shall be stated in the Contract documentation.

20D Inserts, Holes and Chases

1. **General** : a) 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 approval of the client.

b) Plan for and form all holes and chases. Do not cut hardened concrete without acceptance.

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

construction.

d) Holes for fixing balustrades and handrails to be core-drilled neatly into the in-situ concrete elements.

20E Built-in Components

1. **General** : a) Built-in components such as recesses for lighting, carborundum anti slip strips, fixings, hazard warning strips/paving etc to be incorporated into insitu concrete steps and terraces and walls and cast as detailed on the drawings.
- b) Avoid cutting hardened concrete to provide holes or chases.
- c) Formwork shall be rigid and free from movement that shall affect their performance with regard to tolerances or colour of concrete. Allow for all necessary mid-rib reinforcement of the formwork.

31B Production Quality Control

1. **General**: a) The first wall and terrace step units produced shall be inspected at the works for approval. If its appearance is accepted it shall be clearly recorded as a control standard for appearance of subsequently produced areas.
- b) Allow for inspection of all areas of the works and provide adequate space and facilities for full inspection of all surfaces.

31C Inspection

1. **General**: Carefully inspect and check all completed wall and terrace step units for match with accepted sample(s) and compliance with the Specification before submitting areas for approval by the client.

32 Surface Tolerances and Acceptable Finish REVISED

1. Proposed elements and finishes:

INSITU CONCRETE ELEMENTS	INSITU CONCRETE FINISH Refer to detail description for tolerances and acceptable finish	DRAWINGS REQUIRED
Insitu concrete retaining wall WT03	Coordinated lines for jointing; fixings and expansion. Pencil edge to top of wall. Refer to Engigneer specification.	Refer to Engineers drawings
Insitu concrete retaining wall WT04	Coordinated lines for jointing; fixings and expansion. Pencil edge to top of wall. Refer to Engigneer specification.	Refer to Engineers drawings
Insitu concrete step SP02	Coordinated lines for jointing; fixings and expansion. Refer to Engigneer specification.	Refer to Engineers drawings

33A Insitu Concrete Finish to Walls

1. **General**: a) Smooth dense, even-coloured, blemish-free as-struck finish, to provide Class 1, Type B surface finish to BS 8110: Part 1, uniform in appearance.
- b) The finish shall have the following additional requirements:

- i) Crack widths in the exposed surfaces of the concrete shall not exceed 0.3mm.
- ii) Smooth dense as-struck finish with an acid-washed finish to be applied to all visible in-situ concrete to beams and columns.
- iii) A smooth, matt, dense, even-coloured, blemish-free concrete surface using grey/ white cement to match samples.
- iv) The finishes shall be uniform in colour and appearance throughout the works.
- v) The surfaces shall be free from discolouration caused by contamination from release agent, grout leakage, rust staining or other sources.
- vi) 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.
- vii) 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 and approved shop drawings.
- viii) There shall be no uneven distribution of aggregate across all visible faces of concrete terraces, walls or steps.
- ix) Other requirements: Pencil round edges to Terraces; Steps and Walls as defined on the detail drawings.
- x) 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.

There shall be a minimum of abrupt changes to formed surfaces between panel joints. Corners, joints and interfaces between different forming materials and shall be true and of uniform appearance.

xi) The exposed concrete surface shall be free of noticeable and heavy discolouration due to formwork deterioration, scuff marks, release agent, lime streaks, rust marks or construction damage. There shall be no grout runs or honeycombing visible when the concrete is seen from two metres away. Hydration patination marks, very small localised grout loss at arises and at construction joints and minor marks will be tolerated. The intent is to minimise the presence of blowholes but it is acknowledged that blowholes cannot be entirely avoided. As an indication of a standard of acceptability to be observed: air voids/ blow holes of maximum size 3mm will be permissible provided there are not more than 5 nominally in any square metre of surface.

34 Protection of the Works

1. **General:**
 - a) Provide full and adequate protection for the works during and after installation.
 - b) 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.
 - c) The protective measures used shall not in any way permanently mark or damage the concrete finishes.

60 Placing and compacting

1. **Surfaces to receive concrete:** Clean, with no debris, tying wire clippings, fastenings or free water.
2. **Timing:** Place as soon as practicable after mixing and while sufficiently plastic for full compaction.

3. **Temperature limitations for concrete:** 30°C (maximum) and 5°C (minimum). Do not place against frozen or frost covered surfaces.
4. **Compaction:** Fully compact to full depth to remove entrapped air especially around reinforcement, cast-in accessories, into corners of formwork and at joints. Continue until air bubbles cease to appear on the top surface.
 - 4.1. **Methods of compaction:** To suit consistence class and use of concrete.

Deleted clauses

~~20F Colour Consistency~~ **DELETED**

~~20G Aggregates~~ **DELETED**

~~31 Materials Generally~~ **DELETED**

~~33B Corrective Works~~ **DELETED**

~~33C Damaged Insitu concrete Areas~~ **DELETED**

~~33 Definitions for Surface Finish of Concrete~~ **DELETED**

~~34A Cleaning~~ **DELETED**

Ω End of Section

E41

Worked finishes to in situ concrete **REVISED**

To be read with preliminaries/ general conditions.

10 Finishing generally

1. **Timing:** Carry out finishing operations at optimum times in relation to the setting and hardening of concrete.
2. **Prohibited treatments to surfaces:**
 - 2.1. Wetting to assist surface working.
 - 2.2. Sprinkling cement.

10A General notes

1. This section of the specification, when read in conjunction with the Design Drawings, provides particular requirements with respect to the following: a) Insitu concrete finishes to walls (WT03 & WT04); Steps (SP02):
2. The Specification is to be read in conjunction with all relevant Engineers Specifications and all Contract Drawings and Preliminaries/General Conditions. :

110 Wall Type WT03 **REVISED**

1. **Description:** Retaining wall to Engineer's details.
2. **Size:** Refer to Hardworks Plans - RD001-FCB-XX-XX-DR-L-3101 & 3102, 3302 and 5301

110A Wall Type WT04 **REVISED**

1. **Description:** Retaining wall to Engineer's details.
2. **Size:** Refer to Hardworks Plans - RD001-FCB-XX-XX-DR-L-3101 & 3102

110B Step Type SP02 **REVISED**

1. **Description:** In-situ concrete step SP02
2. **Size:** Plan dimension - 2890mm (L)x300mm (W) x 150mm (Exposed H)

Refer to Hardworks Plans:RD001-FCB-XX-XX-DR-L-3101,3102 & 5301

3. **Notes:** Control joints in consecutive steps to match.
4. **Additional requirements:** Contractor to allow for recess in steps for fixing of carborundum non-slip tread inserts.

Method of fixing: Steps to be cast with a recess to receive the contrasting nosing. Fixing to manufacturer's details.

Epoxy adhesive suitable for bonding the Carborundum strip and can withstand submersion in water.

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

115 Precast concrete kerb (KT01)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
 - 1.1. **Product reference:** Fusion kerb or equal & approved
2. **Size:** 145mm (W) with 125mm exposed upstand; Square profile.

When laid next to rain gardens allow for breaks in the upstand kerb. Large flush kerbs of 500mm(L)x255mm(W) to be laid in the breaks. Allow for special corner units on either side of break.
3. **Special shapes:** Corner and radius kerbs
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples
6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs
9. **Note:** Next to rain gardens: Breaks to be provided in between the kerbs at 3.2m spacing to allow the surface water to flow into the rain garden. Spacing of breaks to be confirmed in coordination with adjacent access road designed by others.

115A Precast concrete kerb (KT02)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
 - 1.1. **Product reference:** Fusion kerb or equal & approved
2. **Size:** 255mm (W) flush kerb, flat top
3. **Special shapes:** Corner and radius kerbs
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples
6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs

115B Precast concrete kerb (KT03)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736

- 1.1. **Product reference:** Fusion kerb or equal & approved
2. **Size:** 145mm (W) flush kerb, flat top
3. **Special shapes:** Corner and radius kerbs
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples
6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs

115C Precast concrete kerb (KT06)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
- 1.1. **Product reference:** Fusion edge or equal & approved
2. **Size:** 75mm (W) pin kerb, flat top
3. **Special shapes:** Corner and radius kerbs
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples
6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs

115D Precast concrete kerb (KT07)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
- 1.1. **Product reference:** Fusion kerb dropper or equal & approved
2. **Size:** 145mm (W), double drop kerb
3. **Special shapes:** Radius kerb
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples
6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs

115E Precast concrete kerb (KT04)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
- 1.1. **Product reference:** Fusion kerb or equal & approved
2. **Size:** 145mm (W), 100mm upstand square profile
3. **Special shapes:** Corner kerbs
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples

6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs

115F Precast concrete kerb (KT05)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
1.1. **Product reference:** Fusion kerb or equal & approved
2. **Size:** 145mm (W) , 60mm upstand square profile
3. **Special shapes:** Corner kerbs
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples
6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs

115G Precast concrete kerb (KT08)

1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
1.1. **Product reference:** Fusion kerb dropper or equal & approved
2. **Size:** 145mm (W), double drop kerb
3. **Special shapes:** Radius kerb
4. **Finish:** Textured
5. **Colour:** Silver, subject to review of samples
6. **Bedding:** To Engineer's specification
7. **Joints generally:** 5-7mm mortar joints
8. **Sealant movement joints:** To supplier's recommendation, colour to match kerbs
9. **Note:** To be used with KT01 - KT05 and KT04 - KT05 as a transition to kerbs. Transition from 60mm to 100 and 125mm.

200 Steel Edge to PT12

1. **Description:** Steel edge to asphalt PT03 and resin bound gravel PT12
2. **Manufacturer:** Everedge or equal & approved
2.1. **Product reference:** Halestem or equal & approved
3. **Size:** 2000(L)x 50(D)mm, 2mm thickness
4. **Type/ Material:** Galvanised and powder coated steel
4.1. **Finish:** Powder coated steel
4.2. **Colour:** Black (RAL 9005)
5. **Accessories:** None
6. **Bedding:** To manufacturer's specification
7. **Joints:** To manufacturer's specification

250 Material samples

1. Samples representative of colour and appearance of designated materials: Submit before placing orders refer to Appendix 1
 - 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's details & 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. To Engineer's specification
3. Workability: To Engineer's specification

545 Proprietary bedding

1. Description: To section Z21

547 Bedding/ Backing of units on fresh concrete races

1. Standard: To BS 7533-6.

555 Kerb & haunching dowels

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

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):** 5-7 mm.
2.3. **Unfilled joints:** 2 mm.
3. **Sudden irregularities:** Not permitted.

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:** 6-7 mm.
2. **Pointing:** Joints refilled and tooled to a neat flush profile.
2.1. **Pointing mortar:** 1:3 cement:sand.
2.2. **Pigment colour:** To match kerbs

650 Sealant movement joints

1. **Joint filler:** To Engineer's detail & specification
2. **Sealant:** Submit proposals
2.1. **Colour:** Colour match to kerbs

Ω End of Section

Q22

Coated macadam/asphalt roads/pavings

Clauses

2 To be read with preliminaries/ general conditions.

Types of paving

140 Hot rolled asphalt paving with resin coated chippings

1. Description: Asphalt surfacing with colourchip resin coated chippings - PT03
2. Product /Supplier : Ayton Asphalt- Colourchip or equal & approved
3. Chipping Colour: Buff, subject to sample review
4. Standard: To MCHW Volume 1 'Specification for highway works' To BS EN 13108-4
5. Subgrade improvement layer: To Engineers Specifications
 - 5.1. Compacted thickness: To Engineers Specifications
6. Geotextile: To Engineers Specifications
7. Granular sub-base: To Engineers Specifications
 - 7.1. Compacted thickness: To Engineers Specifications
8. Base: To Engineers Specifications
 - 8.1. Paving grade: To Engineers Specifications
 - 8.2. Compacted thickness: To Engineers Specifications
9. Binder course: To Engineers Specifications
 - 9.1. Paving grade: To Engineers Specifications
 - 9.2. Compacted thickness: To Engineers Specifications
10. Surface course: To Engineers Specifications
 - 10.1. Paving grade: To Engineers Specifications
 - 10.2. Slip/ Skid resistance: To Engineers Specifications
 - 10.3. Compacted thickness: To Engineers Specifications
11. Reclaimed content
 - 11.1. Standard: To BS EN 13108-8.
 - 11.2. Value (maximum): To Engineers Specifications
12. Surface treatment: To Engineers Specifications
13. Other requirements Finished appearance to achieve a consistently even distribution and coverage of chippings throughout the application area. To achieve an approximate 25% chippings coverage. Contractor to submit sample panel for approval, separate to final works.

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

310 Laying generally

1. Preparation: Remove all loose material, rubbish and standing water.
2. Adjacent work: Form neat junctions. Do not damage.
3. Channels, kerbs, inspection covers etc: Keep clean.
4. New paving
 - 4.1. Keep traffic free until it has cooled to prevailing atmospheric temperature.
 - 4.2. Do not allow rollers to stand at any time.
 - 4.3. Prevent damage.
 - 4.4. Lines and levels: With regular falls to prevent ponding.
 - 4.5. Overall texture: Smooth, even and free from dragging, tearing or segregation.
 - 4.6. State on completion: Clean.

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.

Completion - Not Used

Ω End of Section

Q23

Gravel/ hoggin/ woodchip roads/ pavings REVISED

Clauses

2 To be read with preliminaries/ general conditions.

Types of surfacing

160 Self binding gravel (PT06)

1. Description: Self binding gravel - PT06
2. Subgrade improvement layer: To Engineer's recommendation
 - 2.1. Compacted thickness: To Engineer's specification
3. Geotextile: To Engineer's recommendation
 - 3.1. Manufacturer: To Engineer's specification
 - 3.1.1. Product reference: To Engineer's specification
 - 3.2. Manufacturer: To Engineer's specification
 - 3.2.1. Product reference: To Engineer's specification
4. Granular sub-base: To Engineer's detail & specification
 - 4.1. Compacted thickness: To Engineer's specification
5. Blinding to sub-base: To Engineer's specification
6. Gravel: Breedon or equal & approved
Breedon Special Aggregates, Breedon Quarry, Breedon-on-the-Hill, Derby, DE73 8AP.
 - 6.1. Type: 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. Product reference - Wayfarer or equal & approved
 - 6.2. Source: Submit proposals
 - 6.3. Colour: buff/natural rolled finish
 - 6.4. Size: Graded from 6 mm to fines
 - 6.5. Thickness: 50mm (75mm levelled finish and compacted down to 50mm).
NOTE: Compact to produce a firm, regular surface, stable in use. Breedon self-binding gravel is not free draining and requires a cross fall or camber to shed water from its surface into adequate drainage

225 Proprietary porous resin bound (PT02)

1. Description: Porous resin bound gravel with natural aggregate for pedestrian and cycle use - PT02
2. Subgrade improvement layer: To Engineer's specification
 - 2.1. Compacted thickness: To Engineer's specification
3. Geomembrane: To Engineer's specification
 - 3.1. Manufacturer: To Engineer's specification
 - 3.1.1. Product reference: To Engineer's specification
4. Granular sub-base: To supplier's recommendation
 - 4.1. Compacted thickness: To supplier's recommendation
5. Water collection: Perforated pipe to Engineer's specification
6. Geotextile: To supplier's recommendation
 - 6.1. Manufacturer: To supplier's recommendation

- 6.1.1. Product reference: To supplier's recommendation
- 7. Base course: To supplier's recommendation
- 8. Surface course
 - 8.1. Manufacturer: To Engineer's specification
 - 8.1.1. Product reference: To Engineer's specification
 - 8.2. Slip/ skid resistance: To Engineer's specification
 - 8.3. Binder: To Engineer's specification
 - 8.4. Chippings: Submit proposals
 - 8.4.1. Colour: Natural aggregate colour, subject to approval of sample
 - 8.5. Aggregate size: To Engineer's specification
 - 8.6. Mix ratio (binder:aggregate): To suppliers specification
- 9. Application: Thoroughly mixed and uniformly spread.
 - 9.1. Spreading rate: To suppliers specification
 - 9.2. Thickness: To Engineer's specification
 - 9.3. Compaction to all layers: To Engineer's specification

225A Proprietary resin bound gravel (PT12)

- 1. Description: Resin bound gravel with natural aggregate for pedestrian and cycle use - PT12
- 2. Subgrade improvement layer: To Engineer's specification.
Note: base courses to be fully compatible with non-porous resin bound surface product.
 - 2.1. Compacted thickness: To Engineer's specification
- 3. Geomembrane: To Engineer's specification
 - 3.1. Manufacturer: To Engineer's specification
 - 3.1.1. Product reference: To Engineer's specification
- 4. Granular sub-base: To supplier's recommendation.
Note: base courses to be fully compatible with non-porous resin bound surface product.
 - 4.1. Compacted thickness: To supplier's recommendation
- 5. Water collection: Perforated pipe to Engineer's specification
- 6. Geotextile: To supplier's recommendation
 - 6.1. Manufacturer: To supplier's recommendation
 - 6.1.1. Product reference: To supplier's recommendation
- 7. Base course: To supplier's recommendation.
Note: base courses to be fully compatible with non-porous resin bound surface product.
- 8. Surface course
 - 8.1. Manufacturer: Addagrip or equal & approved
 - 8.1.1. Product reference: Addaset pecan resin bound or equal & approved
 - 8.2. Slip/ skid resistance: To Engineer's specification
 - 8.3. Binder: To Engineer's specification
 - 8.4. Chippings: To supplier's specification
 - 8.4.1. Colour: Buff
 - 8.5. Aggregate size: 6-10mm
 - 8.6. Mix ratio (binder:aggregate): To suppliers specification
- 9. Application: Thoroughly mixed and uniformly spread.
 - 9.1. Spreading rate: To suppliers specification
 - 9.2. Thickness: Advised by Engineers

- 9.3. **Compaction to all layers:** By heavy roller or other appropriate means, adequate to resist subsidence or deformation of the completed pavings when in use.

10. **Accessories:** Contractor to allow for metalwork edging, refer to Q10/200

230 Bark surfacing (PT13)

1. **Description:** Amenity bark surfacing for maintenance path surface - PT13
2. **Subgrade improvement layer:** To Engineer's detail & specification
 - 2.1. **Compacted thickness:** To Engineer's specification
3. **Granular sub-base:** To Engineer's detail & specification
 - 3.1. **Compacted thickness:** To supplier's specification
4. **Geotextile:** Weed suppressant geotextile membrane, contractor to submit proposal
5. **Surface course**
 - 5.1. **Manufacturer:** Melcourt Ltd or equal & approved
 - 5.1.1. **Product reference:** Amenity bark or equal & approved
 - 5.2. **Type:** Amenity bark free from pests, disease, weeds, and any additives.
 - 5.3. **Particle size:** 30-75mm
 - 5.4. **Depth(minimum):** 100mm
 - 5.5. **Note:** Additives, dyes or any substance harmful to humans or the environment not permitted. Product to be from a FSC rated source.
6. **Additional requirement**
 - 6.1. **Description:** Timber edge restraint. FSC certified treated softwood with timber stake fixings.
 - 6.1.1. **Product reference:** Contractor to submit proposal for Landscape Architect's approval

Laying

315 Materials

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

320 Samples

1. **Submit:** Representative samples of all aggregates Refer to Appendix 01.

325 Blinding to sub-base

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

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): Refer to Levels Plan
 - 1.2. Camber (minimum): Refer to Levels Plan
2. Unsealed surfaces (minimum): 1:30.

370 Laying granular surfaces in vehicular areas

1. Permissible deviation from required levels, falls and cambers (maximum): ± 20 mm.
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.

Deleted clauses

400 Slip-resistance testing DELETED

Ω End of Section

Q25

Slab/brick/sett/cobble pavings **REVISED**

Clauses

2 To be read with preliminaries/ general conditions.

Natural stone paving selection criteria

60 General

1. All natural stone paving of the same type, e.g.: to be sourced from the same single source
2. All natural stone paving to be free from vents, cracks, fissures or defects which may adversely affect strength or durability
3. All natural stone to meet required technical and performance requirements - Refer to: Q25/330, Q25/320B
4. Additional Requirements: All stone to be of UK or European Source / quarries

General

9 Section index

1. 10 - 59: GENERAL
2. 60 - 99: NATURAL STONE PAVING SELECTION CRITERIA
3. 100 - 199: PAVING SYSTEMS
4. 200 - 299: SYSTEM PERFORMANCE (CONTRACTOR DESIGN ITEMS)
5. 300 - 499: PRODUCTS
6. 500 - 599: PAVING ACCESSORIES
7. 600 - 899: EXECUTION
8. 900 - 949: COMPLETION

10 Unit dimensions

1. The Contractor should note that all dimensions stated for all natural stone: slabs, setts & tactile paving units are **coursing dimensions** rather than cut/finished dimensions
2. The cut/finished dimensions of each individual element should be adjusted to take account of specified joint widths.

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: 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: As shown in Hardworks Plan and others required on site

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
 - 1.8. Balustrades and handrails :
 - 1.9. Fence and gate :
 - 1.10. Bollard as detailed: in Hardworks Plans and detail drawings.
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 drawings: for further details/requirements

Paving systems - Not Used

System performance - Not Used

Products

306 Granular material for layer over existing bases

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

315 Permeable concrete block paving (PT07)

1. **Description:** Permeable concrete block paving - PT07
2. **Standard:** To BS EN 1339.
 - 2.1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
 - 2.1.1. **Product reference:** HydroPave Fusion or equal & approved
3. **Recycled content:** 20% (minimum) to BS EN ISO 14021
4. **Colour:** Mid grey/ silver grey, subject to approval of sample
 - 4.1. **Finish:** Coarse textured
 - 4.2. **Nominal sizes:** 200mmx100mmx80mm, laid in stretcher bond.
Sample to be provided for approval.
5. **Arrises:** Square
6. **Water absorption and freeze/ thaw resistance class:** To manufacturer's recommendation
7. **Bending strength class:** To Engineer's details & specification
8. **Abrasion resistance class:** To Engineer's details & specification
9. **Slip/ Skid resistance:** Extremely low
10. **Breaking load class:** To Engineer's details & specification

315A Concrete block paving (PT08)

1. **Description:** Concrete block paving - PT08
2. **Standard:** To BS EN 1339.
 - 2.1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
 - 2.1.1. **Product reference:** Braemar ground textured block paving or equal & approved
3. **Recycled content:** 20% (minimum) to BS EN ISO 14021
4. **Colour:** Arran stone/ Jura grey ground textured, subject to approval of sample
 - 4.1. **Finish:** Coarse textured
 - 4.2. **Nominal sizes:** 200mmx100mmx80mm in herringbone bond.
Sample to be provided for approval.
5. **Arrises:** Square
6. **Water absorption and freeze/ thaw resistance class:** To manufacturer's recommendation
7. **Bending strength class:** To Engineer's details & specification
8. **Abrasion resistance class:** To Engineer's details & specification
9. **Slip/ Skid resistance:** Extremely low
10. **Breaking load class:** To Engineer's details & specification

315B Precast concrete slab (PT15) REVISED

1. **Description:** Concrete block paving to maintenance path to west of the building - PT15
2. **Standard:** To BS EN 1339.
 - 2.1. **Manufacturer:** Marshalls plc or equal & approved
Contact person: Mark diamond
Mark.Diamond@marshalls.co.uk
07979 302613

- 2.1.1. **Product reference:** Urbex paving or equal & approved
- 3. **Recycled content:** 3% (minimum) to BS EN ISO 14021
- 4. **Colour:** Buff/ natural, subject to approval of sample
 - 4.1. **Finish:** Coarse textured
 - 4.2. **Nominal sizes:** 600mm (L)x600mm (W), 50mm (D)
- 5. **Arrises:** Square
- 6. **Water absorption and freeze/ thaw resistance class:** To manufacturer's recommendation
- 7. **Bending strength class:** To Engineer's details & specification
- 8. **Abrasion resistance class:** To Engineer's details & specification
- 9. **Slip/ Skid resistance:** Extremely low
- 10. **Breaking load class:** To Engineer's details & specification

315C Precast concrete slab (PT01)

- 1. **Description:** Concrete block paving - P01
- 2. **Standard:** To BS EN 1339.
 - 2.1. **Manufacturer:** Tobermore or equal & approved
Contact person: Jack Daw
j.daw@tobermore.co.uk
0844 800 5736
 - 2.1.1. **Product reference:** Braemar ground textured block paving or equal & approved
- 3. **Recycled content:** 3% (minimum) to BS EN ISO 14021
- 4. **Colour:** Arran stone ground textured, subject to approval of sample
 - 4.1. **Finish:** Coarse textured
 - 4.2. **Nominal sizes:** Mix of two sizes: 200mm(L)x 100mm(W)x 80mm(D) and 600mm (L)x300mm (W), 80mm(D) laid stretcher bond, depth to be confirmed by supplier, suitable for MEWP loading.
- 5. **Arrises:** Square
- 6. **Water absorption and freeze/ thaw resistance class:** To manufacturer's recommendation
- 7. **Bending strength class:** To Engineer's details & specification
- 8. **Abrasion resistance class:** To Engineer's details & specification
- 9. **Slip/ Skid resistance:** Extremely low
- 10. **Breaking load class:** To Engineer's details & specification
- 11. **Note:** Product to be suitable for maintenance vehicle (including MEWP and scissor lift) loading

320 Pre-cast concrete tactile blister paving (PT10)

- 1. **Description:** Precast concrete tactile blister paving to pedestrian crossings - PT10
- 2. **Standard:** To DD CEN/TS 15209.
- 3. **Material:** Precast concrete
 - 3.1. **Manufacturer:** Marshalls plc or equal & approved
Contact person: Mark diamond
Mark.Diamond@marshalls.co.uk
07979 302613
 - 3.1.1. **Product reference:** Tactile blister paving
- 4. **Recycled content:** 3% (minimum) to BS EN ISO 14021
- 5. **Nominal sizes:** 400mm(L)x400mm(W)x70mm(D), laid stack bonded to pedestrian crossing points.
- 6. **Colour:** Colour to contrast adjacent paving, subject to sample review
- 7. **Type of surface:** Blister – type B1, to comply with BS8300

320A Pre-cast concrete hazard warning corduroy paving (PT11)

1. **Description:** Precast concrete hazard warning corduroy paving to top and bottom of steps (SP01) - PT11
2. **Standard:** To DD CEN/TS 15209.
3. **Material:** Precast concrete
 - 3.1. **Manufacturer:** Marshalls plc or equal & approved
Contact person: Mark diamond
Mark.Diamond@marshalls.co.uk
07979 302613
 - 3.1.1. **Product reference:** Tactile corduroy paving
4. **Recycled content:** 3% (minimum) to BS EN ISO 14021
5. **Nominal sizes:** 400mm(L)x400mm(W)x70mm(D), laid stack bonded to top and bottom of steps
6. **Colour:** Colour to contrast adjacent paving, subject to sample review
7. **Type of surface:** Rib – type R1, to comply with BS8300

322 Car park demarcation studs (CDS)

1. **Description:** Square Road Stud for car park demarcation

Refer to hardwork plan for number and location
2. **Material:** Stainless steel
 - 2.1. **Manufacturer:** Studmarc or equal and approved
Trefeglwys Road, Caersws, Powys, SY17 5HH
01686 807 450
sales@studmarc.com
 - 2.1.1. **Product reference:** 400-300 Square Road Stud - Smooth - Fishtail
3. **Recycled content:** Submit proposals
4. **Fitment:** Monolith Pin - epoxy resin fixed into drilled hole. Setting out as per contract drawings
5. **Nominal sizes:** 100mm x 100mm x 70mm
6. **Type of surface:** Polish finish

390 Sand/ fine aggregate for unbound laying course and jointing of concrete flag paving

1. **Description:**
2. **Standard:** To BS 7533-4, unbound construction laying course and jointing material.
3. **Purity:** Free from deleterious salts, contaminants, lime and cement.
4. **Procurement:** Obtain from one source and ensure consistent grading.

391 Sand for flexible laying course and jointing of concrete flag paving

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

395 Sand for bedding

1. **Type:** Naturally occurring clean sharp sand, graded as for laying course sand to BS 7533-4, table 4.
2. **Purity:** Free from deleterious salts, contaminants and cement.
3. **Procurement:** Obtain from one source and ensure consistent grading.
4. **Moisture content:** Maintain even moisture content that will give maximum compaction. Sand squeezed in the hand should show no free water and start to exhibit cracking when pressure is released.

396 Sand for bedding

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

410 Mortar bedding

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

415 Proprietary mortar bedding

1. Type: Bedding mortar for concrete block and natural stone paving
2. Manufacturer/Supplier: Steintec or equal & approved
1 Northwick Road
Canvey Island ,Essex
United Kingdom
SS8 0PU
Contact: Steven Burton
steven.burton@tuffbau.com
Tel: 0203 598 9800
 - 2.1. Product Reference: Tuffbed 2-pack Type B permeable bedding mortar with Tuffbond priming mortar
3. Spreading and levelling mortar bedding: To give specified average nominal thickness after bedding of paving units
4. Laying paving units: On full solid bed. Bed down to line and level with a maul.
 - 4.1. In accordance with manufacturer's requirements/recommendations

455 Joint filler for movement joints

1. Type: To mortar supplier's recommendation
2. Manufacturer: Contractor to submit proposal for review and approval.
 - 2.1. Product reference: Contractor to submit proposal for review and approval. Colour to match adjoining paving.

465 Sealant for movement joints

1. Sealant
 - 1.1. Type: To paving Engineer's & specialist supplier's specification
 - 1.2. Manufacturer: Contractor to submit proposal for review and approval.
 - 1.2.1. Product reference: Contractor to submit proposal for review and approval.
 - 1.3. Colour: To match paving colour/ submit proposals

485 Proprietary jointing mortar

1. Type: Jointing mortar for paving
2. Manufacturer/Supplier: Steintec or equal & approved
1 Northwick Road
Canvey Island ,Essex
United Kingdom
SS8 0PU
Contact: Steven Burton
steven.burton@tuffbau.com
Tel: 0203 598 9800
 - 2.1. Product Reference: Tufftop 40N non-permeable jointing mortar
3. Colour: To match paving
4. Application: To manufacturer's specification

Paving accessories

520A Corduroy hazard warning strips (PT14)

1. **Description:** Stainless steel corduroy hazard warning strips - PT14
2. **Location:** To top and bottom of pond deck steps. Refer to Hardworks Plan
3. **Supplier/Manufacturer:** Tactile Paving Services or equal & approved
2 Hayfields Close
Keighley
West Yorkshire
BD22 6SB

Contact Numbers
Office: 01535 500902
Mobile: 07779 442180
Email: steve@tactilepaving.co.uk
<http://www.tactilepaving.co.uk/>
4. **Material:** Stainless steel
5. **Size:** 20mm(W) x 1800mm(L) x 6mm(D)
6. **Method of Fixing:** To manufacturer's detail. The Manufacturer shall make all preparations and drilling required to produce firm secure fixings.
7. **Sample:** Submit to LA: for approval
8. **Additional Requirements:** None
 - 8.1. Compliant with the Department for the Environment, Transport and the Regions (DETR): Corduroy profile pattern to BS8300

Execution

610 Material samples

1. **Samples representative of colour and appearance of designated materials:** Submit before placing orders.
 - 1.1. **Designated materials:** All pavings

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/ fine aggregate**
 - 3.1. **Stockpiled laying course sand/ fine aggregate:** Protect from saturation.
 - 3.2. **Exposed areas of unbound laying course and uncompacted areas of unbound paving:** Protect from heavy rainfall.
 - 3.3. **Saturated unbound laying course:** Remove and replace, or allow to dry before proceeding.
 - 3.4. **Laying dry sand/ fine aggregate 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.

635 Regularity of paved surfaces

1. Maximum variation in gap under a 3 m straight edge placed anywhere on the surface (where appropriate in relation to the geometry of the surface)
 - 1.1. Precast concrete paving blocks and clay pavers for flexible pavements: 10 mm.
 - 1.2. Precast concrete flags or natural stone slabs: 3 mm.
2. Difference in level between adjacent paving units (maximum): 2 mm.
3. Sudden irregularities: Not permitted.

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):
 - 4.2. Vehicular traffic (minimum):
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 unbound 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.

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

671 Laying granular layer over existing bases

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

676 Laying geotextile sheet edging strips

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

681 Laying geotextile sheet patches over drainage holes

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

685 Laying geotextile sheet overlays

1. **Location:** Immediately below the laying course.
2. **Laying:** Fit neatly at edge restraints and other features that interrupt the laying course, e.g. drainage fittings, channels, manholes and kerbs.
3. **Edge detail:** Turn sheet up to form an upstand against features, height not less than thickness of the laying course.
4. **Width:** Contractor to submit proposal
5. **Jointing:** Lap by 500mm.

710 Laying flag and slab paving – sand/ fine aggregate laying course and jointing

1. **Standard:** In accordance with BS 7533-4.
2. **Flag installation and cutting:** To Interpave 'Concrete flag paving'.
3. **Laying course**

- 3.1. Nominal thickness after compaction: To Engineer's specifications
- 4. Joint width: 2-5 mm.

715 Laying flag and slab paving – mortar laying course and jointing

- 1. Standard generally: In accordance with BS 7533-4.
- 2. Flag installation and cutting: To Interpave 'Concrete flag paving'.
- 3. Laying course
 - 3.1. Nominal thickness: To Engineer's specification
- 4. Laying and jointing: To paving supplier's recommendation
- 5. Joint width (nominal): 5-7 mm

730 Laying natural stone sett paving

- 1. Standard generally: In accordance with BS 7533-7.
- 2. Laying type: Rigid.
 - 2.1. Laying and jointing method: To manufacturer's recommendation
- 3. Laying course
 - 3.1. Target thickness after compaction: To Engineer's specification
- 4. Joint width (nominal): 8 -10mm

732 Stone setts

- 1. Orientation: Lay so that natural bed is vertical.

785 Tooled joints in mortar-bedded units

- 1. Joints: Completely filled with bedding mortar as work proceeds.
 - 1.1. Joint width: 6-10 mm
 - 1.2. Finish: Neat flush profile.

790 Tooled coloured joints in mortar-bedded units

- 1. Joints: Completely filled with bedding mortar as work proceeds.
 - 1.1. Joint width: 6-10 mm
- 2. Pointing: 1:3 cement:sand mortar with pigment, colour to match block colour.
 - 2.1. Depth: 10 mm.

795 Sealant movement joints in mortar-bedded units

- 1. Spacing: To manufacturer's recommendations
- 2. Extent of joints: Through edge units and haunching
- 3. Joint filler: Compressible cellular rubber or plastics compatible with specified sealant. Build in as work proceeds.
 - 3.1. Joint width: 10 mm
- 4. Barrier (joint breaker): As recommended by sealant manufacturer. Position filler and barrier accurately to fully support sealant at recommended distance from exposed faces of units.
- 5. Sealant
 - 5.1. Application: As section Z22.

820 Compacted sand bedding

- 1. Bedding sand: As clause: Q25/395

2. **Laying and compacting to specified final thickness:** Vibrating plate as BS 7533-4, table 1. Loosen the top 10 mm using a rake; alternatively, screed out a further 10 mm of loose sand.
3. **Bedding materials:** Do not deliver to working area over uncompacted paving
4. **Bedding course prepared area:** 1 m (minimum) to 3 m (maximum) in advance of laying face, and 1 m (maximum) at end of working period
5. **Protection of prepared bedding course:** Do not allow traffic or leave exposed. Fill, rescreed and recompact areas disturbed by removal of screed rails or trafficking. Lay paving units immediately.
6. **Supply of slabs/ flags to laying face:** Over newly laid paving but stack at least 1 m back from laying face.

825 Compacted sand bedding

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

Completion

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

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

Deleted clauses

640 Colour banding DELETED

930 Slip resistance testing DELETED

Ω End of Section

Q28

Topsoil and growing media

To be read with preliminaries/ general conditions.

5 Section index

1. 10 - 99: GENERAL
2. 100 - 199: SYSTEM OUTLINE
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4. 300 - 339: IMPORTED TOPSOIL
5. 340 - 399: TOPSOIL ADDITIVES, AMELIORANTS, COMPOSTS, ETC.
6. 400 - 499: FERTILIZERS
7. 500 - 599: MANUFACTURED SOILS AND PLANTING MEDIA
8. 600 - 659: EXECUTION
9. 660 - 674: SUBSOIL PREPARATION, GRADING & FORMATION LEVELS
10. 675 - 749: TOPSOIL STORAGE & PLACEMENT OPERATIONS
11. 750 - 799: SITE-MADE TOPSOIL & GROWING MEDIA
12. 800 - 899: ONSITE TOPSOIL AMELIORATION
13. 900 - 949: COMPLETION

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.

30 Scope of works/package responsibilities

1. It is assumed that the formation levels/bulk subsoil levels will be placed by the: Main contractor/ Groundworks contractor
2. It is assumed that the fine grading works will be carried out by the: The 's rates shall include for fine grading and adjustment to the formation levels so that the finished levels are accurately achieved using the prescribed topsoils depths.
3. It is assumed that the topsoil placement, preparation and amelioration works, as set out in Clause: **Q28/55** below, will be carried out by the Landscape contractor

4. The Main Contractor is to submit proposed Contractor responsibilities for the groundworks packages noted above to: for approval.
5. **Testing:** 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 and/or as a benchmark for the importation of topsoil and/or subsoil proposed for the works.
6. **General notes:** The Contractor shall use the stripped site-won topsoil for all landscape works where specified. The contractor shall import certain soil types as set out below and in accordance with the specification.

The Contractor is responsible for ascertaining accurate quantities necessary for the execution of the works which include confirming that there is sufficient quantity of site-won topsoil to carry out the works. The Contractor shall confirm the above requirement at Tender stage. Any deficiency of topsoil existing on site shall be imported by the Contractor to fulfil the requirements of the Contract.

A full written analysis of the existing and any proposed imported topsoil for the various planting beds will be required for approval before soil is transported to site, including recommendations for soil improvements and treatments to the existing soil for the intended planting and biodiversity objectives.

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

1. Prior to commencing fine grading, the: shall inspect/check the formation levels and be satisfied with the works before acceptance.
2. Written reason must be given immediately to the: if any formation levels placed by others are considered unsatisfactory.
3. The CA/ Landscape Architect: is deemed to have inspected, accepted and approved the subsoil placement on commencement of topsoil placement operations. A record of this approval must be provided to the contractor carrying out the topsoil works.
4. The Contractor : must submit method statements for stripping and storage of site won topsoil and subsoil prior to re-use in planting beds

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

115 Topsoil system for wildflower meadow seeding (Soil Type 02)

1. **Description:** Soil for Wildflower meadow planting in newly created areas - Soil type 02. For location refer to soiling and planting plans.
2. **Composition**
 - 2.1. **Soil:** 150mm low fertility graded topsoil (imported or existing suitable for meadows) over minimum 300mm deep existing subsoil (placed or existing)
 - 2.2. **Ameliorants:** Ameliorants to be confirmed once the condition of the topsoil is known. This shall be established by soil analysis. The type of fertilizer will depend on the materials used for soil amelioration and conditioning.
 - 2.3. **Topsoil requirements refer to clause:** : Q28/325 & Q28/326C
 - 2.4. **Subsoil requirements refer to clause:** : Q28/285, Q28/663, Q28/664 & D20

116 Topsoil system for meadow/ grassland seeding in swale(Soil Type 03)

1. **Description:** Soil for meadow/ grassland planting in swale- Soil type 03. For location refer to soiling and planting plans.
2. **Composition**
 - 2.1. **Soil:** 150mm deep low fertility (imported or site won topsoil) for sides and over 150mm deep clean well graded gravel/inert soil mix to the base of the swale.
 - 2.2. **Ameliorants:** Ameliorants to be confirmed once the condition of the topsoil is known. This shall be established by soil analysis. The type of fertilizer will depend on the materials used for soil amelioration and conditioning.
 - 2.3. **Topsoil requirements refer to clause:** : Q28/325 & Q28/326C
 - 2.4. **Subsoil requirements refer to clause:** : Q28/285, Q28/663, Q28/664 & D20

117 Topsoil system for woodland shrubs, herbaceous perennials and grasses(Soil Type 04)

1. **Description:** Soil for woodland shrubs, herbaceous perennials and grasses- Soil type 04. For location refer to soiling and planting plans.
2. **Composition**
 - 2.1. **Soil:** Minimum 450mm deep ameliorated site won or imported topsoil placed over 550mm deep site won subsoil or imported (placed or existing).

Note: The Contractor to ascertain the accurate quantities necessary for the execution of the works and confirm that there is sufficient quantity of site-won topsoil to carry out the works. Any deficiency of topsoil existing on site shall be imported by the Contractor to fulfil the requirements of the Contract.
 - 2.2. **Ameliorants:** Ameliorants to be confirmed once the condition of the topsoil is known. This shall be established by soil analysis. The type of fertilizer will depend on the materials used for soil amelioration and conditioning.

2.3. Topsoil requirements refer to clause : Q28/325 & Q28/326B

2.4. Subsoil requirements refer to clause : Q28/285, Q28/663, Q28/664 & D20

118 Topsoil system for rain garden (Soil Type 05)

1. **Description:** Soil for rain garden- Soil type 05. For location refer to soiling and planting plans.

2. **Composition**

2.1. **Soil:** 900mm deep imported free draining manufactured growing medium over 2-6mm clean crushed granite grit 50mm depth, layer covered with dense weave hessian wrap. Min 450mm deep clean pea gravel layer to base. All rain gardens to receive 50mm deep gravel mulch layer.

Free-draining growing medium containing a high proportion of sandstone aggregate (50%) and recycled glass sand (25%). Topsoil (10%) and Composted green waste 15%)

2.2. **Ameliorants:** Ameliorants to be confirmed once the condition of the topsoil is known. This shall be established by soil analysis. The type of fertilizer will depend on the materials used for soil amelioration and conditioning.

2.3. Topsoil requirements refer to clause : Q28/325 & Q28/510A

2.4. Subsoil requirements refer to clause : Q28/285, Q28/663, Q28/664 & D20

2.5. **Note:** Composition datasheets to be provided with sample for approval.

119 Topsoil system for pond marginal planting (Soil Type 06)

1. **Description:** Soil for pond marginal planting- Soil type 06. For location refer to soiling and planting plans.

2. **Composition**

2.1. **Soil:** Lower marginal bed (between +40.600 and 41.500m A.O.D) - 400mm imported clean washed rounded gravel matrix placed over pond liner and protective fleece.

Upper marginal bed (between 41.500 and 42.000m A.O.D) - 200mm imported clean washed rounded gravel matrix blended with 350mm inert low fertility topsoil placed over pond liner and protective fleece. Top dress upper marginal shelves with 50mm of gravel mulch.

2.2. **Ameliorants:** Ameliorants to be confirmed once the condition of the topsoil is known. This shall be established by soil analysis. The type of fertilizer will depend on the materials used for soil amelioration and conditioning.

2.3. **Notes:** Trade contractor is to ensure a minimum depth of growing matrix is provided over the liner as detailed. The Trade Contractor shall ensure topsoil profiles are carefully placed avoiding potential damage to the liner and geo textile. Methodology to be submitted for CA/ Landscape Architect's approval.

Trade contractor to use approved topsoil, evenly spread to specified depths.

Representative samples of gravels required for approval.

Final depth of material placed over pond liner system subject to confirmation of ballast requirements to Engineer's specification.

Extent of topsoil works to be agreed with CA/ Landscape Architect.

2.4. Topsoil requirements refer to clause : Q28/325 and Q28/522A

2.5. Subsoil requirements refer to clause : Q28/285, Q28/663, Q28/664 & D20

2.6. **Additional requirements:** Capillary Matting.

The Contractor shall supply and install an approved capillary matting system under aquatic planting zones, as located on the contract drawings. The mat is to ensure water is transferred to the planting zones during low water levels 23.6m AOD.

Type and Reference : Contractors choice to meet performance and as approved by CM.

Capillary mat to be placed in accordance with suppliers recommendations.

120 Topsoil system for wildflower meadow planting (Soil Type 08)

1. **Description:** Soil for wildflower meadow planting in existing soil areas and RPAs/ buffer zone- Soil type 08. For location refer to soiling and planting plans.
2. **Composition**
 - 2.1. **Soil:** 50mm low fertility graded topsoil (imported or existing suitable for meadows) to be finely graded over the area to marry in smoothly with levels
 - 2.2. **Ameliorants:** Ameliorants to be confirmed once the condition of the topsoil is known. This shall be established by soil analysis. The type of fertilizer will depend on the materials used for soil amelioration and conditioning.
 - 2.3. **Topsoil requirements refer to clause:** : Q28/325, Q28/326C
 - 2.4. **Subsoil requirements refer to clause:** : Q28/285, Q28/663, Q28/664 & D20

121 Soil infill to geotextile bags (Soil Type 09)

1. **Description:** Soil infill to geotextile bags placed on swale side slopes and base - Soil Type 09. For location and cross section refer to DWG no. RD001-FCB-XX-XX-DR-L-3302. Refer to Q31/XX for vegetated geotextile bags and erosion control mat specification.
2. **Composition**
 - 2.1. **Soil:** Soil mix to comprise of 70% sand and 30% low fertility soil
 - 2.2. **Notes:** Contractor to ascertain quantities necessary for the execution of the works
 - 2.3. **Topsoil requirements refer to clause:** : Q28/325 and Q28/326C
 - 2.4. **Subsoil requirements refer to clause:** : Q28/285, Q28/663, Q28/664 & D20

145 Planting pit backfilling topsoil system

1. **Description:** Ameliorated topsoil as set out in Q31 to all planting pits
2. **Composition**
 - 2.1. **Topsoil:** Topsoil to BS 3882
 - 2.2. **Ameliorants:** As per Q31
 - 2.3. **Accessories:** As per Q31

155 Mulching and top dressing

1. **Description:** Bark mulch to Woodland, native hedgerow, herbeaceous perennial, ornamental grass planting and all treepits in soft
2. **Composition**
 - 2.1. **Material:** Bark nuggets or equal & approved. Sourced from natural sustainably produced FSC certified bark.
 - 2.2. **Supplier:** Melcourt or equal & approved
Malcourt Industries Limited,
Boldridge Brake, Long Newton,
Tetbury, Gloucestershire, GL8 8RT
Tel: +44(0)1666 502711
Email: mail@melcourt.co.uk

156 Gravel mulch to rain gardens

1. **Description:** Gravel mulch to rain gardens
2. **Composition**

- 2.1. **Material:** Clean washed inert rounded pebbles. Contractor to submit proposal and sample for review and approval by Landscape Architect.
- 2.2. **Size:** 25mm nominal dimension in any direction
- 2.3. **Colour:** Buff
- 2.4. **Note:** Submit samples and product datasheet to CA/Landscape Architect for approval prior to order.

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

157 Geotextile bags and erosion control matting

1. **Description:** Geotextile bags to swale side slopes and base. For design intent refer to DWG no. RD001-FCB-XX-XX-DR-L-3302. Supplier to site measure and prepare workshop drawings for Landscape Architect's and Engineer's approval.
Allow for erosion control matting to top of swale slopes.

2. **Geotextile bag supplier:** Greenfix or equal & approved
Old Manor Farm Yard
Beckford Road, Ashton-Under-Hill
Evesham, Worcestershire
WR11 7SU

Tel: 01386 881493

Email: info@greenfix.co.uk

Web: <https://www.greenfix.co.uk>

3. **Product:** Greenlok vegetated wall system or equal & approved
4. **Erosion control mat supplier:** Greenfix or equal & approved
Old Manor Farm Yard
Beckford Road, Ashton-Under-Hill
Evesham, Worcestershire
WR11 7SU

Tel: 01386 881493

Email: info@greenfix.co.uk

Web: <https://www.greenfix.co.uk>

5. **Product:** Greenfix Covamat™ Plus Type 3 unseeded Erosion Control Blanket or equal and approved
6. **Note:** Placement and fixing to supplier's detail

Existing site topsoil

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

1. **Preliminary site investigations:** To be undertaken to establish the suitability of existing topsoil for proposed soft landscape works. Analysis of existing soil to inform the amelioration required to ensure its suitability for reuse
2. **Any shortfall in suitable existing site topsoil for use within soft landscape areas:** 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. Contractor to confirm that there is sufficient quantity of site won topsoil to carry out the works.
 - 3.1. **Quantities to be confirmed, and agreed, with the client/ Landscape Architect:** at Tenderstage
4. **Any deficiency in suitable existing site topsoil (as agreed at Tender: 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 Tender: 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 also to relevant clauses in Section: **C11 & 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

210 Preparation of undisturbed topsoil

1. Standard: In accordance with: BS4428
 - 1.1. Grading and cultivation: For wildflower meadow planting in existing soils areas and RPAs - Soil type 08. Preparation to follow method statement to be submitted by the Contractor prior to works being undertaken.
2. Hard ground: Break up thoroughly by hand
3. Clearing: Remove visible roots and large stones. : Cut the existing grass/sward short and carefully scarify ground in late summer, exposing up to 50% of soil where feasible.
4. Areas covered with turf or thick sward: Carefully dig over to full depth of topsoil by hand. Carefully roll / tread to give good seed/soil contact. Prepare ground for surface sowing and broadcast the specified seed in the autumn
5. Weed control: At appropriate times: by hand. Carefully dig out/remove perennial weeds like nettles, docks, thistles.

270 Site investigation

1. For details on site investigation and Chemical/physical analysis of existing site topsoil and subsoil refer to clause: C11

275 Topsoil analysis

1. Soil to be analysed: Existing topsoil and subsoil on site o be tested for potential re-use
2. Soil analyst: Contractor to submit proposal
3. Samples: Collect in accordance with BS 3882
4. Submit:
 - 4.1. Declaration of analysis: In accordance with BS 3882, clause 6 and Table 1
 - 4.2. Additional analysis: Refer to Q28/280
 - 4.3. Report detailing Soil Analyst's recommendations

280 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. Samples: Collect in accordance with BS 3882
Testing/Analysis: To be in accordance with BS3882
Soil analyst: Tim O'Hare Associates, or equal & approved
Tim O'Hare Associates
Howberry Park
Wallingford
Oxfordshire
OX10 8BA
T: 01491 822653
W: www.timohare-associates.com

Test laboratory to be accredited to BS EN IS/IEC 17025 by a recognised national or international accreditation body.

3. The results of the analysis should be presented in an interpretative report, to include the following:
 - 3.1. 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;
 - 3.2. 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 establishment for each planting typology proposed, e.g. tree pits, native hedgerows, woodland planting, ornamental shrub planting, wildflower meadows, swale meadow and grassland etc;
 - 3.3. Assessment of quantity/depth of in situ site topsoil suitable for reuse, including a clear plan indicating location and corresponding depths;
 - 3.4. Assessment of soil permeability and general site drainage conditions;
 - 3.5. The assessment should take account of the specific demands/requirements of the scheme, i.e. individual planting typologies, in particular requirements for woodland and herbaceous planting, meadow planting in newly created areas as well as in RPAs of existing trees, meadow/ grassland planting in swales;
 - 3.6. Certificate of analysis (clearly dated and referencing site/sample(s))

285 Chemical/physical analysis of existing site subsoil

1. A chemical and physical analysis of the existing site subsoil will be required in order to establish its suitability for reuse within the Contract Works.
2. Samples: Collect in accordance with BS 3882
Testing/Analysis: To be in accordance with BS3882
Soil analyst: Tim O'Hare Associates, or equal & approved
Tim O'Hare Associates
Howberry Park
Wallingford
Oxfordshire
OX10 8BA
T: 01491 822653
W: www.timohare-associates.com
Test laboratory to be accredited to BS EN IS/IEC 17025 by a recognised national or international accreditation body.
3. The results of the analysis should be presented in an interpretative report, to include the following:
 - 3.1. Assessment of the subsoil's suitability for reuse within the proposed scheme, e.g. as a subsoil/planting medium, as a component within a manufactured topsoil, and/or as subsoil;
 - 3.2. Recommendations for treatment and/or additives to ameliorate the site-won subsoil to suit its intended use, to provide a growing medium that will optimise future plant establishment for each planting typology proposed, e.g. tree pits, native hedgerows, woodland planting, ornamental shrub planting, wildflower meadows, swale meadow and grassland etc;
 - 3.3. Assessment of quantity/depth of in situ site subsoil suitable for reuse, including a clear plan indicating location and corresponding depths;
 - 3.4. Assessment of subsoil permeability and general site drainage conditions;
 - 3.5. The assessment should take account of the specific demands/requirements of the scheme, i.e. individual planting typologies, in particular requirements for woodland and herbaceous planting, meadow planting in newly created areas as well as in RPAs of existing trees, meadow/ grassland planting in swales;
 - 3.6. Certificate of analysis (clearly dated and referencing site/sample(s)).

Products

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, River and canal dredgings, coastal sources.

315 Imported topsoil to BS 3882

1. **Description:** Soil for wildflower meadow planting in newly created areas - Soil type 02, Meadow/grassland planting in swale - Soil type 03, Wildflower meadow planting in existing soil areas and RAP's/ buffer zones - Soil type 08. See also Q28/326C
2. **Quantity:** Provide as necessary to make up any deficiency of topsoil existing on site and to complete the work.
3. **Standard:** To BS 3882.
4. **Classification:** Specific purpose - Low fertility
 - 4.1. **Soil textural class to BS 3882, Figure 1:** Class to match specific purpose above
5. **Source:** Contractor to submit proposals
 - 5.1. **Product reference:** Specific purpose - Low fertility soil

325 Imported topsoil - general requirements

1. **Full written analysis of any proposed imported topsoil will be required by the:** CA/Landscape Architect for 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 Architect shall 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:
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.

326B Imported topsoil -

1. **Description:** Soil for woodland shrubs, herbaceous perennials and grasses- Soil type 04
2. **Refer to Clause:** **Q28/325** for general requirements.
3. General Grade Imported Topsoil to be used in the following locations, as defined on the Contract drawings:
4. General Grade Imported Topsoil shall conform to the following (to BS3882):
5. **Physical Characteristics:**
 - 5.1. **Soil Texture:** Well structured, free draining, open textured sandy loam or loamy sand
 - 5.2. **Particle size:** Clay (0 - μm) 5-18 %
 - 5.2.1. Silt ($2\mu\text{m}$ - $63\mu\text{m}$) <45 %
 - 5.2.2. Sand ($63\mu\text{m}$ – 2mm) 50-85 %
6. **- Coarse Fragment Content:** : Reasonably free of stones, with maximum size of stones in any direction 50mm, i.e.:
7. >2mm diameter 0-30 %m/m
8. >20mm diameter 0-10 %m/m
9. >50mm diameter 0 %m/m
10. **- Mass Loss on Ignition:** :
11. Clay (5% - 20%): 3-20 %
12. Clay (20% - 35%): 5-20 %
13. **- Soil pH:** 6.0 - 7.5

14. - **Plant Nutrient Content:**

- 15. Total nitrogen (% m/m): >0.15 %
- 16. Extractable phosphate (mg/L): 16-140 mg/L
- 17. Extractable potassium (mg/L): 121-1500 mg/L
- 18. Extractable magnesium (mg/L): 51-600 mg/L
- 19. - Carbon/nitrogen ratio: : <20:1
- 20. - Electrical Conductivity: >3300µS/cm
- 21. Toxic Elements: **Q28/325**above
- 22. Phytotoxic Contaminants: : **Q28/325**above

326C Imported low fertility soil

- 1. **Description:** Low fertility soil for wildflower meadow planting in newly created areas - Soil type 02, Meadow/ grassland planting to swale - Soil type 03, Wildflower planting in existing soil areas and RPAs - Soil Type 08
- 2. **Refer to Clause:** **Q28/325**for general requirements.
- 3. Low Fertility Imported Topsoil to be used in the following locations, as defined on the Contract drawings:
 - 3.1. Wildflower Meadows
- 4. Low Fertility Imported Topsoil shall conform to the following (to BS3882):
- 5. **Physical Characteristics:**
 - 5.1. **Soil Texture:** Well structured, free draining, open textured sandy loam or loamy sand
 - 5.2. **Particle size:** Clay (0 - µm) 5-18 %
 - 5.2.1. Silt (2µm - 63µm) <45 %
 - 5.2.2. Sand (63µm – 2mm) 50-85 %
- 6. - **Coarse Fragment Content:** : Reasonably free of stones, with maximum size of stones in any direction 50mm, i.e.:
 - 7. >2mm diameter 0-30 %m/m
 - 8. >20mm diameter 0-10 %m/m
 - 9. >50mm diameter 0 %m/m
- 10. - **Mass Loss on Ignition:** :
- 11. Clay (5% - 20%): 4-20 %
- 12. Clay (20% - 35%): 4-20 %
- 13. - **Soil pH:** 6.0 - 7.5
- 14. - **Plant Nutrient Content:**
- 15. Total nitrogen (% m/m): 0.2 to 1.2%
- 16. Extractable phosphate (mg/L): =5 to 10 mg/L
- 17. Extractable potassium (mg/L): - mg/L
- 18. Extractable magnesium (mg/L): - mg/L
- 19. - Carbon/nitrogen ratio: : <35:1
- 20. - Electrical Conductivity: >3300µS/cm
- 21. Toxic Elements: **Q28/325**above
- 22. Phytotoxic Contaminants: : **Q28/325**above

Topsoil additives, ameliorants, composts, etc.

345 Aggregates for rain garden planting soil

1. **Description:** Sandstone aggregate
Content (by dry weight): 50% of the overall rain garden planting soil mix
2. **Source:** Johnson Wellfield Quarries, or equivalent & approved
 - 2.1. **Product reference:** Sandstone Aggregate
3. **Reference, description and grading:**
 - 3.1. **Sandstone aggregate:** Grade: 5-20mm
4. **Recycled content:** Contractor to submit proposal

350 Minerals for rain garden planting soil

1. **Description:** Fine aggregate: Recycled glass sand. Content (by dry weight): 25% of the overall rain garden planting soil mix
2. **Type:** Recycled glass sand
3. **Source:** Contractor to submit proposals
 - 3.1. **Product reference:** Contractor to submit proposals

361 Compost

1. **Description:** For amelioration of planting beds and treepits
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 aperture
 - 12.6. **Carbon:Nitrogen ratio (maximum):** 20:1.
13. **Texture:** Friable.
14. **Objectionable odour:** None.
15. **Compost Certification Scheme certification:** Submit
16. **Declaration of analysis:** Submit.
17. **Samples:** Submit representative sample for review

380 Mycorrhizal inoculant

1. **Description:** Apply to roots or bare root plants before planting and backfilling
2. **Manufacturer:** **PlantWorks Ltd or equal and approved**
Unit 930 Cornforth Drive
Kent Science Park
Sittingbourne
ME9 8HL
01795 411527
info@plantworksuk.co.uk
https://rootgrow.co.uk/
 - 2.1. **Product reference:** Rootgrow mycorrhizal fungi or equal & approved

390 Soil conditioner

1. **Source:** Contractor to submit proposal
 - 1.1. **Product reference:** Seanure Seaweed Soil Builder or equal and approved
2. **Description:** A natural seaweed soil conditioner that builds soil structure, enhances water retention and improves plant health & resistance

393 Compost additive

1. **Source:** Contractor to submit proposal
 - 1.1. **Product reference:** Perlite
2. **Description:** Proprietary lightweight microporous granules used to improve aeration & drainage

395 Peat

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

Fertilizers

400 Organic fertilizer for planting areas

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 or equal and approved
Grant Associates
30-04-2025

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%

Manufactured soils & planting media

510A Imported manufactured growing medium for rain gardens -Soil Type 05

1. Description: 900mm deep imported free draining manufactured growing medium
2. Description: Free-draining growing medium containing a high proportion of sandstone aggregate and recycled glass sand
3. Location: As shown in Soiling Plan
4. Quantity: Provide as necessary to make up the volumes indicated on the drawings. It is the Contractor's responsibility to calculate the volume required, including making an allowance for settlement.
5. Base Material: : Sandstone Aggregate
 - 5.1. Source: Johnson Wellfield Quarries, or equivalent & approved
 - 5.2. Grade: 5 - 20mm
 - 5.3. Content (by dry weight): 50%
6. Fine Aggregate: Recycled glass sand
 - 6.1. Source: Submit proposals
 - 6.2. Content (by dry weight): 25%
7. Topsoil: Sandy silty loam
 - 7.1. Source: Sugar beet washing topsoil from British Sugar Topsoils, or equivalent & approved
 - 7.2. Content (by dry weight): 10%
 - 7.3. Particle Size: Refer to BS3882 (sandy silty loam)
8. Organic Materials: Composted green waste
 - 8.1. Source: Submit proposals
 - 8.2. Content (by dry weight): 15%

9. Contamination: Free from materials hazardous to human or animal life and detrimental to healthy plant growth. Refer to Clause: for requirements for phytotoxic and zootoxic contaminant levels.
10. Nutrient Content (Minimum index values for nitrogen, phosphorus, potassium and magnesium): As multipurpose grade topsoil to BS3882
11. Crumb Structure: Made up of discernible crumbs
12. Foreign Matter: On visual inspection, free of fragments and roots of aggressive weeds, sticks, straw, subsoil, large pieces of brick, concrete, glass, wire, large clumps of clay or vegetation, and the like.
13. Soil Analysis:
 - 13.1. A full written analysis of the proposed growing medium mix will be required by the: for approval before placement. The analysis is to be carried out by an approved soil laboratory , e.g. Tim o'Hare Associates (01491 822653) or equal & approved ,and must include the following:
 - 13.2. Soil reaction (pH)
 - 13.3. Conductivity
 - 13.4. Nutrient content
 - 13.5. Mass loss on ignition
 - 13.6. Results of tests for CLEA elements & compounds
 - 13.7. Results of tests for phytotoxic & zootoxic elements & compounds
 - 13.8. Report outlining the soil analyst's recommendations
 - 13.9. It is the Soil Testing Laboratory's responsibility to consider appropriate threshold limits for any contaminants present in the growing medium, both individually and in combination, and assess the growing medium's suitability for safe use within: development.
 - 13.10. 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 when the growing medium is supplied) and shall confirm this in writing prior to the growing medium's delivery to site.

522 Imported manufactured planting media - hard landscape tree pits

1. Description: Proprietary SUDs soil for treepits in hard - Soil type 07
2. Source: GreenBlue Urban or equal & approved
 - 2.1. Product reference: ArborSoil Hydro Max or equal & approved
3. Description: Proprietary SUDs soil mix
4. Location: As shown in Soiling Plan
5. Composition: Contractor to submit datasheets
6. Application: In accordance with manufacturer's specification
7. Note: Soil to be backfilled into the soil cells in accordance with supplier/ manufacturer's recommendations. Contractor to allow for geotextile membrane separating the structural soil system from existing/ made ground.

522A Imported gravel matrix for pond marginal planting -Soil Type 06

1. Description: Imported clean washed gravel matrix for pond marginal planting
Pond Marginal Beds between 40.600m and 41.500m AOD: 400 mm imported gravel matrix placed over pond liner and protective fleeces

Upper Marginal Beds between 41.500m and 42.000m AOD:

200 mm imported clean washed gravel matrix blended with 350mm inert low fertility topsoil (Q28/326C)

2. **Composition:** The mix shall conform to the following;
10% medium coarse gravel - approx. 25mmdia.
65% medium gravel -approx. 15mmdia.
25% fine gravel - approx4-5mm dia.

Contractor to allow within the tender for grading and mixing of the clean imported gravels to achieve the above matrix.

Sample of the mixed gravel matrix to be submitted for approval together with evidence of source of gravels and no presence of salts and delirious material.

3. **Location:** As shown in Soiling Plan

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 and Subsoil
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 TREE PITS, FOR TOP DRESSING/ MULCHING, FOR PLANTING BEDS, FOR GRASS SEEDING
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 AND FOR COMPOST
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: Required

4. Number of copies: Three

640 Documentation for preparation materials

1. Description: FOR IMPORTED SOIL IMPROVERS
2. Timing: Submit at handover.
3. Contents
 - 3.1. Full description of all components.
 - 3.2. Record of source for all components.
 - 3.3. Analyst's report for each test carried out.
 - 3.4. Supplier's declaration of compliance with BSI PD CR 13456.
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: 2 weeks

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: For all planted 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. Decompect 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, tarmac and large stones (over 200mm dia), or organic matter exposed by this operation, are to be removed and disposed off site

670 Inspecting formations

1. Give notice: Before spreading topsoil for: CA/ Landscape Architects
2. Notice period: 2 weeks

Topsoil storage & placement operations

675 Preparation of undisturbed topsoil (Soil type 08)

1. Standard: In accordance with BS 4428.
 - 1.1. Grading and cultivation: Soil Type 08 will be carefully graded and cultivated to marry in smoothly with existing and proposed areas of soiling
2. Hard ground: Break up thoroughly.
3. Clearing: Remove visible roots and large stones with a diameter greater than: 30mm - care to be taken not to remove tree roots during clearing. All operations by hand only following arboriculturalist's method statements for all work undertaken within an RPA
4. Areas covered with turf or thick sward: Carefully dig over to full depth of topsoil and remove existing vegetation by hand means only

685 Surplus materials to be removed

1. Topsoil removal from site: The contractor shall make allowance for removal of excess topsoil not required to complete the landscape proposals or is found not to be suitable unless otherwise stated or agreed with the CA/ Client
2. Subsoil, stones, debris, wrapping material, canes, ties, temporary labelling, rubbish, prunings and other arisings: Remove.

690 Topsoil storage heaps

1. Location: Contractor to confirm based on availability of space and construction phasing/programme
2. Height (maximum): 2m
3. Width (maximum): Contractor to submit proposals for agreement with CA/Landscape Architect
 - 3.1. Formation: Loose tip and shape from the side only, without running machinery on the heap at any time.
4. Protection:
 - 4.1. Do not place any other material on top of storage heaps.
 - 4.2. Do not allow construction plant to pass over storage heaps.

4.3. Prevent compaction and contamination, by fencing and covering as appropriate.

691 Storage of imported topsoil

1. **Refer to Clauses:** Imported topsoil to be delivered as required and no storage on site permitted unless otherwise stated or agreed with the Client.

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:** months and shall be re-seeded with green manures as required
6. **The spoil heaps are not to exceed:** 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: The minimum depths for each planting typology as set out in Q28
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 the moisture content is greater than the plastic limit.

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: 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: of this specification
5. 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.
6. Use hand tools around trees, plants and in confined spaces, where it is impracticable to use machinery.
7. 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.
8. 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.

717 Final cultivation

1. **Description:** All planting areas
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:** 200mm
5. **Particle size (maximum):** 20mm
6. **Timing:** Prior to planting operations
7. **Weather and ground conditions:** Suitably dry
8. **Surface:** Leave regular and even
9. **Levels:** As per levels shown on contract drawings
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: 20mm
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: 150 mm below finished floor levels and/or DPC
5. Adjacent to Existing trees:
 - 5.1. Not more than 75mm above previous soil levels at butt of existing trees
 - 5.2. Within root spread of existing trees and shrubs to be retained: Do not dig or cultivate
6. 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.: for location/extent of different topsoil regimes
2. Following approval of topsoil placement, spread and incorporate soil ameliorants in accordance with:
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 Architect describing 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: Q31

805 Applying soil ameliorant

1. Description: Planting beds and tree planting pits
2. Type: As per manufacturers recommendations and as set out in Q31
3. Locations: Planting beds and treepits as set out on the contract soiling and planting drawings
4. Fully incorporate into topsoil to a depth of: As per manufacturers recommendations and as set out in Q31
5. Application: Spread evenly.
 - 5.1. Timing: Apply prior to cultivation.
 - 5.2. Rate: As per manufacturers recommendations and as set out in Q31
6. Timing: Prior to cultivation.

810 Applying compost

1. Description: Planting beds and treepits
2. Application rate for trees and shrubs: As per manufacturers recommendations and as set out in Q31
 - 2.1. Timing: Apply prior to cultivation.
3. Application rate for grass:
 - 3.1. Timing: Apply prior to cultivation.

820 Applying general fertilizer

1. Description: Planting beds and treepits
2. Application: Spread evenly, carefully incorporating below mulch materials.
 - 2.1. Timing: Immediately before cultivation.
 - 2.2. Application rate: As per manufacturers recommendations and as set out in Q31

840 Applying mycorrhizal inoculant

1. Description: As per manufacturers recommendations and as set out in Q31
2. Depth: As per manufacturers recommendations and as set out in Q31

845 Applying loose mulch

1. Description: Application of mulch to all planting beds and circular soil areas beneath tree planting. Contractor to provide sample of proposed mulch to CA/Landscape Architect for approval prior to placing order. Refer to clause Q28/155 and Q28/156.
2. Timing: Submit proposal
3. Preparation: Submit proposal

4. Coverage of mulch (minimum): 50mm
 - 4.1. Planting beds (depth): 50mm
 - 4.2. Trees: 50mm
5. Finished level of mulch: Level to be 20mm proud of surrounding levels to allow for settlement

860 Topsoil amelioration

1. Description: General grade topsoil
2. Refer to Softworks Plans : for location/extent
3. The following quantities/soil ameliorant application rates are for guidance only. This amelioration is for Soil type 01 - Native hedgerow and woodland edge planting, Soil type 04 - Woodland shrubs, herbeaceous perennials and grasses and all treepits in hard and soft areas.
 - 3.1. Refer also to Soil Analyst's report for specific topsoil amelioration requirements -: **Q28/325**
4. Evenly apply Compost : at a rate of 20 L/m² over placed topsoil
5. Evenly apply Organic Fertilizer: at a rate of 200 g/m²
6. Evenly apply Soil Conditioner: **Q28/390**) at a rate of 70 g/m²
7. Fully incorporate above items into top: 250 mm of soil achieving an intimate mix 450mm deep for Soil type 04, refer to Q28/ 117.
8. Following incorporation of organic fertilizer, thoroughly water, if deemed necessary
9. The planting bed should be left fallow for a period of: days prior to planting
 - 9.1. Refer to suppliers' recommendations

Completion

900 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's] 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: To all planting beds (wildflower meadows excluded)
2. Duration: Carry out the following operations from completion of seeding/ turfing until the end of the rectification period.
3. Time of year: As per manufacturers recommendations
4. Application: Evenly spread, carefully incorporating below mulch materials.
5. Rate: As per manufacturers recommendations applicable to the varying requirements for each of the individual planting typologies

920 Applying mulch

1. Timing: At end of the rectification period
2. Watering: Ensure that soil is thoroughly moistened prior to mulching, applying water where necessary.
3. Planting beds: Re-mulch.

- 3.1. Depth (minimum): 50mm
- 4. Trees: Remulch.
 - 4.1. Depth (minimum): 50mm

Ω End of Section

Q30

Seeding/turfing

To be read with preliminaries/general conditions.

10 Section index

1. 100 - 199: GENERAL INFORMATION/REQUIREMENTS
2. 200 - 299: PREPARATION
3. 300 - 399: SEEDING
4. 400 - 499: TURFING
5. 500 - 599: PROTECTION & CUTTING
6. 600 - 699: MAINTENANCE & HANDOVER

General information/requirements

100 Reference documents

1. BS3969:1998 + A1:2013: *Recommendations for turf for general purposes*
2. BS4428:1989: *Code of practice for general landscape operations (excluding hard surfaces)*

110 Seeding generally

1. All works to be carried out in accordance with British Standards listed above, unless otherwise specified
2. The Contractor shall be responsible for the successful establishment of the grass sward and shall take all action to ensure its success

115 Seeded and turfed areas

1. **Growth and development:** Healthy, vigorous grass sward, free from the visible effects of pests, weeds and disease.
2. **Appearance:** A closely knit, continuous ground cover of even density, height and colour.

120 Climatic conditions

1. **General:** Carry out the work while soil and weather conditions are suitable.

130 Seasonal constraints

1. Carry out the work during appropriate seasons (Spring/Autumn) and while soil and weather conditions are suitable for the relevant operations. Programme to be agreed with CA . Autumn seeding is preferred to spring seeding.

145 Watering

1. **Quantity:** Wet full depth of topsoil.
2. **Application:** Even and without displacing seed, seedlings or soil.
3. **Frequency:** As necessary to ensure the establishment and continued thriving of all seeding/turfing.

150 Water restrictions

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

160 Notice

1. Give notice before
 - 1.1. Setting out.
 - 1.2. Applying herbicide.
 - 1.3. Applying fertilizer.
 - 1.4. Preparing seed bed.
 - 1.5. Seeding or turfing.
 - 1.6. Visiting site during maintenance period.
2. Period of notice: 1 week

170 Setting out

1. Boundaries: Mark clearly.
2. Delineation: In straight lines or smoothly flowing curves as shown on drawings.

Preparation

210 Herbicide

1. Description: FOR ALL GRASSED AREAS
2. Type: Suitable for suppressing perennial weeds. Must be organic in line with the University's biodiversity policy. Contractor to agree methodology and organic herbicide specification with University prior to undertaking the work.
3. Timing: Allow fallow period before cultivation.
 - 3.1. Duration: As manufacturer's recommendation

212 Seed bed cleaning before sowing

1. Description: ALL GRASSED AREAS
2. Operations: Remove weeds by hand weeding and hoeing.

217 Weed control

1. Generally: 3 (three) to 5(five) days before seeding all areas to be seeded shall be cleared of weeds and rubbish. All planted/grass areas are to be maintained weed free by mechanical or manual methods. The use of herbicides may only be used if so directed by the: CA/Landscape Architect following agreement with the client and the Contractor shall allow for, within the programme, sufficient period for the organic herbicide to act.

220 Topsoil amelioration

1. Refer to Section: **Q28** for requirements

230 Topsoil cultivation

1. Refer to Section: **Q28** for requirements

240 Fertilizer

1. Refer to Section: **Q28** for requirements if required

250 Soil requirements

1. Type
 - 1.1. Seeded areas: Soil for grass swards, as section Q28

Seeding

312 Wildflower & grass seed mix to understorey of woodland edge mix WE02

1. **Description:** Wildflower and grass seed mix to the understorey of woodland edge mix WE02. Refer to Softworks General Arrangement Plans for location.
2. **Supplier:** Emorsgate seeds or equal & approved
Neeps Bridge Farm
Middle Drove, Wisbech
Cambridgeshire
PE14 8JT
Call: 01553 829028
Email: enquiries@emorsgateseeds.com
Website: www.wildseed.co.uk
 - 2.1. **Mixture reference:** Woodland Mixture EW1 or equal & approved. Mix composed of 20% native wild flowers and 80% slow growing grasses (by weight) and is suitable for sowing in moderately developed shade.
3. **Origin of each species (as defined in Flora Locale's Code of practice for collectors, growers and suppliers of native flora):** Certified British Native Wild. Preferably of local provenance.
4. **Application rate:** 4 g/m²

312A Wildflower & grass seed mix to woodland edge mix WE02

1. **Description:** Wildflower and grass seed mix to woodland edge mix WE02. Refer to Softworks General Arrangement Plans for location.
2. **Supplier:** Emorsgate seeds or equal & approved
Neeps Bridge Farm
Middle Drove, Wisbech
Cambridgeshire
PE14 8JT
Call: 01553 829028
Email: enquiries@emorsgateseeds.com
Website: www.wildseed.co.uk
 - 2.1. **Mixture reference:** Hedgerow Mixture EH1 or equal & approved. Mix composed of 20% native wild flowers and 80% slow growing grasses (by weight). Species mix tolerant of semi-shade and is suitable for sowing beneath newly planted or established hedges
3. **Origin of each species (as defined in Flora Locale's Code of practice for collectors, growers and suppliers of native flora):** Certified British Native Wild. Preferably of local provenance.
4. **Application rate:** 4 g/m²

312B Wildflower & grass seed mix to Swale (SW01)

1. **Description:** Wildflower and grass seed mix to swale SW01. Refer to Softworks General Arrangement Plans for location.
2. **Supplier:** Emorsgate seeds or equal & approved
Neeps Bridge Farm
Middle Drove, Wisbech
Cambridgeshire
PE14 8JT
Call: 01553 829028
Email: enquiries@emorsgateseeds.com
Website: www.wildseed.co.uk
 - 2.1. **Mixture reference:** Meadow Mixture for Wetlands EM8 or equal & approved. Mix composed of 20% native wild flowers and 80% slow growing grasses (by weight) and is suitable for seasonally wet soils

3. Origin of each species (as defined in Flora Locale's Code of practice for collectors, growers and suppliers of native flora): Certified British Native Wild. Preferably of local provenance.
4. Application rate: 4 g/m²

312C Wildflower & grass seed mix (MD02)

1. Description: Wildflower and grass seed mix - MD02.
Refer to Softworks General Arrangement Plans for location.
2. Supplier: Emorsgate seeds or equal & approved
Neeps Bridge Farm
Middle Drove, Wisbech
Cambridgeshire
PE14 8JT
Call: 01553 829028
Email: enquiries@emorsgateseeds.com
Website: www.wildseed.co.uk
 - 2.1. Mixture reference: Meadow Mixture for Clay Soils EM4
or equal & approved. Mix composed of 20% native wild flowers and 80% slow growing
grasses (by weight) and adapted to growing on soils with a high clay content.
3. Origin of each species (as defined in Flora Locale's Code of practice for collectors, growers and suppliers of native flora): Certified British Native Wild. Preferably of local provenance.
4. Application rate: 4 g/m²
5. Note: Mix to include 10% (by weight) Poppy seeds

319 Quality of seed

1. Description: FOR ALL GRASSED AREAS
2. Freshness: Produced for the current growing season.
3. Certification: Blue label certified varieties.
 - 3.1. Standard: EC purity and germination regulations.
 - 3.2. Official Seed Testing Station certificate of germination, purity and composition: Submit when requested.
4. Samples of mixtures: Submit when requested.

322 Quality of wildflower seed

1. Description: FOR ALL SEEDED AREAS
2. Standard: In accordance with Flora Locale's 'Code of practice for collectors, growers and suppliers of native flora'.
3. Germination testing: Submit germination test results (to ISTA International rules for seed testing)
4. Freshness of seed: Produced for the current growing season
5. Samples: Submit when requested.

330 Sowing

1. General: Establish good seed contact with the root zone.
2. Method: To suit soil type, proposed usage, location and weather conditions during and after sowing
 - 2.1. Distribution: 2 equal sowings at right angles to each other and diagonally to main axis

332 Sowing general

1. Sow seed using suitable calm weather conditions when temperature and rainfall are at their best for the majority of seed varieties

- 1.1. **Time to be agreed with the:** to ensure grass establishment prior to Practical Completion
2. Spread seed evenly at the specified rate(s) applied in two equal sowings in cross directions
 - 2.1. By hand in confined areas or, where possible, seed shall be sown using a Brillion sowing machine, or equal approved
3. Lightly harrow or rake
4. On light soils, roll and cross roll after seeding using a lightweight roller.
5. **The Contractor shall obtain the:** approval as to the intended method for seed sowing in sloping areas and within RPAs of existing trees
6. Seed shall be incorporated into the top 2-4mm of the seed bed and shall not be buried at a lower depth
 - 6.1. To ensure sufficient depth of seed within the soil the Contractor shall allow for approved surface scarification and or rolling in addition to the 'in built' rolling of the Brillion sowing machine
7. Only machinery with low-pressure tyres shall be used
8. Seed shall be kept well mixed prior to sowing
 - 8.1. Silica may be added as a bulking agent
9. **Any areas which, in the opinion of the:** CA/Landscape Architect, have been seeded in any way contrary to this Specification, unless instructed otherwise, shall be re-tilled and re-seeded as directed at no additional cost to the Contract.

335 Grass sowing season

1. **Grass seed generally:** August to October

336 Wildflower sowing season

1. **Wildflower seed generally:** March to May or August to October

340 Pre-emergent herbicide

1. **Description:** Where soil has not had the opportunity to lay fallow for a suitable period (See [clause 210](#)) a suitable organic pre-emergent herbicide applied to aid suppressing weed growth FOR ALL GRASSED AREAS. Use of organic pre-emergent herbicide to be agreed with CA/Landscape architect/Client
2. **Standard:** Pesticide Safety Directorate approved.
3. **Application rate:** In accordance with manufacturer's written recommendation.
 - 3.1. **Timing:** Immediately after sowing.

350 Turf edging to seeded areas

1. **Description:** ADJACENT TO CAR PARKING, ROADS and ADJCENT TO FOOTPATH
2. **Standard:** To BS 3969, with no perennial ryegrass. E.g Amenity turf by Tillers Turf or equal & approved.
 - 2.1. **Seed mix:** Similar to seeded area.
3. **Timing:** Before sowing.
4. **Preparation:** Rake back a 750 mm wide margin around prepared seed beds.
 - 4.1. **Level of seed bed:** Married in with turf.
5. **Placement:** Single row laid end to end and trimmed to a line.
6. **Watering:** On completion.

352 Edges to seeded areas

1. **Description:** ADJACENT TO PLANTING BEDS AND TREE PITS

2. **Timing:** After seeded areas are well established.
3. **Edges:** Clean straight lines or smooth curves.
 - 3.1. **Mulch and soil:** Draw back to permit edging.
4. **Arisings:** Remove.
5. **Completion:** Respread soil and mulch.

Turfing - Not Used

Protecting/cutting

547 First cut of wildflower areas

1. Cutting of wildflower mix to be in accordance with seed supplier's recommendations for establishment.
2. **The Contractor shall inform:** the CA/Landscape Architect 72hours before the initial cut is carried out.
3. The Contractor shall submit (for all mixes) prior to seeding, a detailed establishment cutting regime as advised by the seed suppliers.
4. The Contractor is deemed to have included within the tender for sufficient cuts to ensure full establishment of all mixes and to a regime that ensures true species representation/diversity within the sward.
 - 4.1. Failure to achieve this will result in the need for remedial works at the Contractor's expense

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

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

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:** 1 cut late August/early September (subject to seasonal variations/growth)
 - 3.2. **Height of first cut:** 75 mm - If nutrient levels are high and weeds are a problem a hard cut to 50mm
 - 3.3. **Frequency of subsequent cutting (minimum):** Wildflower species will be flowering in late July/August. Contractor to allow individual species to set seed prior to cutting. Timing to be agreed with onsite management/maintenance team. Cut to 75mm - leave arisings for 3-7 days and then remove. Mow or graze the re-growth through to late autumn/winter to c 50mm and again in spring if needed, subject to review by Ecologist.

- 3.4. **Height of growth permitted (maximum):** Allow sward to grow to maximum height possible as species mix dictates
4. **Height and frequency of cut in second growing season**
 - 4.1. **Time of cut:** 1 cut late August/early September (subject to seasonal variations/growth)
 - 4.2. **Height of cut:** 75 mm - If nutrient levels are still high and weeds are a problem a hard cut to 50mm
5. **Trimming:** All edges.
 - 5.1. **Arisings:** Remove. Contractor to adhere to University's biodiversity policy of strategy for green waste. Contractor to agree with the client whether arisings composted onsite or removed off site for green waste composting.
6. **Watering:** As required to maintain a healthy species rich sward.

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

1. 10 - 99: GENERAL
2. 100 - 199: PREPARATION FOR PLANTING OPERATIONS
3. 200 - 289: PLANT PROCUREMENT & DELIVERY TO SITE
4. 290 - 299: PLANTERS/PLANT CONTAINERS
5. 300 - 399: PREPARATION OF PLANTING BEDS/PLANTING MATERIALS
6. 400 - 499: PLANTING SHRUBS/HERBACEOUS PLANTS/BULBS
7. 500 - 599: PLANTING TREES
8. 600 - 699: WOODLAND/MATRIX/BUFFER ZONE PLANTING
9. 700 - 799: PROTECTING/MAINTAINING/MAKING GOOD DEFECTS
10. 800 - 850: PLANT PROCUREMENT - ADVANCE PROCUREMENT & CONTRACT GROWING

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: Refer to document(s) WSR-GRAN-XX-XX-SCH-LAN-9001
2. Supporting Images & Specification Notes: Refer to any supporting images in the 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 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 organic herbicide
 - 1.5. Application of organic 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:** 1 week

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

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.

Preparation for planting operations

110 Site clearance - general

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

112 Site clearance generally

1. General: Remove rubbish, concrete, metal, glass, decayed vegetation and contaminated topsoil.
2. Stones: Remove those with any dimension exceeding: 40mm
3. Contamination: Remove material containing toxins, pathogens or other extraneous substances harmful to plant, animal or human life.
4. Vegetation: Grub up and dispose of without undue disturbance of soil and adjacent areas.
5. Large roots: Grub up and dispose of without undue disturbance of soil and adjacent areas.
6. Additional requirements: None

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.

170 Soil requirements

1. *Type*
 - 1.1. *Soil Type 01* - : Native hedgerow & Woodland Edge Planting, refer to Q28/145
 - 1.2. *Soil Type 02* - Wildflower / Meadow Planting in newly created areas, refer to Q28/115 .
 - 1.3. *Soil Type 03* - Swale, refer to Q28/ 116
 - 1.4. *Soil Type 04* - Woodland Shrubs, Herbaceous perennials and Grasses, refer to Q28/117
 - 1.5. *Soil Type 05* - Rain garden, refer to Q28/118
 - 1.6. *Soil Type 06* - Pond Marginal Beds, refer to Q28/119
 - 1.7. *Soil Type 07* - Tree pits in hard, refer to Q28/522
 - 1.8. *Soil Type 08* - Wildflower / Meadow Planting in existing soil areas and RPA / Buffer Zone Areas, refer to Q28/120
 - 1.9. *Tree pits, shrub pits and other backfilling*: For all tree pits types and shrub and other backfilling soiling (topsoil and subsoil mixes) refer to Q28 and Q31
 - 1.10. *Mulch applied after planting*: Refer to Q28/155, Q28/156 and Q31

Plant procurement & delivery to site

200 Plants/ trees - general

1. *Condition*: Materially undamaged, sturdy, healthy and vigorous.
2. *Appearance*: Of good shape and without elongated shoots.
3. *Hardiness*: Grown in a suitable environment and hardened off.
4. *Health*: Free from pests, diseases, discoloration, weeds and physiological disorders.
5. *Budded or grafted plants*: Bottom worked.
6. *Root system and condition*: Balanced with branch system.
 - 6.1. *Standard*: The National Plant Specification and The relevant parts of BS 3936
7. *Species*: True to name.
8. *Origin/ Provenance*: British provenance wherever possible in line with the University biodiversity policy. Contractor to confirm origin/provenance of all proposed plants prior to ordering.
9. *Definition*: Origin and Provenance have the meaning given in the National Plant Specification.

202 Plant procurement - supporting documents

1. The Committee for Plant Supply and Establishment,: *Handling and Establishing Landscape Plants*, November 1995
2. Plant Schedules: Refer to RD001-FCB-XX-XX-SH-L-5000
3. Planting Plans: Refer to RD001-FCB-XX-XX-DR-L-5102 to 5105

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: 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: 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: *Topsizes*, the largest grade bulb commercially available is required.

214 Plant procurement - native wildflower & aquatics

1. **Generally:** Wildflower and aquatic plants shall be container grown and conform to the size and type scheduled. They shall be pure breed, native species and shall only be obtained from an approved source.
2. The Nursery shall confirm the origin of any seed for seed raised plants or origin of propagation material used in vegetative production.
 - 2.1. Local site origin is preferred
 - 2.2. All stock must be of BRITISH PROVENANCE
3. **Age / Establishment:**
 - 3.1. Plants grown from seed must have sufficient time in the container to germinate and establish a well rooted and vigorous plant.

- 3.2. The Nursery shall carefully program potting/growing up of wildflower plants so that well grown plants, which are rooted through the volume of compost within the container (but not root bound), are available to supply at the required times.
- 3.3. If the plants are showing any signs of becoming pot bound, then the Nursery shall pot on the plants at their own expense. Severely pot bound plants delivered to site will be rejected.
- 3.4. Plants shall have a high degree of extension growth typical of the species and appropriate to the season and specified container size. The plants shall be spaced on the nursery as specified/required to allow for a full and uniform structure/leaf coverage to develop, evenly around the pot.
- 3.5. All submerged free-growing aquatic plants shall be supplied weighted (to approved detailing) and bunched as scheduled.

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).

216 Plants/ trees - specification criteria

1. Name, forms, dimensions and other criteria: To the relevant part of BS 3936.

220 Preferred suppliers/nurseries - trees

1. The preferred suppliers/nurseries for tree stock are:
2. **Wyevale Nurseries:**Wyevale nurseries LtdKings AcreHereford, HR4 7AY Tel: 01432 845200
Contact: Andy Congera - andyc@wyevale-nurseries.co.uk
Deepdale Trees: Tithe Farm, Hatley Road, Potton, Sandy, Beds. SG19 2DX Tel: 01767 26 26 36
Contact: Craig Rankin mail@deepdale-trees.co.uk
Barcham Trees: Eye Hill Drove, Ely, Cambridgeshire, CB7 5XF Tel: 01353 720 950 Contact:
info@barchamtrees.co.uk (trade sales www.barchampro.co.uk)
Hilliers: Ampfield House, Ampfield, Romsey, Hampshire SO51 9PA Tel: 01794 368733 Contact:
treesales@hillier.co.uk
Von Ehren Nurseries:Pflanzenhandel Lorenz von Ehren GmbH & Co. KG Malfeldstr. 4 | D-21077
HamburgTel: +49 40 76108 271 / +44 (0)1865 910261Contact:- 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-
OedenrodeNetherlandsTel: +31 (0)413 480482Contact: Jan van Vechel - jan@vdberk.nl

Note: Any change to this strict adherence full justification and approval from the Landscape Architect

221 Preferred suppliers/nurseries - shrubs & herbaceous perennials

1. The preferred suppliers/nurseries for shrub and herbaceous plant stock are:
2. **Wyevale Nurseries:**Wyevale nurseries LtdKings AcreHereford, HR4 7AYT: 01432 845200Contact: Andy Congera - andyc@wyevale-nurseries.co.uk
Johnsons of Whixley:Johnsons of WhixleyWhixleyYorkTO26 8AQT: 01423 330234
Hilliers: Ampfield House, Ampfield, Romsey, Hampshire SO51 9PA Tel: 01794 368733 Contact:
treesales@hillier.co.uk
Robin Tacchi Plants: Fen FarmGarboldishamNorfolk, IP22 2RLT: 01953 681312E:
rtp@robintacchiplants.comW: 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:

246 Labelling and information

1. **Standard:** To BS 3936.

255 Plants/ trees reserved at supplier's premises

1. **Types/ Species:** Refer to the planting schedules and contract drawings
2. **Predelivery inspection:** Give notice.
3. **Labelling:** Identify inspected plants/ trees as reserved for use on this project.

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.

265 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:** Contractor to submit proposals to ensure plants are well protected but packaging is recyclable
5. **Packaging of bulk quantities:** Contractor to submit proposals to ensure plants are well protected but packaging is recyclable
6. **Planting:** Upright or well balanced with best side to front.

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:** is 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:** reserves 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

Preparation of planting beds/ planting materials

300 Herbicide

1. **Description:** TO CLEAR OVERGROWN BEDS
2. **Locations:** All planting areas as appropriate and agreed with CA/Landscape Architect & Ecologist. The use of hand/mechanical weed control shall be used in the first instance as part of the clearance/maintenance/management of planting and organic herbicides should be used as last resort where hand/mechanical is not possible. Contractor to refer to A15, 200.
3. **Type:** Organic and suitable for suppressing perennial weeds.
4. **Timing:** Allow fallow period before cultivation.
 - 4.1. **Duration (minimum):** As manufacturer's recommendation

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/Landscape Architect.
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/Landscape Architect/ Ecologist 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.

305 Weed control

1. **Description:** FOR INVASIVE NON-NATIVE WEEDS
2. **Locations:** All planting areas
3. **General:** Prevent weeds from seeding and perennial weeds from becoming established, by hand weeding. Any use of herbicide shall be agreed with CA/Landscape Architect/Ecologist.

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:** For all bareroot plants
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

400 Plant layout

1. **Description:** TO ALL BEDS
2. **Spacing:** Refer to planting plans and details
3. **Density:** Refer to planting schedules, plans and details

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: Q28/860](#) 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:](#) Organic Fertilizer ([Q28/400](#)) 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

415 Antidesiccant for conifers/ Evergreens

1. **Manufacturer:** Submit proposals
 - 1.1. **Product reference:** Submit proposals
2. **Application:** Dip before delivering to site. Spray soon after planting.
 - 2.1. Do not apply in wet or frosty weather.
 - 2.2. Ensure full coverage of underside of foliage.

420 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:** Stainless steel wire unless otherwise stated
 - 2.1. **Base height:** Refer to contract detail drawing
 - 2.2. **Extent:** Refer to contract detail drawing
 - 2.3. **Centres:** Refer to contract detail drawing
 - 2.4. **Distance from wall:** Refer to contract detail drawing
3. **Fixings:** Stainless steel screw eyes
 - 3.1. **Centres:** Refer to contract detail drawing

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:** CA/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.**

457 Planting aquatic/ Marginal plant plugs

1. **Handling:** Keep plants watered and in shade until planted. Do not allow to dry out.
2. **Preparation:** Remove coarse weeds etc. from planting sites.
3. **Planting sites:** As per Plant schedule
4. **Waterproofing membrane below soil:** Do not puncture.
5. **Planting:** Into a hole to suit plug size and shape. Create a cleft at bottom of hole to improve rooting. Gently firm plant into hole to ensure good root hold into substrate.
6. **Note:** Timing of aquatic planting to be programmed to follow commissioning of pond liner and appropriate season for planting to suit horticultural requirements.

Submerged aquatic plant supplied and planted in proprietary baskets. Pond liner system to be fully compatible with planting intent.

471 Naturalized hedges

1. **Planting:** In trenches large enough to take full spread of roots. Set out plants evenly.

472 Fencing support for new hedges

1. **Type:** Timber post and general pattern wire mesh, as section Q40
2. **Timing:** Before planting hedge.
3. **Support:** Lightly secure hedge plants to fence wires at appropriate intervals.

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:** 50mm

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

491 Mulching - trees in soft landscape areas

1. **Material:** Refer to Q28, 155
 - 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 500 mm radius measured from the tree stem
4. **Depth:** 50mm
5. **Finished level of mulch:** 20mm above surrounding area

Planting trees

500 Tree planting

1. **Standard:** Prepare trees and transplant in accordance with BS 4428

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: CA/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: mm 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: , 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: 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

502 Antidesiccant for conifers/ Evergreens

1. **Manufacturer:** Submit proposals
 - 1.1. **Product reference:** Submit proposals
2. **Application:** Dip or thoroughly spray before delivering to site. Spray again soon after planting.
 - 2.1. Do not apply in wet or frosty weather.
 - 2.2. Ensure full coverage of underside of foliage.

505 Tree pits

1. **Sizes:** As plant schedule
2. **Sloping ground:** Maintain horizontal bases and vertical sides with no less than minimum depth throughout.

3. **Excavated material:** Separate topsoil and subsoil material and stockpile for backfilling. Imported topsoil and subsoil may be required as set out in Q28.
Remove arisings
4. **Pit bottoms:** Excavate with slightly raised centre: Break up base to a depth of 150 mm.
 - 4.1. **Treatment:** Submit proposals
5. **Pit sides:** Scarify.
6. **Backfilling material:** Proprietary tree backfilling material, as section Q28 and Q31 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: **Q28/860** 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**), 120L Organic Compost (**Q28/361**) plus as-dug 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 as-dug 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 as-dug 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 as-dug ameliorated topsoil

510 Tree pit root barriers

1. **Locations:** Contractor to refer to engineers details and specification. Utility trenches to be lined with root barriers to avoid individual tree pit root barriers.
2. **Manufacturer:** Refer to Engineer's details and specification
 - 2.1. **Product reference:** Refer to Engineer's details and specification
3. **Thickness:** Refer to Engineer's details and specification
4. **Barrier depth:** Refer to Engineer's details and specification
5. **Foil liner:** Refer to Engineer's details and specification
6. **Top of root barrier in relation to finished topsoil level:** Refer to Engineer's details and specification

7. **Installation:** With sides vertical. Remove all sharp objects adjacent to barrier.
Note: To be coordinated with landscape proposal prior to installation.
Contractor to submit proposal for Landscape Architect and Engineer's approval.

514 Aeration and Manual Irrigation 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 (Contractor to confirm final size of kits with supplier based on individual tree size (height/rootball/girth))
 - 3.2. **Trees in hard landscape areas:** Metal cap with chain, i.e. RRM4
4. **Note:** All to be fitted in accordance with suppliers recommendations and sized as scheduled by suppliers information pack.

515 Aeration Well for Trees in Hard (Soil cells)

1. All trees in hard paving are to be planted incorporating tree pit aeration system
2. **Supplier:** GreenBlue Urban Treepit system or equal & approved
 - 2.1. **Product Reference:** RootRain ArborVent 150 trafficable irrigation and aeration inlet system or equal & approved.
3. **Cap Types:** Submit proposal for approval by Landscape Architect
 - 3.1. **Trees in hard landscape areas:** 2no. Aeration Wells per tree in hard. Refer to treepit details with recessed inspection cover to accept paved finish and side slots to accommodate aeration to root system (Contractor to confirm final size of kits with supplier based on individual tree size (height/rootball/girth))
4. **Note:** All to be fitted in accordance with suppliers recommendations and sized as scheduled by suppliers information pack.

516 Root deflectors to Treepits in hard

1. **Location:** As indicated in treepit details
2. **Manufacturer:** GreenBlue Urban or equal & approved
 - 2.1. **Product Reference:** ReRoot 600 or equal & approved
3. **Installation:** In accordance with Manufacturer's recommendations
4. **Installation:**
 - 4.1. Lower flange of the Root Director should be level and on a firm even base to avoid settlement
 - 4.2. Ensure top edge of Root Director is level with finished surround, unless installing with a tree grille.
 - 4.3. Backfill inside and outside simultaneously, firming in 150mm deep layers
 - 4.4. Topsoil inside the Root Director should not overflow the top flange:

516A Geonet

1. **Location:** As per soil cell manufacturer's recommendation
2. **Manufacturer:** GreenBlue Urban or equal & approved
 - 2.1. **Product Reference:** Twin walled structural geonet - GLTWGNA or equal & approved
3. **Installation:** In accordance with Manufacturer's recommendations laid over RootSpace

516B Loading bearing Units

1. **Location:** As per soil cell manufacturer's recommendation
2. **Manufacturer:** GreenBlue Urban or equal & approved
 - 2.1. **Product Reference:** ArborCell load bearing units - GBUABC 150A or equal & approved
3. **Installation:** In accordance with Manufacturer's recommendations laid over RootSpace

517 Proprietary soil cells

1. **Location:** As indicated on Soiling Plan and Treepit details
2. **Manufacturer:** GreenBlue Urban or equal & approved
 - 2.1. **Product Reference:** RootSpace 600
3. **Module Size:** 500mm(L)x500mm (W)x 600mm (D). Modules to fit treepit dimensions shown in soiling plan. Supplier to provide workshop drawings/ details for approval
4. **Description:** Recycled plastic interlocking matrix structure
5. **Installation:**
 - 5.1. In accordance with manufacturer's requirements/recommendations
 - 5.1.1. To be installed on a firm, level and free draining base- To be backfilled with ameliorated topsoil in accordance with **Q28/522** To be backfilled with ArborSoil Hydro Max

521 Tree drainage general

1. The Contractor is responsible for the supply and installation of tree pit drainage & tree drains as shown on the Landscape Architect's treepit detail and Engineer's drawings:
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:
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:** For all Tree Pits unless otherwise stated
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:** Varies. Contractor to refer to Tree Planting Pit Detail 5501
4. **Drainage pipes**
 - 4.1. **Type:** Perforated plastics
 - 4.2. **Diameter:** 100 mm
 - 4.3. **Position:** Lay around perimeter of pit within aggregate layer.
 - 4.4. **Discharge:** For positive connection to site wide stormwater and attenuation system Contractor shall refer to civil engineers details and specification
5. **Geotextile filter**
 - 5.1. **Manufacturer:** Submit proposals

- 5.1.1. **Product reference:** Submit proposals
- 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:**
 - 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 prior 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 liaison 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 Trees in hard - TP01

1. **Description:** Tree pit in hard and rain garden next to car park, refer to Treepit detail TP01 & TP02
2. **Manufacturer:** Platipus or equal & approved
 - 2.1. **Product reference:** D-MAN® System - RF1PDMAN (as a guide only)

D-MAN® can be used individually or in multiples and cells depending on the size of tree. D-MAN® is made from recycled plastic and to be used in combination with Plati-Mat® and Platipus engineered ratchet tensioner

The RF1PDMAN Kit Contains:

- 3 x Wire Chokes
- 4 Metres of Galvanised Wire
- 1 x Ratchet Tensioner
- 3 x Plati-Mat®
- 3 x D-MAN® Cell

Contractor to confirm with Platipus final D-MAN kit reference based on individual tree size (height/girth/rootball) schedule of tree sizes i.e. larger trees may require more cells and multiples.

3. **Anchoring system:** D-MAN® System - RF1PDMAN (as a guide only)
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 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:** Platipus D-MAN system or equal & approved
4. System to be capable of high wind loading and secure fixing/support 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.

536 Tree stakes generally

1. **Stakes:** Softwood, peeled chestnut, larch or oak, straight, free from projections and large or edge knots and with pointed lower end.
 - 1.1. **Preparation/finish:** Submit proposals. Refer to tree detail 5501
 - 1.2. **Preservative treatment:** Submit proposals. Refer to tree detail 5501
2. **Stake size (minimum):** Submit proposals. Refer to tree detail 5501
3. **Stake length (minimum):** Submit proposals. Refer to tree detail 5501
4. **Source:** Submit proposals. Refer to tree detail 5501
5. **Orientation:** All stakes to face same direction based on individual stake clauses Q31 536-551
6. **Alignment:** All stakes to face same direction based on individual stake clauses Q31 540-552
7. **Additional requirements:**

- 7.1. The Contractor is to include for increases in schedules stake lengths, diameter and guying systems specification within their tender in order to allow for amendments deemed necessary to suit variations in soil conditions, site microclimate, etc.
- 7.2. Refer to Q31/525 above and tree pit details for further requirements
- 7.3. To be installed in accordance with good horticultural practice:

550 Double staking for Trees in Soft

1. **Description:** Tree pit in soft area , refer to detail Treepit detail TP03
2. **Staking**
 - 2.1. **Position:** Either side of tree position and perpendicular to wind direction.
 - 2.2. **Driving:** Vertically at least 300 mm into bottom of pit before planting.
 - 2.3. **Backfilling:** Consolidate material around stake.
 - 2.4. **Firming:** Sufficiently firm to prevent movement of the rootball/ rootstock.
3. **Height of stakes:** Refer to tree Planting Detail 5501
4. **Horizontal bracing:** Timber Cross Bar - Refer to tree Planting Detail 5501
 - 4.1. **Fixing:** Firmly fix using nails on windward side of tree and as close as possible to the stem without making contact with the bark. Position cross bar horizontally and 25 mm from top of stakes
5. **Ties:** Adjustable. Tree tie to include a plastic/rubber buffer to prevent rubbing. Contractor to submit sample for approval by Landscape Architect
6. **Tying:** Secure tree firmly but not rigidly to cross bar. Prevent tree from touching cross bar using spacer blocks or cushions if required
7. **Nails for fixing ties, belts and webbing:** To BS 1202-1, galvanized, minimum 25 mm long and with 10 mm diameter heads.
8. **Nails for fixing cross bars:** To BS 1202-1, galvanized round wire, minimum 75 mm long and 3.75 mm gauge

551 Double staking and D-Man Guying for Trees in Arrival garden

1. **Description:** Treepit in Arrival garden (for large trees)
Angled Stake 45° and D-man System (refer to tree planting plans for details)
2. **Staking**
 - 2.1. **Position:** Either side of tree position and perpendicular to wind direction.
 - 2.2. **Driving:** Vertically at least 300 mm into bottom of pit before planting.
 - 2.3. **Backfilling:** Consolidate material around stake.
 - 2.4. **Firming:** Sufficiently firm to prevent movement of the rootball/ rootstock.
3. **Height of stakes:** Refer to tree Planting Detail 5501
4. **Horizontal bracing:** Timber Cross Bar - Refer to tree Planting Detail 5501
 - 4.1. **Fixing:** Firmly fix using nails on windward side of tree and as close as possible to the stem without making contact with the bark. Position cross bar horizontally and 25 mm from top of stakes
5. **Ties:** Adjustable. Tree tie to include a plastic/recycled rubber buffer to prevent rubbing. Contractor to submit sample for approval by Landscape Architect
6. **Tying:** Secure tree firmly but not rigidly to cross bar. Prevent tree from touching cross bar using spacer blocks or cushions if required
7. **Nails for fixing ties, belts and webbing:** To BS 1202-1, galvanized, minimum 25 mm long and with 10 mm diameter heads.
8. **Nails for fixing cross bars:** To BS 1202-1, galvanized round wire, minimum 75 mm long and 3.75 mm gauge

9. **D-Man System:** Contractor shall refer to Q31, 527 for Platipus D-MAN system. Contractor to confirm with Platipus exact size of kit required based on each tree size (height/rootball/girth) specified for rain gardens.

580 Tree pit surfacing – consolidated gravel

1. **Surfacing material:** Refer to Q23, 160
2. **Area:** As shown on tree pit details and planting plans
3. **Collar:** Install protective tree collar around base of tree prior to installing surfacing. Allow clearance for tree growth.
4. **Collar infill:** Mulch, as section Q28

590 Mulching trees

1. **Material:** Contractor to refer to Q28, 155
 - 1.1. **Purity:** Free of pests, disease, fungus and weeds.
2. **Preparation:** Clear all weeds. Water soil thoroughly.
3. **Coverage:** For full extent of clear soil area beneath each tree (circular)
4. **Finished level of mulch:** Contractor to refer to Q28/155 & Q28/156

592 Rabbit guards (tubes)

1. **Black polyethylene mesh guards to be used for:** Woodland edge planting WE01
2. **Supplier:** Netlon, or equivalent & approved
 - 2.1. **Product Reference:** Contractor to submit proposal
3. **Mesh Size:** Rabbit guards shall be black polyethylene mesh, grid size 13mm.
4. **Location:** As indicated on plan
5. **Installation:** - In accordance with manufacturer's requirements/recommendations- Erected to form a tube of 150 - 200mm diameter x 600mm height around individual plants- Stakes to secure rabbit guards shall be 32x32mm section CCA pressure treated softwood stakes with a pointed end for driving- Stakes to be 1000mm length for use with 600mm high guards- Galvanised staples (3.5x30mm) shall be used to secure the mesh to the stakes at 3 no. per stake
6. **Additional Requirements:** Sample to be submitted to CA/Landscape Architect for Approval

595 Tree ties

1. **Description:** Black plastic strap and buckle type with rubber spacers
2. **Supplier/manufacturer:** Submit proposals
 - 2.1. **Product reference:** Submit Proposals
3. **Installation:** Submit Proposals

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:**
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:

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 : starting from the date at which the replacement planting is approved by the CA/Landscape Architect

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 unless otherwise agreed with the University**

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 maintaining full thickness of mulch

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:** At each scheduled maintenance visit
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:** or 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 confirming machinery and water sources**
7. **Watering should be stopped and a report made to the: CA/Landscape Architect if 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 organic herbicides may only be used if so directed by the: CA/Landscape Architect following the University's Biodiversity Policy (refer to A15)**

- 17.1. Organic herbicides shall be applied strictly in accordance with the manufacturer's instructions
- 17.2. The Contact organic 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:** As appropriate to the species and in accordance with the agreed maintenance schedule
 - 1.3. **Trees:** Favour a single central leading shoot.
2. **Arising:** Remove to a green waste composting facility.

772 Pest and diseases

1. **Monitor all plant material for any pests and diseases and report to the:** of any symptoms and proposed recommendations/actions
2. Allow for treatment of any problematic plant disease or eradication 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: This shall be in line with the maintenance/management requirements set out in the HCLMP. Provide a schedule of any ongoing maintenance problems experienced during the rectification period and Provide details of any special procedures to be carried out.

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):** 50mm
5. **Trees:** Remulch.
6. **Depth (minimum):** 50mm

Plant procurement - advance procurement & contract growing - Not Used

Ω End of Section

Q35 Landscape maintenance

Clauses - Not Used

To be read with preliminaries/ general conditions.

5 Section index

1. 10 - 199: GENERAL REQUIREMENTS
2. 200 - 399: GRASS SEEDING & TURF AREAS
3. 400 - 499: ORNAMENTAL PLANTING
4. 500 - 699: STRUCTURE PLANTING
5. 800 - 879: TREE WORK
6. 880 - 899: WATER AREAS
7. 900 - 949: HARD LANDSCAPE AREAS & STREET FURNITURE
8. 950 - 999: GREEN ROOFS AND GREEN WALLS - ADDITIONAL REQUIREMENTS

10 Landscape maintenance - scope of specification

1. The following clauses set out the requirements for: Post-Practical Completion landscape maintenance works only

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 Architect for 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 subject to agreement with the Client, giving the Landscape Architect 72 (seventytwo) hours notice 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 a 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, 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 Contractor shall 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: and the shall 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: : rectification or replacements to be undertaken in accordance with the contract
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: by CA/ Landscape Architect
 - 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, Q35/342, Q35/645**

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*/Polygnum 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: 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/Landscape architect 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**

105 Maintenance objectives

1. Location: All Planting
 - 1.1. Duration: To be agreed with the Client
2. Aims: To ensure successful establishment and increase in biodiversity.

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: 7 days

130 Reinstatement

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

156 Watering

1. Supply: Watering points shown indicatively on landscape plans. Irrigation strategy to be confirmed by others
2. Quantity: Wet to field capacity
3. Application: Do not damage or loosen plants.
4. Compacted soil: Loosen or scoop out, to direct water to rootzone.
5. Frequency: As necessary for the continued thriving of all planting

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, hedgerows, wildflower planting areas, trees in hard and soft 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: if the soil is seen to have become water-logged or if any symptoms of bad drainage, sour soil or yellowing of foliage are seen

167A Irrigation/watering supply

1. For the purposes of this tender, the Contractor should assume that all irrigation water supply will be obtained from: To be confirmed by Ramboll

170 Disposal of arisings

1. **General:** Unless specified otherwise, dispose of arisings as follows:
 - 1.1. **Biodegradable arisings:** Contractor to agree with Client means of disposal i.e. either compost on site or remove to green waste recycling facility
 - 1.2. **Grass cuttings:** Contractor to agree with Client means of disposal i.e. either compost on site or remove to green waste recycling facility
 - 1.3. **Tree roots and stumps:** Contractor to agree with Client means of disposal i.e. either compost on site or remove to green waste recycling facility
 - 1.4. **Shrub and tree prunings:** Contractor to agree with Client means of disposal i.e. either compost on site or remove to green waste recycling facility
 - 1.5. **Litter and nonbiodegradable arisings:** Remove from site

180 Chipping or shredding

1. **General:** Not permitted on site unless specified otherwise

181 Mechanical equipment

1. **General:** Minimize.
2. **Prohibited equipment:** The use of chippers, leaf blowers, litter vacuums, etc. shall be agreed prior to use with the Client
3. **Timing:** Use of mechanical equipment to be agreed with the Client in respect to hours of use.

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

200 Grass seeding & turf areas - introduction

1. The following clauses cover the maintenance of areas of wildflower and grass seeding areas, as defined on: the Contract Drawings
2. For ornamental/architectural grass planting (within planting beds) maintenance requirements, refer to the: *Ornamental Planting* clauses of this specification
3. The: *Grass Seeding & Turf Areas* clauses should be read in conjunction with clauses set out within other planting typology sections, e.g. *Ornamental Planting*, *Structure Planting*, etc.

211 Maintenance of grassed areas

1. **Standard:** To BS 7370-3. Carry out maintenance appropriate to each category of turf, as follows:

- 1.1. Objectives: To BS 7370-3, table 6.
- 1.2. Programme: To BS 7370-3, clause 11.
- 1.3. Mowing methods: To BS 7370-3, table 3.

220 Grass cutting generally

1. Before mowing: Remove litter, rubbish and debris.
2. Finish: Neat and even, without surface rutting, compaction or damage to grass.
3. Edges: Leave neat and well defined. Neatly trim around obstructions.
4. Adjoining hard areas: Sweep clear and remove arisings.
5. Drought or wet conditions: Obtain instructions.

225 Tree stems

1. Precautions: Do not use mowing machinery closer than 100 mm to tree stems. Use nylon filament rotary cutters and other hand held mechanical tools carefully to avoid damage to bark.

226 Tree stems

1. Precautions: Do not allow nylon filament rotary cutters and other mechanical tools closer than 100 mm to the stem of any tree.
 - 1.1. Operations close to stems: Complete using hand tools.

235 Bulbs and corms in grassed areas

1. Before flowering: Do not cut.
2. Interval between end of flowering and start of grass cutting (minimum): until leaves have died back

240 Mowing strips

1. Location: Adjacent to service yard fence on the southern side
2. Width (approximate): 2000 mm.
3. Operations: Grass to be maintained at 25mm height

250 Leaf removal

1. Operations: Collect fallen leaves.
2. Disposal: Remove from site to a green composting recycling facility unless client has a compost facility that it agrees for use.

265 Mowing general areas

1. Grass height:
2. Arisings: Remove from site to a green composting recycling facility unless client has a compost facility that it agrees for use

272 Maintaining grassed areas with perennial wild flowers in Woodland Edge (WE02), Swale (SW01) and Meadow mix (MD01)

1. Preparation: Before each cut remove litter and debris.
2. Height and frequency of cut in first growing season:
 - 2.1. Time of first cut: Mid to late summer, e.g early August
 - 2.2. Height of first cut: 75mm
 - 2.3. Frequency of subsequent cutting (minimum): Cut sward down to 50mm during Autumn months

- 2.4. Height of growth permitted (maximum): 75mm
3. Height and frequency of cut in second growing season:
 - 3.1. Time of cut: 1 cut late August/early September cut to 75mm, 1 cut to 50mm in late Autumn. Allow for one cut in spring. Frequency of cuts to be agreed with the Ecologist to meet the biodiversity objectives
 - 3.2. Height of cut: 75mm
4. Trimming: All edges.
 - 4.1. Arisings: Remove.
5. Watering: As required

309 Edges to seeded areas

1. Location: Wildflower and grass seeding areas - Swale (SW01), Meadow mix (MD01) and Woodland edge (WE02)
2. Timing: After seeded areas are well established.
3. Method: Cut to clean straight lines or smooth curves. Draw back soil to permit edging.
4. Arisings: Remove.

310 Re-forming grass edges

1. Location: Wildflower and grass seeding areas - Swale (SW01), Meadow mix (MD01) and Woodland edge (WE02)
2. Method: Draw back soil and re-form edges to clean straight lines or smooth flowing curves, sloping slightly back from vertical.

342 Weed control in wildflower grass areas

1. Wildflower grass seeding/turf areas to be maintained free from weeds
2. Method: Combination of hand removal and regular mowing
 - 2.1. Submit proposals for approval
3. Refer to Clause: for cutting requirements

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: Q28/155 & Q28/156

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:** Refer to Q28
 - 5.2. **Application rate:** Refer to Q28

450 Planting beds of annuals

1. **Clearance:** Remove previous season's bedding, including all bulbs, litter and debris.
2. **Preparation:** Dig over beds using a spade or hand held mechanical cultivator:
 - 2.1. **Annual weeds:** Bury.
 - 2.2. **Perennial weeds:** Carefully dig out.
3. **Fertilizer:** Either in autumn or spring spread and incorporate: Slow release fertilizer.
 - 3.1. **Application rate:** As manufacturer's recommended rate.
4. **Annual bedding plants:**
 - 4.1. **Standard:** To BS 3936-7.
 - 4.2. **Setting out:** Plant out: , including edging plants, main layer, specimen or pot plants, corms, bulbs or tubers.
5. **Watering:** Keep plants watered as necessary before planting out and water in after planting.
6. **Failed planting:** Replant as necessary any plants, or areas of plants, that have failed to thrive.

460 Beds of perennials or perennials and annuals

1. **Plant supports:** Stake and tie plants using: using bamboo canes if necessary.
 - 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.

470 Flower beds generally

1. Operations:
 - 1.1. Remove: Dead flower heads, fallen leaves, litter and debris.
 - 1.2. Weeds: Thoroughly hand weed.
 - 1.3. Cultivate: Lightly hoe.
 - 1.4. Trim: Clip grass edges.
2. Fungicide: Not required
3. Insecticide: Not required

Shrubs/trees/hedges

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

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.

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: As scheduled and immediately after strong 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: When instructed
 - 4.1. Fill stake holes with lightly compacted soil.

515 Tree guy wires

1. Inspection/ Maintenance times: As scheduled and 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: When instructed

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.

526 Tree guards

1. **Loose or defective guards:** Adjust, refix or replace to original specification and to prevent chafing
2. Ensure that at all times the tree guards are secure and undamaged and active as effective protectors against rabbit damage

527 Aeration pipes

1. Aeration pipes and wells (in hard paved areas) 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:** Before starting hedge or tree work during the period of February to August (inclusive), carry out a survey by a qualified ecologist and submit report.
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:** As instructed
2. **Operations:** Remove growth encroaching onto grassed areas, paths, roads, signs, sightlines and road lighting luminaires.
3. **Special requirements:** None

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.

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.

610 Trimming tapering established hedges

1. Time of year: Trim once in July or August, frequency to be agreed with Ecologist to meet the biodiversity objectives
2. Operations
 - 2.1. Form: Trim carefully and neatly to regular line and shape, with the width at the top less than that at the base.
 - 2.2. Trim: Remove current growth rather than old wood.
3. Tools/ Cutting: Suitable mechanical cutters

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 Stainless steel wire.
3. Supporting structures: Check and repair as necessary.

630 Dead and diseased plants

1. Removal: As soon as possible
2. Replacement: In the next suitable planting season

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: None

5. Dressing: Slow release fertilizer:
 - 5.1. Type: Submit proposals
 - 5.2. Application rate: As manufacturer's recommendations

635 Reinstatement of shrub/ herbaceous 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: None
5. Dressing: Slow release fertilizer:
 - 5.1. Type: Submit proposals
 - 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: for 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

645 Weed control generally

1. Weed tolerance: At all times, weed cover less than 5% and no weed to exceed 100 mm high
2. Adjacent plants, trees and grass: Do not damage.

650 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: Reinstatement to original depth.

665 Weed control with winter herbicide

1. Type: Suitable residual soil acting herbicide.
2. Time of year: Unless otherwise agreed, complete before end of March.
3. Timing: Allow recommended period for herbicide to take effect before clearing dead weeds.

670 Weed control with summer herbicide

1. Type: Suitable foliar acting herbicide.
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):** 150 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):** 50 mm
 - 1.1. **Top up:** As scheduled
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
2. **Type of fertilizer:** Slow release
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:** All evergreens
3. **Timing:** Within 24 hours of snowfall

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:** Remove

Tree work

810 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. **Standard:** To BS 3998.
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.

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.

830 Cleaning out and deadwooding

1. **Remove**
- 1.1. Dead, dying, or diseased wood, broken branches and stubs.
 - 1.2. Fungal growths and fruiting bodies.
 - 1.3. Rubbish, windblown or accumulated in branch forks.
 - 1.4. Wires, clamps, boards and metal objects, if removable without causing further damage and not part of a support structure that is to be retained.
 - 1.5. Other unwanted objects, e.g. tree houses, swings.
 - 1.6. Climbing plants as instructed.

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:**
- 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:**

845 Crown lifting

1. **Clearances:** Remove branch systems to give clearance.
- 1.1. **Height:** As recommended by BS 7370-4, clause 3.7.2.3

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:**
3. **Cutting:** Make no cuts of more than
 - 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.

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

880 Water areas, marginal & aquatic planting general

1. **Scope:** All wetland & waterbody features included within the Contract Works, including the following:

2. Contractor to be fully aware of wetland and waterbody construction elements, including liner systems, inlets, outlets, etc., and carry out regular inspections to ensure that they remain in good working order
3. The Contractor shall ensure that any maintenance operations, associated machinery and personnel undertaking maintenance tasks do not cause damage to any wetland and/or waterbody features
 - 3.1. Particular care is to be taken to ensure that any liner systems remain intact and undamaged
4. All wetland and waterbody features to be kept free from floating and sunken litter, rubbish and debris at all times
5. All wetland and waterbody features to be kept free from weeds, algal growth, floating deposits and contaminants
6. Contractor to take all necessary measures to ensure safe working conditions for operatives

885 Marginal, emergent & aquatic planting areas

1. To be kept free from weeds, litter and debris at all times
2. To be regularly inspected for plant failures, presence of harmful, injurious and/or non-native invasive weeds, etc.
 - 2.1. Refer to Clause: **Q35/95** for further requirements
3. Thin planting if it becomes overcrowded and/or impacts on adjacent planting and/or waterbody construction elements such as inlets, outlets, liner systems, etc.
 - 3.1. submit proposals for approval
 - 3.2. consider options for relocating plants to elsewhere within the works

886 Replacement planting

1. Any marginal, emergent or aquatic plants found to be dead, dying or failing to thrive must be replaced by the Contractor, at no additional cost to the Contract
2. **Timing:** To be carried out during the next available planting season following loss
3. Contractor to consider reasons for plant failure, e.g. maintenance regime, suitability of location, ground conditions, water level, etc.
 - 3.1. Submit proposals for replacement planting to: for approval, including proposals for alternative species that may be more suited to localised planting conditions

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: 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.
8. **Timber deck:** Remove litter, leaves and other debris.
To be kept clean by regular brushing with a stiff bristle brush to remove dirt, algae and dead leaves to maintain slip resistance

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 all areas in public realm
 - 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

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.

Commissioning of electrical items with M& E scope. Responsibility for regular testing of automated equipment eg. bollards/ gates to M&E Engineer's specification and in accordance with supplier's recommendations.

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:** of 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

950 General

1. In addition to the landscape maintenance requirements noted above, the following landscape maintenance requirement clauses apply to all areas of green roofs and/or green walls

960 Fire performance - maintenance

1. Maintenance shall be provided, as necessary, in order to minimise fire risk and sustain the system by keeping vegetative roof plants healthy and keeping dry foliage to a minimum
2. Such maintenance includes, but is not limited to, the following:
 - 2.1. Irrigation
 - 2.2. Fertilization
 - 2.3. Weeding
3. Excess biomass such as overgrown vegetation, leaves, and other dead and/or decaying material shall be removed at regular intervals, not less than: 2 No. (two) times per year in accordance with the agreed Fire Strategy document.

4. Provision shall be made to provide access to water for permanent or temporary irrigation

Ω End of Section

Q40 Fencing **REVISED**

Clauses

2 To be read with preliminaries/ general conditions.

Fencing systems

126 Security fencing (FE01)

1. **Manufacturer:** CLD Physical security systems or equal & approved
Modsec House, Moston Road, Sandbach, Cheshire, CW11 3HL
Tel: +44 (0)1270 764751
www.cld-systems.com
 - 1.1. **Product reference:** Securus Lite S1 or equal & approved, subject to review by Security consultant.

358 Rigid mesh fencing system. Tested and certified to LPS 1175, in accordance with Security consultant's recommendations
2. **Standard:** To BS 1722-14, category .
3. **Height:** 3m
4. **Mesh and wire:** Mesh size - 76.2x12.5mm, wire diameter: 4mm, prison mesh to act as anti climb feature
5. **Panel size:** Manufacturer/ fabricator to site measure and prepare shop/ fabrication drawings.
6. **Posts:** Size to supplier's recommendation. Fence system to include all intermediate and corner posts, and gate posts as necessary, compatible with the fence system
7. **Maximum centres of posts:** To manufacturer's detail. Manufacturer/ fabricator to site measure and prepare shop/ fabrication drawings
8. **Finish:** Mesh and posts to be finished in powder coated galvanised steel. Colour to match facade pannel (i.e. to match "Sparkly green", from "Prisma Elements" paint system, reference 377/M09656 – T098372)
9. **Method of setting posts:** In concrete foundations to comply with the design loading requirements specified by BS 1722-14 for this category of fence.
10. **Bottom of fencing:** Bottom of panel maximum 50mm above ground. Foundation to manufacturer's shop drawings. Shop/ fabrication drawings to be submitted to Engineers, Landscape Architect and Security consultant for approval
11. **Accessories:** Gate to match FE01, refer to Q40/560 & 560A. Vibrating sensors to be fitted to the fence and gate in accordance with Security consultant's recommendation
12. **Conformity:** Submit manufacturer's and installer's certificates, to BS 1722-14.

210 Wooden post and rail fencing (FE02)

1. **Manufacturer:** Jackson fencing or equal & approved
Stowting Common, Near Ashford,
Kent TN25 6BN
Tel: 01233 750393
www.jackson-fencing.co.uk
 - 1.1. **Product reference:** Post & rail (morticed), 3 rail fence or equal & approved
2. **Standard:** To BS 1722-7, type MPR 11/3.
3. **Height:** 1m

4. **Size:** Fence post : 125mmx75mm,
Rails : 100mmx38mm,
Prick post: 100mmx38mm
5. **Wood:** FSC certified, sustainably sourced hardwood e.g. European or English Oak or sweet chestnut. Contractor to submit proposal
 - 5.1. **Treatment:** As section Z12 and Wood Protection Association Commodity Specification C3.
 - 5.2. **Finish:** Natural
6. **Maximum centres of posts:** 2.5m; Fabricator to site measure and prepare shop/ fabrication drawings.
7. **Method of setting posts:** To supplier's details. Foundation/ fixing details to be reviewed by Engineers
8. **Accessories:** Single leaf field gate, refer to Q40/550
9. **Conformity:** Submit manufacturer's and installer's certificates, to BS 1722-7.

210A Timber post and wire fencing (FE03) REVISED

1. **Manufacturer:** Jackson fencing or equal & approved
Stowting Common, Near Ashford,
Kent TN25 6BN
Tel: 01233 750393
www.jackson-fencing.co.uk
 - 1.1. **Product reference:** Agricultural wire stock fencing or equal & approved
2. **Height:** 1m
3. **Size:** Fence post : 125mmx75mm,
3 line wire equally spaced.
4. **Wood:** FSC certified, sustainably sourced hardwood e.g. European or English Oak or sweet chestnut. Contractor to submit proposal
 - 4.1. **Treatment:** As section Z12 and Wood Protection Association Commodity Specification C3.
 - 4.2. **Finish:** Natural
5. **Maximum centres of posts:** 2.5m; Fabricator to site measure and prepare shop/ fabrication drawings.
6. **Method of setting posts:** To supplier's details. Foundation/ fixing details to be reviewed by Engineers
7. **Accessories:** Single leaf field gate, refer to Q40/550
8. **Conformity:** Submit manufacturer's and installer's certificates, to BS 1722-7.

440 Boundary protection materials specification

1. Minimum BRE 'Green Guide to Specification Online' rating: To be confirmed

Gates, posts and stiles

550 Timber gate (G03)

1. **Description:** Single leaf timber field gate for pedestrian access - G03, to match FE02 (Q40/210)
2. **Manufacturer:** Jackson fencing or equal & approved
Stowting Common, Near Ashford,
Kent TN25 6BN
Tel: 01233 750393
www.jackson-fencing.co.uk

Product ref: 7 bar uni-field gate or equal & approved
3. **Standard:** To BS 5709.

4. **Wood:** FSC certified, sustainably sourced hardwood e.g. European or English Oak or sweet chestnut.
5. **Treatment:** As section Z12 and Wood Protection Association Commodity Specification C3.
6. **Size:** 1800mm(W)x1000mm(H), supplier to submit fabrication/ shop drawings for approval.

Top rail 100mm x 75mm, Under rail cross braces 75 x 25mm. Hang and Slam stiles (rounded top) 100 x 75mm
7. **Adhesive:** Synthetic resin to BS EN 301, type 1.
8. **Workmanship:** As section Z10.
9. **Fittings:** One pair strap hinges, auto gate latch, gate stop. All joints are morticed and tenoned
9.1. **Finish:** Hot-dip galvanized to BS EN ISO 1461
10. **Method of fixing:** To manufacturer's details. Contractor to submit shop drawings for approval
11. **Accessories:** Soft closing mechanism with anti-trap hinge and closer points to avoid risk of finger trapping

560 Gate type 01(G01)

1. **Description:** High security vehicular double leaf swing gate - G01
2. **Manufacturer:** CLD Physical security systems or equal & approved
Modsec House, Moston Road, Sandbach, Cheshire, CW11 3HL
Tel: [+44 \(0\)1270 764751](tel:+441270764751)
www.cld-systems.com
2.1. **Product reference:** 3m high gate. To match FE01, 358 Rigid mesh fencing system, example Securus Lite S1 or equal & approved, subject to approval by Security consultant.
3. **Standard**
3.1. **Standard:** To BS 1722-12. To comply with automatic gate safety standards. Tested and certified to LPS 1175 security rating as recommended by Security consultant
4. **Materials and workmanship:** As section Z11.
5. **Size:** Gate clear opening: 4000mm(W)x3000mm(H), For location refer to Hardworks plan
6. **Finish:** Hot-dip galvanized to BS EN ISO 1461, Post and mesh to be in powder coated finish
6.1. **Colour:** RAL to be confirmed
7. **Jointing:** Welded.
8. **Fittings:** Automatically controlled. To include magnetic lock certified to LPS 1175. Lock type to be spec and approved by Safety consult.
9. **Method of fixing:** To manufacturer's details. Fabricator to submit shop drawings for review by Engineer and Landscape Architect
10. **Safety:** Special requirements: Minimum gaps 12mm round all edges, soft closing mechanism with anti-trap hinge and closer points to avoid risk of finger trapping
11. **Accessories:** Allow for electromagnetic locks, access control system such as card reader and video entry door station in accordance with Security consultant's recommendations

560B Gate type 04(G04)

1. **Description:** High security vehicular double or four panel sliding gate to service yard - G04
2. **Manufacturer:** CLD Physical security systems or equal & approved
MODSEC HOUSE, Moston Road, Sandbach, Cheshire, CW11 3HL
Tel: [+44 \(0\)1270 764751](tel:+441270764751)
www.cld-systems.com
2.1. **Product reference:** 3m high gate. To match FE01, 358 Rigid mesh fencing system, example Securus Lite S1 or equal & approved, subject to review by Security consultant.
3. **Standard**

- 3.1. **Standard:** To BS 1722-12. To comply with automatic gate safety standards. Tested and certified to LPS 1175 security rating as recommended by Security consultant
4. **Materials and workmanship:** As section Z11.
5. **Size:** G04A- Gate clear opening: 7000mm (L)x3000mm(H),
G04B - Gate opening: 10000mm(L)x3000(H)
For location refer to Hardworks plan
6. **Finish:** Hot-dip galvanized to BS EN ISO 1461, Post and mesh to be in powder coated finish
 - 6.1. **Colour:** RAL to be confirmed
7. **Jointing:** Welded.
8. **Fittings:** Automatically controlled. To include magnetic lock certified to LPS 1175. Lock type to be spec and approved by Safety consult.
9. **Method of fixing:** To manufacturer's details. Fabricator to submit shop drawings for review by Engineer and Landscape Architect
10. **Safety:** Special requirements: Minimum gaps 12mm round all edges, soft closing mechanism with anti-trap hinge and closer points to avoid risk of finger trapping
11. **Accessories:** Allow for electromagnetic locks, access control system such as card reader and video entry door station in accordance with Security consultant's recommendations

Accessories

635 Gate openers

1. **Description:** Gate openers for pedestrian and vehicular gates G01, G02, G03 & G04
2. **Manufacturer:** Contractor to submit proposal
 - 2.1. **Product reference:** Contractor to submit proposal

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.

760 Nailed wood rails

1. **Length (minimum):** Two bays, with joints in adjacent rails staggered.
2. **Fixing:** Nail each length of rail to each post with two 100 mm galvanized nails.
3. **Rails with split ends:** Replace.

765 Cleft wood rails

1. **Length (maximum):** 3.05 m.
2. **Fixing:** Rail end section shaped to adequately fill the post mortice. Nail each rail to each prick post with two galvanized nails.
3. **Rails with split ends:** Replace.

766 Arris rails

1. **Fixing**
 - 1.1. **Rail end section:** Shaped to adequately fill the post mortice or recess.
 - 1.2. **Recessed posts:** Rails bolted to each post.
 - 1.3. **Top rails:** Fixed at both ends using One 8 mm diameter bolt .
2. **Rails with split ends:** Replace.

770 Site cutting of wood

1. **General:** Kept to a minimum.
2. **Below or near ground level:** Cutting prohibited.
3. **Treatment of surfaces exposed by minor cutting and drilling:** Two flood coats of solution recommended for the purpose by main treatment solution manufacturer.

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

Q41

Barriers/ guardrails **REVISED**

Clauses

2 To be read with preliminaries/ general conditions.

General

10 Fabrication drawings

1. The Contractor is to submit fully detailed & dimensioned fabrication drawings of the following elements to: prior to placing final order:
2. The fabrication drawings shall include details of all components, fittings, fixings, accessories, associated temporary works for installation, etc.
3. Typical details will not be accepted

20 Material samples

1. Samples representative of colour, finish & appearance of designated materials/elements: Submit to: prior to placing final order
2. Designated materials: Submit shop drawings for handrail and balustrade

30 Control samples

1. Sample areas: Refer to Appendix 01 for requirements
2. Designated materials/elements: Submit shop drawings for handrail and balustrade. Mock up panel to be installed for approval of Landscape Architect.
3. Location: Submit proposals - Location(s) to be chosen to provide a good representation of all designated materials/elements noted above
4. Size: As shown in drawing
5. Approval of appearance: Notify: and give opportunity to inspect/approve before proceeding. Refer to A15/231 for sample requirements.

Types of barriers/ guardrails

130 Metal Work Balustrade (BA01)

1. Description: High quality Steel balustrade to pond deck - BA01. Powder coated (RAL 9005) galvanised steel flat bar frame with stainless steel tensioned wire rope infill. 1.1m high with timber horizontal top rail.

-Metalwork balustrade post, e.g. 50mm x 20mm section. Length of post subject to fixing details, to achieve overall 1100mm height to balustrade above level of adjacent deck. Note post sizing and fixings to meet loading criteria.

- Balustrade infill; vertical ss tensioned wire rope (e.g. 4mm dia). Note wire dia and fixings to meet loading criteria. To fabricator details.

-Metalwork c-section, e.g 50mm depth x 25mm width, to conceal tensioned wire connection points. Length to suit balustrade post spacings. To fabricator details.

-FSC rated timber horizontal top rail, e.g. 200mm (W) x 50- 80mm (D). Fixing to fabricator details.

Refer to DWG no. for design intent RD001-FCB-XX-XX-DR-L-5301 and RD001-FCB-XX-XX-DR-L-3510

2. **Standard:** To BS 6180. and BS 7818
Performance verification: Submit a certificate of the restraint system's conformity to BS 7818, issued by a United Kingdom Accreditation Service (UKAS) independent laboratory, prior to ordering materials.
3. **Manufacturer :** Submit proposals & fabrication drawings for CA/ landscape architects approval
4. **Height above datum:** 1100mm
5. **Material/ Protection:** Steel, galvanized to BS EN ISO 1461 after fabrication

Flat bar frame 50mm thick with mesh infill panels and timber top
6. **Surface finish:** Powder coating, as section Z31
6.1. **Colour/ Texture:** Colour to complement architectural finishes. RAL to be confirmed
7. **Fixings/ Foundations:** Baseplate fixing to side of deck structure.
Fabricator to submit shop drawings for review by Engineer and Landscape Architect. Engineer to input into fixing details based on the loading requirements.
 - Material for fixings: Similar material or coating to the connected items, or isolating washers/ bushes provided to prevent bimetallic corrosion.
 - Resistance to vandalism: High torque.
8. **Other requirements:** Production inspection required
9. **Note: Balustrade along the pond, ramp and bike store wall -**
Minimum horizontal loads:
Minimum horizontal loads for parapets, barriers and balustrades as per Table 2 in BS6180:2011:
Use the loads corresponding to the "Type of occupancy" category that is "Areas susceptible to overcrowding" item (xi) "Theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studio. Footways or pavements greater than 3 m wide adjacent to sunken areas."

130A Metal Work Balustrade (BA02)

1. **Description:** High quality Steel balustrade - BA01. Powder coated (RAL 9001) galvanised steel flat bar frame with stainless steel tensioned wire rope infill. 1.1m high with timber horizontal top rail.
 - Metalwork balustrade post, e.g. 50mm x 20mm section. Length of post subject to fixing details, to achieve overall 1100mm height to balustrade above level of adjacent deck. Note post sizing and fixings to meet loading criteria.
 - Balustrade infill; vertical ss tensioned wire rope (e.g. 4mm dia). Note wire dia and fixings to meet loading criteria. To fabricator details.
 - Metalwork c-section, e.g 50mm depth x 25mm width, to conceal tensioned wire connection points. Length to suit balustrade post spacings. To fabricator details.
 - FSC rated timber horizontal top rail, e.g. 130mm (W) x 50mm (D). Fixing to fabricator details.

Refer to DWG no. for design intent RD001-FCB-XX-XX-DR-L-3501 and 3502, RD001-FCB-XX-XX-DR-L-3510
2. **Standard:** To BS 6180. and BS 7818
Performance verification: Submit a certificate of the restraint system's conformity to BS 7818, issued by a United Kingdom Accreditation Service (UKAS) independent laboratory, prior to ordering materials.
3. **Manufacturer :** Submit proposals & fabrication drawings for CA/ landscape architects approval
4. **Height above datum:** 1100mm
5. **Material/ Protection:** Steel, galvanized to BS EN ISO 1461 after fabrication

Flat bar frame 50mm thick with mesh infill panels and timber top
6. **Surface finish:** Powder coating, as section Z31

- 6.1. **Colour/ Texture:** Colour to complement architectural finishes and BA01. RAL to be confirmed
7. **Fixings/ Foundations:** Root fixed to concrete foundation.
Fabricator to submit shop drawings for review by Engineer and Landscape Architect. Engineer to input into fixing details based on the loading requirements.
- Material for fixings: Similar material or coating to the connected items, or isolating washers/ bushes provided to prevent bimetallic corrosion.
- Resistance to vandalism: High torque.
8. **Other requirements:** Production inspection required
9. **Note: Balustrade along the pond, ramp and bike store wall -**
Minimum horizontal loads:
Minimum horizontal loads for parapets, barriers and balustrades as per Table 2 in BS6180:2011: Use the loads corresponding to the "Type of occupancy" category that is "Areas susceptible to overcrowding" item (xi) "Theatres, cinemas, discotheques, bars, auditoria, shopping malls, assembly areas, studio. Footways or pavements greater than 3 m wide adjacent to sunken areas."

135 Door guard (DG01)

1. **Description:** Door Guard
2. **Manufacturer:** Broxap or equal & approved.

Address: Broxap Ltd. Rowhurst Industrial Estate Chesterton Newcastle-under-Lyme Staffordshire, ST5 6BD

Email: info@broxap.com

- 2.1. **Product reference:** BX146620
3. **Height above datum:** 900 mm
 4. **Width:** 800 mm
 5. **Diameter tube :** 48 mm
 6. **Material/ Protection:** Mild steel
 7. **Surface finish:** Stainless Steel
 8. **Colour/ Texture:**
 - 8.1. **Minimum film thickness:**
 9. **Fixings/ Foundations:** Submit Proposals
 10. **Other requirements:**

135-A Stand-alone post (DG01-A) (A) REVISED

1. **Description:** Stand alone post for bypass Tapping Bar.
2. **Manufacturer:** Broxap or equal & approved.

Address: Broxap Ltd. Rowhurst Industrial Estate Chesterton Newcastle-under-Lyme Staffordshire, ST5 6BD

Email: info@broxap.com

- 2.1. **Product reference:** BX47/MitredTop-1
3. **Height above datum:** 1000 mm
 4. **Diameter tube :** 89mm
 5. **Material/ Protection:** Mild steel - To match door guard DG-01
 6. **Surface finish:** Stainless Steel - To match door guard DG-01
 7. **Colour/ Texture:**
 - 7.1. **Minimum film thickness:**

8. **Fixings/ Foundations:** Submit Proposals
9. **Note::** Note: Post not include the swipe card access/by pass access card. Swipe card access to match post look.

136 Door guard (DG02)

1. **Description:** DDA compliant door guard on the east road
2. **Manufacturer:** Barricade fabrications or equal & approved.

Address:

Unit 6 Conway Industrial Estate, Skull House Lane, Appley Bridge, Wigan, Lancashire. WN6 9DW

Email:info@barricade.co.uk

2.1. **Product reference:** HB4.DB7

3. **Height above datum:** 1000 mm
4. **Width:** 600 mm
5. **Diameter tube :** 50 mm
6. **Material/ Protection:** Mild steel
7. **Surface finish:** Galvanised
8. **Fixings/ Foundations:** Root Fix
9. **Other requirements:** Black PVC bump stop to be added

241 Stainless Steel Handrails to steps (HR02)

1. **Description:** Powder coated (RAL 9005) galvanised steel single handrail and posts to steps with timber horizontal top rail- HR02. Refer to design intent RD001-FCB-XX-XX-DR-L-3510.
2. **Standard:** To BS 6180
3. **Fabricator:** Fabricator to submit shop drawings for approval of Landscape Architect and Engineer
4. **Rail:**
 - 4.1. **Material/protection:** Stainless Steel Grade: 316L
 - 4.2. **Surface finish:** Brushed
 - 4.3. **Cross section:** 40mm dia circular tube
 - 4.4. **Height above finished paving levels:** Pitch line :900mm Landings:1000mm
5. **Posts:**
 - 5.1. **Surface finish:** Posts primed and painted, rail in brushed finish. Post colour to complement metalwork balustrade BA01 & BA02, Q41/130 & 130A. RAL to be confirmed
 - 5.2. **Cross section:** 50mm dia. circular tube
6. **Foundations/Base Fixings:** To Engineers details
7. **Fixings:** Core drilled
 - 7.1. **Materials for fixings:** - Material for fixings: Similar material or coating to the connected items, or isolating washers/ bushes provided to prevent bimetallic corrosion.
 - 7.2. **Resistance to vandalism:** High Torque
8. **Additional Requirements:** Single rails
Allowance for cover plate at the base of each post. To comply with BS8300.

241B Stainless Steel Handrails to steps (HR03)

1. **Description:** Powder coated (RAL 9005) galvanised steel steel free standing single handrail - HR03. Refer to design intent RD001-FCB-XX-XX-DR-L-3510.
2. **Standard:** To BS 6180
3. **Fabricator:** Fabricator to submit shop drawings for approval of Landscape Architect and Engineer

4. Rail:
 - 4.1. Material/protection: Stainless Steel Grade: 316L
 - 4.2. Surface finish: Brushed
 - 4.3. Cross section: 40mm dia circular tube
 - 4.4. Height above finished paving levels: Pitch line :900mm Landings:1000mm
5. Posts:
 - 5.1. Surface finish: Posts primed and painted, rail in brushed finish. Post colour to complement metalwork balustrade BA01 & BA02, Q41/130 and 130A. RAL to be confirmed
 - 5.2. Cross section: 50mm dia. circular tube
6. Foundations/Base Fixings: To Engineers details
7. Fixings: Core drilled
 - 7.1. Materials for fixings: - Material for fixings: Similar material or coating to the connected items, or isolating washers/ bushes provided to prevent bimetallic corrosion.
 - 7.2. Resistance to vandalism: High Torque
8. Additional Requirements: Single rails
Allowance for cover plate at the base of each post. To comply with BS8300.

241C Stainless Steel Handrails (HR04)

1. Description: Powder coated (RAL 9005) galvanised steel single handrail fixed to BA02- HR04. Refer to design intent RD001-FCB-XX-XX-DR-L-3510.
2. Standard: To BS 6180
3. Fabricator: Fabricator to submit shop drawings for approval of Landscape Architect and Engineer
4. Rail:
 - 4.1. Material/protection: Stainless Steel Grade: 316L
 - 4.2. Surface finish: Brushed
 - 4.3. Cross section: 40mm dia circular tube
 - 4.4. Height above finished paving levels: Pitch line :900mm Landings:1000mm
5. Posts:
 - 5.1. Surface finish: Posts primed and painted, rail in brushed finish. Post colour to complement metalwork balustrade BA01 & BA02, Q41/130 and 130A. RAL to be confirmed
 - 5.2. Cross section: 50mm dia. circular tube
6. Foundations/Base Fixings: To Engineers details
7. Fixings: Core drilled
 - 7.1. Materials for fixings: - Material for fixings: Similar material or coating to the connected items, or isolating washers/ bushes provided to prevent bimetallic corrosion.
 - 7.2. Resistance to vandalism: High Torque
8. Additional Requirements: Single rails
Allowance for cover plate at the base of each post. To comply with BS8300.

242 Pedestrian barrier (PB)

1. Description: Pedestrian barrier - PB. For location refer to Hardworks Plan and design intent RD001-FCB-XX-XX-DR-L-3510.
2. Standard: To BS 6180
3. Fabricator: Pipe Dream Fittings or equal & approved

Address: Pedmore Rd, Dudley DY2 0RD
Email: Karl, Sales@pipedreamfittings.com
Phone No. 01218284048

Fabricator to submit shop drawings for approval of Landscape Architect and Engineer

4. Rail:
 - 4.1. Material/protection: Galvanised steel
 - 4.2. Cross section : 45mm dia circular tube
 - 4.3. Height above finished paving levels: 1100mm
5. Posts: 45mm dia circular tube
 - 5.1. Material/protection: Galvanised steel
 - 5.2. Cross section: 45mm dia. circular tube
6. Foundations/Base Fixings: To Engineers details
7. Fixings: Core drilled
 - 7.1. Materials for fixings: - Material for fixings: Similar material or coating to the connected items, or isolating washers/ bushes provided to prevent bimetallic corrosion.
8. Additional Requirements: Allowance for cover plate at the base of the barrier. To comply with BS8300.
9. Note: **For all other barriers in the service yard:**
Minimum horizontal loads:
Minimum horizontal loads for parapets, barriers and balustrades as per Table 2 in BS6180:2011:
Use the loads corresponding to the "Type of occupancy" category that is "Vehicular" (xiv) and (xv)

Performance/ inspection/ testing

305 Production inspection of posts

1. General: At place of fabrication, at rate of
- 1.1. Weld defect levels: As stipulated in Highways England 'Manual of contract documents for highway works' Volume 1 'Specification for highway works' Series 400.

330 Verification of anchorages

1. Description: For balustrade type 01 (BA01), balustrade type 2 (BA02) and handrail type 02, 03 & 04 (HR02, HR03 & HR04)
2. Certification: Four weeks prior to installation, submit certificates from a United Kingdom Accreditation Service (UKAS) independent laboratory, stating that for tests in accordance with BS 5080-1, anchorages are capable of resisting the loading requirements recommended by Engineer.
3. Tolerance: Certification must include the maximum tolerance of hole size and evidence that load can be supported when anchor is installed in holes having these tolerances.

340 Site testing anchorages in drilled holes

1. Description: For balustrades and handrails
2. Test parapet posts: Install on site.
3. Loading tests: To BS 5080-1.
 - 3.1. Frequency of testing: To engineer's recommendation
4. Anchorage loadings: Incrementally in tension to 10% above the nominal tensile load determined in accordance with design loading, as advised by Engineer.
 - 4.1. Load holding periods
 - 4.1.1. Incremental loads: Not less than 30 seconds.
 - 4.1.2. Test loads: Not less than 5 minutes.
 - 4.2. Readings: Take after applying load and at the end of the time intervals stated.
 - 4.3. Movement: Total not to exceed 1 mm during test.

4.3.1. Any evidence of slip during loading shall constitute failure.

5. Test results: Submit prior to full parapet installation.

Installation

405 Competence

1. **Operatives:** Contractors must employ competent operatives.
2. **Qualifications:** Submit certification of training.
 - 2.1. UKAS Sector Scheme 2A sub categories:
 - 2.2. UKAS Sector Scheme 2C sub categories:

410 Work on or adjacent to highways

1. **Requirement:** Comply with the Department for Transport's 'Safety at street works and road works. A code of practice'. Retain a copy of this document on site at all times during the course of the works.

420 Alignment

1. **Erection:** Fences/ barriers to present a flowing alignment. Tops of posts to follow ground profile.
2. **Tolerance:** ±30 mm of prescribed alignment and, within any 10 m length, ±15 mm from the straight or required radius.

430 Erection generally

1. **Protection:** Coat all internal and external surfaces of aluminium and steel posts below and up to 150 mm above ground level, with two coats of bituminous paint to BS 6949 type 2, unless other applied surface finish is specified.
2. **Prevention of electrolytic corrosion:** Isolate dissimilar metals.
3. **Steel components:** Do not drill, cut or weld after galvanizing.

480 Concrete foundations for posts

1. **Excavations:** To have vertical sides. Dispose of all arisings. Blind excavation bottoms with a 50 mm layer of concrete.
2. **Concrete mix:** To BS 8500-2, Designated mix not less than GEN 4 or Standard mix not less than ST5. Do not use admixtures.
3. **Placing concrete:** Fill holes to the specified depth and fully compact. Do not backfill for at least four days.
4. **Temporary support to posts:** Provide for a at least four days after placing concrete.

490 Damage repair to galvanized surfaces

1. **Areas of repair:** Minor damage, including fixings and fittings.
 - 1.1. Total area of repair not to exceed 0.5% of total surface area.
 - 1.2. Each area not to exceed 1000 mm².
2. **Renovation:** Use low melting point zinc alloy repair rods or powders or at least two coats of zinc-rich paint to BS 4652.

500 Preservative treated timber

1. **Surfaces exposed by minor cutting and drilling:** Treat with two flood coats of a solution recommended for the purpose by main treatment solution manufacturer.

510 Preparation for site painting

1. Preparation and application: As soon as possible after installation of barriers/ guardrails.

Completion - Not Used

Ω End of Section

Q50

Site/street furniture/equipment **REVISED**

Clauses

2 To be read with preliminaries/ general conditions.

Gates, barriers and parking controls

190A Fixed bollards (BL04)

1. Description: Bolt down fixed bollard - BL04
2. Manufacturer: Macs Automated Bollard System or equal & approved
Unit 8.1b Tameside Business Park
Windmill Lane, Denton
Manchester, M34 3QS
Contact person: Damian Corcoran, Technical Director
Tel; 0161 320 6462
Mobile; 07856 779666
Email; Damian@macs-bollards.com
Website: www.macs-bollards.com
 - 2.1. Product reference: Contractor/ supplier to submit proposal for approval
3. Material: Powder coated galvanised steel
 - 3.1. Finish as delivered: Primed
 - 3.2. Colour: Black (RAL 9005) powder coated finish. To match other metalwork items.
4. Height above ground: 900mm above ground
5. Sectional size: Tube diameter 120-130 mm diameter
6. Top: Domed
7. Special features: None
8. Method of fixing: Base plate bolted to 150mm thick in situ concrete base set below the paving
9. Note: Contractor to allow for core drilling of stone units around base to achieve neat interface.

190C PAS 68 Fixed Bollards (BL02)

1. Description: Fixed bollard - BL02
2. Manufacturer: Macs Automated Bollard System or equal & approved
Unit 8.1b Tameside Business Park
Windmill Lane, Denton
Manchester, M34 3QS
Contact person: Damian Corcoran, Technical Director
Tel; 0161 320 6462
Mobile; 07856 779666
Email; Damian@macs-bollards.com
Website: www.macs-bollards.com
 - 2.1. Product reference: PILOMAT 275/K12 900A or equal & approved, subject to approval by Security consultant.
3. Material: Steel
 - 3.1. Finish as delivered: Polyester powder-coated, as section Z31 pr painted in RAL colour
 - 3.2. Colour: Black (RAL 9005), To match other metalwork items.
4. Height above ground: 900mm
5. Sectional size: Diameter 271mm
6. Top: Flat

7. **Special features:** None
8. **Method of fixing:** Foundation to manufacturer's detail
9. **Note:** Bollards to be HMV/ PAS68 rated.
Contractor to allow for core drilling of stone units around base to achieve neat interface.
Contractor to allow for automated access control system such as electronic card reader as per Security consultant recommendations.

Bollards to be suitably designed to PAS68 specification/ standard stopping a 7.5ton vehicle travelling at 50km/hr, as advised by Security consultant.

190D Removable bollards (BL05)

1. **Description:** Removable bollard with padlock - BL05
2. **Manufacturer:** Macs Automated Bollard System or equal & approved
Unit 8.1b Tameside Business Park
Windmill Lane, Denton
Manchester, M34 3QS
Contact person: Damian Corcoran, Technical Director
Tel; 0161 320 6462
Mobile; 07856 779666
Email; Damian@macs-bollards.com
Website: www.macs-bollards.com
 - 2.1. **Product reference:** Contractor/ supplier to submit proposal for approval
3. **Material:** Powder coated galvanised steel
 - 3.1. **Finish as delivered:** Primed
 - 3.2. **Colour:** Black (RAL 9005) powder coated finish. To match other metalwork items.
4. **Height above ground:** 900mm above ground
5. **Sectional size:** Tube diameter 120-130 mm diameter
6. **Top:** Domed
7. **Special features:** Removable lift out posts using padlock fixing to allow temporary vehicle access
8. **Method of fixing:** Bolt down fixing to 150mm thick in situ concrete base set below the paving
9. **Note:** Contractor to allow for core drilling of stone units around base to achieve neat interface.

190E PAS68 Manual Gate MG

1. **Description:** 6.1 wide manually operated drop down arm HMV barrier.
2. **Manufacturer:** Avon Barrier Corporation Ltd or equal & approved
147 South Liberty Lane
Bristol BS3 2TL
United Kingdom
Tel. (+44) (0) 117 953 5252
www.avon-barrier.com
sales@avon-barrier.com
 - 2.1. **Product reference:** Avon Universal Cedar Gate or equal & approved
3. **Material:** Galvanised steel powder coated in RAL colour
 - 3.1. **Finish as delivered:** As manufactured
 - 3.2. **Colour:** RAL 9005
4. **Height above ground:** 900mm above ground
5. **Boom length:** 6.1m, subject to coordination of footing with below ground utilities
6. **Sectional size:** Refer to product datasheet in Appendix
7. **Special features:** To include pillar and housing for automated access control system/intercom system

8. **Method of fixing:** To supplier's detail
9. **Note:** Contractor to allow for core drilling of stone units around base to achieve neat interface.

190F PAS 68 Fixed Bollards (BL01)

1. **Description:** PAS 68 Fixed bollard - BL01
2. **Manufacturer:** Macs Automated Bollard System or equal & approved
Unit 8.1b Tameside Business Park
Windmill Lane, Denton
Manchester, M34 3QS
Contact person: Damian Corcoran, Technical Director
Tel; 0161 320 6462
Mobile; 07856 779666
Email; Damian@macs-bollards.com
Website: www.macs-bollards.com
 - 2.1. **Product reference:** 275/K12FB 900F or equal & approved, subject to approval by Security consultant.
3. **Material:** Steel
 - 3.1. **Finish as delivered:** Polyester powder-coated, as section Z31 or painted in RAL colour. To match other metalwork items.
 - 3.2. **Colour:** Black (RAL 9005)
4. **Height above ground:** 900mm
5. **Sectional size:** Diameter 271mm
6. **Top:** Flat
7. **Special features:** None
8. **Method of fixing:** Foundation to manufacturer's detail
9. **Note:** Product to be PAS 68 rated. Contractor to allow for core drilling of stone units around base to achieve neat interface.

Bollards to be suitably designed to PAS68 specification/ standard stopping a 7.5ton vehicle travelling at 80km/hr, as advised by Security consultant.

190G PAS 68 Removable Bollards (BL03)

1. **Description:** PAS 68 Removable bollard - BL03
2. **Manufacturer:** Macs Automated Bollard System or equal & approved
Unit 8.1b Tameside Business Park
Windmill Lane, Denton
Manchester, M34 3QS
Contact person: Damian Corcoran, Technical Director
Tel; 0161 320 6462
Mobile; 07856 779666
Email; Damian@macs-bollards.com
Website: www.macs-bollards.com
 - 2.1. **Product reference:** 275/K12RM 900 or equal & approved, subject to approval by Security consultant
3. **Material:** Steel
 - 3.1. **Finish as delivered:** Polyester powder-coated, as section Z31 or painted in RAL colour
 - 3.2. **Colour:** Black (RAL 9005). To match other metalwork items.
4. **Height above ground:** 900mm
5. **Sectional size:** Diameter 271mm
6. **Top:** Flat
7. **Special features:** None

8. **Method of fixing:** Shallow foundation to manufacturer's detail
9. **Note:** Contractor to allow for core drilling of stone units around base to achieve neat interface.

Site and street furniture

210 Cycle stands (CS01)

1. **Manufacturer:** Broxap Ltd or equal & approved
Rowhurst Industrial Estate,
Chesterton, Newcastle-under-Lyme,
ST5 6BD, United Kingdom
www.broxap.com
 - 1.1. **Product reference:** Sheffield Cycle Stand or equal approved
2. **Type:** Single stands, Refer to Hardworks Plan
3. **Material:** Stainless steel
 - 3.1. **Finish:** Stainless steel
 - 3.2. **Colour:** Black (RAL 9005)
4. **Accessories:** None
5. **Method of fixing:** Root, 300 mm below ground, set in concrete base
6. **Note:** Contractor to allow for core drilling of stone units around base to achieve neat interface – no concrete foundation to be exposed.

210A Car stopper

1. **Manufacturer:** Rediweld Traffic Products Ltd or equal & approved
9-10 Newman Lane, Alton, Hampshire, GU34 2QR, UK
sales@rediweldtraffic.co.uk
+ 44 (0) 1420 543007
 - 1.1. **Product reference:** Car stop or equal approved
2. **Material:** Recycled rubber
 - 2.1. **Colour:** Black
3. **Size:** 1000mm(L)x140mm(W)x80(D)mm
4. **Method of fixing:** To suppliers detail

210B Feature boulder (DR01)

1. **Manufacturer:** Decorative natural stone rocks to be integrated in the landscape. Refer to Appendix for images. Contractor to submit proposal.
2. **Material:** Natural stone sourced from local quarry
3. **Size:** As indicated in hardworks plan. Contractor to submit proposal for review of Landscape Architect. Boulder position, spacing, size and numbers are subject to review by Security consultant. Boulders shall be placed in between the trees to block access to car park and Arrival garden.
Approximate sizes -

No.	Size	Aprox. Dimension
18	Small	2300/3500mm(L)x 1800/2000mm (W)x1000/1200mm(H)
8	Medium	3500/4500mm(L)x 2000/3000mm(W)x1200/1500mm(H)
4	Large	4500/ 5500mm(L) x300/4000/1500mm (W)x1500/2000mm(H)

4. **Method of fixing:** To suppliers detail
5. **Note:** Confirmation of source and sample of stone to be submitted in advance of installation. Contractor to submit photographic examples of stones proposed.

210C Large seating rock (ST05)

1. **Manufacturer:** Large seating rock in Arrival garden. Refer to Appendix for images.
2. **Material:** Natural stone sourced from local quarry. Contractor to submit proposal.
3. **Size:** Contractor to submit proposal for review of Landscape Architect. Position, numbers and size of rocks subject to review by Security consultant.
4. **Method of fixing:** To suppliers detail
5. **Note:** Confirmation of source and sample of stone to be submitted in advance of installation. Contractor to submit photographic examples of stones proposed. Refer A15/231 for sample requirements.

210D Cycle stands (CS02)

1. **Manufacturer:** Lock It Safe Ltd or equal & approved
G25-26Innovation Centre, Innovation Way Europark, GrimsbyDN37 9TT
sales@lockit-safe.co.uk
Tel 01472 346382
Fax 01472 242092
1.1. **Product reference:** Two tier cycle racks or equal approved
2. **Type:** Modular two tier racking system to accommodate 32 no. cycle stands, Refer to Hardworks Plan.

Height differential to provide adequate clearance for all types of cycles.

3. **Material:** Galvanised steel
 - 3.1. **Finish:** Galvanised steel
 - 3.2. **Colour:** None
4. **Size:** Contractor to site measure and submit workshop drawings for approval
5. **Accessories:** 3 point locking system
6. **Method of fixing:** To manufacturer's details
7. **Note:** All fixings to be in galvanised steel.
Contractor to allow for core drilling of paving units around base to achieve neat interface – no concrete foundation to be exposed.

2 no. electric charging points in line with the 5% provision indicated in the planning application.
Refer to Engineers information.

210E Cycle shelter

1. **Manufacturer:** Lock It Safe Ltd or equal & approved
G25-26Innovation Centre, Innovation Way Europark, GrimsbyDN37 9TT
sales@lockit-safe.co.uk
Tel 01472 346382
Fax 01472 242092
1.1. **Product reference:** Winchester shelters for two tier cycle stands or equal approved.
2. **Type:** Bike shelter for two tier cycle stands, Refer to Hardworks Plan
3. **Material:** Galvanised steel
 - 3.1. **Finish:** Powder coated
 - 3.2. **Colour:** Black RAL 9005

4. **Size:** Shelter to accommodate 32no.s cycle stands, approximate size: 9340mm(L)x2300mm(W)x3000mm(H). Contractor to site measure and submit workshop drawings for approval
5. **Accessories:** Integrated lighting by others
6. **Method of fixing:** To manufacturer's detail
7. **Note:** Contractor to allow for core drilling of stone units around base to achieve neat interface – no concrete foundation to be exposed.

210F Cycle stands for disabled (CS03)

1. **Manufacturer:** Lock It Safe Ltd or equal & approved
G25-26Innovation Centre, Innovation Way Europark, GrimsbyDN37 9TT
sales@lockit-safe.co.uk
Tel 01472 346382
Fax 01472 242092
 - 1.1. **Product reference:** Oversized Sheffield Stands or equal approved
2. **Type:** Oversized Sheffield stands, Refer to Hardworks Plan
3. **Material:** Galvanised steel
 - 3.1. **Finish:** Galvanised steel
 - 3.2. **Colour:** None
4. **Size:** Stands to be minimum 750mm high from the finished floor level
5. **Accessories:** Stands to include visibility bands
6. **Method of fixing:** Root, 300 mm below ground, set in concrete base
7. **Note:** Contractor to allow for core drilling of stone units around base to achieve neat interface – no concrete foundation to be exposed.

220A Benches (ST06)

1. **Description:** Timber sleeper barrier to top of pond deck - ST06
2. **Manufacturer:** Woodscape or equal & approved
Shadsworth Business Park, 1 Sett End Road West, Blackburn BB1 2QJ
01254 685 185
sales@woodscape.co.uk
www.woodscape.co.uk
 - 2.1. **Product reference:** Seasoned oak or equal & approved.
Refer to design intent drawing DWG no. RD001-FCB-XX-XX-DR-L-5301
Supplier to site measure and prepare shop/ fabrication drawings for approval.
3. **Material:** Contractor to submit proposal.
Example seasoned oak or equal & approved. Bench to include anti-skate warp detail. Timber to match ST04 timber cladding (Q50/ 225)
 - 3.1. **Finish:** Timber to be free from splinters, blemishes and burrs. Contractor to ensure timber is free from tannins or similar to avoid stains. Surface finish: Planed, sanded smooth, flat and straight, free from splinters and burs.
 - 3.2. **Colour:** Natural, subject to review of sample.
4. **Size:** Refer to design intent drawing DWG no. RD001-FCB-XX-XX-DR-L-3101 & 3102.
Approximate sizes:

No.	Size (L)mm x (W)mm X (H)mm
1	1350x2600x550
2	2000x2000x550
2	2300X1500x550
5	3000 X1500x550
1	3360x1300x550
1	4300x1500x550
2	4500x1500x550

Supplier to site measure and prepare shop/ fabrication drawings for approval.

5. **Accessories/ Special requirements:** Metal work detail wrap and round head bolts as anti skate fixtures
6. **Method of fixing:**

To manufacturer's/ fabricators detail

7. **Note:**

Timber Source

Sustainable Source: All timber to be from UK/European plantations managed for sustainability – a renewable resource that is being planted faster than it is being harvested and is approved by the Forestry Stewardship Council (FSC). Proof is to be provided by the contractor of evidence that the timber complies with this clause including a certificate of source. Tropical hardwoods or products containing tropical hardwoods from unsustainable or unknown origin are prohibited. Only FSC wood made from softwoods or temperate hardwoods may be used. No timber material should be ordered before confirmation of the acceptability of the origin and the suppliers sustainable resource policy.

Timber Grade

No sapwood to be used.

Free from decay and insect attack.

Type/desired: Timber to be pre-seasoned to avoid leaching of tannins

220B Benches (ST01) REVISED

1. **Description:** Timber bench - ST01
Note: Group 3 client item, supply and installation by the client as advised by MACE. Location number and specification are indicative only.
2. **Manufacturer:** Factory Furniture or equal & approved
Unit 5 Pioneer Road, Faringdon, SN7 7BUJ
Tel + 44 (0) 1367 242731
office@factoryfurniture.co.uk
<https://www.factoryfurniture.co.uk/>
 - 2.1. **Product reference:** Bespoke bench with cleft oak legs and timber slats. For design intent refer to Appendix. Contractor to submit proposal for approval by Landscape Architect
3. **Material:** locally sourced seasoned English oak.
 - 3.1. **Finish:** Timber to be free from splinters, blemishes and burrs. Contractor to ensure timber is free from tannins or similar to avoid stains. Surface finish: Planed, sanded smooth, flat and straight, free from splinters and burs.
 - 3.2. **Colour:** Natural
4. **Size:** 4000mm(L)x 700mm (W)x 450mm (H).
Supplier to submit shop drawings for approval.
5. **Accessories/ Special requirements:** Cleft oak legs with concealed fixings
6. **Method of fixing:**

To manufacturer's/ fabricators detail

7. **Note:**

Timber Source

Sustainable Source: All timber to be from UK/European plantations managed for sustainability – a renewable resource that is being planted faster than it is being harvested and is approved by the Forestry Stewardship Council (FSC). Proof is to be provided by the contractor of evidence that the timber complies with this clause including a certificate of source. Tropical hardwoods or products containing tropical hardwoods from unsustainable or unknown origin are prohibited. Only FSC wood made from softwoods or temperate hardwoods may be used. No timber material should be ordered before confirmation of the acceptability of the origin and the suppliers sustainable resource policy.

Timber Grade

No sapwood to be used.

Free from decay and insect attack.

Type/desired: Timber to be pre-seasoned to avoid leaching of tannins

220C Benches (ST02)

1. **Description:** Timber bench with arm rest and back rest- ST02
2. **Manufacturer:** Factory Furniture or equal & approved
Unit 5 Pioneer Road, Faringdon, SN7 7BUJ
Tel + 44 (0) 1367 242731
office@factoryfurniture.co.uk
<https://www.factoryfurniture.co.uk/>
 - 2.1. **Product reference:** Bespoke bench with cleft oak legs and timber slats to match ST01. For design intent refer to Appendix. Contractor to submit proposal for approval by Landscape Architect
3. **Material:** locally sourced seasoned English oak.
 - 3.1. **Finish:** Timber to be free from splinters, blemishes and burrs. Contractor to ensure timber is free from tannins or similar to avoid stains. Surface finish: Planed, sanded smooth, flat and straight, free from splinters and burs.
 - 3.2. **Colour:** Natural
4. **Size:** Type A: 4000mm(L)x 700mm(W)x 450mm (H).
Type B: 8000mm(L)x 700mm(W)x 450mm(H)
Supplier to submit shop drawings for approval.
5. **Accessories/ Special requirements:** Cleft oak legs with concealed fixings
6. **Method of fixing:**

To manufacturer's/ fabricators detail

7. **Note:**

Timber Source

Sustainable Source: All timber to be from UK/ European plantations managed for sustainability – a renewable resource that is being planted faster than it is being harvested and is approved by the Forestry Stewardship Council (FSC). Proof is to be provided by the contractor of evidence that the timber complies with this clause including a certificate of source. Tropical hardwoods or products containing tropical hardwoods from unsustainable or unknown origin are prohibited. Only FSC wood made from softwoods or temperate hardwoods may be used. No timber material should be ordered before confirmation of the acceptability of the origin and the suppliers sustainable resource policy.

Timber Grade

No sapwood to be used.

Free from decay and insect attack.

Type/desired: Timber to be pre-seasoned to avoid leaching of tannins

220D Picnic Set (ST03)

1. **Description:** Picnic set - ST03.
Note: Group 3 client item, supply and installation by the client as advised by MACE. Location number and specification are indicative only.
2. **Manufacturer:** Factory Furniture or equal & approved
Unit 5 Pioneer Road, Faringdon, SN7 7BUJ
Tel + 44 (0) 1367 242731
office@factoryfurniture.co.uk
https://www.factoryfurniture.co.uk/
 - 2.1. **Product reference:** Bespoke bench with cleft oak legs and timber slats to match ST01. For design intent refer to Appendix. Contractor to submit proposal for approval by Landscape Architect
3. **Material:** locally sourced seasoned English oak.
 - 3.1. **Finish:** Timber to be free from splinters, blemishes and burrs. Contractor to ensure timber is free from tannins or similar to avoid stains. Surface finish: Planed, sanded smooth, flat and straight, free from splinters and burs.
 - 3.2. **Colour:** Natural
4. **Size:** Table: 3000mm(L)x 900mm(W)x 740mm (H).
Bench: 3000mm(L)x 450mm(W)x 450mm(H)
Supplier to submit shop drawings for approval.
5. **Accessories/ Special requirements:** Cleft oak legs with concealed fixings
6. **Method of fixing:**

To manufacturer's/ fabricators detail
7. **Note:**

Timber Source
Sustainable Source: All timber to be from UK/European plantations managed for sustainability – a renewable resource that is being planted faster than it is being harvested and is approved by the Forestry Stewardship Council (FSC). Proof is to be provided by the contractor of evidence that the timber complies with this clause including a certificate of source. Tropical hardwoods or products containing tropical hardwoods from unsustainable or unknown origin are prohibited. Only FSC wood made from softwoods or temperate hardwoods may be used. No timber material should be ordered before confirmation of the acceptability of the origin and the suppliers sustainable resource policy.

Timber Grade
No sapwood to be used.
Free from decay and insect attack.
Type/desired: Timber to be pre-seasoned to avoid leaching of tannins

225 Timber cladding to seating terrace (ST04)

1. **Description:** FSC timber cladding to in-situ concrete terraces - ST04.
2. **Manufacturer:** Woodscape or equal & approved
Shadsworth Business Park, 1 Sett End Road West, Blackburn BB1 2QJ
01254 685 185
sales@woodscape.co.uk
www. woodscape.co.uk
 - 2.1. **Product reference:** Seasoned Oak or equal & approved.
Fabricator to site measure and prepare site specific shop/ fabrication drawings for approval
3. **Material:** Contractor to submit proposal.
Example Seasoned oak or equal & approved. Timber to match PT04 timber deck (Q50/ 380).

- 3.1. **Finish:** Natural. Timber to be free from splinters, blemishes and burrs. Contractor to ensure timber is free from tannins or similar to avoid stains. Surface finish: Planed, sanded smooth, flat and straight, free from splinters and burs.
- 3.2. **Type:** Timber type to agreed and confirmed and selected for intended use and durability.
4. **Size:** Refer to design intent drawing DWG no. RD001-FCB-XX-XX-DR-L-5301
Supplier to site measure and prepare shop/ fabrication drawings for approval.

Contractor to allow for 2 no.s powder coated metalwork armrest with timber top. Armrest timber to match bench timber type.

5. **Accessories/ Special requirements:** All fixings to be hidden. Countersunk stainless steel through bolts anchored into concrete seating wall under.
6. **Method of fixing:** To manufacturer's detail
7. **Note:** Timber Source
Sustainable Source: All timber to be from UK/European plantations managed for sustainability – a renewable resource that is being planted faster than it is being harvested and is approved by the Forestry Stewardship Council (FSC). Proof is to be provided by the contractor of evidence that the timber complies with this clause including a certificate of source. Tropical hardwoods or products containing tropical hardwoods from unsustainable or unknown origin are prohibited. Only FSC wood made from softwoods or temperate hardwoods may be used. No timber material should be ordered before confirmation of the acceptability of the origin and the suppliers sustainable resource policy.

Timber Grade

No sapwood to be used.

Free from decay and insect attack.

Type/desired: Timber to be pre-seasoned to avoid leaching of tannins

242 Bins

1. **Description:** Recycling Bin set
2. **Manufacturer:** mmcite or equal & approved
The Counting House
9 High Street
Tring HP23 5TE
www.mmcite.co.uk

Contact: Jozef Hupian M.A.
senior business development manager
m +44 7591 214 612
j.hupian@mmcite.co.uk
- 2.1. **Product reference:** Quinbin or equal & approved
3. **Material:** Galvanised steel frame with powder coated finish. FSC hardwood timber wood slat cladding with laser cut lettering to identify its waste type. The bin units stand together in rows of 3 to divide waste up appropriately
- 3.1. **Finish:** Charred black
- 3.2. **Colour:** Black
- 3.3. **Size:** Triple Bin: L: 1065mm x W: 395mm x H: 785mm Capacity: 50L x 3
4. **Accessories/ Special requirements:** Lettering & charred black finish.
Bin to include rain cover
5. **Method of fixing:** Surface mounted.
Contractor to allow for core drilling of stone units around base to achieve neat interface – no concrete foundation to be exposed.

Timber structures

370 Compost bins

1. **Manufacturer:** Agamemnon Timber or equal & approved
 - 1.1. **Product reference:** Triple bay compost bin or equal & approved
2. **Material:** Pressure treated timber
 - 2.1. **Finish:** Natural
 - 2.2. **Size:** 1400mm(L) x 800mm(W) x 780mm(D)
3. **Accessories/ Special requirements:** None
4. **Method of fixing:** To supplier's detail

373 Timber sleeper (PT05)

1. **Manufacturer:** **Ecochoice Ltd or equal & approved**
External Solutions in Certified Timbers
info@ecochoice.co.uk
T. 0345 638 1340
M. 079 30397453
www.ecochoice.co.uk
2. **Material:** Reclaimed oak sleepers
 - 2.1. **Finish:** Scarified, planed and sanded to achieve a smooth finish. Timber to be free from splinters, blemishes and burrs.
 - 2.2. **Size:** 1500mm(L)x200mm(W)x100mm(D)
3. **Preparation:** Oak to be flushed with high pressure water hose to release any tannins prior to fixing.
4. **Note:** Allow for anti slip strips
5. **Contractor to submit full fabrication drawings to:** for approval prior to commencement of fabrication

375 Timber deck design

1. **Timber decking, structure and associated features:** Submit workshop/ fabrication drawings for approval
2. **Proposals:** Submit drawings, technical information, calculations and manufacturers' literature.
3. **Performance criteria:** Timber Source
Sustainable Source: All timber to be from UK/European plantations managed for sustainability – a renewable resource that is being planted faster than it is being harvested and is approved by the Forestry Stewardship Council (FSC). Proof is to be provided by the contractor of evidence that the timber complies with this clause including a certificate of source. Tropical hardwoods or products containing tropical hardwoods from unsustainable or unknown origin are prohibited. Only FSC wood made from softwoods or tropical/ temperate hardwoods may be used. No timber material should be ordered before confirmation of the acceptability of the origin and the suppliers sustainable resource policy.

Timber Grade

No sapwood to be used.

Free from decay and insect attack.

Type/desired: Timber to be pre-seasoned to avoid leaching of tannins

380 Timber deck (PT04)

1. **Supplier:** Woodscape or equal & approved
Shadsworth Business Park, 1 Sett End Road West, Blackburn BB1 2QJ
01254 685 185
sales@woodscape.co.uk
www.woodscape.co.uk

- 1.1. **Product reference:** Seasoned Oak or equal & approved.
Fabricator/ supplier to prepare shop/ fabrication drawings based on design intent. For design intent refer to DWG no. RD001-FCB-XX-XX-DR-L-5301.
2. **Base preparation:** To supplier's details
3. **Timber other than decking boards:** Timber joists to supplier/ Engineer's details & specification.
4. **Post setting:** Support structure to Engineer's details and specification
5. **Subframing:** Timber joists to supplier's details.
6. **Decking boards:** Contractor to submit proposal.
Example Seasoned Oak or equal & approved
 - 6.1. **Size:** 150mm (W)x 2000mm(L)x 40mm(D). Refer to design intent DWG no. RD001-FCB-XX-XX-DR-L-5301. Joist spacing and size to supplier's details.
 - 6.2. **Preservative treatment:** To supplier's recommendation
 - 6.3. **Fasteners:** To fabrication drawings
 - 6.4. **Joints:** Kept to a minimum, and formed only as butt joints situated over joists.
 - 6.5. **Length:** Each board must span not less than two bays between joists with joints in adjacent boards staggered.
7. **Accessories:** Deck boards to include anti-slip carborundum strips.

390 Pergola (PG)

1. **Manufacturer:** Woodscape or equal & approved
Shadsworth Business Park, 1 Sett End Road West, Blackburn BB1 2QJ
01254 685 185
sales@woodscape.co.uk.
www. woodscape.co.uk
 - 1.1. **Product reference:** Seasoned Oak or equal & approved.
Fabricator/ supplier to prepare shop/ fabrication drawings based on design intent. For design intent refer to DWG no. RD001-FCB-XX-XX-DR-L-5302
2. **Material:** Contractor to submit proposal.
Example Seasoned oak or equal & approved. To match timber cladding to seating terraces - ST04, refer to Q50/225
 - 2.1. **Preservative treatment:** To supplier's recommendation
 - 2.2. **Finish:** Scarified, planed and sanded to achieve a smooth finish. Timber to be free from splinters, blemishes and burrs.
 - 2.3. **Size:** Refer to design intent DWG no. RD001-FCB-XX-XX-DR-L-5302
 - 2.4. **Colour:** Natural
3. **Accessories:** To include stainless steel tensioned wire rope (e.g. 4mm dia) to support climbing plants. For design intent refer to DWG no. RD001-FCB-XX-XX-DR-L-5302.

All fixings to be hidden. Countersunk stainless steel through bolts anchored into concrete seating wall under.

4. **Method of fixing:** To fabrication drawings. Fixing to deck structure to be reviewed by Engineers
5. **Note:** Timber Source
Sustainable Source: All timber to be from UK/European plantations managed for sustainability – a renewable resource that is being planted faster than it is being harvested and is approved by the Forestry Stewardship Council (FSC). Proof is to be provided by the contractor of evidence that the timber complies with this clause including a certificate of source. Tropical hardwoods or products containing tropical hardwoods from unsustainable or unknown origin are prohibited. Only FSC plywood made from softwoods or temperate hardwoods may be used. No timber material should be ordered before confirmation of the acceptability of the origin and the suppliers sustainable resource policy.

Timber Grade

No sapwood to be used.
Free from decay and insect attack.
Type/desired: Timber to be pre-seasoned to avoid leaching of tannins

Installation

510 Concrete foundations generally

1. **Standard:** To BS 8500-2.
2. **Concrete:** To Engineer's detail & specification
3. **Admixtures:** Do not use.
4. **Foundation holes:** Neat vertical sides.
5. **Depth of foundations, bedding, haunching:** To Engineer's detail & specification
Appropriate to provide adequate support and to receive overlying soft landscape or paving finishes.

515 Setting components in concrete

1. **Holes:** To Engineer's specification
2. **Components:** Accurately positioned and securely supported.
3. **Concrete fill:** Fully compacted as filling proceeds.
4. **Concrete foundations exposed to view:** To Engineer's specification. Compacted until air bubbles cease to appear on the upper surface, then weathered to shed water and trowelled smooth.
5. **Temporary component support:** Maintain undisturbed for minimum 48 hours.

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:** of 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: of 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

Z10

Purpose made joinery

To be read with preliminaries/ general conditions.

20 Cross section dimensions of timber

1. General: Dimensions on drawings are finished sizes.
2. Maximum permitted deviations from finished sizes:
 - 2.1. Softwood sections: To BS EN 1313-1.
 - 2.2. Hardwood sections: To BS EN 1313-2.

30 Preservative treated wood

1. Cutting and machining: Completed as far as possible before treatment.
2. Extensively processed timber: Retreat timber sawn lengthways, thickened, planed, ploughed, etc.
3. Surfaces exposed by minor cutting and/ or drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

110 Fabrication

1. Standard: To BS 1186-2.
2. Sections: Accurate in profile and length, and free from twist and bowing. Formed out of solid unless shown otherwise.
 - 2.1. Machined surfaces: Smooth and free from tearing, wooliness, chip bruising and other machining defects.
3. Joints: Tight and close fitting.
4. Assembled components: Rigid. Free from distortion.
5. Screws: Provide pilot holes.
 - 5.1. Screws of 8 gauge (4 mm diameter) or more and screws into hardwood: Provide clearance holes.
 - 5.2. Countersink screws: Heads sunk at least 2 mm below surfaces visible in completed work.
 - 5.3. Adhesives: Compatible with wood preservatives applied and end uses of timber.
6. Adhesives:

120 Cross section dimensions of timber

1. General: Dimensions on drawings are finished sizes.
2. Maximum permitted deviations from finished sizes
 - 2.1. Softwood sections: To BS EN 1313-1:-
 - 2.1.1. Clause 6 for sawn sections.
 - 2.2. Hardwood sections: To BS EN 1313-2:-
 - 2.2.1. Clause 6 for sawn sections.
 - 2.2.2. Clause NA.3 for further processed sections.

130 Preservative treated wood

1. Cutting and machining: Completed as far as possible before treatment.
2. Extensively processed timber: Retreat timber sawn lengthways, thickened, planed, ploughed, etc.

3. Surfaces exposed by minor cutting and/ or drilling: Treat as recommended by main treatment solution manufacturer.

140 Moisture content

1. Wood and wood based products: Maintained within range specified for the component during manufacture and storage.

250 Finishing

1. Surfaces: Smooth, even and suitable to receive finishes.
 - 1.1. Arrises: Eased unless shown otherwise on drawings.
2. End grain in external components: Sealed with primer or sealer as section M60 and allowed to dry before assembly.

Ω End of Section

Z11

Purpose made metalwork

To be read with preliminaries/ general conditions.

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.

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 ISO 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.

Completion - Not Used

Ω End of Section

Z12

Preservative/ fire retardant treatment

To be read with preliminaries/ general conditions.

10 Treatment application

1. **Timing:** After cutting and machining timber, and before assembling components.
2. **Processor:** Licensed by manufacturer of specified treatment solution.
3. **Certification:** For each batch of timber provide a certificate of assurance that treatment has been carried out as specified.

25 Preservative treatment solution strengths/ treatment cycles

1. **General:** Select to achieve specified service life and to suit treatability of specified wood species.

110 Treatment application

1. **Timing:** After cutting and machining timber, and before assembling components.
2. **Processor:** Licensed by manufacturer of specified treatment solution.
3. **Certification:** For each batch of timber provide a certificate of assurance that treatment has been carried out as specified.

120 Commodity specifications

1. **Standard:** In accordance with the Wood Protection Association (WPA) publication 'Industrial wood preservation specification and practice'.

130 Preservative treatment solution strengths/ treatment cycles

1. **General:** Select to achieve specified service life and to suit treatability of specified wood species.

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 distort 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 Proprietary Mortar (Bedding, Primer and Jointing) for Precast Steps, Walls and Seating Units

1. **Specification:** Proportions and additional requirements for mortar materials are specified elsewhere.
2. **Proprietary bedding mortar for paving:** 30mm Steintec tuffbed 2-pack Type B permeable bedding mortar with tuffbond priming mortar.
Refer to Q25/415.
3. **Proprietary jointing mortar for paving:** Steintec tufftop 40N non-permeable jointing mortar Q25/485.
4. **Colour :** Colour to match precast step and seating units. Contractor to provide samples for approval.
5. **Manufacturer:** Steintec or equal & approved
Contact person: Steve Burton
Steven.Burton@tuffbau.com
Technical Director, Steintec
tuffbau limited, 1 Northwick Road, Canvey Island, Essex, SS8 0PU
Tel: 0203 598 9800
Mob: 07748 652 206
www.tuffbau.com

Cement gauged mortars - Not Used

Lime:sand mortars - Not Used

Ω End of Section

Z22 Sealants

To be read with preliminaries/general conditions.

61 Suitability of joints

1. Presealing checks: Contractor to refer to engineers details and specification for location of all joints requiring sealant.
 - 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.

62 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.

63 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.

Products

310 Joints

1. Description: Precast Steps
2. Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

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

E10

In situ concrete **DELETED**

E70

Finishes to precast concrete **DELETED**



Specification created using NBS Chorus

APPENDICES

APPENDIX 01- HARDWORKS & FURNITURE SUPPLIER/PRODUCT INFORMATION

APPENDIX 02 – SOFTWORKS PRODUCT INFORMATION

APPENDIX 1

HARDWORKS & FURNITURE SUPPLIER/PRODUCT INFORMATION

- Concrete block paving – PT01
 - Permeable concrete block paving - PT07
- Pre-cast concrete tactile corduroy paving - PT11
- Pre-cast concrete tactile blister paving – PT10
 - Pre-cast concrete slab – PT15
 - Pre-cast concrete kerb type 01 – KT01
 - Pre-cast concrete kerb type 01 – KT06
 - Amenity bark mulch – PT13
 - Self binding gravel – PT06
 - Resin bound gravel – PT12
- Asphalt surfacing with resin coated chippings – PT03
 - Stainless steel hazard warning strips – PT14
 - Proprietary metalwork edge to PT12
 - Gabion wall – WT01
 - Timber bench - ST01(reference image)
- Large seating rock – ST05 (reference image)
 - Recycle bin – BN
 - Cycle stand – CS01
 - PAS 68 Fixed bollard – BL01
 - PAS 68 Removable bollard – BL03
 - Security fence system – FE01
 - Timber post & rail fence – FE02
 - Timber post & wire fence – FE03
 - Single leaf timber swing gate -G03
- Gabion seat with timber cladding- ST04
 - Timber decking- PT04
 - Cycle stand – CS02
 - Cycle shelter- CST
 - Cycle stand for disabled – CS03
- Car park demarcation studs – CDS
 - Door guard - DG01
 - Door guard - DG02
 - Door guard - DG01-A


SCAN HERE

Braemar

Premium concrete paving with the aesthetic appeal of natural granite.

Manufactured from carefully selected premium aggregates, Braemar is diamond ground to produce two distinct finishes in a block paving size range in a choice of granite colours.

- Cost-effective alternative to natural stone
- Premium block paving
- Manufactured with natural granite aggregates
- Superb hard-wearing granite surface
- Vibrant long-lasting colours
- Creates a striking, contemporary look
- Readily available with much shorter lead times than natural stone

 **PrimeTop®**
 **Ef-Stop®**

GT Ground Textured	G Ground	 Pedestrian Use	 Light Traffic	 Commercial Traffic	 BIM Level 2
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Finish

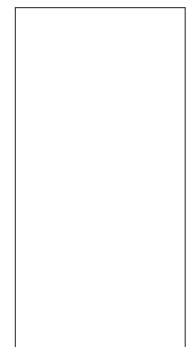
Refer to relevant guidance in BS 7533



200 x 100mm



300 x 200mm



600 x 300mm

Sizes


80mm

Depths


Braemar



Specification

 **PrimeTop®**  **Ef-Stop®**

Product type	Concrete Paving Block	
Manufactured to	BS EN 1338:2003	300x200x80mm 200X100X80mm
	BS EN 1339:2003	600X300X80mm
Surface Layer	Hard-wearing surface layer with a minimum of 4mm and >390kgs/m ³ cement	
Surface Finish	Ground/Ground Textured	
Granite Content in Surface Layer (Not less than %)	Arran Stone	83.3%
	Alto Silver	63.3%
	Innis Black	53.3%
	Jura Grey	51.3%
	Islay Rose	54.6%
Chamfer	Square Edged	
Efflorescence	Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence	
Slip/Skid Resistance	Mean polished skid resistance value (PSRV) >45	
	Mean unpolished skid resistance value (USRV) >45	
Installed to	(Externally)	BS 7533-3:2005 200X100X80mm 300X200X80mm
	(Internally)	BS 7533-4:2006 600X300X80mm
		Details available on request
Tensile Splitting Strength	BS EN 1338:2003	Typical tensile splitting strength of >3.6MPa,
	BS EN 1339:2003	Typical tensile splitting strength of >5MPa (Class 3)
NS	Plus Q24 110	200X100X80mm
	Create 45-20 64/400	300X200X80mm
	Plus Q24 110	600X300X80mm
	Create 45-20 64/395	
Tolerances on Dimensions (mm)	Length ±2mm, width ±2mm, thickness ±3mm	
Abrasion Resistance (mm)	≤ 23mm (Wide Wheel Abrasion Test) Class 3	
Durability (Freeze-thaw)	≤ 1.0 kg/m ² as a mean with no individual value > 1.5 kg/m ² Class 3	
External Fire Performance	Deemed to satisfy when used for roofing	
Reaction to Fire	Class A1	
Applications	Refer to the relevant part of BS 7533 for the correct sub-base design and the most suitable product size for your application. Available from www.bsigroup.com	
Energy used	100% renewable energy	
Water used	100% from our rainwater harvesting system and groundwater bore hole	
Recycled content	Not less than 10%	200X100X80mm 300X200X80mm
	Not less than 6%	600X300X80mm
 Carbon Footprint	EPD Verified (2020) 50.74kgCo ₂ e/m ² (+7%, - 0.6% depending on specific product)	
Recyclable	100% of this product can be recycled	
Manufacturing & Delivery	From one location within the UK	
 Breeam rating www.bre.co.uk	B , according to the Green Guide to Specification, 4 th Edition 2009. A , can be achieved when used in conjunction with a prepared recycled sub-base.	

Tobermore products are manufactured in accordance with an accredited ISO 9001:2015 Quality Management. Manufacturing facilities are accredited to ISO14001:2015 Environmental Management. The company publish environmental labels and declarations in accordance with BES 6001.

Contact Us

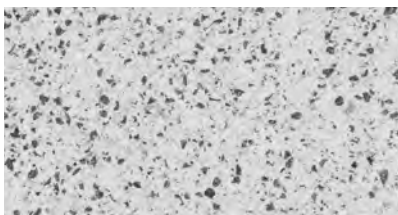
GB: 0844 800 5736
NI: 028 7964 2411
ROI: 048 7964 2411

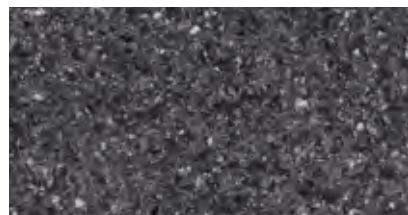
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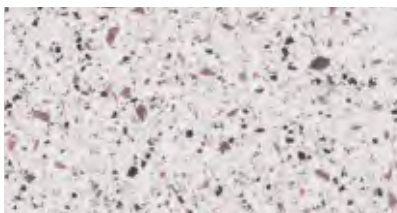
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Braemar


Alto Silver[†]

Jura Grey[†]

Innis Black[†]

Arran Stone[†]

Islay Rose[†]


Stock

product	size (mm)	edge	colours available	in stock	m ² per pack	m ² per slice	no. per m ²	no. per pack	weight kg per pack GB	weight kg per pack NI/ROI
Braemar Ground & Ground Textured 80mm BIM	200 x 100 x 80	Square edge	Arran Stone, Alto Silver, Jura Grey, Innis Black, Islay Rose	YES	9.6	1.6	50	480	1756	1746
	300 x 200 x 80	Square edge	Arran Stone, Alto Silver, Jura Grey, Innis Black, Islay Rose	YES	9.6	2.4	16.66	160	1756	1746
	600 x 300 x 80	Square edge	Arran Stone, Alto Silver, Jura Grey, Innis Black, Islay Rose	YES	7.2	3.6	5.55	40	1319	1309

BIM - This product is available to download from our website in BIM Level 2 format.

IMPORTANT INFORMATION

A regular maintenance programme should always be established and active for all public spaces to reduce the risk of slip/skid. Tobermore's stunning ground and ground textured finishes are created using a modern diamond grinding process which achieves a premium finish.

Ground textured provides a higher level of slip resistance. Tobermore recommend that you separate product groups using contrasting bands of colour as each product is manufactured separately and may have slight variations in colour.

Inevitably on light coloured units any contamination caused by vehicle tyres, leaves, beverages / food etc will be more visible compared to darker coloured units. Therefore careful consideration should be applied when specifying colours in specific applications. If light coloured units are specified it must be accepted that these will require more maintenance if the overall appearance is to be maintained.

† Product Information - Manufactured with natural granite aggregates

Contact Us

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ROI: 048 7964 2411

Email

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sales@tobermore.co.uk

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Hydropave Fusion



SCAN HERE

Permeable paving with natural granite aggregates.

Hydropave Fusion is a popular permeable block paving product, manufactured with a natural granite appearance creating a striking, contemporary look.

- Functions as a SuDS paving system
- Granite appearance
- Manufactured with natural granite aggregates
- Superb hard-wearing granite surface
- Vibrant long-lasting colours
- Creates a striking, contemporary look



200 x 100mm

Sizes



80mm

Depths

 **PrimeTop®**

 **Ef-Stop®**

TGA

Textured
Granite Aggregate

Finish



Pedestrian
Use



Light
Traffic



Commercial
Traffic

Refer to relevant guidance in BS 7533



Hydropave Fusion



Specification

 **PrimeTop®**  **Ef-Stop®**

Product type	Concrete Paving Block
Manufactured to	BS EN 1338:2003
Surface Layer	Hard-wearing surface layer with a minimum of 4mm and >350kgs/m ³ cement
Surface Finish	Textured Granite Aggregate
Granite Content in Surface Layer (Not less than %)	53% Silver, Graphite, Mid Grey 45% Oat
Efflorescence	Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence
Drainage Void Width	5.5% to accommodate correct grit grading, reduce maintenance and maximise drainage flow rate
Tensile Splitting Strength	Typical tensile splitting strength of >3.6MPa
Slip/Skid Resistance	Mean polished skid resistance value (PSRV) >45 Mean unpolished skid resistance value (USRV) >45
Installed to	BS 7533-3:2005
NS	Plus Q24 115 Create 45-20-64/400 Plus Q24 117 Create 45-20-64/400 Plus Q24 119 Create 45-20-64/400
Tolerances on Dimensions (mm)	Length ±2mm, width ±2mm, thickness ±3mm
Abrasion Resistance	≤ 23mm (Wide Wheel Abrasion Test) Class 3
Durability (Freeze-thaw)	≤ 1.0 kg/m ² as a mean with no individual value > 1.5 kg/m ² Class 3
External Fire Performance	Deemed to satisfy when used for roofing
Reaction to fire	Class A1
Applications	Refer to the relevant part of BS 7533 for the correct sub-base design and the most suitable product size for your application. Available from www.bsigroup.com
Energy used	100% renewable energy
Water used	100% from our rainwater harvesting system and groundwater bore hole
Recycled content	Not less than 6%
 Carbon Footprint	EPD Verified (2020) 24.36kgCO ₂ e/m ²
Recyclable	100% of this product can be recycled
Manufacturing & Delivery	From one location within the UK
 Breeam rating www.bre.co.uk	B , according to the Green Guide to Specification, 4 th Edition 2009. A , can be achieved by using a recycled sub-base.

Tobermore products are manufactured in accordance with an accredited ISO 9001:2015 Quality Management. Manufacturing facilities are accredited to ISO14001:2015 Environmental Management. The company publish environmental labels and declarations in accordance with BES 6001.

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Hydropave Fusion



Stock

product	size (mm)	colours available	in stock	m ² per pack	m ² per slice	no. per m ²	no. per pack	weight kg per pack GB	weight kg per pack NI/ROI
Hydropave Fusion	200 x 100 x 80	Graphite, Mid Grey, Oat, Silver	YES	9.6	1.6	50	480	1739	1729

Silver



Mid Grey



Graphite



Oat



Contact Us

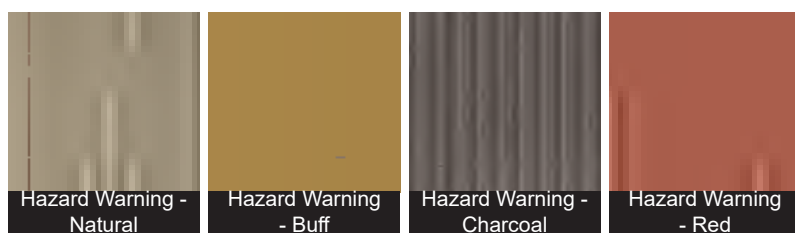
GB: 0844 800 5736
NI: 028 7964 2411
ROI: 048 7964 2411

Email

technical@tobermore.co.uk
sales@tobermore.co.uk

tobermore.co.uk

Tactile Hazard Warning 400 x 400 x 50



Designed to warn users of potential hazards in the immediate vicinity and to proceed with caution, Hazard Warning Tactile Flag Paving features a raised striped pattern which runs across its surface. Also referred to as Corduroy paving, this product should be used in accordance with The Disabled Persons Act 1981 and DDA 2004. Hazard Warning Tactile Flag Paving is for use at the top and bottom of steps, level crossings and intersections of shared cycle/pedestrian routes. It should be installed at 90 degrees and 400mm from any potential hazards. This product is available in a range of colour options - Red, Buff, Natural and Charcoal. Buff and Natural are also available as textured paving. Two different plan sizes feature in the range, 400 x 400mm and 450 x 450mm.

DESCRIPTION	
Appearance	Solid unit with profiled surface
Manufacturing Process	Hydraulically pressed concrete
Base Raw Material	Concrete
Governing Manufacturing Standards	All data where relevant manufactured, but not in compliance, to BS EN 1339 : 2003, as the tactility of paving is excluded from the Scope
NBS Specification	Q25 320

Tactile Hazard Warning 400 x 400 x 50

PHYSICAL PROPERTIES

Work Dimensions (mm)	398 x 398 x 50
Nominal Dimensions (mm)	400 x 400 x 50
Tolerances on Work Dimensions (mm)	Length ± 2 mm, width ± 2 mm, thickness ± 3 mm
Abrasion Resistance (mm)	≤ 23 mm (Wide Wheel Abrasion Test)
Durability (Freeze-thaw)	≤ 1.0 kg/m ² as a mean with no individual value > 1.5 kg/m ²
Material Density	2300 kg/m ³ (typically)
Slip/Skid Resistance (polished)	Mean polished skid resistance value (PSRV) : > 45
Slip/Skid Resistance (unpolished)	Mean unpolished skid resistance value (USRV) : > 45
Thermal Conductivity (K value)	Design data as defined to BS EN 13369 : 2013
Bending Strength MPa	Characteristic bending strength of 4.0 MPa with no individual result less than 3.2 MPa

SPECIFICATION

Approx unit weight (kg)	19
Emission of Asbestos	No content
External Fire Performance	Deemed to satisfy. See commission decision 2000/553/ECU
Reaction to fire	Class A1, see commission decision 2000/605/EC

SUSTAINABILITY

Breem	These units can achieve an "A" rated system when used in conjunction with the correct sub-base components
Carbon Footprint	13 kg CO ₂ m ²

APPLICATION

Loading Classification	Category 1 - Pedestrian and domestic driveways
Loading Classification Note	The loading classification details above are specific to this product and plan size. For additional guidance on bond patterns and sub-base designs, please contact Technical Advisory Services Department on 0370 411 2233.

SITE WORKS

Coverage	6.25 no per m ²
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SUPPLY

Av. Pack Size m2	5.8
Units Per Pack	36
Av. pack weight (kg)	684

FURTHER INFORMATION

Cleaning & Maintenance	Available on request
Efflorescence	Any product containing cement during its early life may exhibit a temporary white discolouration known as efflorescence. This is not a product fault and will gradually disappear with exposure to natural weathering and trafficking
Weathering	It should be appreciated that with all products weathering and site conditions can cause shade variation to appear across the surface of individual units. This does not in any way affect the performance of the units and any such variation will diminish over a period of time as the product matures.
Product Evolution	The evolution of new product design is continuous and information is subject to change without notice. Customers should check with the supplier to ensure that they have the latest details. Marshalls reserve the right to amend the technical information as deemed necessary and in accordance with the relevant national and international standards without notice
Contact Us	For technical information on the design, specification and construction when utilising the product, contact Group Technical Services on 0370 411 2233



Tactile Blister 400 x 400 x 50



Created to aid visually impaired and blind people as they navigate towns and cities on foot, Marshall's Blister Tactile Flag Paving makes it easier to identify where drop kerbs and appropriate road-crossing places are located.

The raised blister paving can be felt underfoot, while those with less severe sight loss can also use the product's colour coding to access extra information about their surroundings.

Red Blister Tactile Slabs & Flag Paving is laid at controlled crossing points, while the same product in buff is found at uncontrolled crossing points. Alternatively, natural and charcoal units are permitted in some types of conservation areas.

DESCRIPTION	
Appearance	Solid unit with profiled surface
Manufacturing Process	Hydraulically pressed concrete
Base Raw Material	Concrete
Governing Manufacturing Standards	All data where relevant manufactured, but not in compliance, to BS EN 1339 : 2003, as the tactility of paving is excluded from the Scope
NBS Specification	Q25 31,Q25 320

Tactile Blister 400 x 400 x 50

PHYSICAL PROPERTIES

Work Dimensions (mm)	398 x 398 x 50
Nominal Dimensions (mm)	400 x 400 x 50
Tolerances on Work Dimensions (mm)	Length ± 2 mm, width ± 2 mm, thickness ± 3 mm
Abrasion Resistance (mm)	≤ 23 mm (Wide Wheel Abrasion Test)
Durability (Freeze-thaw)	≤ 1.0 kg/m ² as a mean with no individual value > 1.5 kg/m ²
Material Density	2300 kg/m ³ (typically)
Slip/Skid Resistance (polished)	Mean polished skid resistance value (PSRV) : > 45
Slip/Skid Resistance (unpolished)	Mean unpolished skid resistance value (USRV) : > 45
Thermal Conductivity (K value)	Design data as defined to BS EN 13369 : 2013
Bending Strength MPa	Characteristic bending strength of 4.0 MPa with no individual result less than 3.2 MPa

SPECIFICATION

Approx unit weight (kg)	19
Emission of Asbestos	No content
External Fire Performance	Deemed to satisfy. See commission decision 2000/553/ECU
Reaction to fire	Class A1, see commission decision 2000/605/EC

SUSTAINABILITY

Breem	These units can achieve an "A" rated system when used in conjunction with the correct sub-base components
Carbon Footprint	13 kg CO ₂ m ²

APPLICATION

Loading Classification	Category 1 - Pedestrian and domestic driveways
------------------------	--

SITE WORKS

Coverage	6.25 no per m ²
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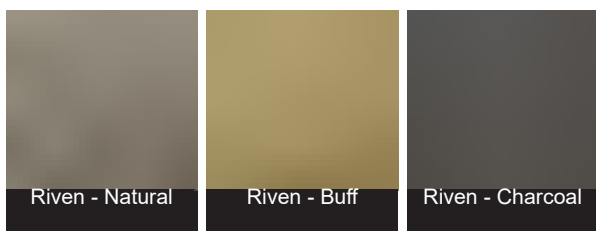
SUPPLY

Av. Pack Size m2	5.8
Units Per Pack	36
Av. pack weight (kg)	684

FURTHER INFORMATION

Cleaning & Maintenance	Available on request
Efflorescence	Any product containing cement during its early life may exhibit a temporary white discolouration known as efflorescence. This is not a product fault and will gradually disappear with exposure to natural weathering and trafficking
Weathering	It should be appreciated that with all products weathering and site conditions can cause shade variation to appear across the surface of individual units. This does not in any way affect the performance of the units and any such variation will diminish over a period of time as the product matures.
Product Evolution	The evolution of new product design is continuous and information is subject to change without notice. Customers should check with the supplier to ensure that they have the latest details. Marshalls reserve the right to amend the technical information as deemed necessary and in accordance with the relevant national and international standards without notice
Contact Us	For technical information on the design, specification and construction when utilising the product, contact Group Technical Services on 0370 411 2233

Urbex Riven 600 x 600 x 50



Urbex paving provides a cost effective utility paving solution that's suitable for commercial pedestrianised areas and housebuilder pathways and patios. Available in three modular plan sizes and a choice of thicknesses, providing a paving solution that's suitable for multiple spaces.

Urbex is now available in two finishes and is a great alternative to Standard Pimple Paving. It's a particularly smart practical choice for residential areas - or for any project where spending is restricted. Available in three colour options, Buff, Natural and Charcoal Marshall's Urbex Paving means you don't have to compromise on appearance to achieve a great price - and vice versa.

DESCRIPTION	
Appearance	Solid unit with riven profile
Manufacturing Process	Hydraulically pressed concrete
Base Raw Material	Concrete
Governing Manufacturing Standards	All data where relevant to be established in accordance with BS EN 1339 : 2003
UKCA Marking/DOP	www.marshalls.co.uk/declarations
NBS Specification	Q25 315



Urbex Riven 600 x 600 x 50

PHYSICAL PROPERTIES

Work Dimensions (mm)	598 x 598 x 50
Nominal Dimensions (mm)	600 x 600 x 50
Tolerances on Work Dimensions (mm)	Class 2 tolerances to all dimensions as standard, Length $\pm 2\text{mm}$, width $\pm 2\text{mm}$, thickness $\pm 3\text{mm}$
Abrasion Resistance (mm)	$\leq 23\text{mm}$ (Wide Wheel Abrasion Test)
Durability (Freeze-thaw)	$\leq 1.0 \text{ kg/m}^2$ as a mean with no individual value $> 1.5 \text{ kg/m}^2$
Material Density	2300 kg/m^3 (typically)
Slip/Skid Resistance (polished)	Mean polished skid resistance value (PSRV) : > 45
Slip/Skid Resistance (unpolished)	Mean unpolished skid resistance value (USRV) : > 45
Thermal Conductivity (K value)	Design data as defined in BS EN 13369 : 2013
Bending Strength MPa	Characteristic bending strength of 4.0 MPa with no individual result less than 3.2 MPa

SPECIFICATION

Approx unit weight (kg)	42
Emission of Asbestos	No content
External Fire Performance	Deemed to satisfy. See commission decision 2000/553/ECU
Reaction to fire	Class A1, see commission decision 2000/605/EC

SUSTAINABILITY

Breeam	These units can achieve an "A" rated system when used in conjunction with the correct sub-base components
Carbon Footprint	$13 \text{ kg CO}_2 \text{ m}^2$

APPLICATION

Loading Classification	Category 6 - 10 large goods vehicles per week (0.15 msa)
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SITE WORKS

Coverage	3 no per m^2
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SUPPLY

Av. Pack Size m^2	7.2
Units Per Pack	20
Av. pack weight (kg)	842

FURTHER INFORMATION

Cleaning & Maintenance	Available on request
Efflorescence	Any product containing cement during its early life may exhibit a temporary white discolouration known as efflorescence. This is not a product fault and will gradually disappear with exposure to natural weathering and trafficking
Weathering	It should be appreciated that with all products weathering and site conditions can cause shade variation to appear across the surface of individual units. This does not in any way affect the performance of the units and any such variation will diminish over a period of time as the product matures.
Product Evolution	The evolution of new product design is continuous and information is subject to change without notice. Customers should check with the supplier to ensure that they have the latest details. Marshalls reserve the right to amend the technical information as deemed necessary and in accordance with the relevant national and international standards without notice
Contact Us	For technical information on the design, specification and construction when utilising the product, contact Group Technical Services on 0370 411 2233




SCAN HERE

Fusion Kerb

Contemporary granite aggregate
kerb with an attractive surface finish.

Tobermore's Fusion Kerb is a cost-effective, premium
kerb with the striking aesthetics of a granite kerb.

- Features an exposed granular surface with a hint of sparkle
- Emulates the unique appearance of traditional granite kerbs
- Perfect accompaniment to granite aggregate paving
- Designed with strength and durability in mind
- Cost effective premium kerb
- Matching ancillary kerb products available

Ef-Stop®

TGA

Textured
Granite Aggregate

Finish



Pedestrian
Use



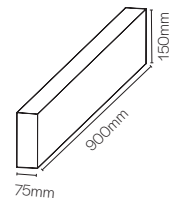
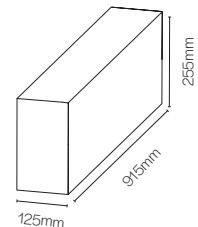
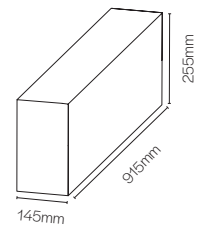
Light
Traffic



Commercial
Traffic



BIM
Level 2



Sizes



Fusion Kerb



Specification



Product type	Concrete Kerb
Manufactured to	BS EN 1340: 2003
Efflorescence	Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence
Breaking / Bending Strength: Transverse Test	Characteristic bending strength of 3.5 MPa with no individual result less than 2.8 MPa
Durability (Freeze-thaw)	$\leq 1.0 \text{ kg/m}^2$ as a mean with no individual value $> 1.5 \text{ kg/m}^2$ Class 3
Abrasion Resistance (mm)	$\leq 23\text{mm}$ (Wide Wheel Abrasion Test)
Slip/Skid resistance	Mean polished skid resistance value (PSRV) >45 , Mean unpolished skid resistance value (USRV) >45
Installed to	BS 7533-6:1999
BSI	Plus Q10 110 Create 45-20-64/370 Plus Q10 110 Create 45-20-64/365
Applications	Residential and Commercial when designed in accordance with the latest British Standard. Available from www.bsigroup.com
Energy used	100% renewable energy
Water used	100% from our rainwater harvesting system and groundwater bore hole
Recycled content	Not less than 5%
Carbon footprint	Fusion Kerb 255x125x915mm 10.86kgCo ² e/LM Fusion Kerb 255x145x915mm 12.70kgCo ² e/LM Fusion Centre Kerb 150x125x915mm 10.86kgCo ² e/LM Fusion Centre Kerb 150x145x915mm 12.74kgCo ² e/LM Fusion Edge 3.71kgCo ² e/LM Fusion End Kerb 255x125x455mm 5.43kgCo ² e/LM Fusion End Kerb 255x145x455mm 6.35kgCo ² e/LM
Recyclable	100% of this product can be recycled
Manufacturing & Delivery	From one location within the UK
breeam rating www.bre.co.uk	Refer to the Green Guide to Specification, 4th Edition 2009.

Tobermore products are manufactured in accordance with an accredited ISO 9001:2015 quality. Manufacturing facilities are accredited to ISO14001:2015 Environmental Management. The company publish environmental labels and declarations in accordance with BES 6001.

Contact Us

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tobermore.co.uk

Fusion Kerb

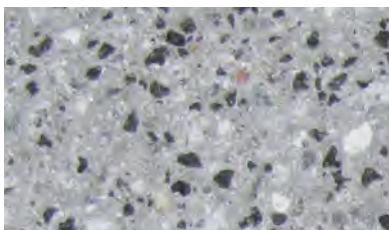


Stock

product	size (mm)	colours available	in stock	no. per pack	weight kg per pack GB	weight kg per pack NI/ROI
Fusion Kerb BIM	125 x 255 x 915	Silver	YES	16	1113	1103
	145 x 255 x 915	Silver	YES	16	1290	1280
Fusion Edge BIM	150 x 75 x 900	Silver	YES	60	1200	1200
Fusion Kerb Dropper (specify left or right hand dropper)	125 x 255/150 x 915	Silver	YES	16	842	832
	145 x 255/150 x 915	Silver	YES	16	1292	1282
Fusion Dropper Centre Kerb	125 x 150 x 915	Silver	YES	32	1354	1344
	145 x 150 x 915	Silver	YES	32	1536	1536
Fusion Corner Kerb External or Internal	125 x 255 x 915/770	Silver	YES	12	852	852
	145 x 255 x 915/790	Silver	YES	12	732	732
Fusion End Kerb	125 x 255 x 455	Silver	YES	32	1280	1280
	145 x 255 x 455	Silver	YES	32	1112	1112

BIM - This product is available to download from our website in BIM Level 2 format.

Silver



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SCAN HERE

Textured Kerb

Cost effective decorative kerb
with a shot blasted finish.

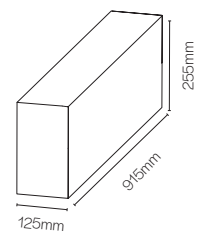
Textured Kerb offers a rustic and understated aesthetic which complements a wide variety of paving and other hard surfaces.

- Features an exposed granular surface
- Shot blasted textured finish
- A step up from standard precast concrete kerbs
- Budget friendly decorative kerb

Ef-Stop®



Finish

Pedestrian
UseLight
TrafficCommercial
TrafficBIM
Level 2

Size



Textured Kerb



Specification



Product type	Concrete Kerb
Manufactured to	BS EN 1340: 2003
Efflorescence	Minimum 12 hour vapour curing to significantly reduce the possibility of efflorescence
Breaking / Bending Strength: Transverse Test	Characteristic bending strength of 3.5 MPa with no individual result less than 2.8 MPa
Durability (Freeze-thaw)	≤ 1.0 kg/m ² as a mean with no individual value > 1.5 kg/m ² Class 3
Abrasion Resistance (mm)	≤ 23mm (Wide Wheel Abrasion Test)
Slip/Skid resistance	Mean polished skid resistance value (PSRV) >45, Mean unpolished skid resistance value (USRV) >45
Installed to	BS 7533-6:1999
BS	Plus Q10 110 Create 45-20-64/370 Plus Q10 110 Create 45-20-64/365
Applications	Residential and Commercial when designed in accordance with the latest British Standard. Available from www.bsigroup.com
Energy used	100% renewable energy
Water used	100% from our rainwater harvesting system and groundwater bore hole
Recycled content	Not less than 5%
 Carbon footprint	8.82kgCo2e /LM
Recyclable	100% of this product can be recycled
Manufacturing & Delivery	From one location within the UK
 rating www.bre.co.uk	Refer to the Green Guide to Specification, 4th Edition 2009.

Tobermore products are manufactured in accordance with an accredited ISO 9001:2015 quality. Manufacturing facilities are accredited to ISO14001:2015 Environmental Management. The company publish environmental labels and declarations in accordance with BES 6001.

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Textured Kerb



Stock

product	size (mm)	colours available	in stock	no. per pack	weight kg per pack GB	weight kg per pack NI/ROI
Textured Kerb BIM	125 x 255 x 915	Natural	YES	16	1112	1102
Textured Kerb Dropper (specify left or right hand dropper)	125 x 255/150 x 915	Natural	YES	16	842	832
Textured Dropper Kerb	125 x 150 x 915	Natural	YES	32	1354	1344
Textured Kerb Corner External or Internal Corner	125 x 255 x 915/790	Natural	YES	12	834	834
Textured Kerb End Unit	125 x 255 x 455	Natural	YES	32	1102	1102

BIM - This product is available to download from our website in BIM Level 2 format.

Natural



Contact Us

GB: 0844 800 5736
NI: 028 7964 2411
ROI: 048 7964 2411

Email

technical@tobermore.co.uk
sales@tobermore.co.uk

tobermore.co.uk



Amenity Bark Mulch™

A versatile mulch, suitable for a wide range of professional landscape applications where a larger particle size is required, including car parks, superstores and business parks.



Product Description

- Nominal particle size range 30 to 75mm
- Naturally acidic
- Easy to handle
- Dark brown in colour
- Long effective service life of 2 years plus
- Fire resistant characteristics, confirmed by testing in accordance with BS 4790:1987, make Melcourt Amenity Bark Mulch particularly useful in areas of potential fire risk, e.g. car parks, vehicle fuel filling stations, adjacent to offices and pedestrian walk ways, housing estates etc
- Processed from natural, sustainably produced mixed conifer bark
- Certified by the Forest Stewardship Council (FSC)*
- 100% peat free
- Hostile living environment for pests
- Suppresses weed growth replacing expensive shrub bed hoeing and chemical weed-killing
- Conserves soil moisture, minimising drought stress and plant death and eliminating the need for excessive plant

watering

- Successfully used for many years on sites throughout the UK and proved to perform extremely well
- Provides an insulating layer, substantially reducing the effects of ground freezing and over-heating during extreme weather conditions
- Good resistance to wind and rain erosion
- Slowly improves the soil's organic content, as it decomposes into the soil
- Easy to lay and install, using simple tools and requiring little subsequent maintenance
- Allows clean access onto mulched area for plant pruning

Available in bulk bags and in loose bulk

This product is from FSC MIX Sources at a minimum of 70%, FSC certificate number CU-COC-806457.*

* Product sold in loose bulk is FSC certified by special request only



How To Use

- Ensure the area to be mulched is entirely free from both annual and perennial weeds
- Lay Amenity Bark Mulch evenly onto freshly cultivated moist soil, after planting has been completed.
- The mulch should be laid at between 75 to 100mm depths, allowing at least 10-15% for settlement
- For greatest longevity, do not disturb once applied

Other Advice



- Use in a ventilated place and avoid breathing in dust.
- Always wear gloves when gardening and wash hands after use.
- Close bag after use to avoid drying out and to prevent contamination.
- White mould: under certain conditions a white mould may appear on the surface of some of the particles in Amenity Bark Mulch. This is entirely normal and not harmful to humans, plants or animals.
- Store in cool, dry conditions.

Specification



Main Constituent	Conifer bark
Origin	British
Nominal Particle Size	5 - 75mm
Dust and Fines content	minimal
pH	4.5 - 5.5
Bulk Density	200 - 250 g/l
Durability	2+ years

Fire tested to BS 4790

Yes

Volume Calculator

+

Please note that the calculator is for general guidance only.
We suggest allowing approximately 10% for product settlement (15% if using Softfall™).

** All values given in the Specifications table are typical. However, some variation may occur from time to time. Melcourt Industries Ltd reserves the right to alter the specification without notice, for the purpose of product improvement.*



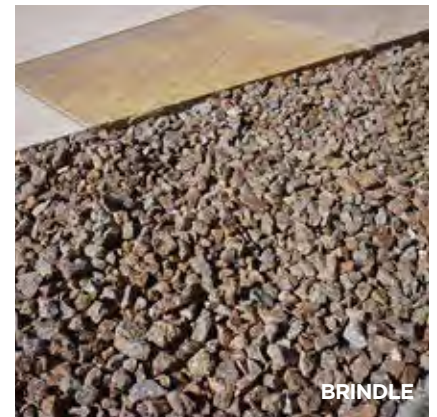


DECORATIVE AGGREGATES

www.breedon-special-aggregates.co.uk

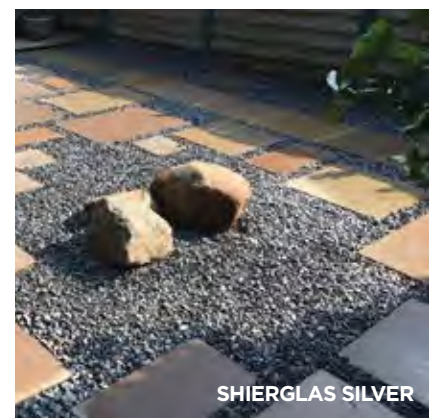
DECORATIVE LANDSCAPING AGGREGATES

ALL AGGREGATES ARE AVAILABLE IN BULK BAGS AND LOOSE.



APPLICATIONS

- Commercial and residential pathways
- Driveways
- Car parks
- Courtyards
- Architectural landscaping
- Gardening – patios and rockeries to planters and tubs



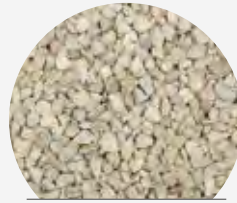
OUR RANGE



PLUM SLATE
WET



PLUM SLATE
DRY



COTSWOLD BUFF
WET



COTSWOLD BUFF
DRY



WARWICK GOLD
WET



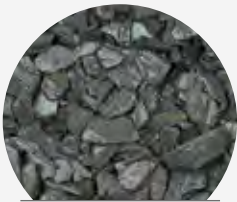
WARWICK GOLD
DRY



MOORLAND BLACK
WET



MOORLAND BLACK
DRY



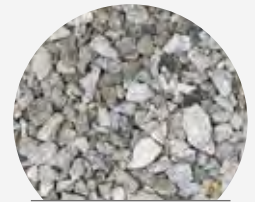
GREY SLATE
WET



GREY SLATE
DRY



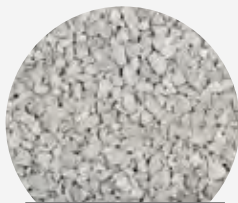
CORNISH SILVER
WET



CORNISH SILVER
DRY



DOWLOW GREY
WET



DOWLOW GREY
DRY



HIGHLAND BLEND
WET



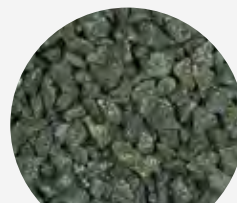
HIGHLAND BLEND
DRY



BRINDLE
WET



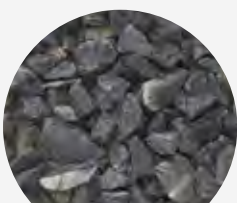
BRINDLE
DRY



CRIGGION GREEN
WET



CRIGGION GREEN
DRY



SHIERGLAS SILVER
WET



SHIERGLAS SILVER
DRY



BREEDON BUFF
WET



BREEDON BUFF
DRY

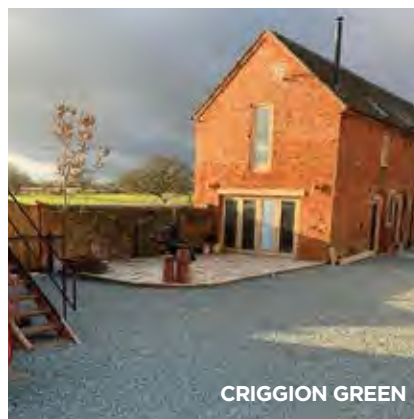
CHOOSE COLLECTION OR DELIVERY

We can deliver our aggregates nationwide, or you can come and collect – the choice is yours.

Our comprehensive fleet of vehicles and team of experienced drivers mean we are able to deliver your order at your convenience – whether loose or in bulk bags. You can also come and see our products before you buy. Our experienced teams are on hand to discuss your exact requirements and recommend the right product for you.



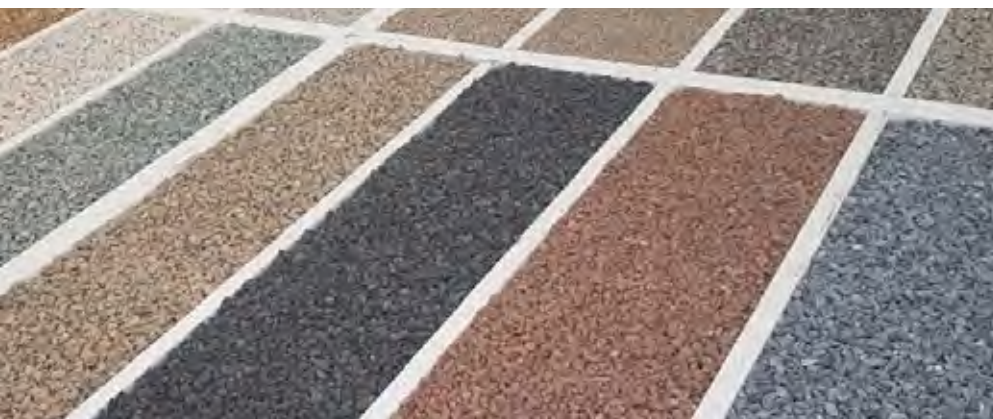
GREY SLATE



CRIGGION GREEN



DOWLOW GREY



TO DISCUSS YOUR INDIVIDUAL REQUIREMENTS PLEASE CONTACT:

TEL: 01332 694001

specialaggs@breedongroup.com

www.breedon-special-aggregates.co.uk

Breedon Special Aggregates, Breedon Quarry,
Breedon-on-the-Hill, Derby, DE73 8AP.



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addacolor®

Coloured Resin Bound Surfacing

Addacolor is our Resin Bound surfacing system adding a splash of colour to meet project needs creating logos and patterns.

Addacolor is available from the UK's leading suppliers of the first BBA accredited Resin Bound surfacing systems Addaset, Addabound and Terrabound.

Installed by our nationwide network of approved contractors.

DECORATIVE • LOW MAINTENANCE • HARD WEARING

Contact us to speak to one of our technical advisers
tel. 01825 761333 or email. sales@addagrip.co.uk
www.addagrip.co.uk

Another Quality Product From Addagrip Terraco Ltd



Experts in Resin Since 1980

addacolor®

Coloured Resin Bound Surfacing System From Addagrip Terraco Ltd



Adding colour
to create stunning
surface designs,
patterns and
logos



Experts in Resin Since 1980

addacolor®

Addacolor retains all of the benefits of our standard resin bound paving and is ideally suited to those projects that require a splash of colour both inside and out.

Addacolor is UV stable and ideal for demarcation, logos, patterns and designs as well as regular projects associated with resin bound surfacing such as footpaths, playgrounds, swimming pool surrounds, courtyards and other pedestrian schemes.

Using templates, our approved contractors can create intricate patterns and wording to any size.

If you are looking for a hard wearing, low maintenance decorative aggregate surface with the wow factor - Addacolor fits the bill.

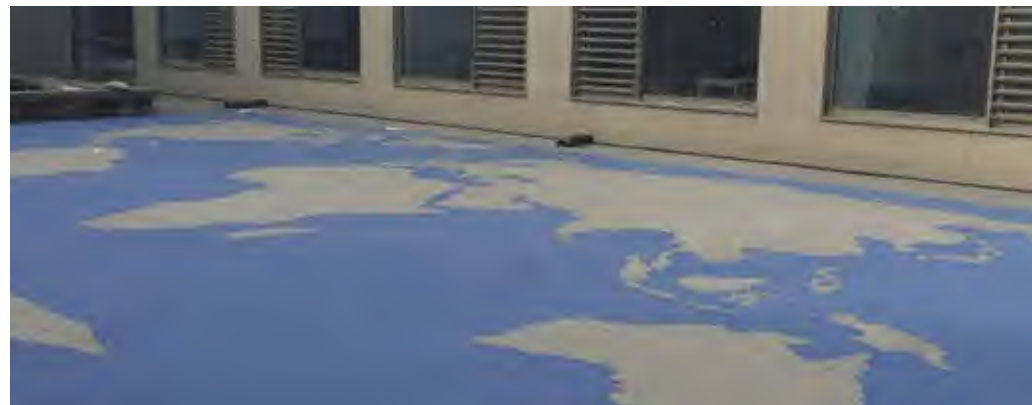
A range of 12 standard colours are available, however, special colours can be supplied on request. We can match RAL colours to create a bespoke logo or match a corporate colour scheme.

Resin Bound Surfacing With a splash of colour for pedestrian and decorative projects



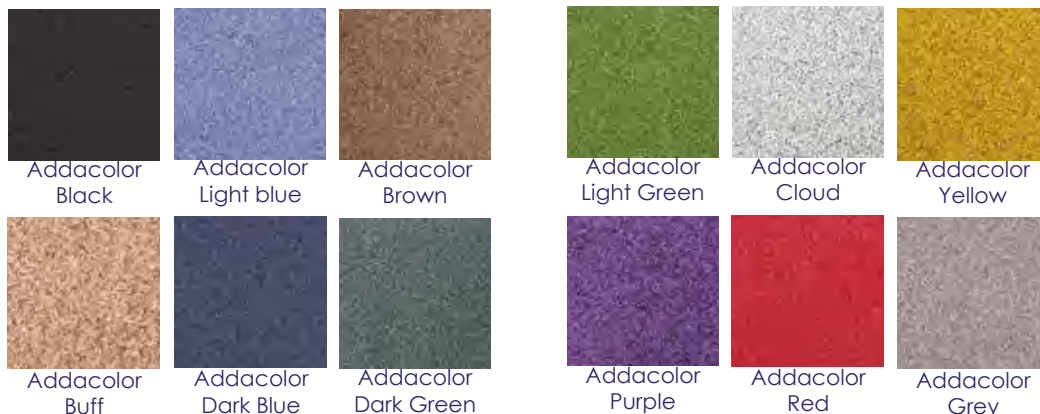
addacolor®

Resin Bound Surfacing With a splash of colour for pedestrian and decorative projects



Suitable for Pathways, Patios, Courtyards, Pool Surrounds and creating logos

- 15 years minimum lifespan
- Low maintenance
- Seamless
- Durable
- Semi-porous
- Attractive
- Anti-slip
- Wheelchair friendly





OVERVIEW

ADDACOLOR resin bound surfacing is a cold applied clear polyurethane resin screed designed to bind coloured aggregates. **ADDACOLOR** is flexible, resistant to cracking and can be supplied in a range of colours allowing imaginative designs to be incorporated within the paved surface.

PREPARATION OF SURFACE

Concrete surfaces to be treated should be clean, dry and free of laitance, oil, grease and loose friable particles which could affect adhesion. Asphalt surfaces must be clean and dry, details of suggested suitable base build ups are available on request. A suitable edging detail should be specified using either brick, stone, concrete or steel as required to provide a high quality finish detail.

HEALTH & SAFETY

Before using this product, please ensure you have been supplied and have read carefully the following:-

1. The hazard label (complying with CLP – European Regulation (EC) No. 1272/2008 on Classification, Labelling and Packaging of substances and mixtures) applied to the container.

2. Safety Data Sheet

Avoid prolonged contact with eyes and skin. For detailed information refer to relevant safety data sheet.

CLEANING OF EQUIPMENT & SKIN

Tools, brushes etc... should be cleaned immediately after use in Addagrip Solvent Mixture. For cleaning of hands/skin, use a deep cleaning soap with water. Please note if a rash appears seek medical attention.

DISPOSAL CONSIDERTIONS

Normally the Part A resin will be mixed in its own container with Part B. When this is done correctly the resultant material in the container is inert and the label must be defaced. The container and remnant may be disposed of as normal industrial waste. Any uncured material must be disposed as hazardous waste. Please consider the regional or national regulations regarding disposal.

MIXING & APPLICATION

The **ADDACOLOR** Resin Part 'A' & 'B' is delivered in pre-weighed units to which the **PU Accelerator** Part 'C' should be added (refer to **PU Accelerator** guidance table found on provided "Mix Details" sheet with each order). To prevent an area being installed without accelerator a small quantity has already been added to Part 'A' to ensure the mixed material will cure albeit at a slower rate. The mixed resin should then be thoroughly mixed with a slow speed, high torque drill and paddle for a minimum of 45 seconds.

The mixed **ADDACOLOR** resin and accelerator should then be immediately added to the pre-mixed aggregate placed in a suitable mechanical mixer. Mix for 1-2 minutes then discharge into a suitable wheelbarrow and move immediately to the point of application.

The mixed material should then be spread evenly across the surface at the required depth using a straight bladed squeegee. The surface should then be hand trowelled or using a lightly weighted finishing power tool to a smooth compacted finish as required.

To improve the slip resistance on the surface fine glass grit or white aluminium oxide should be applied at a rate of 50-80g per sqm. This will be provided with your order.

TECHNICAL DATA

Product	Polyurethane resin for resin bound surfacing
Density	1.06g/cm ³
Application Conditions	+5°C to 30°C, maximum 80% relative humidity
Surface Temperature	Must be 3°C above the dew point temperature.
Initial cure	Varies on accelerator addition
Full Chemical Cure	7 days
Skid resistance (TRL 176)	Slider 96 (Pedestrian) > 55 Slider 57 (Vehicle) > 60
Permeability/Porosity (BS EN 12697-40:2005)	3mm @ 12mm depth = 4.46-7.67 L/sec/m ²
Material Consumption/Coverage	Please refer to site mix sheets
Packaging	Supplied in pre-weighed units
Storage	Store above 7°C, not in direct sunlight, wind nor rain. 3 months in original unopened containers.

For technical enquiries please contact your nearest representative:

UK:

ADDAGRIP

Tel: +44 (0)1825 761 333

E-mail: sales@addagrip.co.uk

Web: www.addagrip.co.uk / www.terraco.com



Colourchip® Coated Chippings

Description

Colourchip® resin coated chippings are the simple way to create attractive and cost effective decorative finishes and eye catching colour demarcations in blacktop surfacing.

Colourchip® chippings comprise specially selected and graded aggregates coated in a bespoke clear resin which are fully compatible with bitumen based products.

The clear binder allows the Colourchip® to fully bond to the HRA while also allowing the natural colour of the aggregate to provide an immediate decorative finish which is maintained as the surface mellows and weathers.

Colourchip® coated chippings can be used in locations where a permanent coloured or decorative finish is required.

Typical Uses

- Pedestrian areas
- Driveways
- Footpaths
- Roadways
- Bus and cycle lanes
- Village gateways

Availability

Colourchip currently available as standard:

PC10 8-14mm Harden Red pigmented

PC8 14-20mm Harden Red pigmented

PC11 14-20mm Balmullo Pink clear coated

PC13 8-14mm Norfolk Gravel clear coated

PC14 14-20mm Norfolk Gravel clear coated

PC19 8-14mm Silver Grey Granite clear coated

PC22 14-20mm Silver Grey Granite clear coated

In addition Criggion Green and Harden Red clear coated are available to special order.

Supply

Colourchip® is usually supplied in 1 tonne or 25kg bags collected from our Wymondham or Cambridge depots or delivered on our transport. Large quantities can be manufactured and delivered by bulk tipper. Please check the lead time when ordering.

Rates of Spread

Colourchip® is supplied as a decorative, aesthetic enhancement to HRA and consequently the suggested spread rates to achieve an approximate 25% coverage are:

5kg per square meter for 14mm chippings

6.5kg per square meter for 20mm chippings

Application

Colourchip® coated chippings should be spread evenly over the surface and rolled into the hot asphalt at the time of laying. A correctly calibrated chipping machine can be used however hand chipping using a wide mouthed shovel is also an acceptable method of distribution.

Hot rolled asphalt to BSEN 13108-4 must not contain more than 40% of coarse aggregate to allow the Colourchip® to successfully bed into the surface.

Colourchip® is manufactured and supplied as a decorative enhancement to HRA and it is the specifiers responsibility to decide its suitability for any given location. The aggregate is graded and Colourchip® manufactured to a bespoke specification and has not been tested to comply with any highway specification.

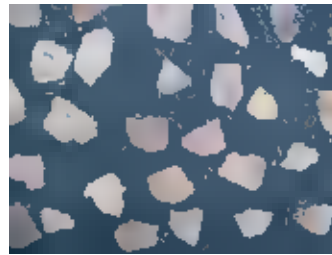
For more information or to place an order

Tel: 01953 602002

E mail: sales@ayton.co.uk

Fax: 01953 609864

www.ayton.co.uk



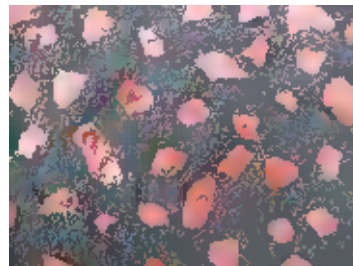
Balmullo



Norfolk Gravel



Silver Grey



Harden Red Pigmented

Ayton Products, Browick Road, Wymondham, Norfolk, NR18 0RJ

Ayton Products is a trading name of Kier Integrated Services Limited registered in England 00873179

Registered Office: Tempsford Hall, Sandy, Bedfordshire, SG19 2BD

Feb 2018



TACTILE PAVING SERVICES LIMITED

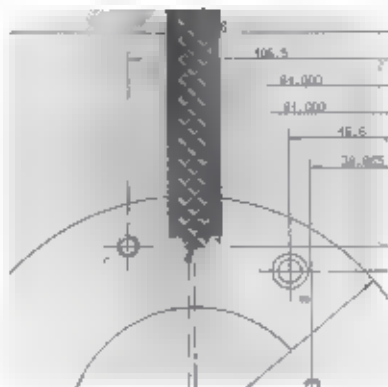


2 Hayfields Close
Keighley
West Yorkshire
BD22 6SB
01535 500902
07779 442180

Corduroy Warning Strips Data Sheet

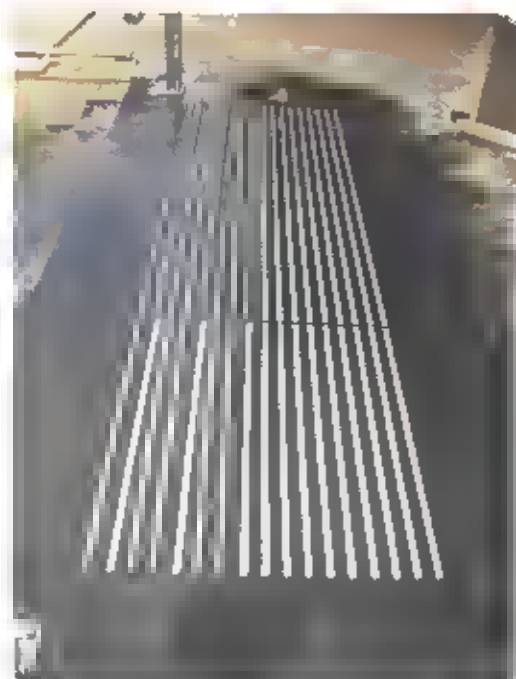
Available in : Stainless steel, Brass and Bronze
Bar size : 20 mm wide x 5.5 mm thick
Lengths available : 200 mm—1800 mm
Fixing details : blind fixed or counter sunk holes

Fitting methods : resin fixed in 12 mm drilled holes or plugged and screwed



The corduroy strips have been slip tested and pass as a low slip hazard

Maintenance : The corduroy hazard warning strips should self clean with foot traffic. Any heavy duty dirt can be removed with Warm soapy water and a stiff brush.





The new L-Shaped steel edging, Flexibility with a robust edge.

Halestem is a new product from EverEdge that has been specifically designed to offer a flexible solution for straight lines or curves where an L-shape edge is required.

Made from galvanised steel, the 6mm rolled top edge guarantees a robust product that is ideal for use with asphalt/tarmac, resin bonded surfaces, blocks, paving and driveways.

Coming in two versions, it allows buyers to select either the rigid option for straight lines or a flexible alternative to work with curved borders. Separate corner sections are also available to form 90 degree bends, ensuring a neat and unified finish.

- Quick and easy to install
- 2mm thick edging can be laid to suit any design
- Comes with 5 anchor pins per strip

Typical Usage

- Asphalt/Tarmac
- Resin Bonded Surfaces
- Blocks, Paving & Driveways



Code	Height (mm)	Rigid/Flexible	Thickness (mm)
HST50/R	50	RIGID	2
HST50/F	50	FLEXI	2
HST75/R	75	RIGID	2
HST75/F	75	FLEXI	2
HST100/R	100	RIGID	2
HST100/F	100	FLEXI	2
HST150/R	150	RIGID	2
HST150/F	150	FLEXI	2

Technical Data	
Current Size Range	50-150mm
Steel thickness	2.0mm high tensile galvanised steel
Length	2.5 metres
Steel specification	BSEN 10346-2015 DX51 D+Z
Tensile Strength	270 to 500 N/mm ²
Roll-top	6 x 10mm
Types	Flexi and rigid
Anchor Pins	5 x 2.5 metres, 7 x 200mm spiralled



ENVIROMESH[®]

a design guide for building
Gabion Retaining Walls

BS EN 1997-1:2004
BS 8002:2015



ENVIROMESH
DESIGN GUIDE SERIES
VOLUME 1

MARCH 2019





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other guides available

VOLUME 2

a design guide for building
Cladding & Freestanding Walls

VOLUME 3

a design guide for
River & Erosion Protection



AVAILABLE TO DOWNLOAD ONLINE

www.enviro-mesh.com



1.1 Gabion retaining walls

Gabions have long become an established method of construction for retaining structures worldwide, providing economical and environmentally acceptable solutions.

These structures are generally designed as mass gravity walls with either stepped or flush faces depending upon the requirements of the engineer and the stability calculations.

This design guide has been prepared to assist competent structural and civil engineers and architects in the best practice of designing gabion retaining walls. Enviromesh offers all clients a desktop design and feasibility service using dedicated, in-house software. Our technical expertise is aimed at supporting those clients who require design engineering advice and equally importantly, guidance on how best to meet budgetary requirements for their projects.



Enviromesh designed, supplied and installed the above stepped-face gabion retaining wall at the Beacon Barracks MoD site in Stafford. For more information on this Case Study, please visit our website: enviro-mesh.com

1.2 Conditions, copyright, limitations

Conditions relating to this design guide

This design guide has been prepared by Cerana Limited trading as Enviromesh.

Copyright

The information, specifications and other supporting documentation included herein are the copyright of Enviromesh. No unauthorised copying or distribution of this document is permitted without the prior written permission of Enviromesh.

Limitations

Whilst every care has been undertaken in the preparation of this guide which is based on BS EN 1997-1:2004 and BS 8002:2015, it is the user's responsibility to satisfy themselves that the information is correct.

Please get in touch for technical engineering support, product information and supply, and gabion installation services.

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1.3 What are gabions?

The term 'gabion' refers to a modular containment system that enables rock, stone and nondegradable inert materials to be used as a construction material.

The modules, units or 'cages' as they are known, are formed from wire mesh fabric panels, jointed to form square, rectangular or trapezoidal shaped units. These units are part pre-assembled in the factory to form a flat-pack system.

These flat-pack units are supplied to the customer and formed into the final shaped module on site with the necessary lacing wire, helicals and / or 'C' rings as required. Each module has to be connected to adjacent modules to form a monolithic structure.

The types of mesh used, must be of a non ravelling type such as welded wire mesh or hexagonal woven wire mesh and provided with corrosion protection to suit the required exposure conditions.

The gabions are normally machine-filled in layers with the contractor picking the stone over by hand to reduce excessive voids. The exposed faces can be hand-packed to provide an appearance of a dry stone wall.

Although some structures are only machine-filled, this procedure is not normally recommended as it may give rise to a high void content which can result in deformation. For gabion structures to perform correctly, the quality of installation is of paramount importance.

The term 'gabion' refers to a modular containment system that enables rock, stone and nondegradable inert materials to be used as a construction material.

Below left, an example of mixed gabion fill used to create a monolithic structure with visual impact - visit us online to read the full case study.

Below right, hexagonal woven mesh can be used as an alternative to bi-axial welded mesh in certain situations i.e. gabion mesh mattresses and slope protection netting.

Right, shows one of four stepped-faced gabion retaining walls installed at the Jaguar Land Rover (JLR) site near Kenilworth. The four granite-filled, Galvan coated welded mesh 'wing-walls' were completed in 2017 as part of a wider scheme to support a service tunnel running underneath JLR's overpass and vehicle test-track.



1.4 Bi-axial welded mesh gabions

Bi-axial welded mesh gabions are manufactured from a square mesh, normally of opening size 75.0mm × 75.0mm where the longitudinal wires are welded to the cross wires at their intersection points.

This type of fabric manufacture, produces a dimensionally stable mesh. The mesh is produced in standard sheets which are then cut into the required panel sizes (and partially factory-connected) to form the flat pack unit.

This is done by clipping the face, rear, side and diaphragms (partitioning panels) to the base panel so that they can rotate and be folded flat.

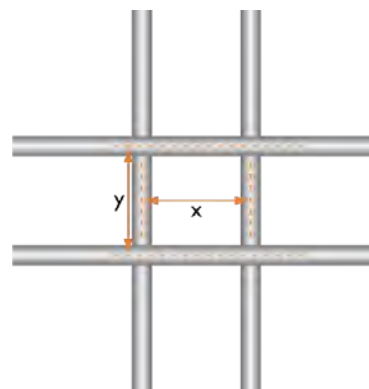
The lid may be clipped to the front or back panel or left loose dependant upon the unit size. Units can be manufactured in any multiple of the mesh size, but are normally supplied as standard sizes to the industry.

Welded mesh gabions are available in a number of wire diameters to suit the application or can be manufactured in a combination of mesh-wire specifications to provide economy in supply.

Welded mesh gabions can be readily modified on site by cutting the mesh back to the next transverse mesh wire. Welded mesh gabions are available in a number of wire diameters to suit the application or can be manufactured in a combination of mesh-wire specifications to provide economy in supply. The resultant gabions' flexibility is dependant upon the choice of wire diameter.

Where two types of stone fill are required, additional loose panels can be supplied and fitted on site to separate the two types of fill materials.

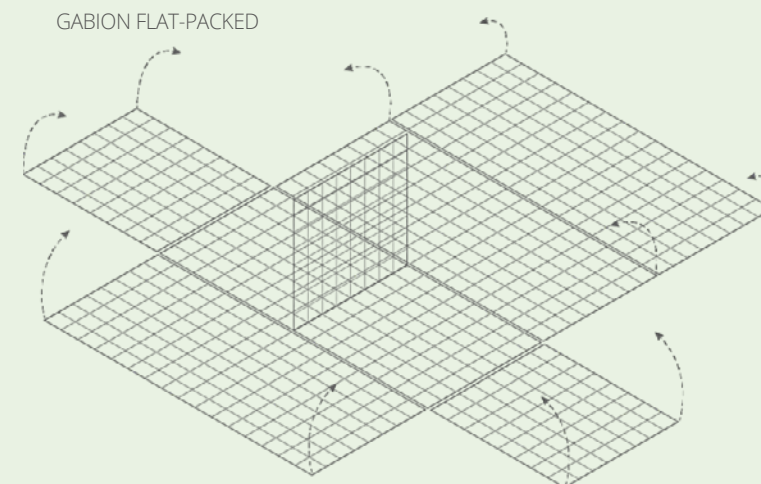
The mesh can be specified as either Galvan coated or Galvan coated with an external organic polymer powder (PVC) coating, as required by design.



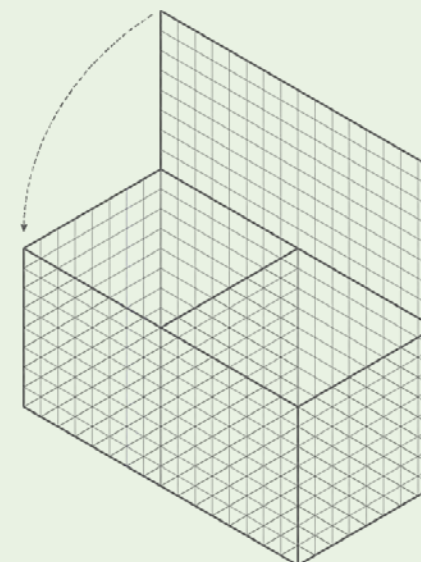
Bi-axial welded mesh

Nominal dimensions (x) and (y)

Gabions: 75mm and Mattresses: 75mm



GABION FORMED INTO A 'BASKET' ON SITE



For more information, please refer to Section 3, Gabion specifications and detailing (see pages 23-47).

1.5 Hexagonal woven mesh gabions

Hexagonal woven mesh gabions are manufactured from a mesh that has a hexagonal opening which is formed by twisting pairs of wire together with one and a half turns (sometimes referred to as triple or double twist).

This type of mesh production is continuous. To form panels, the mesh is guillotined across the weave and the cut ends of the wire are wrapped around a heavier wire to form a selvedge end.

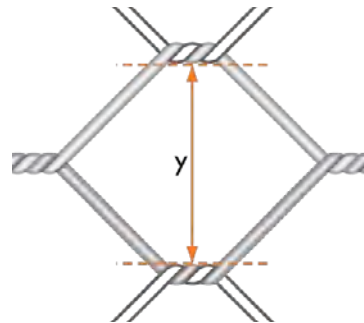
The unit is factory fabricated from one main panel which forms the front, base, rear and lid of the unit with additional panels connected to the base section of the main panel to form the diaphragm and end panels.

Normally, dependant upon the manufacturer, the mesh orientation is either with the weave horizontally or with the weave vertically, on the vertical panels. The connection of the ends and diaphragm to the base is via a spiral wire or pairs of twisted wires, twisted together around the base mesh.

This type of mesh is flexible as it can articulate about the twists. It is normally manufactured from a 2.7mm wire diameter for gabions or 2.0mm wire diameter for mattresses. Wire coatings are either galvanised or Galfan coated. For more aggressive environments, an additional organic polymer powder (PVC) coating should be applied to a Galfan coated base wire.

The dimension between the twists is a nominal 80mm for gabions and 60mm for mattresses.

Hexagonal woven mesh is flexible as it can articulate about the twists. Wire coatings are either galvanised or Galfan coated, or Galfan coated with an additional PVC coating.

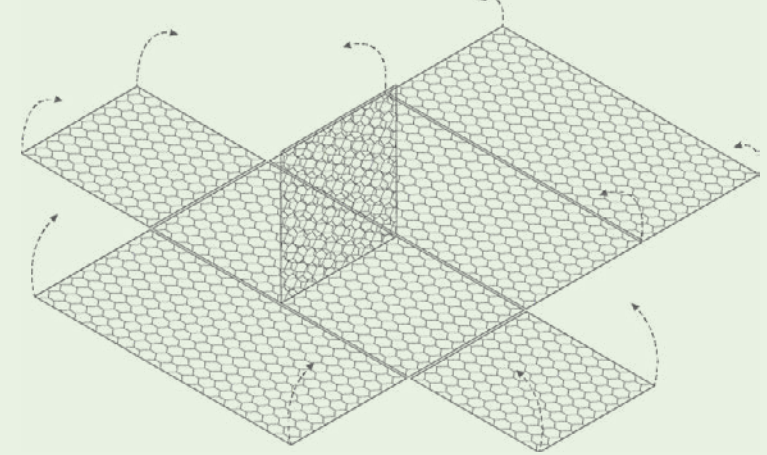


Hexagonal double-twist woven mesh

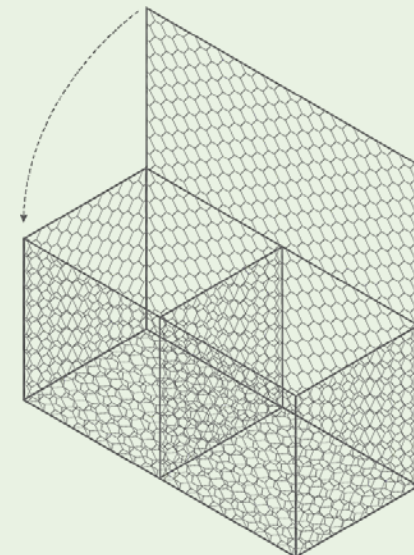
Nominal dimension (y)

Gabions: 80mm and Mattresses: 60mm

GABION FLAT-PACKED



GABION FORMED INTO A 'BASKET' ON SITE



For more information, please refer to Section 3, Gabion specifications and detailing (see pages 23-47).

1.6 Gabion filling materials: selection

The design of a gabion retaining wall is based on the mass of the contained stone or rock being able to resist the disturbing forces due to soil and external loadings. The design does not consider the gabion mesh as contributing to the stability of the structure. The design code applicable to gabions is BS EN 1997-1:2004 and BS 8002:2015.

In the design of the retaining structure, the principles are the same for both woven and welded mesh gabions. Where walls are subject to possible settlement, woven mesh gabions have more flexibility and therefore may be better suited to these situations. Where a high quality of visual appearance is needed, welded mesh gabions are better choice, providing the selection of mesh wire combinations is correct.

selecting the correct filling materials

The selection of rock or stone fill is very important, as the performance of a gabion structure is dependant upon its mass. Although the mass is the criteria for design, other factors to be considered are:

Grading of fill

Gabion fill is normally a graded fill of between 100 to 200mm in diameter with a nominal 6% of the stone being smaller or larger.

The grading can be tightened from 80mm to 150mm providing the control of the grading is good. Stones smaller than the mesh will not be contained by it.

The grading is important to ensure that voids within the gabions are minimised, otherwise settlements can occur.

Angularity of fill

The more angular the fill, the better the interlock, which in turn means there is less deformation of the face.



The selection of rock or stone fill is very important because the performance of gabion structures is dependant upon their mass. Ideally, all gabions should be fair faced (hand-packed on the exposed faces).

Stone types

Quarried stone which is normally angular, is the preferable fill as the interlock is very good.

Crushed concrete although angular, tends to become rounded. It does have greater interlock than rounded stones, therefore 4mm wire diameter in Galfan coated or 3.8mm wire diameter for PVC welded wire mesh should be specified.

Rounded stone has a smoother face and therefore lower interlock potential, which can result in increased deformation of the unit's face. A heavier mesh wire should be used to overcome this. Welded mesh gabions are manufactured from 3, 4, or 5mm wire diameters for Galfan coated gabions and 2.7mm or 3.8mm wire core diameters for PVC coated gabions. For rounded stone fills, welded wire mesh gabions should be

specified in 4mm or 5mm wire diameters for Galfan coated or 3.8mm wire diameter for PVC coated units.

Blocky stone or flat stone when machined-filled can result in large voids, which may result in settlements. Care should be taken when machine filling to minimise large voids.

Ideally, all gabions should be fair faced (hand packed on the exposed faces). Where the cost of quarried rock fill is high, the gabions can be filled with two types of fill: a quarried rock or block stone for the exposed face with a cheaper stone fill behind. To assist in the placement of different types of filling materials at the construction stage, an additional cell can be incorporated either during manufacture or additional panels supplied loose for fitting on site (normally set back 300mm from the face of the unit).

1.7 Gabion filling materials: swatches



COTSWOLD STONE



COBBLES



CARBONIFEROUS LIMESTONE



LEICESTERSHIRE GRANITE



GRITSTONE



KENT RAGSTONE



HARD SANDSTONE



PORTLAND STONE



RECYCLED BRICK AND CONCRETE



IRONSTONE



MENDIP LIMESTONE



SLATE

Disclaimer. Visual representations of the gabion stone in the swatches above are included as a guide only and as such are not guaranteed to be accurate. Enviromesh recommends all clients obtain stone samples prior to procurement to ensure the grade, type and colour meet the requirements for each installation. Stone is a natural occurring mineral and therefore colour variations may be evident in the finished structure.



ENVIROMESH[®]

design supply installation



For more information or to discuss your next project

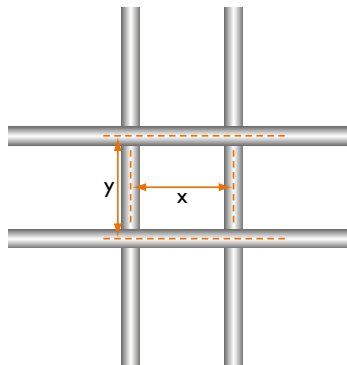
Telephone +44 (0)1782 692 310
Email enquiries@enviro-mesh.com
Fax +44 (0)1782 692 318
Post Unit 4 Cartwright Industrial Estate, Spring Garden Road, Longton, Staffordshire, ST3 2TE, United Kingdom

enviro-mesh.com



Gabion Design Specification : Bi-Axial Welded Mesh

GABION ENV555



SPECIFIED MESH BI-AXIAL WELDED

Nominal dimensions (x) and (y) : Gabions, 75mm Mattresses, 75mm

Gabions are to be manufactured and / or supplied by:

Enviromesh, Unit 4 Cartwright Industrial Estate, Spring Garden Road, Longton, Staffordshire, ST3 2TE.

Telephone +44 (0)1782 692310 Fax +44 (0)1782 692318 Email: enquiries@enviro-mesh.com Online: www.enviro-mesh.com

The certification, materials, manufacture, assembly and installation of the above-mentioned product shall comply with all of the following criteria:

Certification

1. All gabion products are manufactured in accordance with the requirements of BS EN 10223-8:2013 where the gabions are considered to have a life expectancy **of greater than 50 years** in a 'low aggressive C2 environment' (ref. EN ISO 9223:2012 Table 1).
2. Evidence of relevant certificates of conformity with respect to wire strength, weld strength and coating weights used in the manufacture of the mesh fabric and wire products are to be issued upon request.

Materials

The wire used in the manufacture of the gabions and installation accessories shall comply with the following:

Mesh Fabric

The mesh fabric shall be formed by electrically welding at each and every intersection, hard drawn steel line and cross wires into a dimensionally stable bi-axial square metric mesh of size **75mm x 75mm**.



The weld strength shall be **75%** of the minimum ultimate tensile strength of the wire.

The nominal wire diameter for the mesh fabric shall be **5.00mm** for the base, front, rear, ends, diaphragm panels and lid, all within the tolerances specified in BS EN 10218-2:2012 and shall have a tensile strength that falls within a range of **540-770 N/mm²**.

Tensile strengths of less than **540 N/mm²** may result in increased deformation of the filled units and a reduction in weld strength shall not be permitted.

Lacing Wire

The lacing wire used for site assembly shall be of a nominal **2.2mm** wire diameter in accordance with BS EN 10218-2:2012 and shall have a tensile strength that falls within a range of **350 to 550 N/mm²**.

Helical Binders *(where specified, not supplied as standard)*

Full height helical binders for the vertical joints for gabion installation and assembly shall be of a nominal **3.00mm** wire diameter in accordance with BS EN 10218-2:2012 and shall have a minimum tensile strength of **350 N/mm²**.

Preformed Corner Bracing Ties *(where specified, not supplied as standard)*

Preformed corner bracing ties are to be formed from a nominal **3.00mm** wire diameter in accordance with BS EN 10218-2:2012 and shall have a minimum tensile strength of **350 N/mm²**.

Corrosion Resistance

All wire used in the mesh fabric or accessories shall be Galvan coated (95% Zinc / 5% Al) in accordance with BS EN 10244-2: 2009 (Class A).

Manufacture

Unit Formation

The gabion is to be formed from mesh panels such that the front, rear, ends and diaphragm panels are connected to the base panel with either **Stainless Steel CL35 clips** or **Galvan coated CL50 'C' rings** at a maximum spacing of **225mm** for all joints. This process must be undertaken in a factory-controlled environment. The lid may be supplied loose or fixed in the same manner to the rear or face panel. Diaphragm (partitioning panels) spacings should not exceed 1.050m on units orientated as stretchers and 1.65m orientated as headers.

Should units be required to be pre-filled and lifted as opposed to filling in situ, additional clips, rings and mesh panels may be required. In such circumstances the manufacturer must be consulted prior to supply to ensure product is suitable for application.

Gabion Sizes

It should be noted that it is industry standard for gabions to be quoted as overall nominal sizes. The actual gabion sizing is dependant upon the physical mesh configuration.

Clarification should always be sought from the manufacturer in relation to gabion sizing.

Designation of sizes **length x width x height**

Gabion standard unit lengths: 975mm or 2025mm

Gabion standard unit widths: 450mm, 675mm, 975mm, 1350mm, 1500mm or 1650mm

Gabion standard unit heights: 300mm, 450mm or 675mm

Non-standard sizes available in multiples of 75mm on request.

Assembly and Installation

Note Please also refer to manufacturer's installation instructions, which are available upon request in either electronic or hard copy format.

Jointing

Gabions are supplied with lacing wire as standard for horizontal jointing and vertical jointing of adjacent units whilst empty. Lacing is to be continuous along all joints using alternate single and double loops at a maximum spacing of 100mm ensuring that it forms a tight joint. Start or termination of lacing is formed by three turns ensuring the free end is turned into the unit. .

Where helical binders are requested for use on verticals joints, the top and bottom helical turn should be rotated through 90 degrees to prevent movement. All horizontal joints are to be laced as described above unless specially requested.

If CL50 'C' rings are to be used for final jointing as an alternative to lacing then these must be installed at every other mesh opening to achieve the required joint strength.

Internal Bracing

Internal bracing is formed by creating a continuous windlass tie between the face and rear of the exposed cells within the structure.

For 1m high units, two internal windlass bracings are required at third widths and at each third height of the gabion.

In all cases the windlass tie is to span two or three mesh openings on the front and rear cells to spread the load. The exposed end gabions to the wall should also be braced in both directions to prevent end face deformation.

Geotextile Separators

Where a geotextile separator between the rear of the gabion and backfill is to be used, refer to the engineer's design proposal and specification.

Foundations

Reference to the engineer's design proposal must be made with respect to foundation requirements, wall inclination, face configuration (stepped, flush or combination thereof), drainage and backfilling requirements. Any soft areas in the sub-grade should be excavated and replaced with a granular material to the engineer's requirements.

Filling

Units are to be filled with a hard, durable, non-frost susceptible rock, stone or clean crushed concrete as specified by design. The grading of the fill is to be 100 to 150mm or 100 to 200mm (6G). Where dual fills of the same grading are specified a separation panel is optional. Where the secondary fill grading is less than the mesh aperture size, it is necessary for the fills to be separated using pre-cut correx panels or geotextile that is inserted into the gabion on site. If this is the case then this will require the fitting of an additional longitudinal diaphragm set back from the face. In such instances it is important to refer to the engineer's design proposal with respect to additional drainage that may be required. It is also important to note that cohesive fills are not to be used as a secondary fill within gabions.

The units shall be filled in layers not exceeding 340mm, if large voids are present then the stone must be re-orientated to minimise voids. Where specified the gabions are to have a hand placed front face.

The units shall be filled such that the mesh lid bears down onto the gabion filling material. It may be beneficial to blind the top of the filled unit with a 20 to 50mm aggregate.

Filling should be staged so that no adjacent cells have more than a half difference in the level of filling for units of greater height than 500mm.

To assist in maintaining face alignment and reduce deformation, the use of external formwork i.e. timber or scaffold tubes can be tied onto the external face of the structure at third heights and then removed upon completion.



















Ascot Litter Bin

The Ascot is a smart, practical litter solution. Manufactured from 3CR12 stainless steel then powder coated and clad in hard wearing timbers as standard, but also available with powder coated steel doors or charred timber option for a sleek, stylish finish. The standard unit has a capacity of 110 litres complete with galvanised steel liner. The Ascot Triple Litter Bin has a 50L capacity for each individual bin.

Standard Dimensions:

Single Bin: L: 650mm x D: 400mm x H: 1110mm x Capacity: 110L

Triple Bin: L: 1050mm x D: 300mm x H: 890mm Capacity: 50L x 3

Customisable options include:

- Ashtray
- Lettering or Custom Decals
- Powder Coating in any RAL colour
- Timber or steel door
- Galvanised Steel Liner

Advantages of this design include:

- Tri-key lock to ensure security
- Modern and stylish design
- Modular with single, double or triple unit
- Decals and lettering for separation of waste type
- Surface mounted for a clean and easy finish

Litter Bin is ideal for:

- Retail Parks & Shopping Centres
- Universities
- Student Accommodation
- Corporate spaces

L: 650mm x D: 400mm x H: 1110mm x Capacity: 110L

Materials, Finishes & Options

Litter Bin Body

Available in the options below
for further details on visit our [materiality page](#) >>>

Standard

Premium



3CR12
Powder Coated

Custom Colours available

Door Cladding

Available in the options below
for further details speak to our sales team >>>

Standard

Premium



Timber

Charred
Timber

Powder
Coated Steel

Fixtures

This product can be customised with a range of optional fixtures. If you have any further bespoke requirements get in touch, our sales team will be happy to help



Ashtray



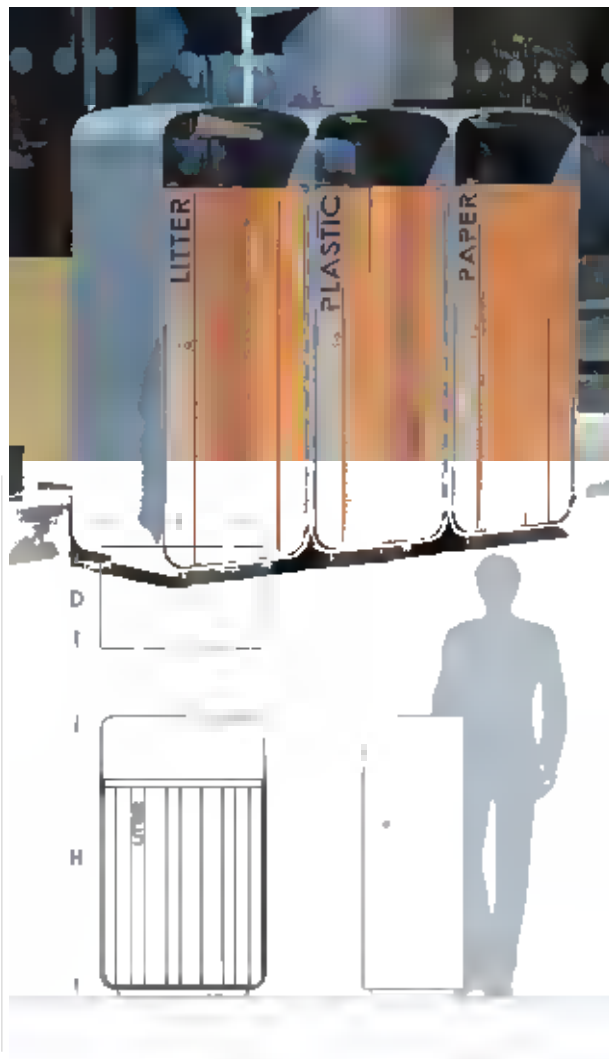
Lettering



Custom
decals



Surface Mount
/ Foot Fixed



Cycle Parking Specification Sheet

Sheffield Cycle Stand BXMW/GS/Sheffield-Stand



Standard Unit Dimensions:

Width: 715mm
Height: 800mm
Diameter: 48.3mm

Recommended spacing between cycle stands:

800mm

Colours/Finishes:

Galvanised Only	White Aluminium	Anthracite Grey
BS 4800 10 A 07 Nimbus Grey	Traffic Red	Jet Black
BS 4800 14 C 39 Holly Green	Traffic Yellow	Goose Grey
Mid Blue	Dark Blue	Traffic White

The colours shown are a guide only.
Please check a colour chart to see the actual colour.

Product Information

The Sheffield Cycle Stand is recommended by the national cycling associations, this best selling tubular cycle stand allows the bike to be secured in a variety of ways. Simple and easy to install this cycle stand is available in a variety of different sizes, fixings and finishings. Thus allowing this best selling cycle stand to complement any external environment, and pre-existing street furniture suite.

Features

- Hot dipped galvanised to BS EN ISO 1461
- Recommended by the national cycling associations
- Available in a variety of different sizes, fixings and finishings
- Complements any external environment
- Available root fixed or baseplated

Materials Used

- Mild Steel

Finish Options

- Galvanised to BS EN ISO 1461
- Galvanised to BS EN ISO 1461 & Polyester Powder Coated

Broxap Limited, Rowhurst Industrial Estate, Chesterton, Newcastle-under-Lyme, Staffordshire, ST5 6BD T: 01782 564411 E: info@broxap.com W: www.broxap.com



Sheffield Cycle Stand BXMW/GS/Sheffield-Stand

Guarantees, Warranties, Design-Life and Life-Expectancies

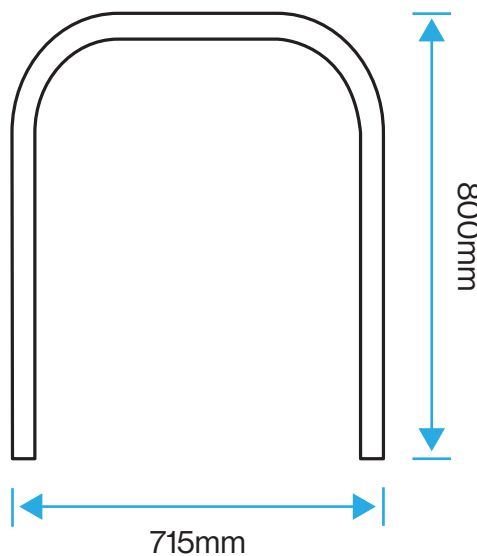
- 34 year (min) life expectancy for Hot Dip Galvanizing
- 8-10 year life expectancy on standard powder coatings
- 10-15 year life expectancy on Duplex (Zinc Coated) powder coatings
- 12 months' warranty* on parts & labour

*Maintenance and other qualifying criteria apply

Options

- Stands also available in junior size - See Sheffield Junior Cycle Stand for details
- Polyester powder coating to RAL and BS colours
- Available in a range of different sizes, fixings and finishings
- Available in other materials: Grade 304 stainless steel or duracast™ polyurethane

Diagram



Standard Unit Dimensions:

Width: 715mm
Height: 800mm
Diameter: 48.3mm

Recommended spacing between cycle stands:

800mm

Colours/Finishes:

		
Galvanised Only	White Aluminium	Anthracite Grey
		
BS 4800 10 A 07 Nimbus Grey	Traffic Red	Jet Black
		
BS 4800 14 C 39 Holly Green	Traffic Yellow	Goose Grey
		
Mid Blue	Dark Blue	Traffic White

The colours shown are a guide only.
Please check a colour chart to see the actual colour.

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275/K12FB 900F-1200F



ANTI-TERRORISM FIXED BOLLARDS WITH BASEMENT

The fixed 275/K12FB bollards have been designed and built with architectural appearance similar to that of the retractable bollard and therefore also allows the combined use of both versions.

Current models are the result of our 40 years' experience in the security field and in excess of 20 years in the specific design and manufacture of bollards.

GENERAL FEATURES

The fixed antiterrorism bollards are used to separate and prevent vehicles from breaching the perimeter of the following areas: Research Centres Embassies, Police Headquarters, Military Bases, Ministerial Buildings Sites in Sensitive Areas. These items are designed to ensure antiterrorism defence, and must be cemented into the ground at a depth that meets the standards of breakout resistance.

CERTIFIED

PAS68:2013 V/7500(N3)/80/90:0.0/20.0
IWA 14-1:2013 V/7200(N3C)/80/90:0.3
ASTM F2656/2656M 18a C750 - P1



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REVIEW 10/01/2022

275/K12FB 900F-1200F



AVAILABLE ITEMS

BOLLARD 275/K12FB FEV - NORMAL STEEL PAINTED

BOLLARD 275/K12FB IXV - STAINLESS STEEL PAINTED

BOLLARD 275/K12FB IXS - STAINLESS STEEL BRUSHED

KNURLING ON FIXED CYLINDER

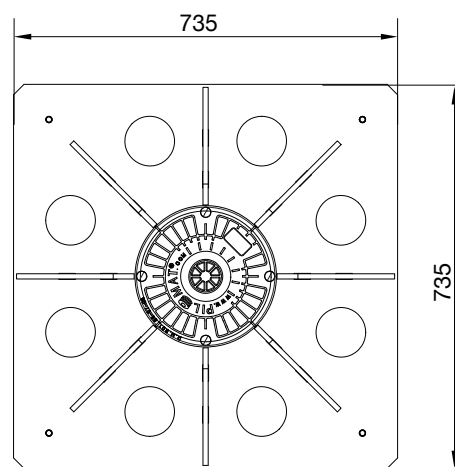
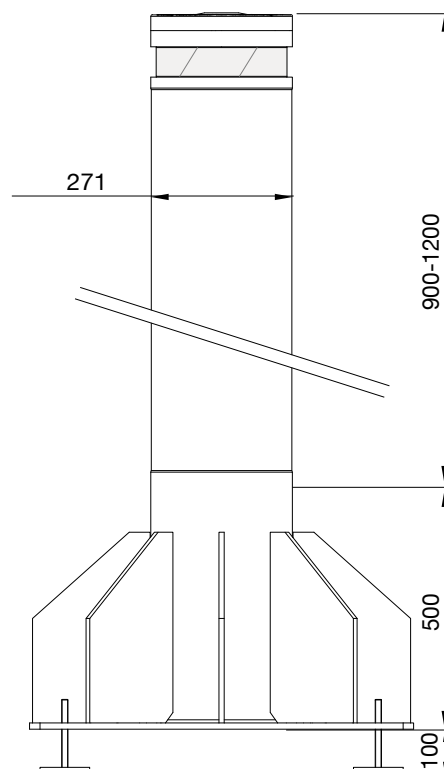
HEAD WITHOUT LOGO FOR 275/K12FB

REFLECTING ADHESIVE STRIP - WHITE (NO-LOGO)

MULTILED LIGHTING STRIP - 25 LED POINTS

LIGHTING STRIP POWER CIRCUIT FOR FIXED BOLLARDS (MAX. 8 BOLLARDS)

PAINTING WITH RAL COLOUR ON REQUEST



PAG.2/3

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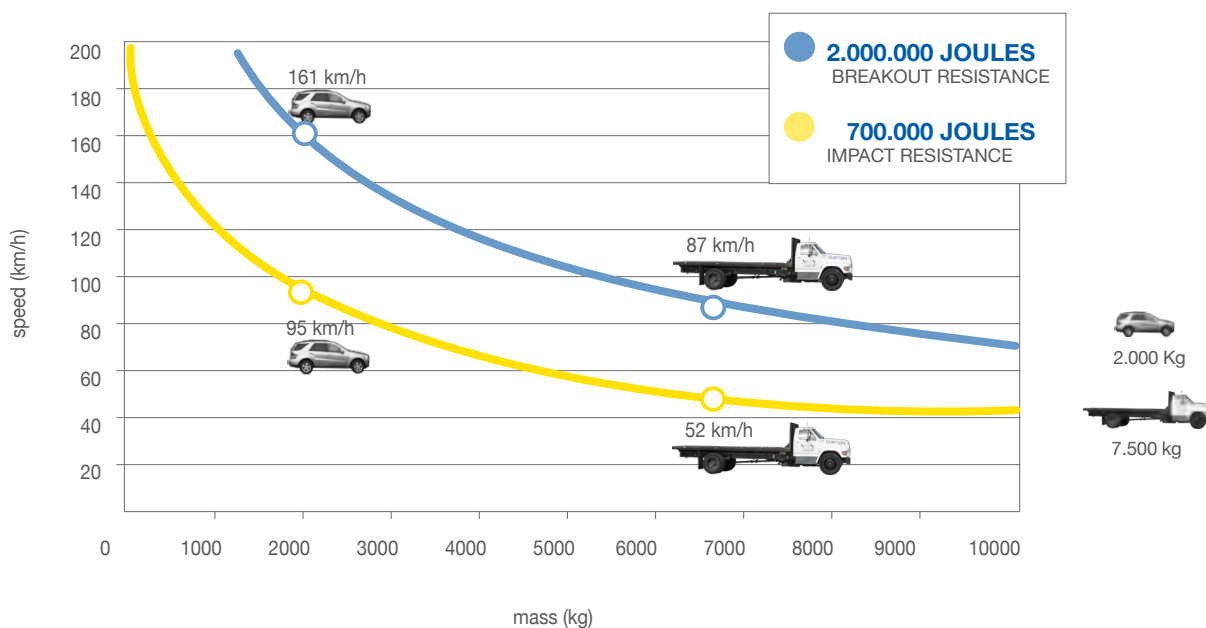
REVIEW 10/01/2022

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Picture shown is for illustration purpose only.

275/K12FB 900F-1200F



	275/K12FB-900F	275/M50FB-1200F
CYLINDER MATERIAL	S355JR NORMAL STEEL - X5CrNi 18-10 (AISI 304) STAINLESS STEEL - X5CrNiMo 17-12-2 (AISI 316) STAINLESS STEEL	
CYLINDER DIAMETER	271mm	
CYLINDER HEIGHT	900mm	1200mm
CYLINDER THICKNESS	23mm	
CYLINDER NORMAL STEEL FINISH	ANTI-CORROSION TREATMENT - GREY ANTHRACITE STANDARD PAINTING	
CYLINDER STAINLESS STEEL FINISH	GREY ANTHRACITE STANDARD PAINTING OR BRUSHED	
OTHER CYLINDER FINISH	KNURLING ON CYLINDER'S SURFACE	
REFLECTING ADHESIVE STRIP	STANDARD - HEIGHT 55mm	
CONNECTION LINE FOR LIGHTING STRIP (OPTIONAL)	STANDARD 10m (MAX. LENGTH 80m)	
PROTECTION CLASS	IP67	
IMPACT RESISTANCE (WITHOUT DEFORMATION)	700.000 J	
BREAKOUT RESISTANCE	2.000.000 J	
ANTI-CORROSION TREATMENT "M"	OPTIONAL ORDER IN CASE OF INSTALLATION AT LESS THAN 2KM FROM THE SEA ORDER IN CASE OF INSTALLATION WHERE SALT IS USED ON THE ROAD TO AVOID ICE FOR A PERIOD UP TO 3 MONTHS	



PAG.3/3

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REVIEW 10/01/2022

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275/K12RM 900-1200



REMOVABLE ANTITERRORISM BOLLARDS

The removable 275/K12RM bollards are typically used to prevent the parking , transit and access of unauthorised vehicles in sensible sites.

It is advised that the removable bollard is used only if the amount of daily movements is limited (if not, the automatic version should be used) or when the depth of installation does not allow for the installation of the automatic bollards.



275/K12RM 900-1200



AVAILABLE ITEMS

BOLLARD 275/K12RM FEV – NORMAL STEEL PAINTED equipped with standard EU lock with 3 keys

BOLLARD 275/K12RM IXV – STAINLESS STEEL (AISI 304) PAINTED equipped with standard EU lock with 3 keys

BOLLARD 275/K12RM IXS – STAINLESS STEEL (AISI 304) BRUSHED equipped with standard EU lock with 3 keys

NORMAL STEEL PAINTED BASEMENT TO BE FIXED INTO THE GROUND

CYLINDER IN AISI 316 STAINLESS STEEL

SQUARE CROWN DEVICE FOR BASEMENT (MOUNTING SET)

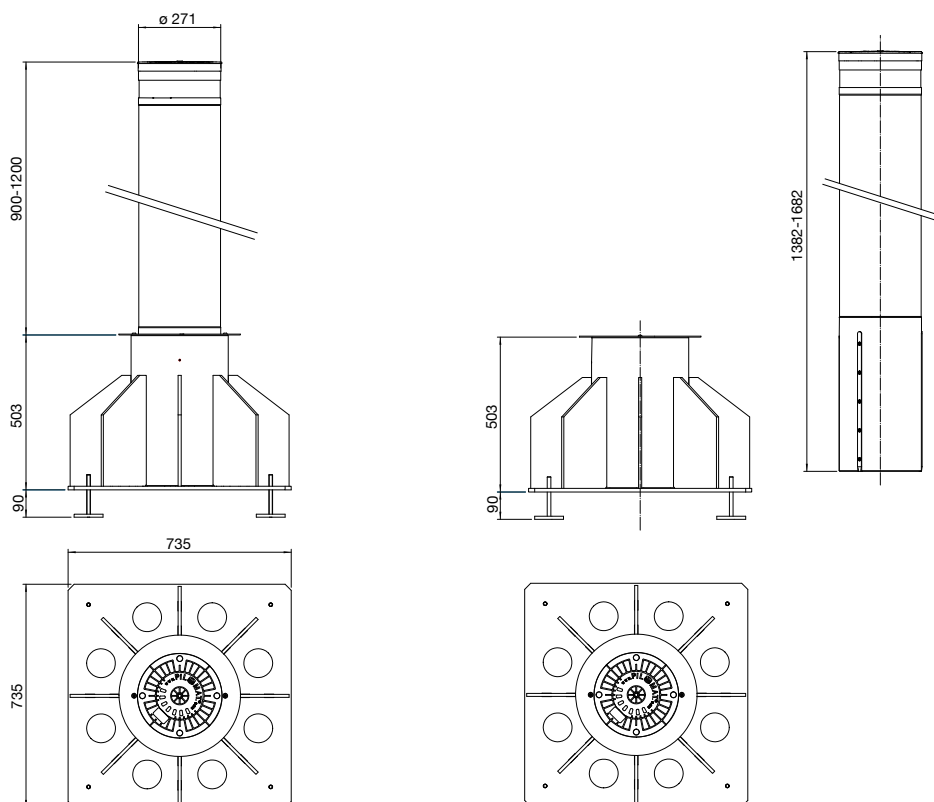
The squared perimeter crown has the same dimension of the automatic version

CYLINDER PAINTING IN ANY RAL COLOR

ADDITIONAL COST FOR EU PROFILE LOCK WITH IDENTICAL KEYS

ADDITIONAL KEY FOR EU LOCK

ADDITIONAL HEAD FOR 275/K12RM BOLLARD



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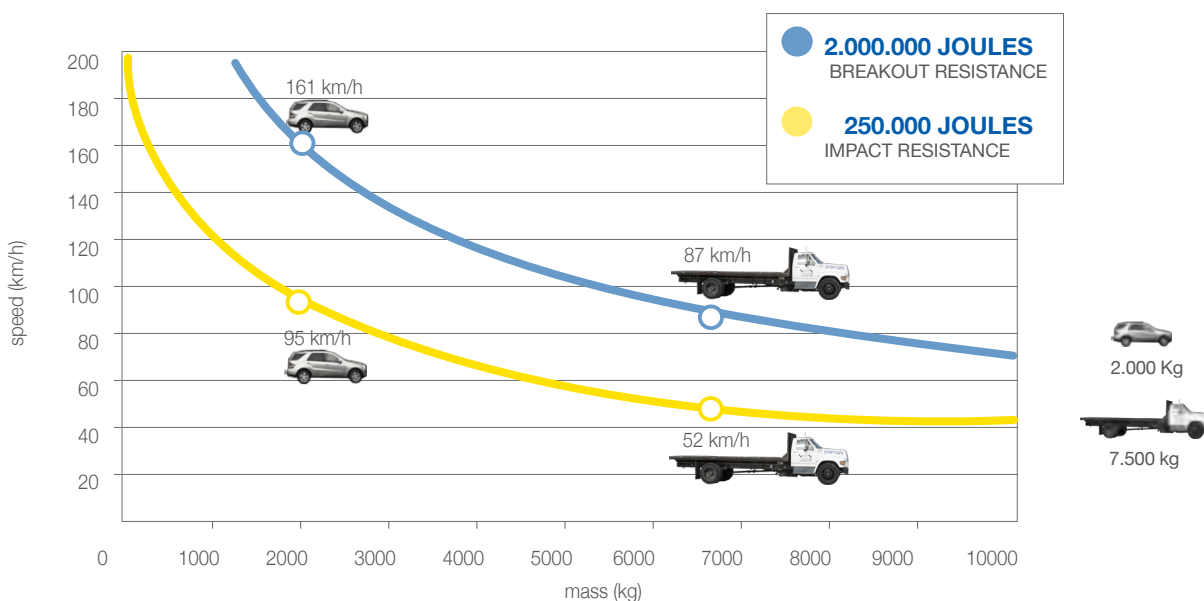
REVIEW 04/08/2021

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Picture shown is for illustration purpose only.

275/K12RM 900-1200



	275/K12RM 900	275/K12RM 1200
CYLINDER MATERIAL	S235JR NORMAL STEEL - X5CrNi 18-10 (AISI 304) STAINLESS STEEL - X5CrNiMo 17-12-2 (AISI 316) STAINLESS STEEL	
CYLINDER DIAMETER	271mm	
CYLINDER HEIGHT	900mm	1200mm
CYLINDER THICKNESS	23mm	
CYLINDER NORMAL STEEL FINISH	ANTI-CORROSION TREATMENT - GREY ANTHRACITE STANDARD PAINTING	
CYLINDER STAINLESS STEEL FINISH	GREY ANTHRACITE STANDARD PAINTING OR BRUSHING	
REFLECTING ADHESIVE STRIP	STANDARD - HEIGHT 55mm	
IMPACT RESISTANCE (WITHOUT DEFORMATION)	250.000 J	
BREAKOUT RESISTANCE	2.000.000 J	
SECURITY LOCK	STANDARD - EUROPEAN PROFILE HALF CYLINDER ACCORDING TO DIN 18252 3 KEYS INCLUDED	
CYLINDER WEIGHT (WITHOUT BASEMENT)	199 Kg	243 Kg
BASEMENT WEIGHT	184 Kg	
PERIMETRAL CROW (CIRCULAR)	INCLUDED IN THE SUPPLY	
ANTI-CORROSION TREATMENT "M"	OPTIONAL TO BE ORDERED IN CASE OF INSTALLATIONS THAT ARE LESS THAN 2 KM FROM THE SEA TO BE ORDERED IN CASE OF INSTALLATIONS WHERE SALT IS USED ON THE ROAD TO AVOID ICE FOR A PERIOD UP TO 3 MONTHS	



PAG.3/3

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REVIEW 04/08/2021

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CLD Securus Lite S1

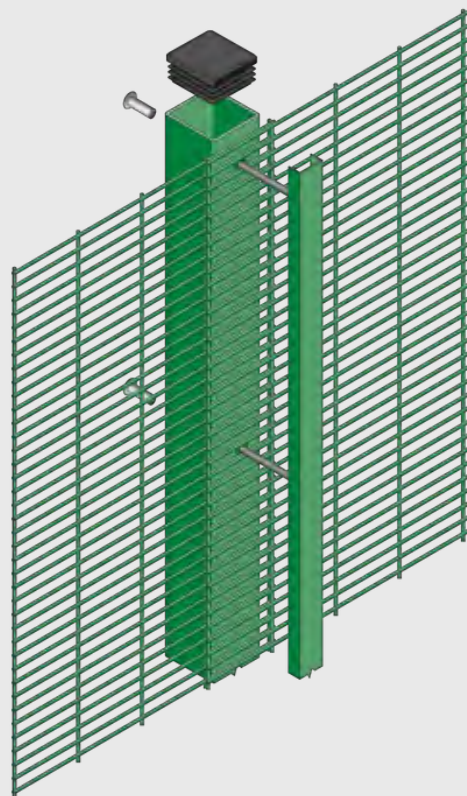
High security flat panel system



Find out more
Scan for more information

Description

CLD Securus Lite S1 is a permanent, in-ground security fence. Tested and certified to LPS 1175 A1 (SR1) Issue 8. It guarantees a minimum delay of 60 seconds against attacks. This fenceline is suitable for Police Stations, Industrial Buildings, Schools, and MODs: quality is assured with this fence line.



Features

Optional active anti-intruder toppings

Two clamp bar options available

LPS 1175 Issue 8 A1 security rating

Exploded view of post and fixing details for the CLD Securus Lite S1
This product has additional features not demonstrated for security reasons



cld-systems.com

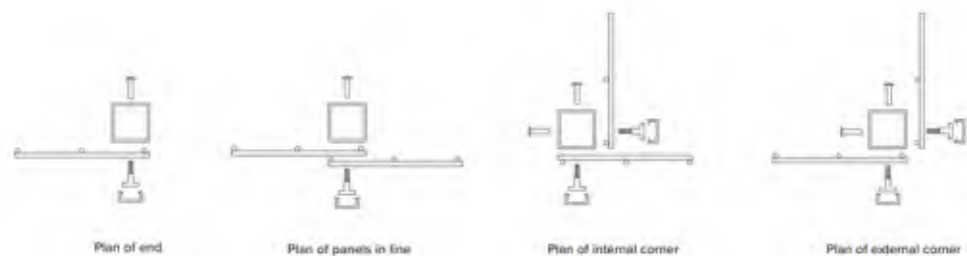
CLD Securus Lite S1

High security flat panel system

Product Technical Information

Standard	BS1722-14:2017 BS EN ISO 141:2009 BS EN 13438:2013 Secured By Design
Panel Type	Single layered mesh panel system. Profiled version also available.
Panel Width	2518mm
Wire Diameter	4mm
Mesh size	76.2 x 12.5 mm
Fixings	41mm x 21mm clamping channels and CLD SafeTFix hidden fixing system OR 30mm x 5mm full length clamp bar. Through bolt, security washer and non removable shear nut
Available Heights	1800, 2000, 2100, 2400, 3000mm (up to 5000mm)
Nominal Heights	1.8m to 5.0m
Finish	Polyester powder-coated to 60-80 microns or 160-200 microns with marine grade and metallics. Any RAL colour available
Top Edge Projection	30mm
Panel installation	Bottom of panel maximum 50mm above ground
Topping Options	Nil
Posts	SHS or RHS, galvanised after manufacture and polyester powder-coated to match fencing
Post Dimensions	Minimum 60mm x 60mm depending upon application
Post Centres	2440mm
Foundations	Set posts in holes minimum 450mm square x 950mm deep min. Note: Contractor/ client is responsible for the foundation size suitable for the ground conditions and fence height.
Warranty	Minimum of 15 years against manufacturing defects.

System Details



Disclaimer

Fencing should be installed in accordance with BS 1722-14. Every care has been taken to ensure that all information provided on this data sheet is accurate. CLD Fencing Systems Ltd reserves the right to change product specification at any time. Please ensure that you have the latest information which can be found on our website or by contacting our team.

Document Reference - CLD_Securus_Lite_S1_DS_20230413

Q40 Fencing & Gates Specification

To be read in conjunction with Preliminaries/General conditions

Description: Perimeter security fencing panel system

Standard: LPS 1175 A1 (SR1) Issue 8
BS1722-14: 2017
BS EN ISO 1461:2009
BS EN 13438:2013
Secured by Design - Police Preferred Specification

Manufacturer: CLD Fencing Systems info@cld-systems.com
Tel. 01270 764751 www.cld-systems.com

Product Reference: CLD Securus Lite S1 Rigid Mesh Panel System

Panel type: Single layered mesh system. Profiled version also available.

Panel Width: 2518mm

Wire diameter: 4mm

Mesh size: 76.2 x 12.5 mm

Height: 1800, 2000, 2100, 2400, 3000mm (up to 5000mm)

Nominal height: 1.8m to 3.0m

Finish: Polyester powder-coated to 60-80 microns or 160-200 microns with marine grade and metallics. Any RAL colour available

Top edge projection: nil

Panel installation: Bottom of panel maximum 50mm above ground

Security topping options: Barbed and razor wire, cranked and straight

Posts: SHS, galvanised after manufacture and polyester powder-coated to match fencing

Post dimensions: 60mm x 60mm

Maximum post Centres: 2440mm

Fixings: 41mm x 21mm clamping channels and CLD SafeTFix hidden fixing system
or

30mm x 5mm full length clamp bar. Through bolt, security washer and non removable shear nut

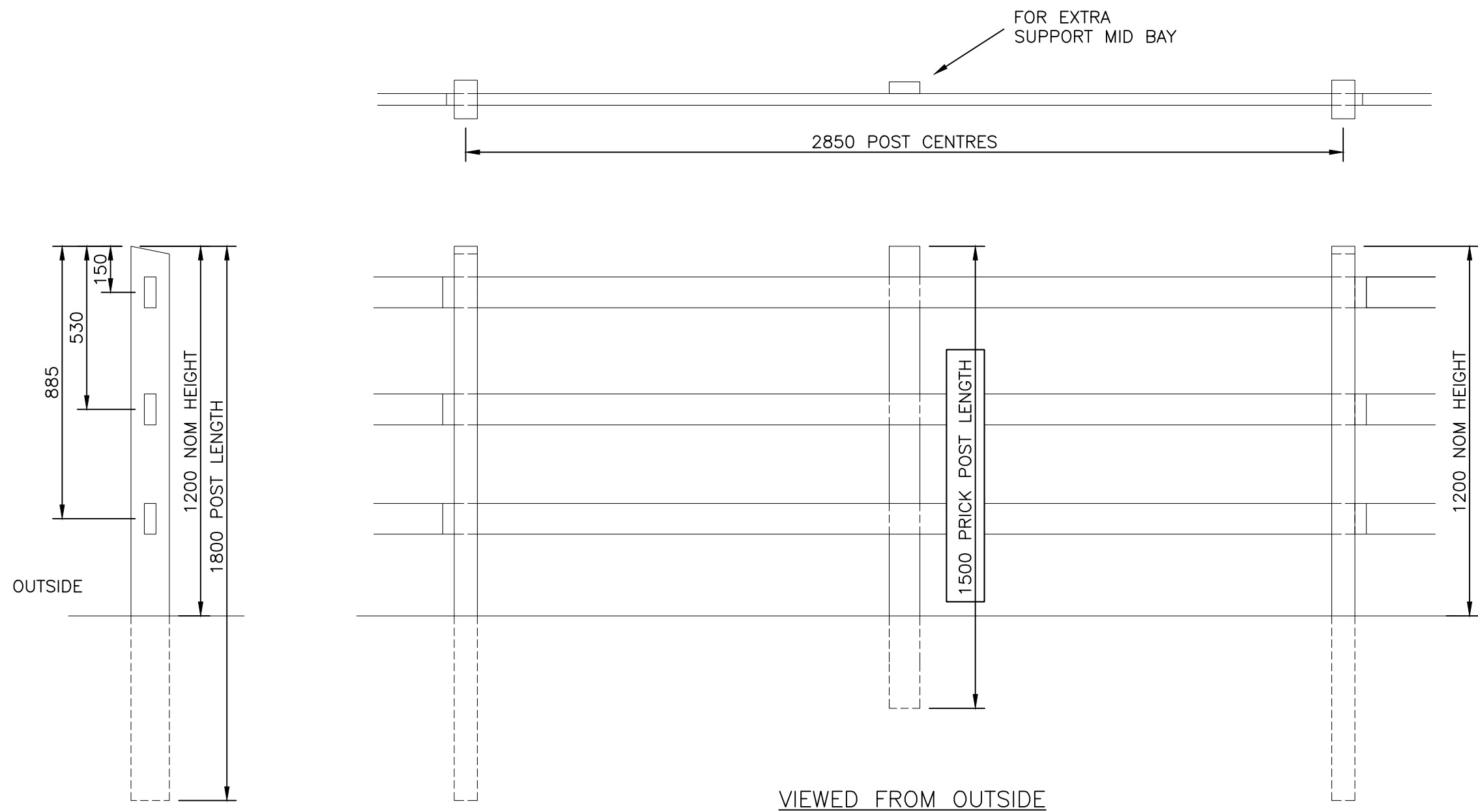
Foundations: Set posts in holes minimum 450mm square x 950mm deep min. Note: Contractor/ client is responsible for the foundation size suitable for the ground conditions and fence height.

Warranty: Minimum of 15 years against manufacturing defects.

Notes: All dimensions are nominal, for further information please contact CLD Fencing Systems.

Information is correct at time of production. As part of our policy of continuous improvement, we reserve the right to alter product specification without notice.

DO NOT SCALE – IF IN DOUBT ASK



NOTES.
ALL DIMENSIONS ARE IN mm (U.N.O)
GAPS UNDERNEATH FENCES ARE
NOMINAL DUE TO GROUND LEVELS.
Materials.

FENCE POSTS – 125mm x 75mm (JAKCURED)
RAILS – 100mm x 38mm (JAKCURED)
PRICK POSTS – 100mm x 38mm (JAKCURED)

Jacksons Fencing	Stowting Common, Near Ashford, Kent. TN25 6BN Telephone: 01233 750393 Fax: 01233 750403 www.jacksons-fencing.co.uk www.jacksons-security.co.uk	17/03/16 Original Issue	Drawn LA		TITLE POST & RAIL (MORTICED) 3 RAIL FENCE (SALES DRAWING)	
			Date 16/03/16			
			Checked LA		CUSTOMER	Drawing No. J7/01278 Sheet 1
			Size A3	Scale 1:16 U.O.S		
This Drawing Is The Property Of H.S. Jackson & Son (Fencing) Ltd, And May Not Be Copied Or Reproduced In Any Way Without Prior Written Permission.						

Post and Rail

Manufacturer: Jacksons Fencing.
Web: www.jacksons-fencing.co.uk.
Tel: +44 (0)1233 750393.

All materials are covered by the Jacksons 25-year guarantee. On timber products, **only** the unique Jakcure® treatment process delivers a 25-year guarantee against all wood boring pest and all forms of dry and wet rot. On steel fencing, the exclusive Jacksons 25-year Service Life guarantee provides cover against defects such as design, manufacturing finish and fitness for purpose.

Product reference: Post and Rail.

•Posts:

(AND)

- [170100]. - 1800 mm, for nailed rails. 125 x 76 section.
- [170500]. - 2100 mm, for nailed rails. 125 x 75 section.
- [190200]. - 1800 mm, three mortises. 125 x 75 section.
- [190400]. - Prick post, 1500 mm. 38 x 100 section pointed.
- [190600]. - Corner post, 1800 mm, three mortises. 125 x 125 section.
- [190700]. - 2100 mm, four mortises. 75 x 125 section.
- [190800]. - Corner post, 2100 mm, four mortises. 125 x 125 section.
- [190900]. - Prick post, 1800 mm. 38 x 100 section pointed.

•Rails:

- [135000]. - Half round nailed rail, 3600 mm long. 100mm diameter.
- [170200]. - Square nailed rail, 3600 mm long. 38 x 100 section.
- [190300]. - Square rail, 3000 mm long for use with mortised posts. 38 x 100 section.

Options

Post:

- 125 x 75 mm section, weathered one way, sawn finish.
- 1.8 m long posts for a three-rail fence 1.2 m high.
- 2.1 m long post for a four-rail fence 1.5 m high, or three rail nailed fence in soft ground.

Square rail:

100 x 38 mm section, sawn finish.

Half round rail:

Machine rounded.

Sturdy fencing consists of sawn square section vertical posts, with three or four horizontal rails, available either nailed or mortised to the posts.

Features:

All fixings heavily galvanized.

- Nailed:

- Two rail shapes; square or half round.
- Machine rounded timber for regular size.

- Mortised:

- Prick posts mid bay for enhanced looks and extra support available.
- Posts have special galvanized fitting embedded in top to prevent splitting.

All timber used throughout is superior quality Jakcured softwood guaranteed for twenty five years.

Customer Name:.....
Sales Order No:.....
Gate Height:.....
Gate Width:.....
Salesman:.....

7 BAR Uni-Field Gates
(NARROW)

NOTE: HINGES WILL BE FITTED
AS STANDARD UNLESS INDICATED

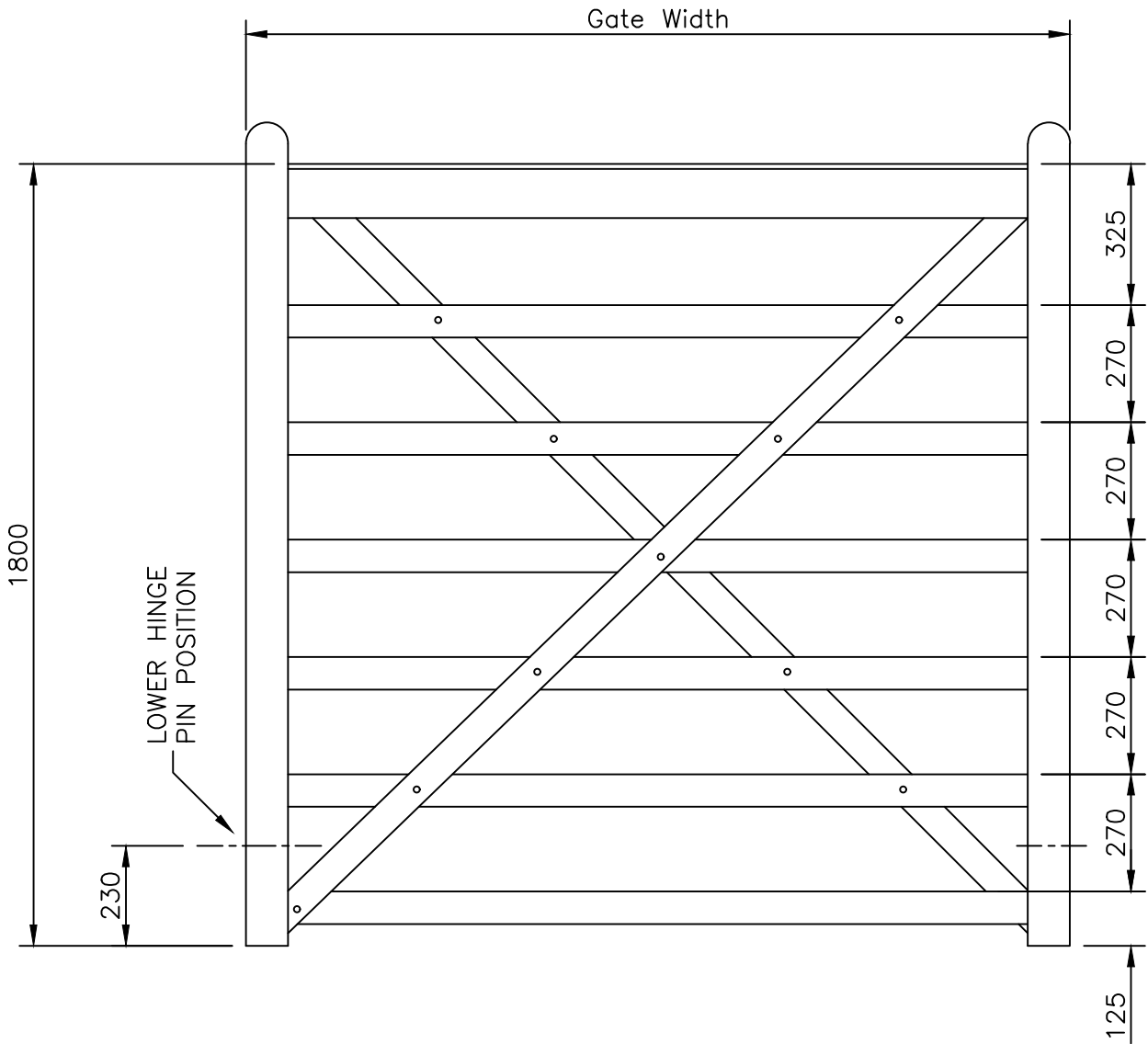
IF FITTINGS ARE REQUIRED
TO BE SUPPLIED SEPARATELY
PLEASE TICK BOX.....☐

Specification - (0.9m min. - 2m max.)

Gates are 1.8m high overall.
Top rail 100mm x 75mm,
Under rail cross braces 75 x 25mm.
Hang and Slam stiles (rounded top) 100 x 75mm,
with both stiles drilled to allow gates to be hung on
the left or the right.
Supplied in Natural Jakcured finish.

If gates are automated with underground
operators, bottom rail is increased to 95
x 75mm, with stiles cut back to suit.
(See separate drawing)

- Our Uni-Field gates are called this as they are 'Universal' which means they can be hung as right or left handed
- Designed with Heavy top rail over entire width for extra strength
- All timber used through out is superior quality Jakcured softwood guaranteed for 25 years
- Both hanging and slam stiles are drilled to allow gates to be hung on the left or right
- Quality Planed finish
- Rail and brace crossings are bolted with stainless steel bolts
- Top bars are chamfered
- Cross braced for extra strength
- All joints are morticed and tenoned



MANUFACTURE
TOLERANCE
±5mm

Jacksons Fencing	Stowting Common, Near Ashford, Kent. TN25 6BN Telephone: 01233 750393 Fax: 01233 750403 www.jacksons-fencing.co.uk www.jacksons-security.co.uk	DO NOT SCALE – IF IN DOUBT ASK		Drawn PW		TITLE 7 BAR UNI-FIELD GATE NARROW			
				Date 30/01/2014					
				Checked		CUSTOMER		Drawing No. J7/02154 Sheet 4A	
				Size A3	Scale 1:16 U.O.S				
This Drawing Is The Property Of H.S. Jackson & Son (Fencing) Ltd, And May Not Be Copied Or Reproduced In Any Way Without Prior Written Permission.		2	08/11/18	Rail Spacing Dims Added					
		1	02/02/2018	NEW BORDER + HEIGHT CORRECTED					
		0	30/01/2014	Original Issue					



Jacksons Fencing Specification Sheet

Fencing Stakes and Posts

This is a versatile and hard wearing general purpose fencing suitable for all sorts of agricultural situations. With Jakcured stakes and galvanized wire it's long lasting too.

- All timber used throughout is superior quality Jakcured softwood guaranteed for 25 years
- Versatile and sturdy general purpose fencing
- Machine rounded with chamfered tops

Specification

Struts

Machine rounded. Minimum diameter of 60mm diameter jakcured: 1.8m long

Stakes

Softwood mixed cleft and round 75-100mm across or through the butts, peeled, pointed.

Length: 1.65m and 1.8m

Machine Rounded Jakcured Fencing Stakes

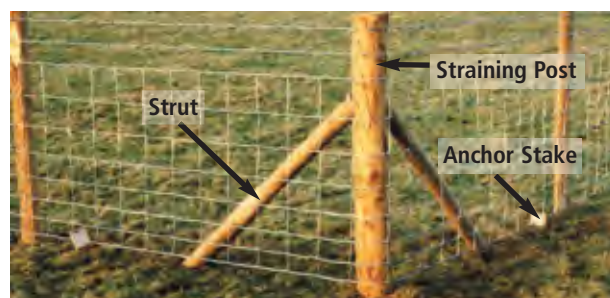
Pointed, with chamfered tops. 75mm diameter: 1.5m, 1.65m and 1.8m long and 90mm diameter: 1.65m and 1.8m long

Anchor Stakes

Half round with a minimum of 75mm face, peeled to act as a trust plate for the struts: 750-900mm

Straining and Corner Posts

Round and peeled. Diameter measurement is approximately through the butt: 2.3m long x dia. 150mm and 2.7m long x dia. 125mm. Straining Posts and struts should be installed at a maximum of every 50m and at all changes of direction and significant changes of level. Intermediate posts for mild steel fencing at 3.5m centres



Wire Fencing

- Galvanized wire field fences that are strong, durable and economical
- Wire fencing types 1-4 are coated with Galfan, highly corrosion resistant zinc and aluminium alloy - Laboratory tests have shown these to last twice as long as ordinary galvanized wires
- Supplied in 50m or 100m rolls for high tensile

Specification

1. Cattle or Stock Fence 1.15m (Galfan coated)

Available in medium weight.

Eight line wires
uprights 300mm apart

C8/11/30 (50m rolls)

Top and bottom gauge 3.0mm
Intermediate gauge 2.5mm

300	
230	
200	
180	
150	
140	
130	
115	

2. Pig Fence 800mm (Galfan coated)

also lamb proof
Eight line wires

uprights 150mm apart

Medium C8/80/15 (50m rolls)

Top and bottom gauge 3.0mm
Intermediate gauge 2.5mm

High Tensile* 8/80/15

all wires 2.5mm (100m rolls)

150	
150	
140	
130	
115	
100	
90	
75	

3. Sheep Fence 900mm (Galfan coated)

Six line wires
uprights 300mm apart

Heavy B6/90/30 (50m rolls),
4.0mm, 3mm

Medium C6/90/30 (50m rolls)
3.0mm, 2.5mm

300	
230	
200	
180	
150	
140	

4. Forest Fence 1.0m (Galfan coated)

Seven line wires
uprights 150mm apart

Medium C7/10/15 (50m rolls)
3.0mm, 2.5mm

150	
230	
200	
180	
150	
140	
130	

5. Jacksons galvanized Deer Fence

Conforms to B.S.S.
Deer Fence 1.9m

High tensile (100m rolls)
Vertical wires 150mm apart for perimeter fencing.

High tensile* 13/190/15,
2.5mm, 2.5mm

150	
260	
220	
220	
200	
180	
150	
140	
130	
115	
100	
80	
80	

* High tensile fence allows the posts to be further apart



Jacksons Fencing Specification Sheet

Wire Fencing and Netting

Wire netting galvanized to B.S.E.N 10223

Suggestions for use:

- 13mm: protecting fruit from small birds; keeping out rats
- 25mm: plastering and floor screeding; chicken runs
- 31mm: protection against the smallest rabbits
- 50mm: poultry; general purpose



		Height in millimetres				
Mesh	Wire Gauge	600	900	1050	1200	1800
50 Metre Roll						
25mm	20		✓		✓	✓
31mm	19	✓		✓	✓	
	18			✓	✓	
50mm	19	✓	✓		✓	✓
25 Metre Roll						
13mm	22	✓	✓			
25mm	20	✓	✓		✓	
50mm	19	✓	✓		✓	

Plain Wire

Mild steel galvanized

High Tensile: 3.15mm (10g) 410m, 2.5mm (12.5g) 651m

Size - 25kg coils	Approx length	Size - 5kg coils	Approx length
5.00mm (6g)	162m	3.15mm (10g)	82m
4.00mm (8g)	254m	2.50mm (12g)	130m
3.15mm (10g)	410m	2.00mm (14g)	203m
2.5mm (12g)	651m		
2.0mm (14g)	1017m		
1.6mm (16g)	1590m		



Actual Size

● 5.00mm

● 3.15mm

● 2.0mm

● 4.00mm

● 2.5mm

● 1.6mm

Barbed Wire



Best Jacksons galvanized double strand barbed wire available in 200m with barbs at 100mm centres.

Length	Gauge
200m	2.5mm
200m high tensile	1.6mm

Register on the website to gain access to Q40 specification documents and CAD drawings.

A fully made to measure service is available. All Jacksons fencing systems and gates may be designed and manufactured to suit site conditions.

Jacksons Fencing Stowting Common Ashford Kent TN25 6BN UK

T: +44 (0) 1233 750 393 F: +44 (0) 1233 750 403

E: sales@jacksons-fencing.co.uk W: jacksons-fencing.co.uk



Jacksons
Quality that lasts
Fine Fencing, Gates and More

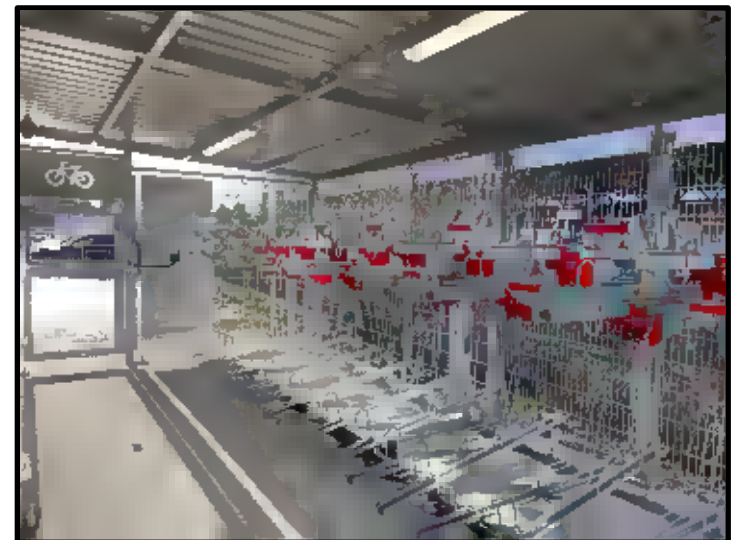




Two Tier Cycle Racks

Specifications

- Allows cycles to be positioned in rows one above the other, providing a unique way of optimising limited space
- Modular Construction allows the system to be extended to any length
- Can be in face to face or back to back layout
- 100mm x 100mm galvanised steel box section framework supports
- Robust 4mm thick Galvanised steel wheel troughs with front wheel holder
- Anti-tilt wheel brackets
- Height differential provides adequate clearance for all types of cycles
- Long lasting neoprene and PTFE smooth rolling system which eliminates need for bearing which fail over time and reduces maintenance and whole life costs.
- Lifting of cycle onto the top level of the stand is done so with minimal effort via the pull out handle and is fitted with **gas assistance for easier lifting.**
- Hi visibility head height handles
- Product is guaranteed for 3 years (tray work and moving parts)
- Main support frames and supporting steelwork guaranteed for over 10 years.
- 3 point locking system including 16mm thick solid steel (galvanised) round bar
- Galvanised 100mm x 100mm top tier support bar which is fully welded and comes with additional strengthening of fully welded gusset supports
- All fixings provided and are security fixings
- Please note our two tier cycle racks are currently going through the secure by design accreditation which will be in place when the contract commences.



Two Tier Cycle Racks – Suitability of Equipment

Suitability of Equipment

LockIt Safe Two Tier Cycle Racks is one of our most popular products due to the fact that you can accommodate double the number of cycles within the footprint of standard cycle parking products.

All structures are supplied in a base material of mild steel with sections and grades of material being used that ensures they are fit for purpose and function for many years to come.

Front and rear positive stops to eliminate risk of top tray sliding out on its own accord.

Due to the high quality finish and the fact the product is Hot Dipped Galvanised to BS EN ISO 1461 our Two Tier Cycle racks are almost maintenance free.

To ensure a long and safe life span of the rack we would recommend following these simple guidelines:

Every 6 months ensure that all bolts are secured and have not been tampered with or vandalised, tighten or replace if in any doubt. We will supply spare bolts with our maintenance package and Operating Maintenance Manual.

Every 6 months ensure that all ground anchors are firmly attached and tightened; We will supply spare ground anchors with our maintenance package and Operating Maintenance Manual.

Every 6 months ensure that all rails run smoothly and grease if required.

Every 12 months we would recommend a wipe down with warm water and cloth to remove any debris that could affect use of the racks.

The Two Tier cycle rack is especially popular within the Rail Industry as space is a premium within station boundaries. We have installed over 5000 cycle parking spaces within the last 3 years in Stations where the cycle racks are used multiple times on a daily basis and as stated above they are relatively maintenance free. The quality of our Two Tier Product is so high that we are able to offer a 3 year guarantee as opposed to other companies who only offer a 1 year guarantee.

Materials and Processes used

Materials

- Steel in grade S255
- Fixings in stainless steel
- Ground anchors – Sleeve or resin type

Processes used

- Bending, forming, fabrication and welding occur in the LockIt Safe factory (weld procedures are available on request)
- Hot dip galvanizing
- Electro zinc plating of fasteners and fixings

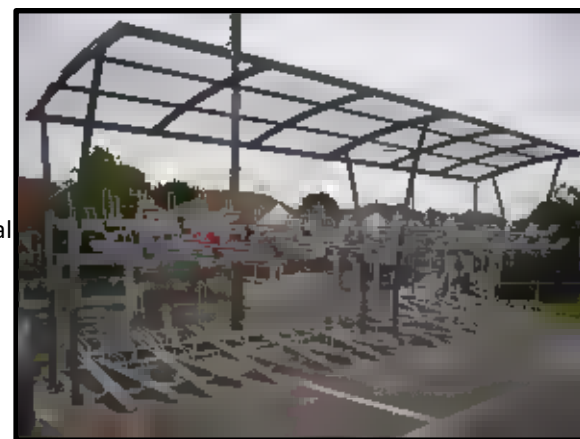
Galvanized Coating

The galvanised process provides a barrier to prevent any rusting of the steelwork but should any major knock occur this may cause the raw steel to be exposed. If this should occur we recommend using a galvanising spray on the affected area that should heal the damaged steel and prevent any rusting in the future.

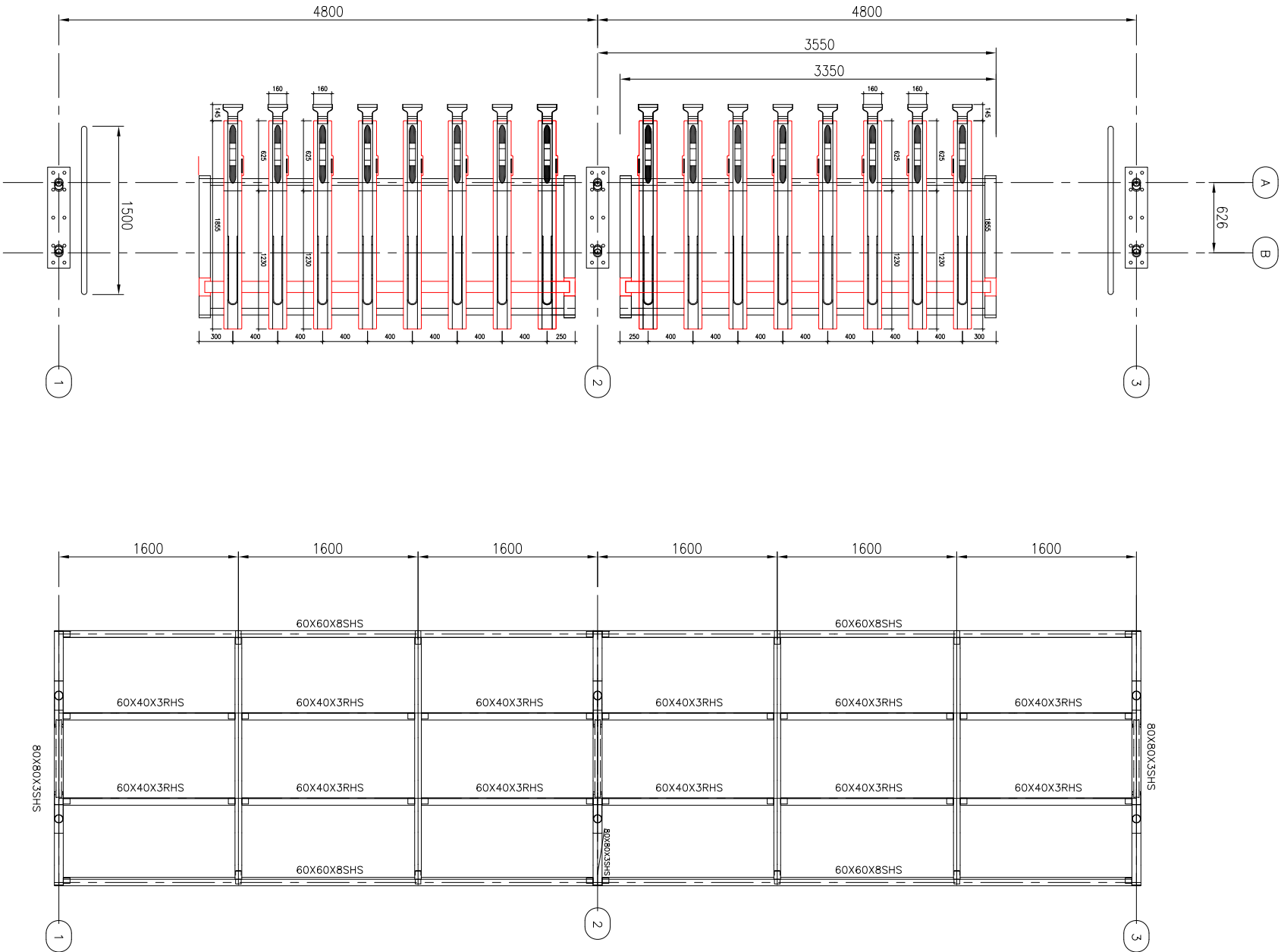
If the Major knock has gone unnoticed for a period of time and rust is starting to show, the area should be wire brushed to bring back to a steel finish and then apply the galvanising spray on the affected area.

With regular inspections and maintenance we guarantee the galvanising will last in excess of 10 years.

We have a whole range of shelters available to cover our two tier cycle racks. As these shelters are manufactured in-house at our base in Lincolnshire the shelters can be made to any size and shape to suit the surrounding environment. The shelters are made from hot dipped galvanised steel to BS EN ISO 1461 which ensures durability and longevity. The galvanised steel frame can be polyester powder coated in a choice of 14 standard colours and is clad on the roof with durable 16mm Multiwall Roof sheets.



- Shelter manufactured from 80mm diameter pipe, Galvanised as standard to BS1461:2009.
- Shelter can be polyester powder coated as well as galvanised. Choice of 14 standard colours – Additional cost
- Shelters are modular units and can be extended to any size.
- Shelter base plates to have 6 bolts and will have plastic bolt caps and will be flush with steel.
- Shelters clad in clear PETg sheeting on the roof. With sealing strip to cover joins.
- Shelter can be Surface mounted onto an existing concrete base or sub surface mounted using concrete pockets.
- With regular inspections and maintenance all shelters will last in excess of 10 years.
- Height of 2.7m



PLAN ON COLUMN BASES

FRAME PLAN

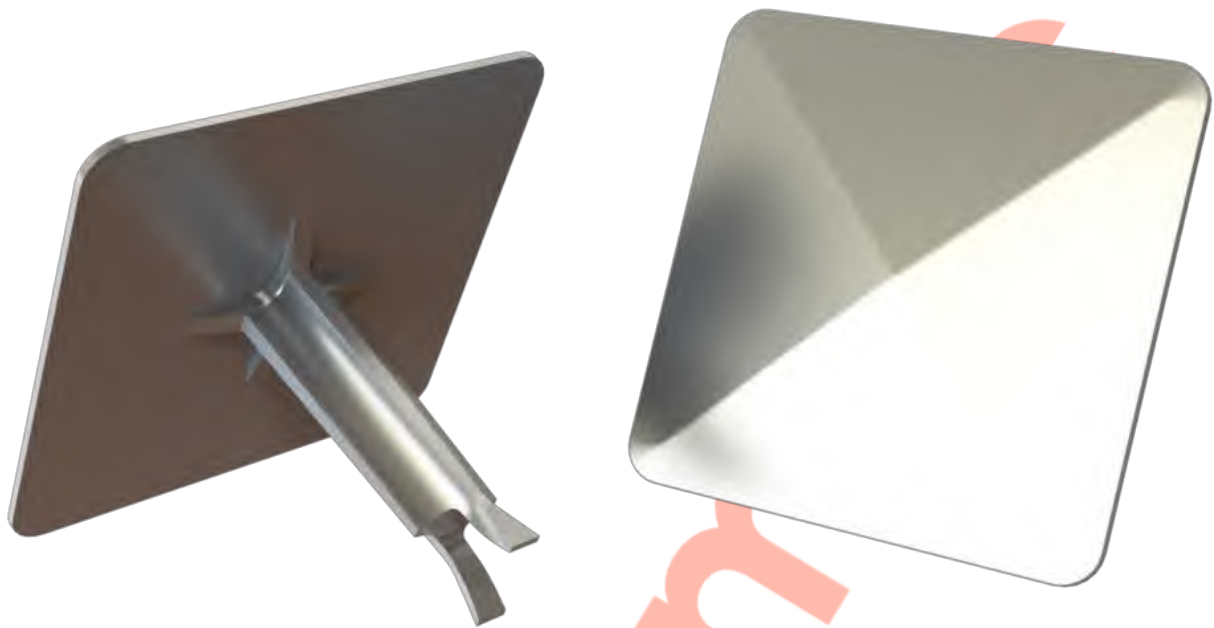
END FRAME

			GENERAL NOTES:										CLIENT		DRAWN		NR	03/02/25		LOCK IT SAFE G9, INNOVATION CENTRE, INNOVATION WAY, EUROPARC GRIMSBY, DN37 9TT Tel: 01472 346382 WWW.LOCKIT-SAFE.CO.UK					
													VARIOUS		CHECKED										
													PROJECT												
													CANOPY DETAILS												
													TITLE		VARIOUS										
REV	BY	DATE	DETAILS		REV	BY	DATE	DETAILS												SCALE	JOB No		DWG No.		REV
																				NTS	SHELTER		GA01		

Sheffield Stands – Sub Surface Sheffield Stands And Oversized



- All stands are 50mm Circular hollow section with 3mm thickness.
- All stands can be either sub surface or surface mounted. Surface mounted stands are manufactured with a 130mm x 50mm x 6mm base plate with 2 bolts per plate, 4 per stand.
- All stands can be manufactured with or without a tapping rail.
- Visibility bands can be provided With the regular inspections and maintenance all Sheffield Stands are guaranteed for a period of 10 years.
- Sheffield Stand to be 750mm off the ground
- Stands spaced as standard at 800mm. Can be extended up to 1100mm
- Oversized Sheffield Stands are 1500mm in length

400-300 Square Road Stud - Smooth - Fishtail

Above. Shown with satin polish finish

Description

Manufactured from Stainless steel.

Satin polish finish as standard.

Constructed from non corrosive material.

Long Service life.

Comes with a bevelled and smooth top.

Dimensions

100mm x 100mm x 70mm

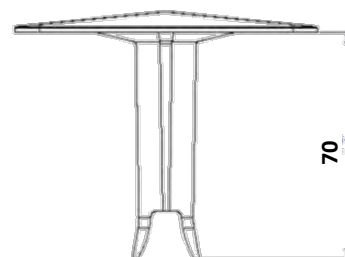
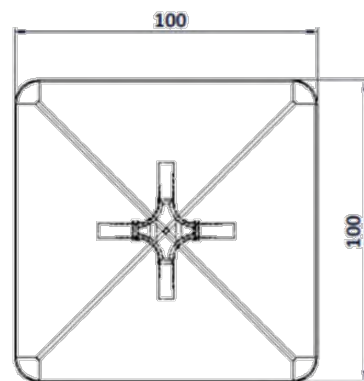
Options

Smooth topped version suitable for off-highway use such as car parks

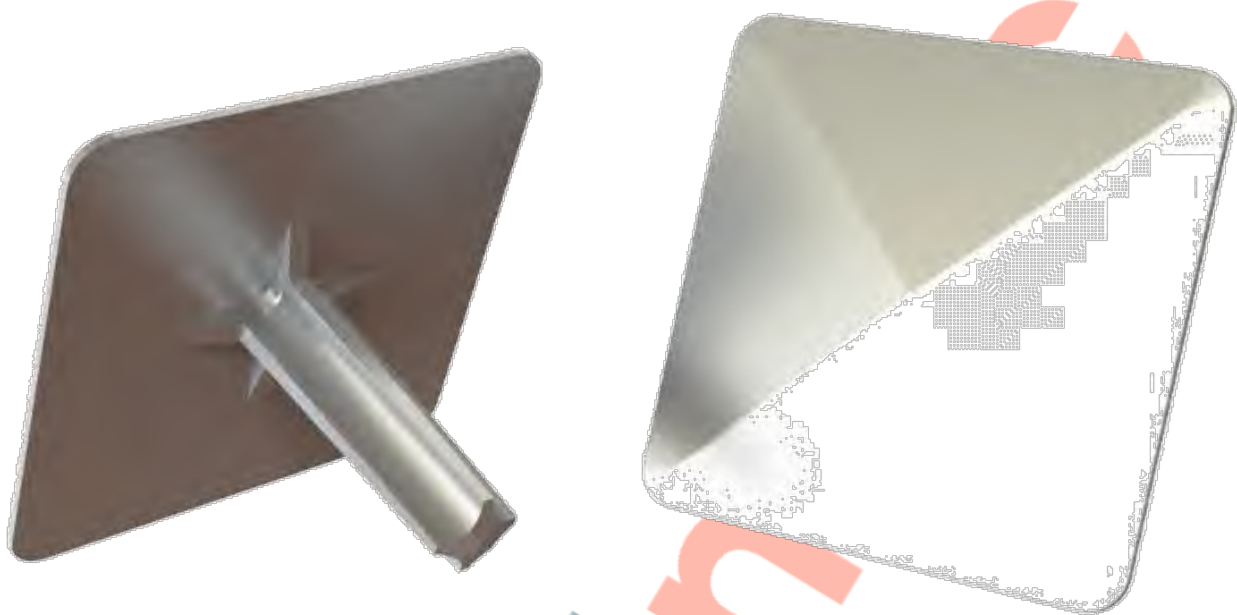
Aluminium Version

Ribbed version

Full installation service - POA



400-301 Square Road Stud - Smooth - Chisel



Above. Shown with satin polish finish

Description

Manufactured from Stainless steel.

Satin polish finish as standard.

Constructed from non corrosive material.
Long Service life.

Comes with a bevelled and smooth top.

Dimensions

100mm x 100mm x 70mm

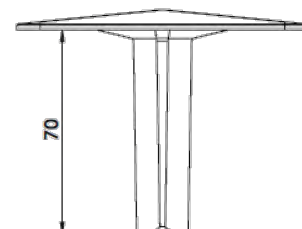
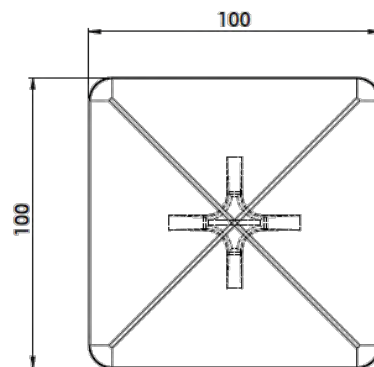
Options

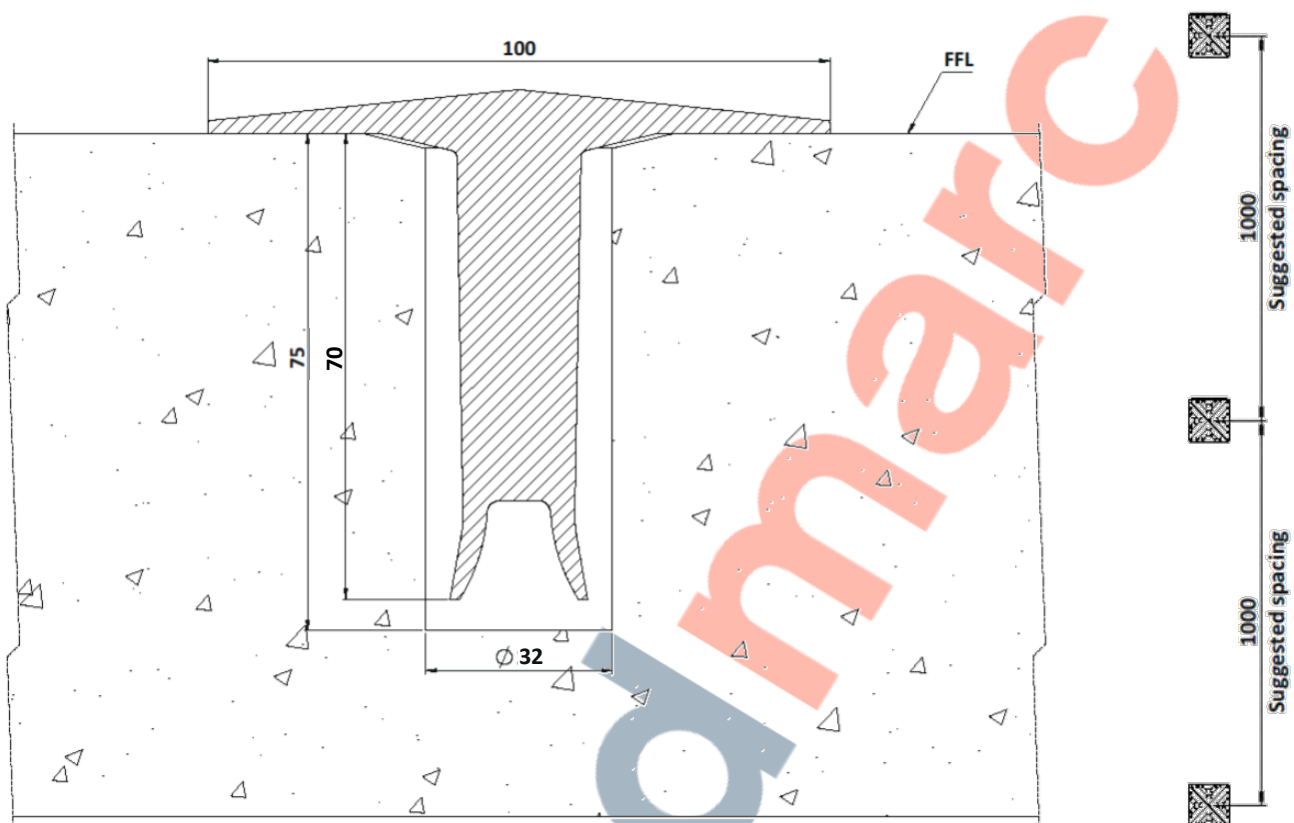
Smooth topped version suitable for off-highway use such as car parks

Aluminium Version

Ribbed version

Full installation service - POA





Installation

1. Drill a hole 32mm in diameter to a depth of 75mm which should allow the crossing stud to sit level on the surface.

Note: for concrete surfaces it is necessary to prime the hole and surrounding road surface with bitumen emulsion primer prior to grouting.

2. Fill the hole fully with hot bitumen grout **or** Studmarc Epoxy Resin and IMMEDIATELY insert the marker shank and firmly press the head to the road surface taking care that the marker is properly aligned.
3. If necessary, pressing may be supplemented by light tamping with a wood or rubber headed mallet or similar. **ON NO ACCOUNT SHOULD THE STUD BE HAMMERED.**
4. The surplus of bitumen will be forced out of the hole by the ingoing shank to form a bed for the head. Any surplus bitumen beyond the area of the marker should be trimmed off.

Cleaning & Maintenance

This product is designed for all weather exposure requiring only minimal maintenance as detailed below.

Stainless Steel: Manufactured from Stainless steel. Maintenance free, inspect fixing every 6 months. Add additional Adhesive where required.

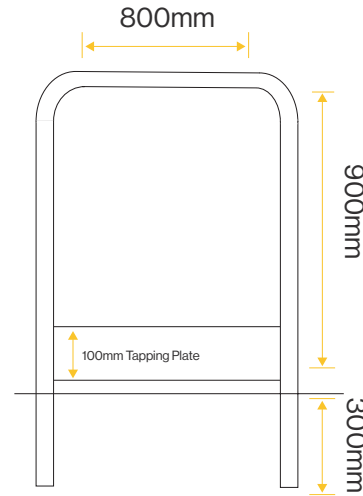
DATASHEET

400-300 Square Road Stud

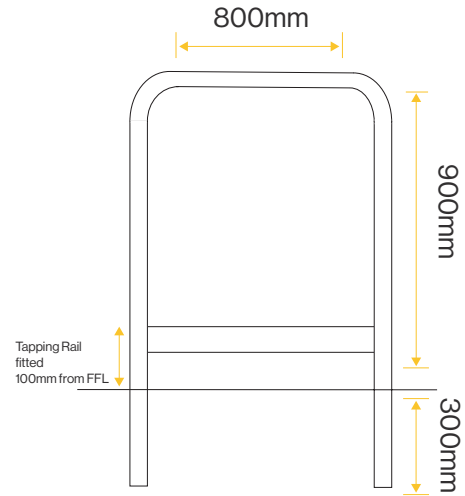


Door Barrier with Tapping Bar BX14 6620

Diagrams



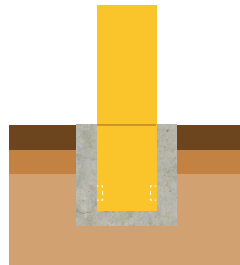
With Tapping Plate



With Tapping Rail

Installation

Standard
Root Fixed



Standard Unit Dimensions:

Overall Height: 1200mm
Above Ground Height: 900mm
Width: 800mm
Diameter Tube: 48mm

Colours/Finishes:

RAL 9005 Jet Black	RAL 9016 Traffic White	RAL 7016 Anthracite Grey
RAL 5013 Colbalt Blue	BS 4800 20 C 40 Duchess Blue	BS 4800 00 A 05 Goose Grey
RAL 6005 Green	BS 4800 14 C 39 Holly Green	RAL 5015 Sky Blue
RAL 3020 Traffic Red	RAL 1023 Traffic Yellow	

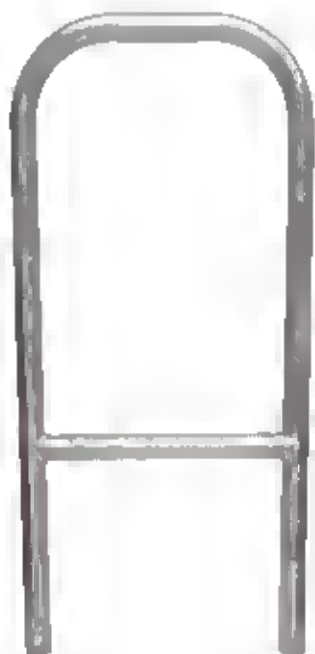
The colours shown are a guide only.
Please check a colour chart to see the actual colour.

Broxap Limited, Rowhurst Industrial Estate, Chesterton, Newcastle-under-Lyme, Staffordshire, ST5 6BD T: 01782 564411 E: info@broxap.com W: www.broxap.com



Specification Sheet: 50mm DDA Compliant Door Guard - Tapping Bar - Root Fix

Product Code: HB4.DB7



Height Above Ground:	900mm
Root Depth:	300mm
Overall Height	1200mm
Overall Width:	600mm
Diameter:	50mm dia.
Product Material:	Mild Steel
Finish:	Hot Dipped Galvanised
Optional Finish:	Polyester Powder Coating
Features:	Extended Leg for Concreting In. DDA Tapping Rail 100mm Above Ground Height. Optional Rubber Bump Stop To Absorb Impact



High-quality mild steel door barrier with DDA compliant tapping bar. Door barrier can be fitted with a rubber bump stop to absorb any impact from opening doors.

Available in both root fix and base plate fix versions.

Root fixed option has 300mm extended leg for concreting in.

Tapping bar / Cane rail is 100mm above ground level.

The door guards can be used as a fixing point to hold a door open using a latch that can be fixed to the hoop. The door guards are fabricated from mild steel and can be powder coated in any standard RAL colour.

APPENDIX 2

SOFTWARES SUPPLIER/PRODUCT INFORMATION

- Bark mulch to planting areas
 - Structural soil system – RootSpace
 - Irrigation and aeration inlet
 - Root deflector
 - Root guying for treepits in hard
 - Treepit SUD soil – Soil Type 07
- EM4 – Wildflower & grass meadow mixture to the understory of WE01
 - EM8 – Wildflower & grass meadow mixture to SW01
- EH1 – Wildflower & grass meadow mixture to understorey of hedgerow
 - Geotextile bags
 - Erosion control matting

Mitred Top Sheffield Stainless Steel Bollard

BX47/MitredTop-1

broxap
bollards & barriers



Standard Unit Dimensions:

Height Above Ground: 750mm

Root Length: 300mm

Diameters Available: 76mm,
89mm, 101mm, 114mm, 129mm,
140mm, 154mm, 204mm

Colours/Finishes:



Grade 304 Stainless Steel

Product Information

This Mitred top stainless steel bollard provides a modern edging to any external works package. Available in a variety of sizes.

Features

- Mitred top
- 2mm gauge
- Grade 304 stainless steel as standard
- 240 grit matt satin polished as standard

Materials Used

- Grade 304 Stainless Steel

Options

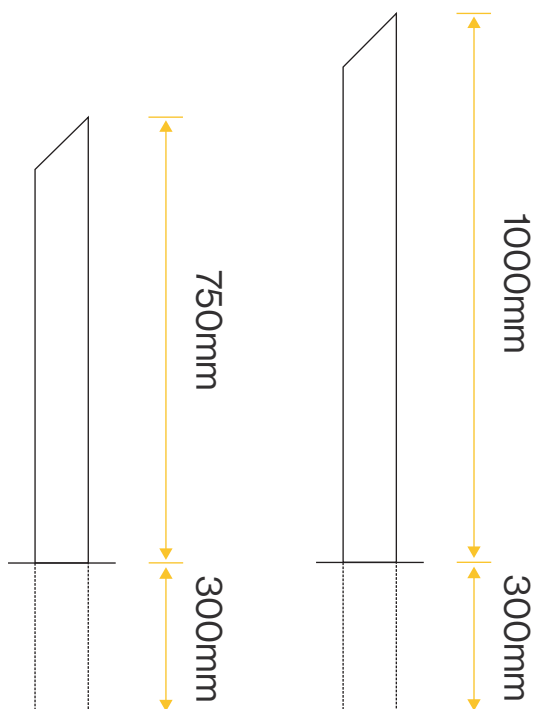
- Available in nonstandard overall heights
- Loose mild steel inserts can be added for additional strength
- Base plated fixing
- Removable fixing
- Root fixing
- Mirror polished finish

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All dimensions are in millimeters, weights in kilograms and capacities in litres, are approximate and do not form any part of the contract. All prices are guide prices only and should be used for estimating purposes only. Broxap Limited reserve the right to change the design, specification or price of any item sold at any time. All prices exclude VAT and delivery. Please Note: All information on this data sheet is subject to orientation (N,S,E,W) altitude and proximity to buildings, but is sufficient for use as general/preliminary information).

Diagram



Standard Unit Dimensions:

Height Above Ground: 750mm

Root Length: 300mm

Diameters Available: 76mm,
89mm, 101mm, 114mm, 129mm,
140mm, 154mm, 204mm

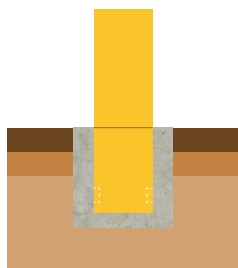
Colours/Finishes:



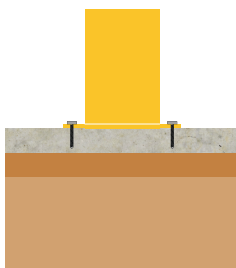
Grade 304 Stainless Steel

Installation

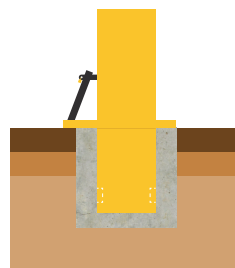
Standard Root Fixing



Surface Mounted Baseplate



Removable Socket Fixing





Bark Nuggets®

A long lasting, versatile, high performance mulch, suitable for a wide range of professional and domestic landscape applications, including prestigious sites. Particularly effective when a high quality, decorative finish is required.



Product Description

- Nominal particle size range 15 to 65mm
- Naturally acidic
- Free flowing and easy to handle
- Very attractive visual appearance
- Rich mid-brown in colour
- Long effective service life of 4 years plus
- Fire resistant characteristics, confirmed by testing in accordance with BS 4790:1987, make Bark Nuggets particularly useful in areas of potential fire risk, e.g. car parks, vehicle fuel filling stations, adjacent to offices and pedestrian walk ways, housing estates etc
- Processed from natural, sustainably produced pine bark, Douglas fir and larch
- RHS endorsed (when sold in 60 litre bags)
- Certified by the Forest Stewardship Council® (FSC®)*
- Hostile living environment for pests
- 100% peat free
- Suppresses weed growth replacing expensive shrub bed hoeing and chemical weed-killing
- Conserves soil moisture, minimising drought stress and plant death and eliminating the need for excessive plant watering
- Substantially enhances the visual appearance of new and existing planted areas
- Successfully used for many years on sites throughout the UK and proved to perform extremely well
- Provides an insulating layer, substantially reducing the effects of ground freezing and over-heating during extreme weather conditions
- Good resistance to wind and rain erosion
- Suitable for use on moderate slopes
- Slowly improves the soil's organic content, as it decomposes
- Easy to lay and install, using simple tools and requiring little subsequent

maintenance

- Allows clean access onto mulched areas for plant pruning

Available in 60 litre bags, bulk bags and in loose bulk

This product is from FSC MIX Sources at a minimum of 70%, FSC certificate number CU-COC-806457.

* Product sold in loose bulk is FSC certified by special request only



How To Use

- Ensure the area to be mulched is entirely free from both annual and perennial weeds
- Lay Melcourt Bark Nuggets evenly onto freshly cultivated moist soil, after planting has been completed.
- The mulch should be laid at between 50 to 100mm depths, allowing at least 5% for settlement
- For greatest longevity, do not disturb once applied

Other Advice

- Use in a ventilated place and avoid breathing in dust.
- Always wear gloves when gardening and wash hands after use.
- Close bag after use to avoid drying out and to prevent contamination. Store in cool, dry conditions
- White mould: under certain conditions a white mould may appear on the surface of some of the particles in Bark Nuggets. This is entirely normal and not harmful to humans, plants or animals.

Plastics

The Bark Nuggets packaging has been manufactured using at least 30% post consumer waste plastic. We are working with our suppliers to increase this level as quickly as we can. The bag is 100% recyclable but check regionally for local recycling options.

Specification

Main Constituents	Pine, Douglas fir and larch bark
Origin	British
Nominal Particle Size	15 – 65mm
Dust and fines	minimal
pH	4.5 – 5.5
Bulk Density	200 – 250 g/l
Durability	4+ years
Fire tested to BS 4790	Yes

Product & Barcodes

Bag Size	60 litres
Product Code	5066
Bags per Pallet	50
Pack Weight	16-17kg
Barcode Number	5060157810728

Volume Calculator

Please note that the calculator is for general guidance only.

We suggest allowing approximately 10% for product settlement (15% if using Softfall™).

** All values given in the Specifications table are typical. However, some variation may occur from time to time. Melcourt Industries Ltd reserves the right to alter the specification without notice, for the purpose of product improvement.*



GBURS RootSpace

Pavement support system.

Data Sheet
24DataCell-0041.1



The GBU RootSpace Pavement Support System is an engineered, load-bearing soil cell with over 95% open void space for maximum rooting volume as well as the ability to accommodate utilities.

Overview

RootSpace is manufactured in the UK from 100% recycled material and is designed to be economically freighted. The culmination of more than 30 years' experience in planting trees in complex urban environments can be seen in our Case Studies and supported with Google Earth views.

Features

RootSpace comes in 400mm and 600mm leg lengths, and can be laid in multiples up to 3-cells deep. If using 3 cells it is recommended to install infill panels for additional lateral stability. Open lattice legs provide unlimited access for roots to 100% of the void space. RootSpace Ocean including recycled marine waste is available as an option. Unique aeration deck lid providing air to the entire system keeping the soil viable. BBA approved. EPD certificated. Infill panels can be installed along roadway edges to provide added stability for lateral loading of passing heavy traffic.

Benefits

Optimum conditions for soil biology maximising root growth and tree health. Fast and simple assembly, reducing the installation time and cost. Adaptable for various layouts to accommodate utilities and other subterranean obstacles. Minimum excavation requirements due to weight-loading capacity. At least 200mm build-up to accommodate the ArborVents to complete the aeration system. Can be used close to highways and under secondary roads with slower moving/lighter weight traffic, or within parking zones due to loading capacities. Minimal carbon footprint due to UK manufacturing and efficient transport volumes.

Product codes	Code	Height	Unit quantity	Cubic volume
	GBURS41A	400mm (1 Cell deep)	1m ²	0.4 m ³
	GBURS61A	600mm (1 Cell deep)	1m ²	0.6 m ³
	GBURS42A	800mm (2 Cells deep)	1m ²	0.8 m ³
	GBURS64A	1000mm (2 Cells deep)	1m ²	1.0 m ³
	GBURS62A	1200mm (2 Cells deep)	1m ²	1.2 m ³

Please specify whether side panels are required or not **Engineer Support Required**
Add suffix '-OP' for RootSpace Ocean version made from marine waste

Standard tree pit components	Description	Use	Included FOC / Product Code
	Structural black Geogrid	Base stabilisation and lateral support	Included
	Twinwall geonet with black geogrid c/w white nonwoven membrane	Paving layerworks support	Included
	RootSoil 20	Premium top and sub soil for filling RootSpace	ROOTSOIL20A
	Washed angular aggregate	Drainage base layer and perimeter backfill	GBUDRSC
	ArborVent aeration system c/w manifold	Aeration of the soil	RRARBV150B



Twinwall



Geogrid



Soil



Aggregate



ArborVent Manifold

SUDS tree pit components	Description	Use	Included FOC / Product Code
	Structural black Geogrid	Base stabilisation and lateral support	Included FOC
	Twinwall geonet with black Geogrid c/w white nonwoven membrane	Paving layerworks support	Included FOC
	Close weave mesh	Porous mesh for paving support and water distribution	CWMA
	Hessian fabric membrane	Short term silt filtration separation layer between soil and drainage stone	GBUHESA
	ArborSoil Hydro	Premium SUDS soil for filling RootSpace	ASHMAX
	Washed angular aggregate	Drainage base layer and perimeter backfill	GBUDRSC



Hessian



ArborCell

	Leg height*	Infill panels	Standard max loading**	Reinforced loadings**
Loading capacity	400	N	386 kN/ m ²	628 kN/ m ²
	800	N	346 kN/ m ²	557 kN/ m ²
	800	Y	448 kN/ m ²	713 kN/ m ²
	600	N	344 kN/ m ²	614 kN/ m ²
	1200	N	365 kN/ m ²	542 kN/ m ²
	1200	Y	447 kN/ m ²	667 kN/ m ²

*test included 75mm AirFlow lid
1 tonne is 9.8 kN

**These are weight loadings directly ontop of the lids, with no geotextiles or build-up included.
Reinforced material can be proposed for exceptional weight loading capacity - special request.

NBS references

RootSpace Ss_45_35_05_66
Structural Geogrid (GRN20) and Twin-wall (GLTWGNA) (Pr_15_57_33_64)
CWMA_ (Pr_25_57_51_66)
RootSoil 20 (Pr_45_31_89_50)
ArborVent (Pr_70_55_42_90)

CAD Illustrations

<https://greenblue.com/gb/resources/cad-drawings/>

RootSpace

Tree Pit Installation Guide



Health & Safety

- Works to be carried out under competent supervision.
- Lift safely using correct manual handling methods.
- Mechanical equipment to be used only by appropriately certificated persons.
- Recommend wearing full PPE including gloves, safety glasses, hard hats, safety boots, etc.
- Observe site rules and H&S requirements.
- GreenBlue Urban cannot be held responsible for any damage, loss or injury resulting from inappropriate handling, use or installation of GreenBlue products or tools or equipment used therewith.

Contents

Tools/equipment	Page 4
Components	Page 5
Quick Start Guide	Page 6
Detailed Guide	
Excavate	Page 8
Drainage layer	Page 10
Assemble RootSpace	Page 11
Backfill perimeter	Page 14
Fill with soil	Page 14
Complete lids	Page 15
Final steps before paving	Page 17
Tree maintenance guide	Page 18

Construction Traffic

Restrict construction traffic until paving is complete.

Maximum load over RootSpace during construction and paving:

Vehicle Type	Light plant	Vibrating roller	Vibrating roller	Wheeled vehicle	Wheeled vehicle
Gross vehicle weight		1.8t	2.75t	up to 7.5t	over 7.5t
Drum width / Max. Axle load		950mm wide	1300mm wide	59 kN / Axle	113 kN / Axle
RootSpace + no cover	✓	✗	✗	✗	✗
+ 150mm Type 1	✓	✓	✗	✓	✗
+ 150mm Type 1 + 75mm DBM	✓	✓	✓	✓	✗
+ 150mm Type 1 + 150mm DBM	✓	✓	✓	✓	✓

Details of loadings such as Tracked vehicles, MEWPs or Crane wheel/outriggers to be submitted to GreenBlue Urban for evaluation. (Note that the table applies to single height G2 600 and G2 400 units. More calculations would be required for double and triple height units)

Tools / equipments

Rubber mallet



Spray paint



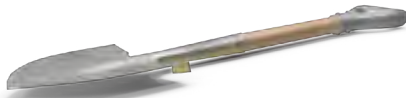
Knife



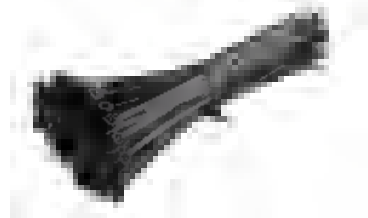
Tape measure



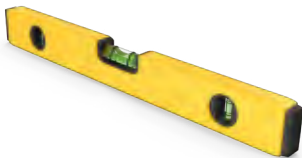
Shovel



Cable ties



Spirit level / surveyors' level



Straight edge



Compactor plate



Rake & Broom



Excavator

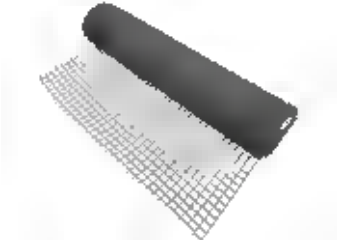


Combi drill



Components

GRN20 Netting



RootSpace Upright

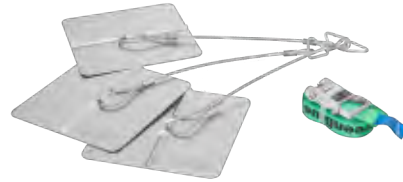


RootSpace Side Panel



*optional component

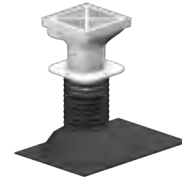
ArborGuy AnchorPlate



RootSpace Lid



ArborVent 150 - manifold/pipe/inlet

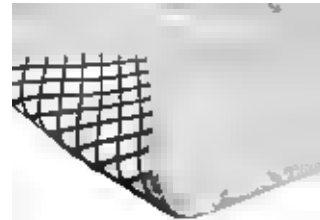


RootDirector



*Other options available

GLTWGNA Geonet

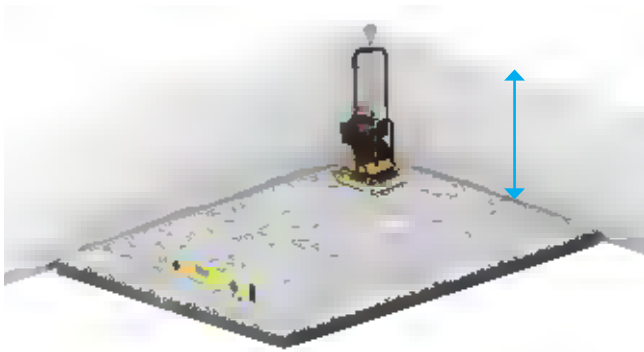


Tool kit - Install guide, zip ties, tape measure, knife,
rubber mallet



Quick Start Guide

1. Excavate tree pit, install and compact drainage stone flat and level.



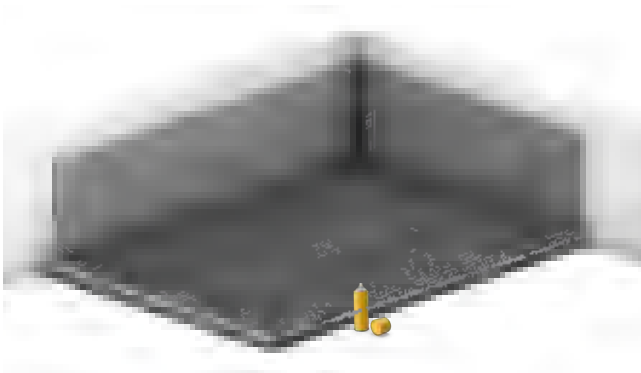
Step 1-5

2. Lay GRN20 Netting to base and up the sides.



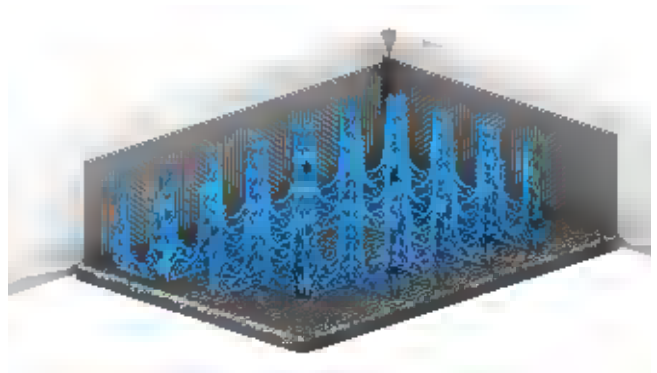
Step 9

3. Mark tree location.



Step 10

4. Assemble RootSpace Uprights around tree location.



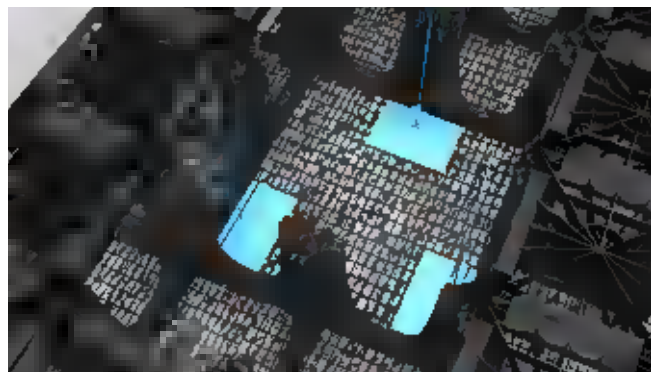
Step 11

5. Install RootSpace lids - leave 1mtr square gaps to ease soil filling.



Step 14

6. Position ArborGuy system as per product instructions.



Step 16

Quick Start Guide

7. Wrap GRN20 Netting around sides of RootSpace structure.



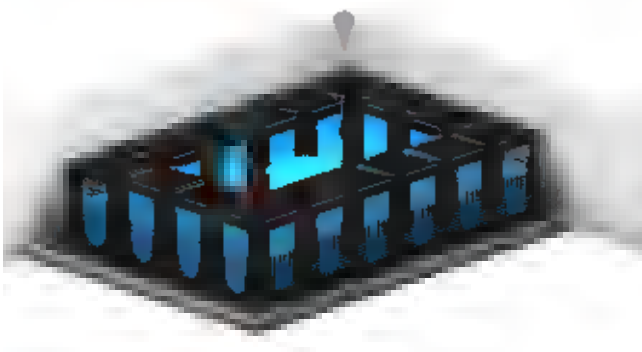
Step 15

8. Backfill perimeter with aggregate as specified.



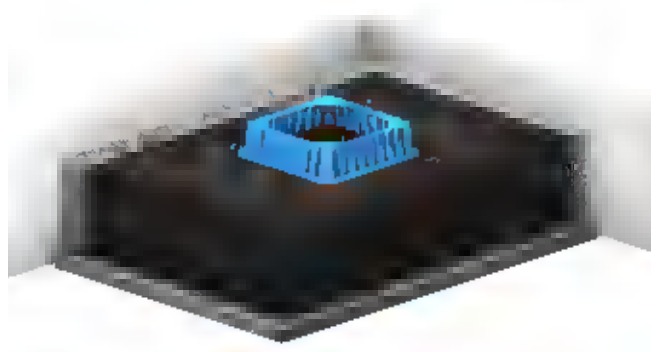
Step 17

9. Fill structure with soil, treading in thoroughly - install remaining RootSpace lids.



Step 18-21

10. Slot RootDirector into RootSpace tree location and fill with soil.



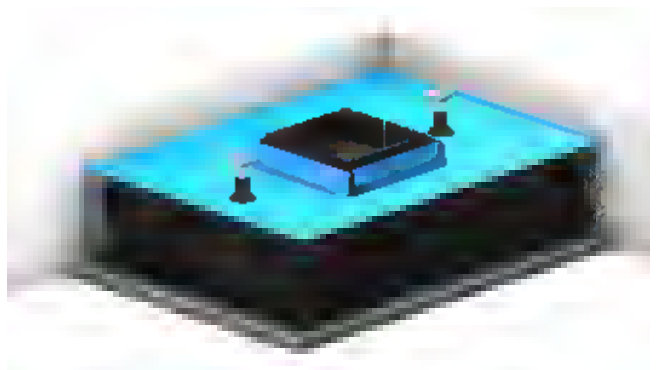
Page 17

11. Fit ArborVent aeration manifold as per product instructions.



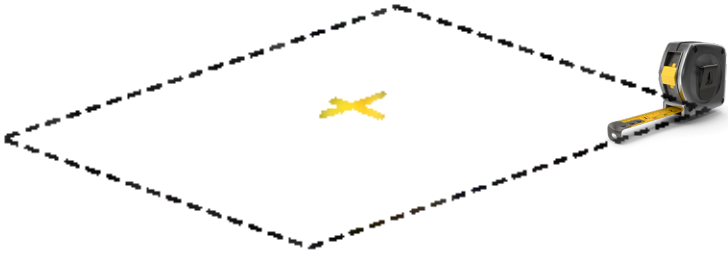
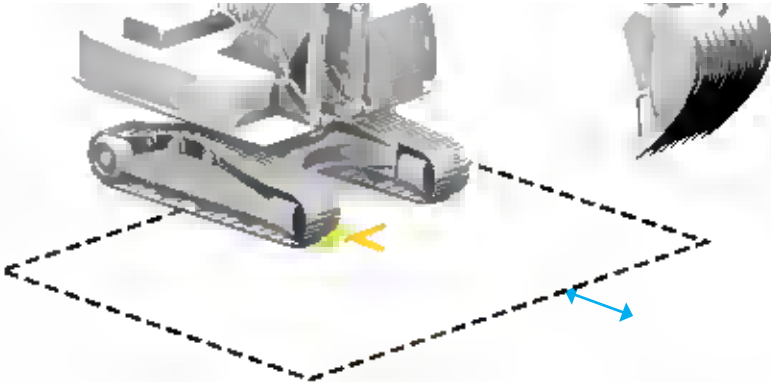
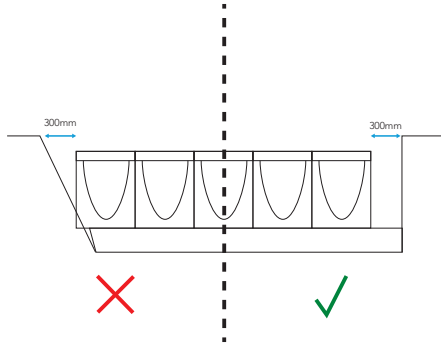
Step 23

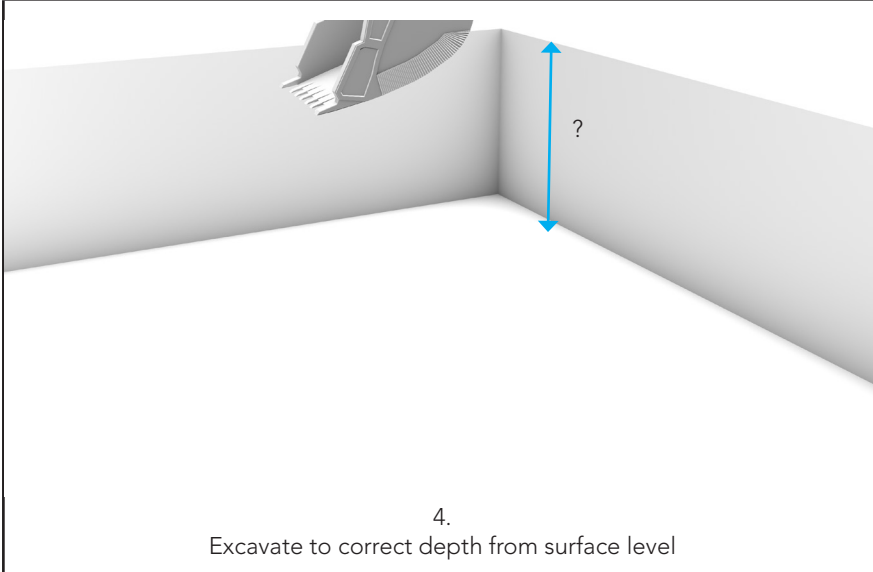
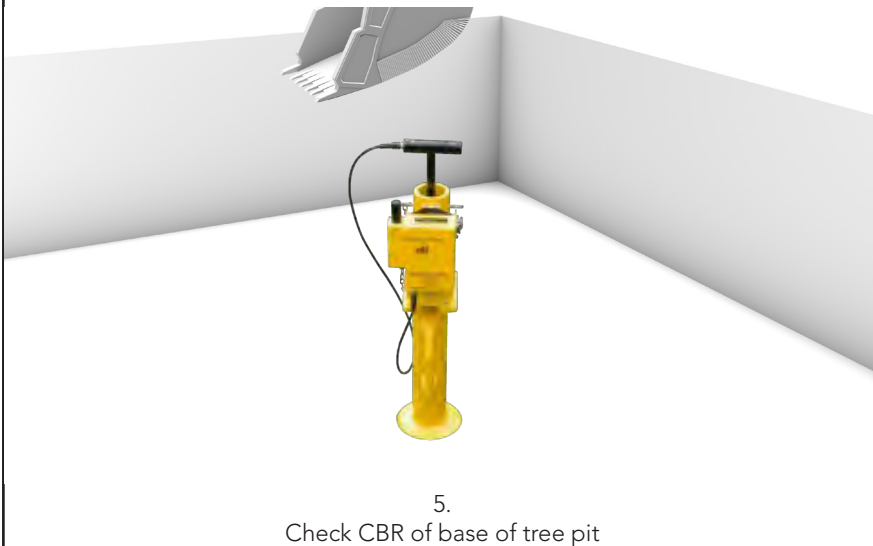
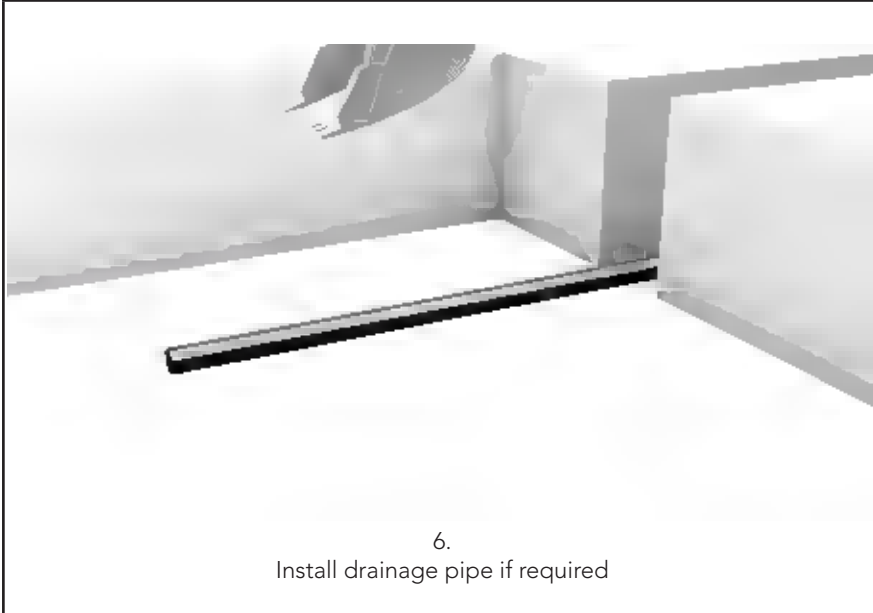
12. Lay GLTWGNA Geonet over RootSpace, RootDirector sides.

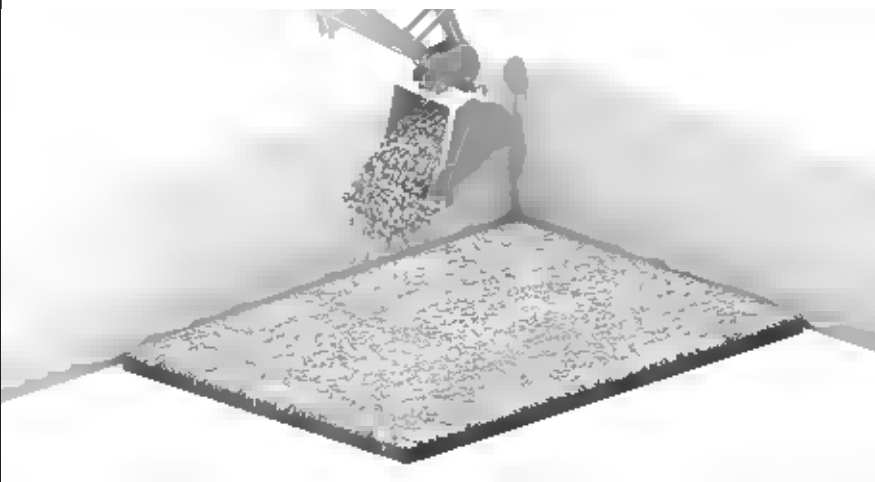
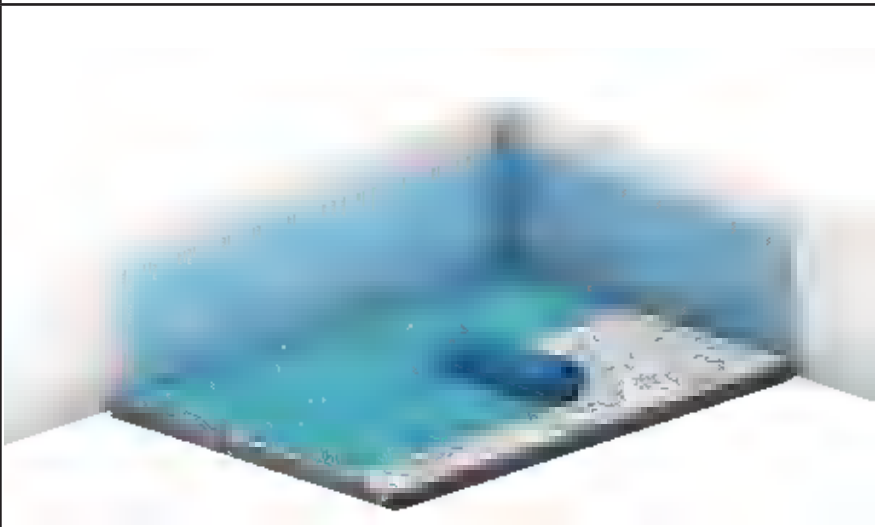


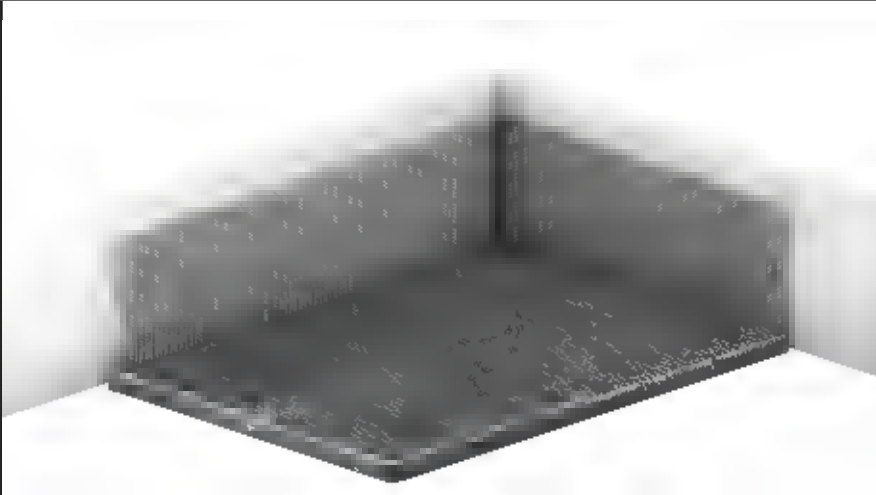
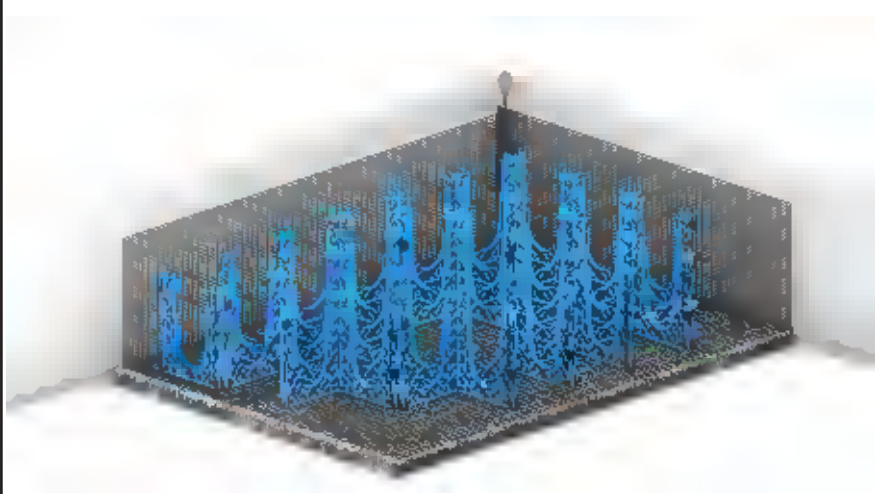
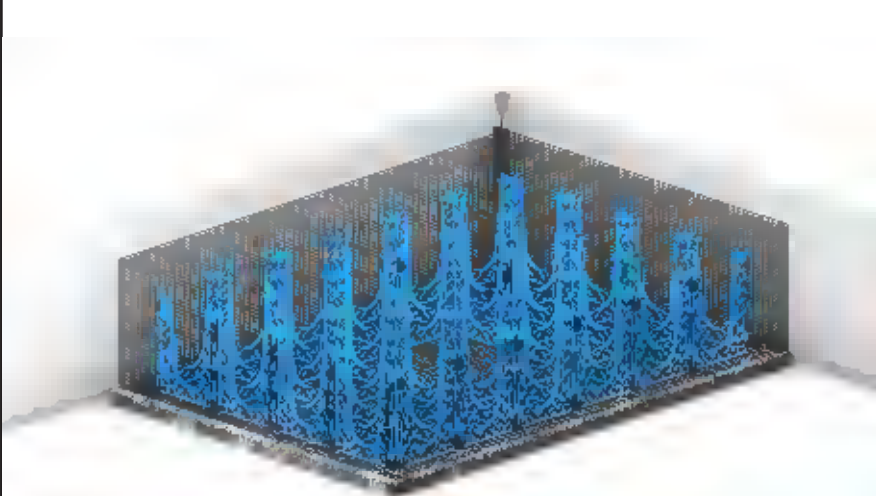
Step 24

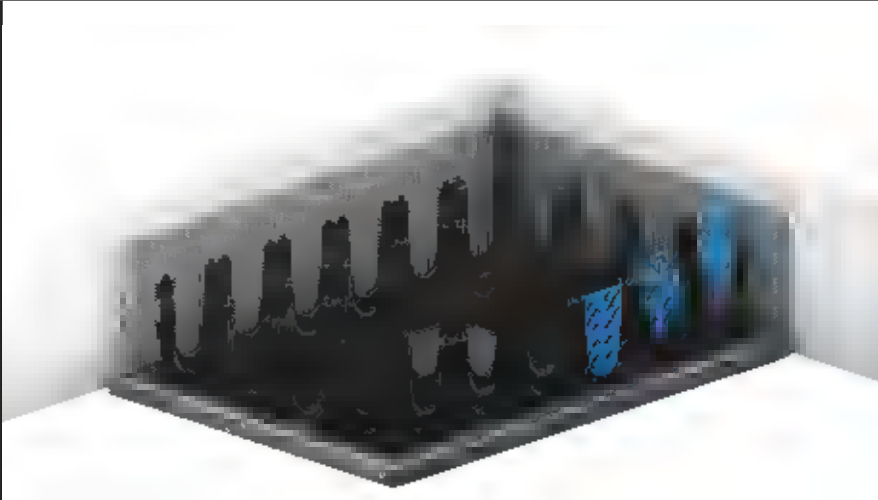
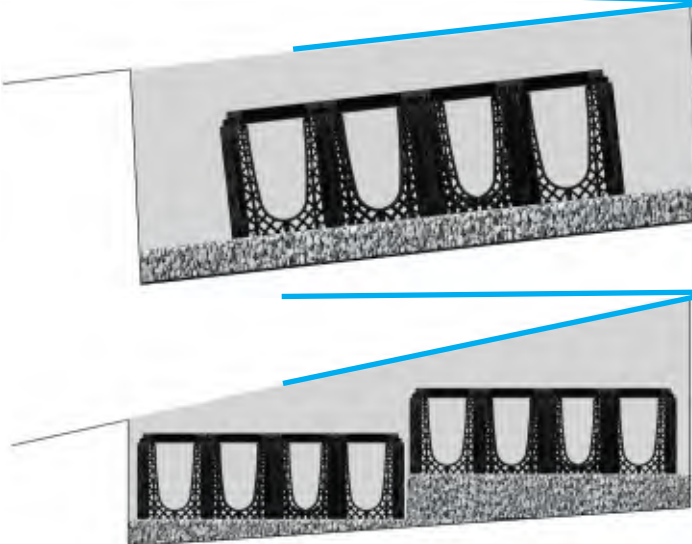
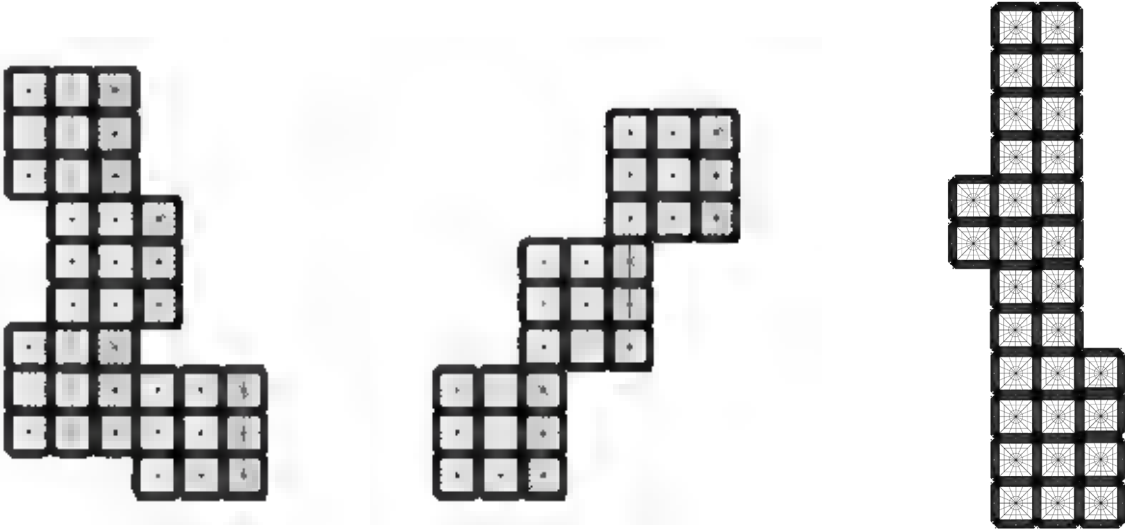
Detailed Guide

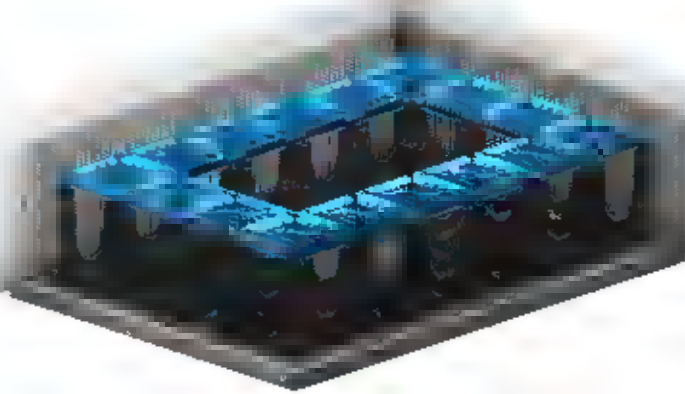
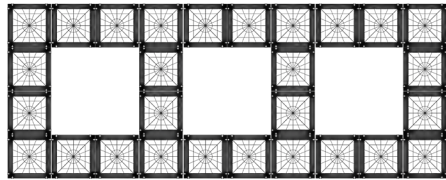
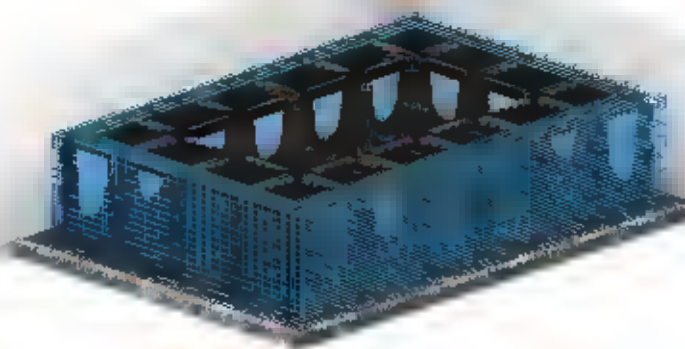
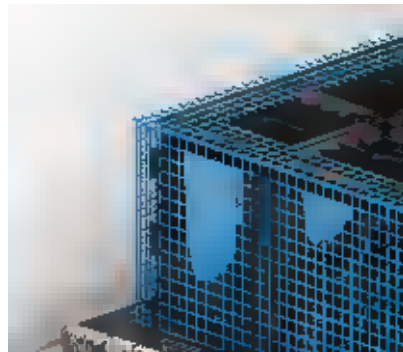
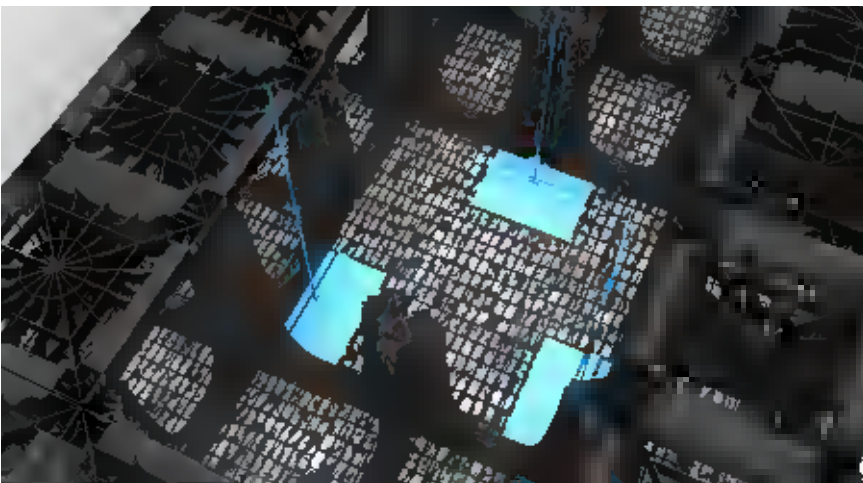
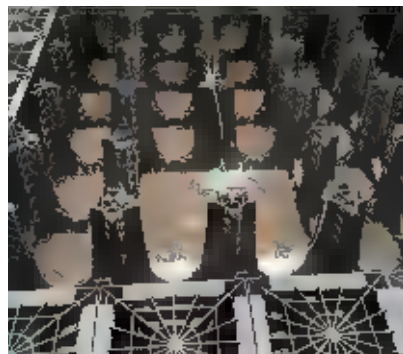
Main guidance	Advice	External ref
 1. Mark location of tree		Refer to engineers drawing
 2. Mark perimeter of RootSpace construction		Refer to engineers drawing
 3. Excavate 300mm beyond RootSpace perimeter	 Straight sides	

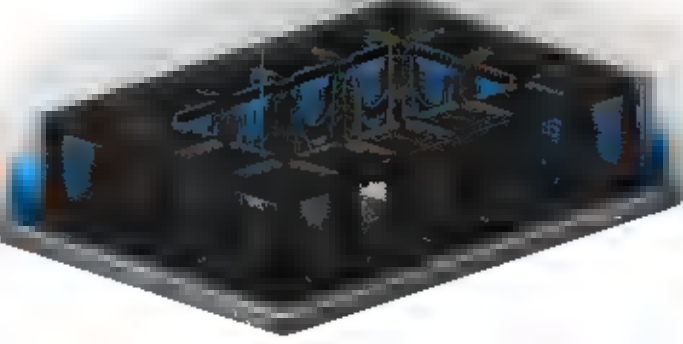
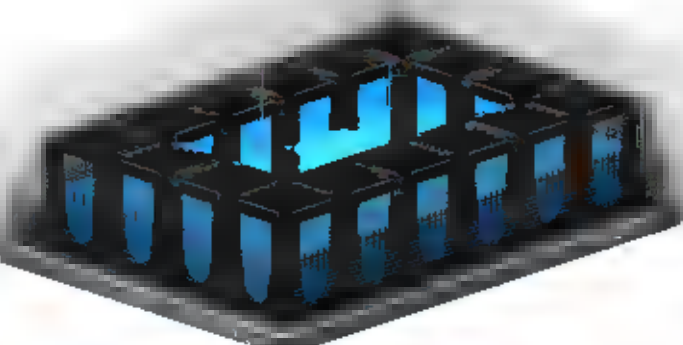
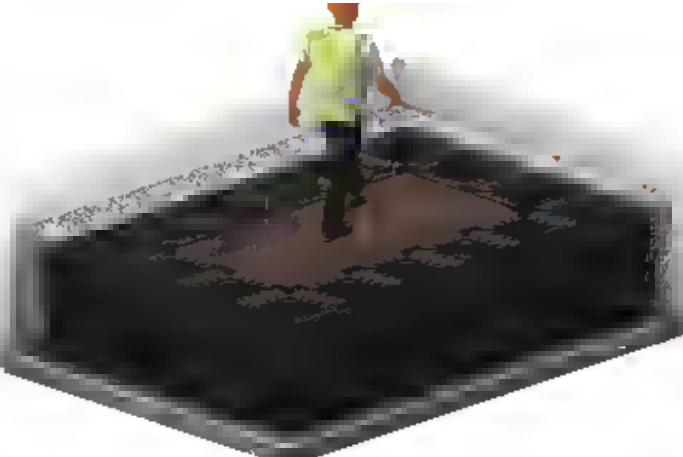
Main guidance	Advice	External ref										
 4. Excavate to correct depth from surface level	<table><tr><td>Tarmac</td><td>*m</td></tr><tr><td>Subbase</td><td>*m</td></tr><tr><td>RootSpace Lid</td><td>75mm</td></tr><tr><td>RootSpace Leg</td><td>600mm</td></tr><tr><td>Drainage layer</td><td>200mm</td></tr></table> Typical tree pit build up. *Refer to engineers drawing	Tarmac	*m	Subbase	*m	RootSpace Lid	75mm	RootSpace Leg	600mm	Drainage layer	200mm	
Tarmac	*m											
Subbase	*m											
RootSpace Lid	75mm											
RootSpace Leg	600mm											
Drainage layer	200mm											
 5. Check CBR of base of tree pit	Add twinwall geonet if CBR below 3% Engineer to approve if CBR below 2%	Refer to engineers drawing										
 6. Install drainage pipe if required	Essential for SuDS tree pits, may be required for standard tree pits	Refer to engineers drawing										

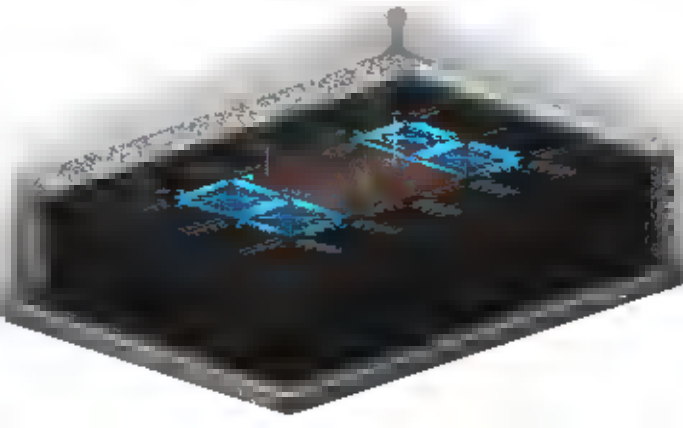
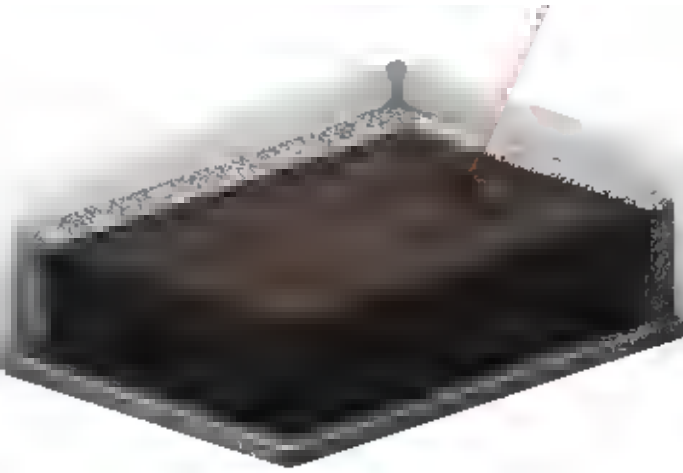
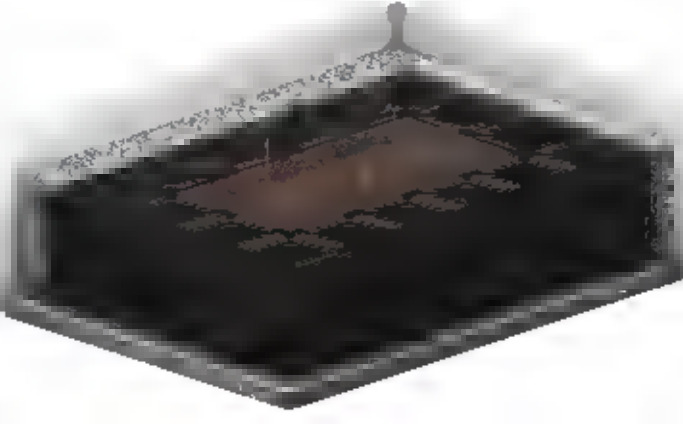
Main guidance	Advice	External ref
 7. Fill drainage stone	Drainage stone to base and sides of tree pit to be clean angular 20-40mm stone with no fines.	
 8. Carefully level and compact to correct depth		Refer to engineers drawing
 9. Lay GRN20 Netting to base and up the sides	Overlap layers of GRN20 by 100mm	

Main guidance	Advice	External ref
 10. Mark exact location of tree - square for space for rootball		Refer to engineers drawing
 11. Construct RootSpace Uprights around tree location		
 12. Complete RootSpace Upright assembly		

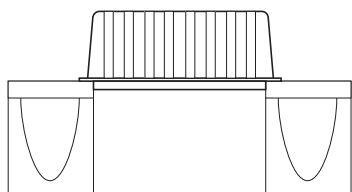
Main guidance	Advice	External ref
 13. Fit side panels	Only supplied if required by engineer	Refer to engineers drawing
Incline 	Suitable for gradients up to (1:20). Gradients greater than (1:20) to be approved by structural engineer. Suitable for any incline.	
Curves 		

Main guidance	Advice	External ref
 14. Fit RootSpace lids around perimeter and strips across tree pit	 Plan view For larger tree pits, ladder Rootspace lids before filling with soil	
 15. Wrap GRN20 Netting around sides of RootSpace structure and secure to RootSpace lids using cable ties	 Ensure GRN20 Netting is lapped over the shoulder of the RootSpace lids and secure with cable ties.	
 16. Install ArborGuy AnchorPlate. Secure wire to RootSpace lids using cable ties	 Real example of anchor plates in situ.	

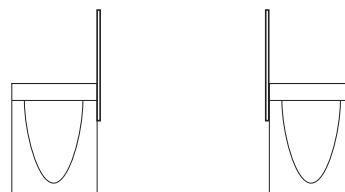
Main guidance	Advice	External ref
 17. Backfill stone around perimeter		
 18. Fill RootSpace with soil	If possible, counter balance back filling of stone with the filling of soil	
 19. Foot treading soil	No compactor plates just light foot treading	

Main guidance	Advice	External ref
 20. Fit remaining lids		
 21. Fill soil to top of lids	Essential due to soil settlement	
 22. Compact perimeter stone		Refer to engineers drawing

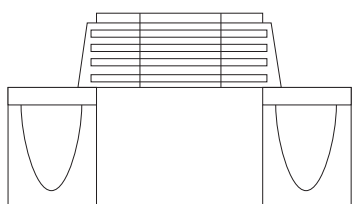
This is a range of optional products used for root control. Refer to engineers drawings to confirm selection.



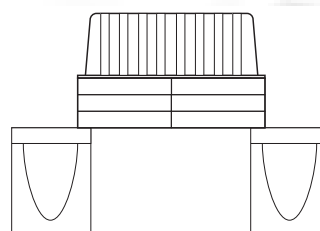
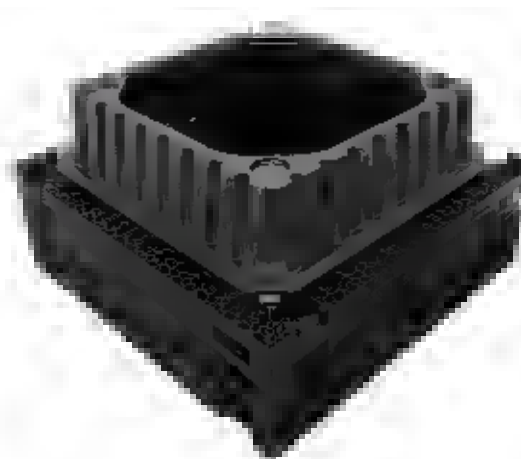
Root Director



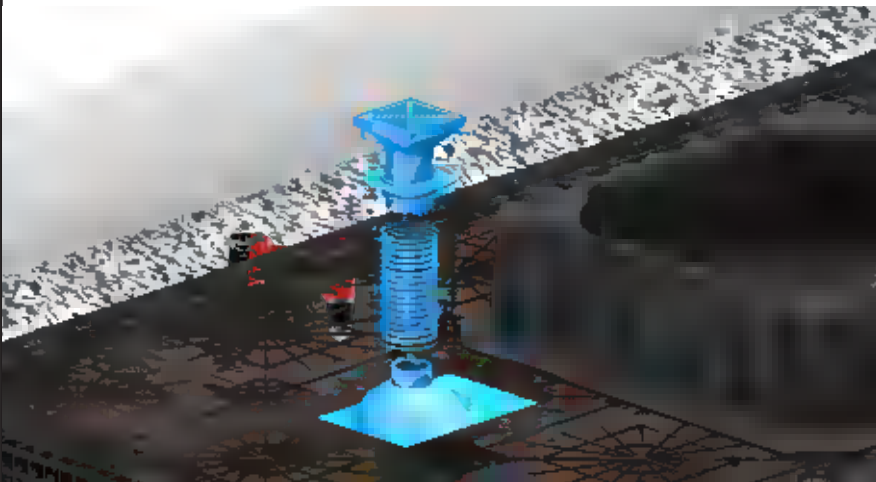
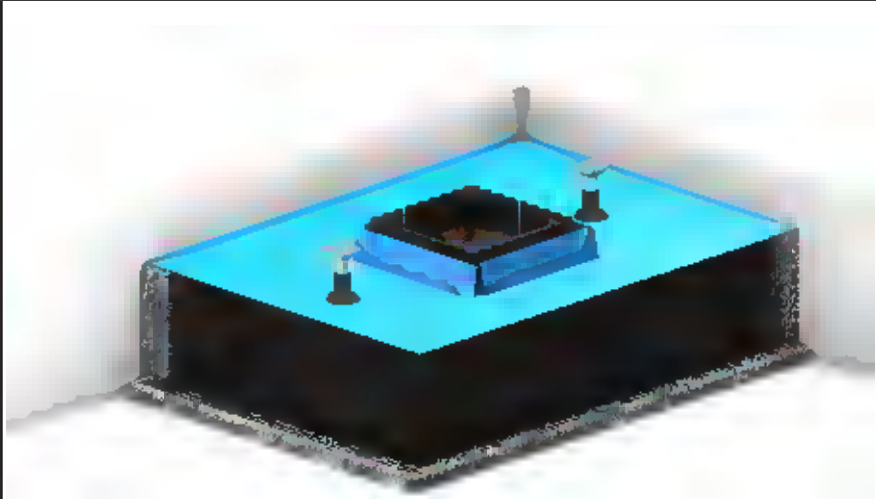
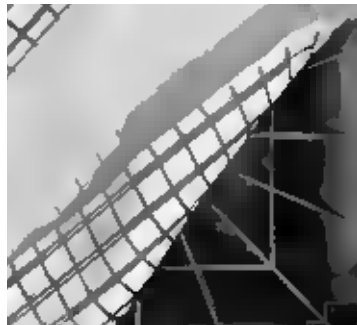
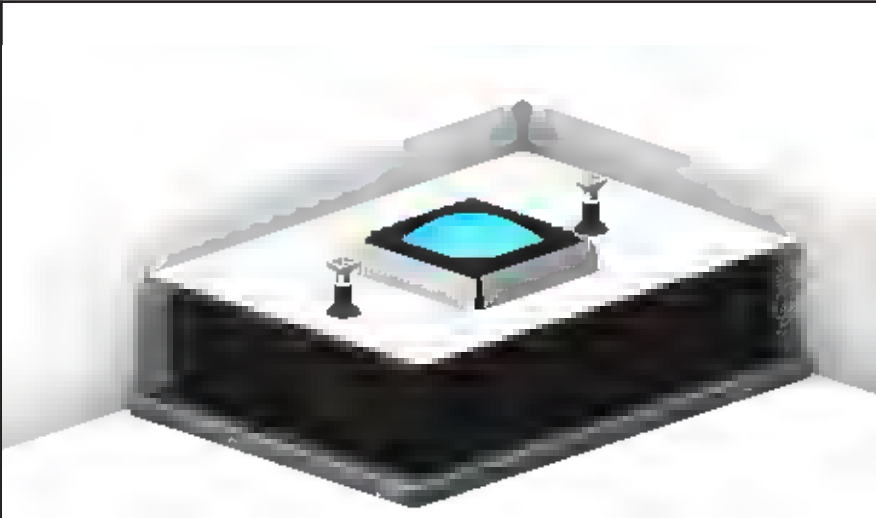
ReRoot Ribbed



RootForm



RootDirector Riser + Root Director

Main guidance	Advice	External ref
 23. Assemble and position ArborVent 150	Securing with screws is preferable	
 24. Lay GLTWGNA Geonet	 Install black side down. Lap up the sides of root directors by 200mm. Installed beyond the perimeter of the RootSpace structure by 300mm.	
 25. Fill RootDirector with soil	Light foot treading only. System now ready for paving to engineers' specification. Please note allowable construction traffic restrictions (refer to Page 3).	

Ongoing tree maintenance
2-4 Weeks after planting Check to see if anchor straps need re-tensioning. Check soil level.
6 months Maintain regular irrigation during growing seasons, frequency and water volume determined by climatic conditions. Visual inspection to check for pest and disease. Clear leaf litter in Autumn. Clear irrigation and aeration inlets with blue filter brush.
5 years Visual inspection to check for pest, disease, and damage. Formative pruning and crown lifting if necessary. Check suitability of grille and guard.
10 years + Check growth and remove guard/grille as required.

RootRain Precinct

Irrigation and aeration for rooting areas below hard surfaces.



Overview

GreenBlue's RootRain Precinct 100 irrigation and aeration system maintains long term soil health and fertility by facilitating high volumes of water and nutrients such as oxygen to reach the tree rooting area directly, and allowing toxic gasses to escape. This is critical for trees for, without water and aeration, soil beneath paved areas will quickly become anaerobic and unable to support the life of the tree.

The Precinct 100 is designed with irrigation and aeration of the wider tree pit in mind, but can be used for the primary root-ball irrigation depending on the type of tree surround being used. The heavy-duty cast aluminium structure is perfect for heavily trafficked hardscape areas.

Features

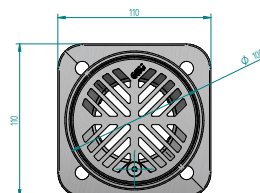
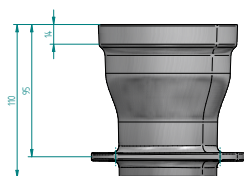
Heavy duty cast aluminium inlet withstands over 10t wheel loads inc. street sweepers
Anti-vandal lid lifts and swings to one side for fast irrigation & maintenance
Unique removable self-cleaning device supplied with all ArborVents
ArborVent 150 includes Manifold for connectivity with RootSpace structure
Concrete flange at base of ArborVent prevents slumping

Benefits

Constant gaseous exchange for soil health
Critical for tree survival and longevity
High quality robust construction for durability during construction and throughout working life
Flush mounting fits seamlessly with virtually any type of paving finish
Flush finish heel-safe grating eliminates trip hazards
Self-cleaning device atomises water flow to reduce soil erosion within tree pit

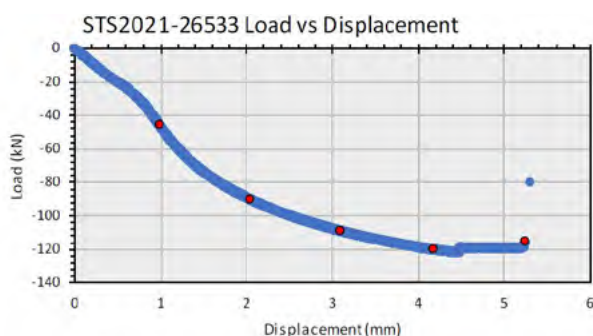
	Code	Inlet size	Pipe dia	Downpipe	Pipe length	Inlet	Inline filter
Product codes	RRPREC1C	100mm dia	60mm	700mm	3mtr	Single	RRILF60A
	RRPREC2C	100mm dia	60mm	700mm	5mtr	Single	RRILF60A
	RRPREC3C	100mm dia	60mm	700mm	8mtr	Single	RRILF60A
	RRPRECDI3C	100mm dia	60mm	700mm	8mtr	Double	RRILF60A

Technical Drawings



Precincts are suitable for vertical loads up to 10t

Load bearing capacity



	Part	Material	Finish	Colour
Finish	Body	ADC12 Aluminium	Machined	Natural
	Lid	ADC12 Aluminium	Brushed	Natural
	Pipe	Recycled HDPE	Natural	Black
	Tee	Recycled HDPE	Natural	Black

Bespoke options Precincts can be manufactured in other materials such as brass and bronze.

Maintenance **Annual inspection**
Clean irrigation and aeration inlet filter brushes



ReRoot 300, ReRoot 600 and ReRoot 1000 products (Patent 2311309) are ribbed root barriers designed for the protection of paved surfaces, shallow service ducts and utilities.

Overview

This versatile root management system can be used to surround individual or groups of trees because the ribs are proven to divert lateral root growth downwards which has many benefits.

Many local authorities now state in their planning policy that trees planted in soft areas within 3m of a paved/hard surface, that will be adopted by the council, must be lined with a root barrier.

Features

Available in 300mm, 600mm and 1000mm depths
Supplied in roll form and cut to order in 10m increments to minimise waste
100% recycled HDPE is resistant to puncture, biodegradation, and photodegradation
ReRoot jointing tape allows root-proof joints
Full depth rib - the rib extends to the full depth of the root barrier

Benefits

Prevents 'root girdling' - a fatal rooting pattern
Deeper root growth improves drought tolerance and tree stability
Guides roots away from areas vulnerable to de-icing salts
Prevents pavement 'root heave' effectively eliminating trip hazards
Ease of installation in virtually all situations with no specialist equipment required
Roll form provide flexibility to work around obstacles while being rigid enough to hold it's form when backfilling

		Code	Depth	Roll length			
Product codes		RER300A	300mm	30mtr			
		RER600A	600mm	30mtr			
		RER1000A	1000mm	30mtr			
Rib profile	Width: 13mm Depth: Full depth - rib extends to the full depth of the root barrier Distance between ribs: approx 300mm						
Material	100% recycled extruded polypropylene 1mm thick						
Lifespan	In excess of 50 years						
Material performance characteristics	Test	Standard		Mean	Std Dev		
	Static Puncture CBR	BS EN ISO 12236:2006(2016)	Force (kN)	3.10	0.46		
			Displacement (mm)	94	21		
	Melt Flow Index	BS EN ISO 1133-1:2011(2016) 190c, 2.16KG	g/10min	0.12	-		
	Tear Resistance	BS ISO 34-1:2015 Trouser Tear Method A					
			Machine Direction	F, N	140.8	7.8	
				d, mm	1.07	0.02	
				T _s kN/m	131.5	5.8	
			Cross Machine Direction		F, N	136.5	3.8
					d, mm	1.06	0.06
					T _s kN/m	128.7	4.8
			Permeability: ReRoot is completely impervious to water Chemical resistance: HDPE is resistant to most bacerial and chemical degradation				
	Accessories	RERJTA - ReRoot jointing tape for root-proof joints					
Maintenance	No maintenance required						

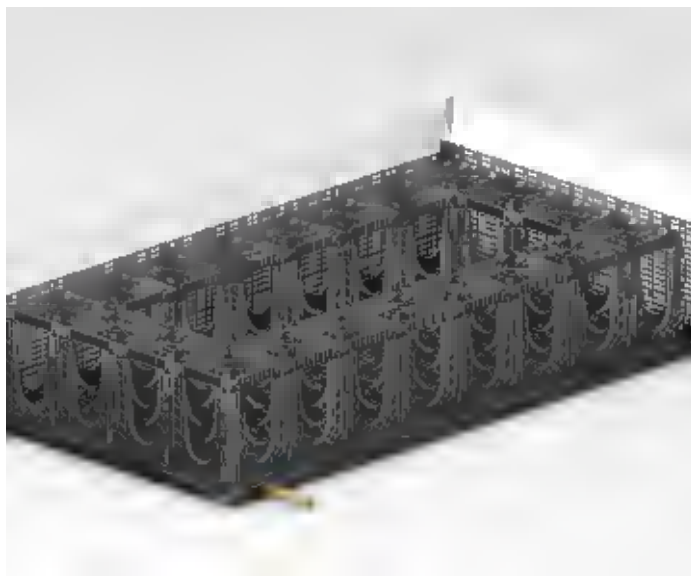
ArborGuy AnchorPlate

Installation Instructions

These instructions show the recommended installation procedure for GreenBlue Urban's **ArborGuy AnchorPlate** system.

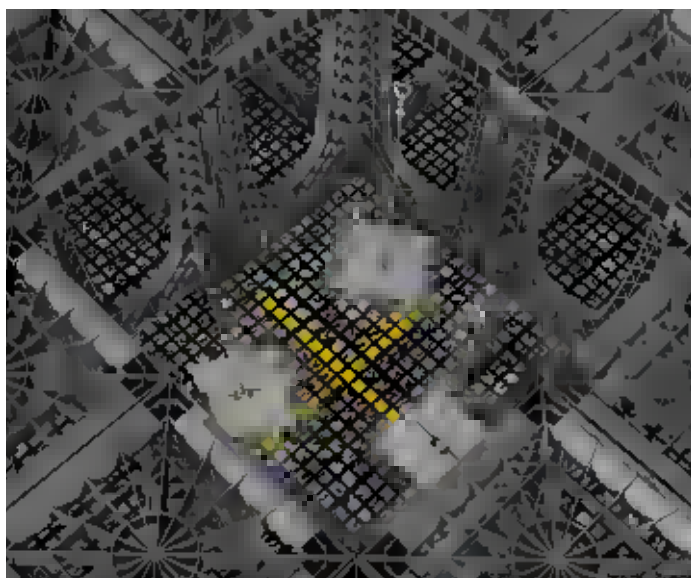


1



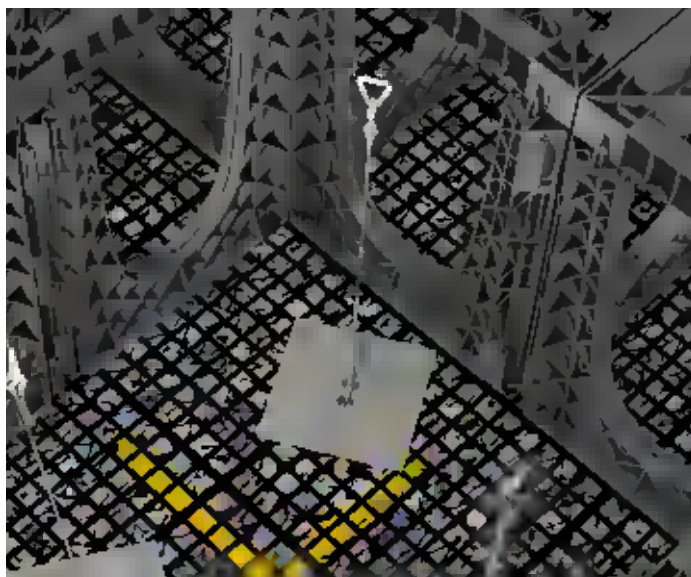
**Prior to ArborGuy installation
RootSpace must be assembled.**

2



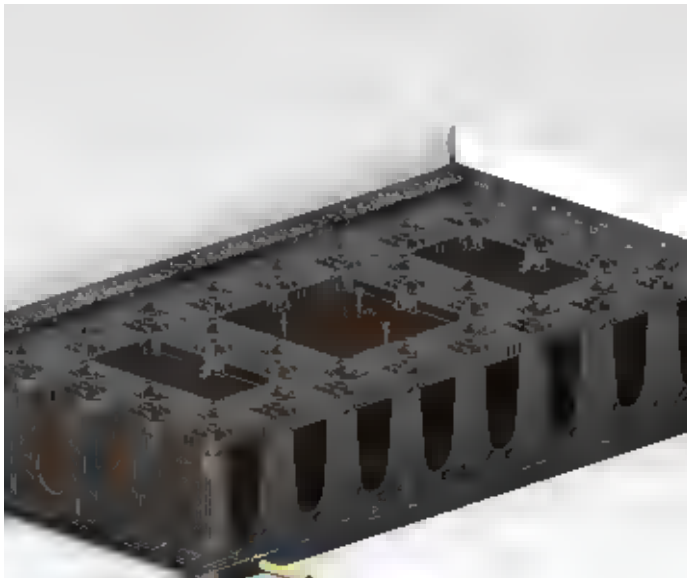
**Place plates in the bottom of the tree
pit, located partly beneath RootSpace
legs (where possible).**

3



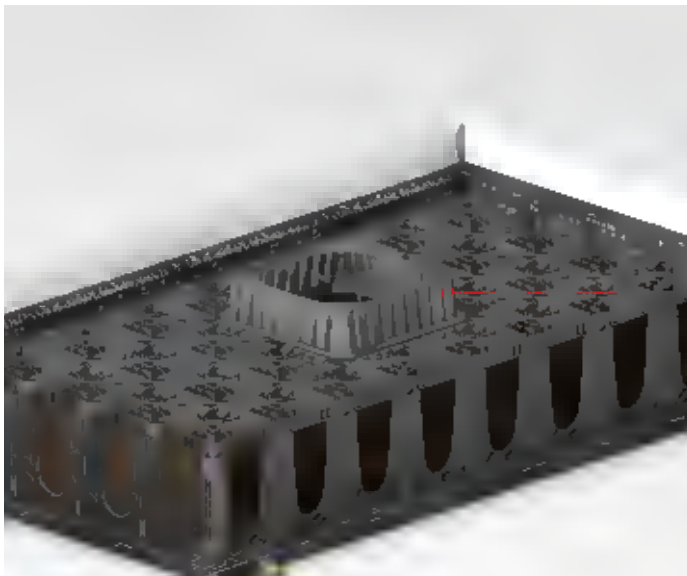
**Tie ArborGuy wires up to the top of
the RootSpace to prevent them being
buried by soil.**

4



RootSpace to be filled with soil - compact soil by foot treading only.

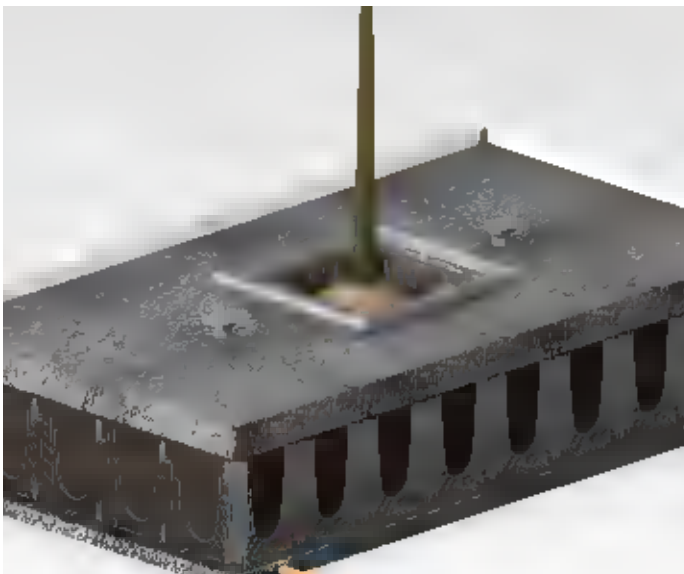
5



Root director positioned on top of the RootSpace.

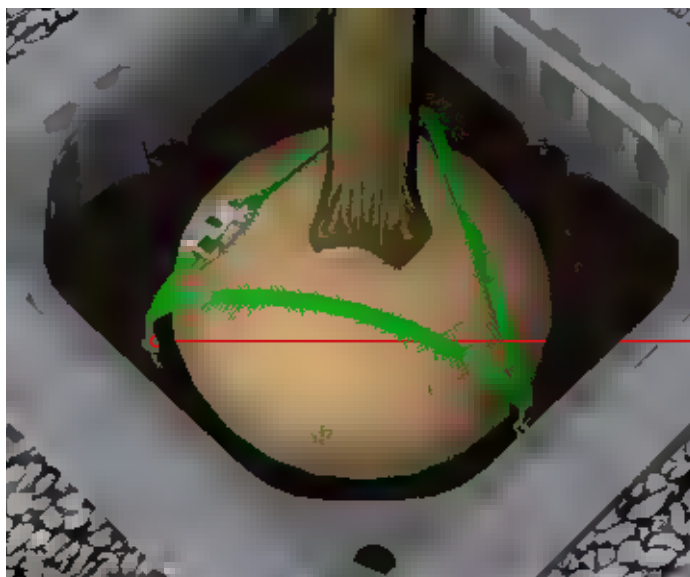
Root Director

6



Plant tree.

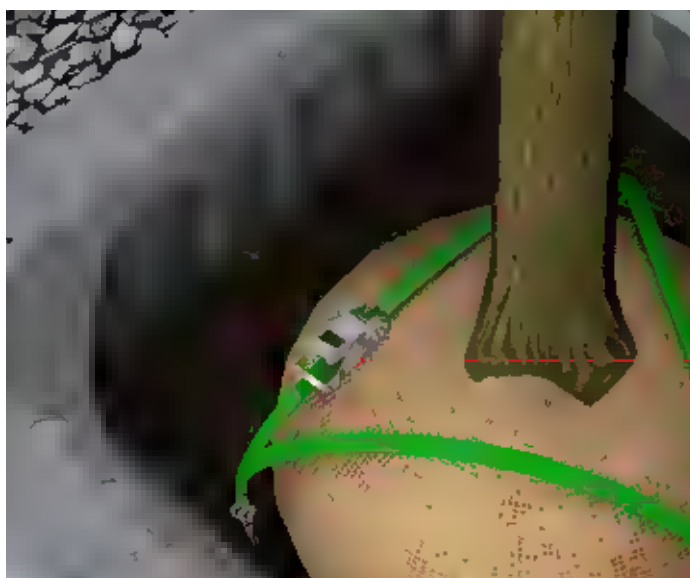
7



Thread ArborGuy strap through rings on ArborGuy wires.

ArborGuy wires.

8



Thread ArborGuy strap through ratchet lever and tension as tightly as possible without damaging the tree rootball.

Ratchet

9



Check and retention within 3-6 months.

ArborSoil Hydro MAX



SPECIFICATION

GreenBlue Urban, following months of extensive research in field and laboratory, have developed a unique, marketing-leading blend of soil for rain gardens and SuDS tree pits.

Quality control

With a growing supply chain throughout the UK, ISO9001 standard of supplier selection and quality control is essential to providing assurance in consistency of materials and long-term reliability of performance.

Due to a wide variation in availability of raw materials around the UK, monitoring suppliers and raw materials is a critically important. Regular supplier audits and detailed records are kept of all raw materials. Monitoring of blending and handling processes is also crucial to ensure accuracy of blending.

Physical Properties

Particle grade	MIN	MAX
Stones >8	1	6
Coarse gravel 8-4	10	30
Fine gravel 4-2	10	25
Very coarse sand 2-1	8	15
Coarse sand 1.0-0.5	8	15
Medium sand 0.50-0.25	20	35
Fine sand 0.250-0.125	2	10
Very fine sand 0.125-0.050	1	5
Silt 0.050-0.002	1	5
Clay <0.002	1	5
Organic matter	5	15

Hydraulic Properties

Parameter	MIN	MAX
Saturated HC (mm/hr)	350 +/-25%	
Total Porosity (%)	32	55

Chemical Properties

Parameter	MIN	MAX
pH	5.5	8.5
Electrical conductivity (1:2.5 water extract) us/cm	-	1500
Total Nitrogen (%)	0.1	-
C:N Ratio	-	20:1

Phytotoxic Contaminants

Parameter	Unit	Upper limit
Cadmium	mg/kg	< 11
Nickel	mg/kg	< 180
Copper	mg/kg	< 200
Lead	mg/kg	< 200
Zinc	mg/kg	< 300

GENERAL PURPOSE MEADOW MIXTURES, EM1-EM3

EM1, EM2 and EM3 are perennial mixtures for creating flower rich meadows on a wide range of soil types.

MEADOW MIXTURES for SPECIFIC SOILS, EM4-EM10

These mixtures are designed specifically for different soil types, including clay, loams, sandy soils, calcareous soils and wetlands.

BRUSH HARVESTED MEADOW MIXTURES, EM11-EM32

These are completely wild mixtures and have been brush harvested directly from high quality wild donor sites.

SPECIAL PURPOSE MIXTURES, EP1, EH1 and EW1

This group includes mixtures for the wet conditions at pond edges, the shaded conditions below hedges, and woodland ground flora.

CORNFIELD ANNUALS, EC1 and EC2

These wild cornfield annual mixtures produce a brilliant display of flowers in the first summer after sowing. Maintain from year to year by cultivating in the autumn.

MIXTURE COMPOSITION

Most of our complete mixtures consist of 20% wild flower seed and 80% grass seed by weight. The exceptions are; EM1, which contains 10% wild flower seed, EM2, which contains 15% wild flower seed, and Cornfield Mixtures EC1 and EC2, which are 100% wild flower seed. Special mixtures can be created by selecting seeds from the species lists, and/or by combining a range of flower (only) and grass (only) mixtures in varying proportions. The species composition of our mixtures will change to suit the season and the availability of species. For example, Yellow Rattle will not germinate from a spring sowing. Please keep an eye on our website.

SOWING RATES for MEADOW MIXTURES

The standard rate for sowing meadow mixtures in a garden, or a landscaping situation, is 4g/m². This rate should not be exceeded, but may be reduced when sowing on farmland and over large areas. In such situations, and where conditions are good, 2g/m² is usually adequate. The rate may be reduced further to 1g/m². This low rate creates an open structure, allowing for natural colonisation by other species. An application rate of 1g/m² equates to approximately 1,000 seeds/m².

If resources are limited it is better to sow at a low rate on a larger area than at a standard rate on a small area. The standard rate gives quicker establishment of full ground cover, but after 10-20 years there may be little observable difference between sowing rates of 4g/m², 2g/m² and 1g/m².

EM4: MEADOW MIXTURE for CLAY SOILS

EM4 is a special mixture for clay soils, containing wild flowers and wild grasses that are well adapted to these conditions.

% **Wild flowers (EM4F)**

0.5	<i>Achillea millefolium</i> , Yarrow
0.5	<i>Agrimonia eupatoria</i> , Agrimony
0.5	<i>Betonica officinalis</i> , Betony
2.0	<i>Carex flacca</i> , Glaucous Sedge
2.5	<i>Centaurea nigra</i> , Common Knapweed
0.2	<i>Filipendula ulmaria</i> , Meadowsweet
0.5	<i>Geranium pratense</i> , Meadow Crane's-bill
1.0	<i>Knautia arvensis</i> , Field Scabious
0.2	<i>Leontodon hispidus</i> , Rough Hawkbit
1.5	<i>Leucanthemum vulgare</i> , Moon Daisy
0.2	<i>Lotus corniculatus</i> , Bird's-foot Trefoil
1.0	<i>Malva moschata</i> , Musk Mallow
2.5	<i>Plantago lanceolata</i> , Ribwort Plantain
0.4	<i>Primula veris</i> , Cowslip
2.0	<i>Prunella vulgaris</i> , Selfheal
1.5	<i>Ranunculus acris</i> , Meadow Buttercup
0.5	<i>Ranunculus bulbosus</i> , Bulbous Buttercup
1.0	<i>Rhinanthus minor</i> , Yellow Rattle
0.5	<i>Rumex acetosa</i> , Common Sorrel
0.5	<i>Silaum silaus</i> , Pepper Saxifrage
0.5	<i>Vicia cracca</i> , Tufted Vetch

% **Meadow grasses (EG4)**

5.0	<i>Agrostis capillaris</i> , Common Bent
3.0	<i>Anthoxanthum odoratum</i> , Sweet Vernal-grass
3.0	<i>Briza media</i> , Quaking Grass
58.0	<i>Cynosurus cristatus</i> , Crested Dog's-tail
10.0	<i>Festuca rubra</i> , Red Fescue
1.0	<i>Trisetum flavescens</i> , Yellow Oat-grass



Clay soils are composed of very fine particles and are sticky and heavy when wet, and very hard when dry. Therefore they are difficult to work, and it is often best to autumn plough and allow winter frosts to create a tilth. Clay soils are usually moderately fertile and slightly acid to neutral in pH.

EM8: MEADOW MIXTURE for WETLANDS

EM8 is suitable for seasonally wet soils in lowland areas and is based on the vegetation of traditional water meadows.

% **Wild flowers (EM8F)**

0.5	<i>Achillea millefolium</i> , Yarrow
1.0	<i>Betonica officinalis</i> , Betony
3.0	<i>Centaurea nigra</i> , Common Knapweed
0.4	<i>Filipendula ulmaria</i> , Meadowsweet
3.0	<i>Galium verum</i> , Lady's Bedstraw
0.5	<i>Leontodon hispidus</i> , Rough Hawkbit
0.5	<i>Leucanthemum vulgare</i> , Moon Daisy
1.8	<i>Lotus corniculatus</i> , Bird's-foot Trefoil
1.0	<i>Plantago lanceolata</i> , Ribwort Plantain
0.5	<i>Primula veris</i> , Cowslip
0.4	<i>Prunella vulgaris</i> , Selfheal
0.8	<i>Ranunculus acris</i> , Meadow Buttercup
0.2	<i>Ranunculus bulbosus</i> , Bulbous Buttercup
0.8	<i>Rhinanthus minor</i> , Yellow Rattle
1.4	<i>Rumex acetosa</i> , Common Sorrel
0.1	<i>Sanguisorba officinalis</i> , Great Burnet
0.3	<i>Silaum silaus</i> , Pepper Saxifrage
2.0	<i>Silene flos-cuculi</i> , Ragged Robin
0.3	<i>Succisa pratensis</i> , Devil's-bit Scabious
0.6	<i>Taraxacum officinale</i> , Dandelion
0.1	<i>Tragopogon pratensis</i> , Goat's Beard
0.8	<i>Vicia cracca</i> , Tufted Vetch

% **Wetland grasses (EG8)**

4.0	<i>Agrostis capillaris</i> , Common Bent
4.0	<i>Anthoxanthum odoratum</i> , Sweet Vernal-grass
4.0	<i>Briza media</i> , Quaking Grass
54.0	<i>Cynosurus cristatus</i> , Crested Dog's-tail
4.0	<i>Deschampsia cespitosa</i> , Tufted Hair-grass
10.0	<i>Festuca rubra</i> , Red Rescue



EH1: HEDGEROW MIXTURE

EH1 contains species that are adapted to semi-shade and is suitable for sowing alongside newly planted and established hedges, and on rides and woodland margins.

% **Wild flowers (EH1F)**

2.0	<i>Agrimonia eupatoria</i> , Agrimony
0.1	<i>Alliaria petiolata</i> , Garlic Mustard
1.0	<i>Arctium minus</i> , Lesser Burdock
0.1	<i>Anthriscus sylvestris</i> , Cow Parsley
1.5	<i>Carex echinata</i> , Star Sedge
2.0	<i>Centaurea nigra</i> , Common Knapweed
0.5	<i>Chaerophyllum temulum</i> , Rough Chervil
1.0	<i>Cruciata laevipes</i> , Crosswort
0.8	<i>Daucus carota</i> , Wild Carrot
1.5	<i>Dipsacus fullonum</i> , Wild Teasel
1.0	<i>Filipendula ulmaria</i> , Meadowsweet
0.5	<i>Galium album</i> , Hedge Bedstraw
0.2	<i>Geranium pratense</i> , Meadow Crane's-bill
1.5	<i>Leucanthemum vulgare</i> , Moon Daisy
0.1	<i>Origanum vulgare</i> , Wild Marjoram
0.2	<i>Primula veris</i> , Cowslip
1.0	<i>Prunella vulgaris</i> , Selfheal
0.2	<i>Rumex acetosa</i> , Common Sorrel
0.1	<i>Saponaria officinalis</i> , Soapwort
2.5	<i>Silene dioica</i> , Red Campion
1.0	<i>Silene vulgaris</i> , Bladder Campion
1.0	<i>Torilis japonica</i> , Upright Hedge-parsley
0.2	<i>Vicia cracca</i> , Tufted Vetch

% **Grasses (EG9)**

5.0	<i>Agrostis capillaris</i> , Common Bent
4.0	<i>Anthoxanthum odoratum</i> , Sweet Vernal-grass
1.0	<i>Brachypodium sylvaticum</i> , False Brome
45.0	<i>Cynosurus cristatus</i> , Crested Dog's-tail
5.0	<i>Deschampsia cespitosa</i> , Tufted Hair-grass
10.0	<i>Festuca rubra</i> , Red-fescue
10.0	<i>Poa nemoralis</i> , Wood Meadow-grass



The flora at the base of hedges is vulnerable to field operations. Mixture EH1 can be used to repair past damage, or may be sown when planting a new hedge.

MEADOW CREATION BY SOWING ONTO PREPARED SOIL

Ground Preparation: Select ground that is not highly fertile, and does not have a problem with perennial weeds. Remove any existing vegetation by repeated cultivation or turf stripping. Then plough, surface cultivate or dig to bring up clean soil, harrow or rake to produce a medium tilth, and roll or tread to produce a firm surface. Aim to produce a firm, weed free, medium tilth, seed-bed.

Sowing rate: Sow at 4g/m² in a landscaping or garden setting. A reduced rate of around 2g/m² may be used in an agricultural setting or on large areas.

Sowing: Sow in the autumn or the spring, or at any other time of the year if the ground conditions are good. Divide the quantity of seed and sow half in one direction over the entire area and the remainder at 90°. The seed must be sown on the surface and can be applied by seed drill, seed fiddle, or broadcast by hand. Do not incorporate or cover the seed, but firm in with a roll, or by treading, to give good seed/soil contact.

Aftercare: Most of the sown meadow species are perennial and are slow to establish. Soon after sowing there will be a flush of annual weeds, arising from the soil seed bank. These weeds can look unsightly, but they will offer shelter to the sown seedlings, are great for bugs, and they will die before the year is out. So resist cutting the annual weeds until mid to late summer, especially if the mixture contains Yellow Rattle, or has been sown with a nurse of cornfield annuals. Then cut, remove and compost. Early August is a good time. This will reveal the young meadow, which can then be kept short by grazing or mowing through to the end of March of the following year.

In the second growing season, and each year thereafter, leave the meadow uncut and un-grazed from the end of March to mid-summer, allowing the sown species to flower in June and July. After flowering, cut and remove the vegetation. This may be taken off as hay, or cut and stacked nearby to rot. The meadow may then be kept mown or grazed through to the end of March in the following year. Moderate winter poaching is beneficial. Flowering in the second growing season will be very good, and as the years go by, and with good management, species diversity will increase.

Cutting date can be varied from year to year, bringing it forward to early July if the meadow becomes rank, or taking a later cut in early August if the structure is good. Perennial weeds can be controlled by selective scything or topping. Cut perennial weeds at flowering and before seed set.

MEADOW RESTORATION BY SOWING INTO EXISTING GRASS

Meadow restoration is a no-plough method for diversifying existing established grassland. However, restoration is more challenging than creation, and success depends upon, (1) a good site, (2) very hard scarification, (3) autumn sowing and (4) Yellow Rattle.

Select grassland with a good wild grass content (but otherwise species poor) on poor to moderately fertile soil. Avoid ground infested with Docks, Thistles or Nettles. Prepare in late summer by cutting low and/or grazing very hard. Then scarify hard with harrows or by raking, aiming to create around 50% bare soil. This is best done when the ground is dry. Sow on the surface in the autumn (September is the best month) using a complete meadow mixture at 4g/m², following the method given above. Then roll hard to firm back the soil and give good seed/soil contact. Continue cutting or grazing after sowing the seed, and until the end of March in the following year. From then on manage as a meadow, leaving it uncut each year till mid summer.

Yellow Rattle at up to 0.5g/m², if not already in the standard mixture, will help to suppress some of the existing coarse grasses and assist in the establishment of the sown species.

SOWING YELLOW RATTLE INTO EXISTING GRASS

Ground preparation: Yellow Rattle is a partial parasitic annual of other plant species. It's hosts include Perennial Ryegrass and Yorkshire Fog. Sowing Yellow Rattle can reduce the productivity of grassland, reduce competition from existing grasses and increase species diversity. However, establishment can be tricky. Prepare for sowing by cutting or grazing very hard in mid summer. Then scarify hard with harrows or by raking, aiming to create around 50% bare soil.

Sowing: Yellow Rattle seed has poor longevity in soil and a strict requirement for vernalisation. It will not germinate from a spring sowing. Therefore, sow fresh seed in late summer to early winter at up to 0.5g/m². Yellow Rattle may be sown alone or combined with other species. Sow on the surface and roll in. Autumn and winter grazing will help to tread the seed in.

Aftercare: Germination usually occurs around February/March. Cease grazing or cutting at the end of March and manage as an established meadow. Under favourable conditions plant numbers can increase quickly, producing a flush of Yellow Rattle in years two or three. A flush is always followed by decline, and it is this decline that provides opportunities for other sown species.

Heavy grazing or cutting during the growing season will eliminate Yellow Rattle.

SOWING SPECIAL PURPOSE MIXTURES

Ground preparation for these mixtures will be similar to that for meadow creation, taking into account the site and ground conditions. In many cases it will be necessary to create a weed free seed-bed before sowing the seed. As with meadow mixtures, sow on the surface and firm in.

Tussock, Pond, Woodland, Hedgerow, and Pollinator mixes should be left uncut throughout the year and from year to year, or can be lightly grazed. However, occasional selective scything and topping may be needed to control scrub or patches of weed.

SOWING CORNFIELD ANNUALS

Ground preparation: Cultivate the soil to create a weed free seed-bed with a medium to fine firm tilth, following the method described for meadow creation.

Sowing rate: Sow cornfield mixtures at 2g/m². If sown as a nurse for a meadow then sow both mixes together at a combined rate of 6g/m².

Sowing: If the Cornfield Annuals are being sown alone then sow in the autumn, winter or early spring. A later sowing will shift flowering beyond the normal peak in June. If sowing as a nurse for a meadow mixture then combine the two mixtures and sow in the autumn, winter or early spring. Sow on the surface and roll in.

Aftercare: Cornfield Annuals sown alone should be allowed to grow, flower and shed seed, then in late summer the area can be cut and cultivated. An annual cultivation is essential for re-establishment from self-sown seed.

If the cornfield annuals have been sown as a nurse for a meadow mixture then cut after flowering in mid summer and remove the cuttings, but do not cultivate. The cornfield annuals will suppress annual weed growth in the first year and give shelter to the under-sown perennial meadow species. After cutting manage the area as an established meadow, allowing the meadow species to replace the cornfield annuals in year two and thereafter.



Green-winged Orchid, *Anacamptis morio* and Cowslip, *Primula veris*

Donald MacIntyre, Jane Lipington, Mischa MacIntyre, Marsha MacIntyre, Laurie MacIntyre, Myrica MacIntyre, Daniel Campbell, Marc Bullock, Albert Hughes, Carl Cockle, Mark Schofield, Marion Robinson, Karen Claxton, Sue Potter, Phil Brooker, Amanda Evenett, and Nicole Scott.

Greenfix Covamat™

GENERAL APPLICATIONS

- Prepare the soil by raking the top 25mm -50mm surface layer to a uniform even finish, as shown in Fig 1 on the following page.
- Dig a 150mm "V" trench at the top of the bank, as shown in Fig 2.
- Carefully roll out the blankets, paper side down, ensuring close contact with the prepared ground, as shown in Fig 3.
- Pin the blanket to downward side of the "V" trench at 150mm centres and backfill with soil, as shown in Fig 4.
- Using suitable fixing pins secure the blanket to the slope, we recommend 3 pins per m², as shown in Fig 5. Please see indicative pinning pattern.
- Where required overlap adjacent blankets and ends of rolls by 150mm, as shown in Fig 6. Securely pin the blanket following the recommended 3 pins per m².
- To improve ground contact and seed germination thinly cast soil on the blanket, 5mm cover maximum.
- Cover all the outside edges of the blanket with soil.

DITCH AND CHANNEL LININGS

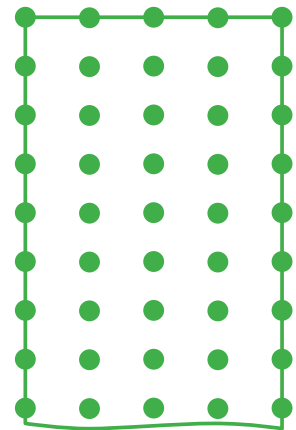
- Note the steps of General Applications above.
- For the arrangement of the blankets refer to the channel installation graphic on the following page and follow the steps below.
- Upstream ends of the blankets should be buried in a 300mm "V" trench and pinned at 150mm centres, as shown in Fig 7.
- Roll the blankets out along the length of the ditch, beginning in the invert and working up the sides, overlapping the end joints in the direction of the flow by at least 150mm, as shown in Fig 8. Pin at 150mm centres.
- Proceed by overlapping the length of the next blanket up the ditch over the lower blanket by at least 150mm and pin according to the pinning pattern, as shown in Fig 9.
- Extend the mats beyond the crest of the channel by approximately 300mm and secure by soiling or trench along the entire length, as shown in Fig 10.

STORAGE

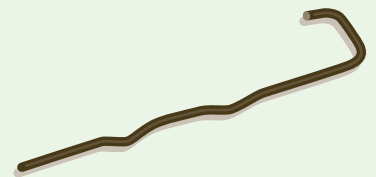
- Covamat Plus should be stored off the ground in a cool, dry space and covered. If stored correctly the rolls can remain onsite for approximately 21 days.
- Covamat Fresh rolls are required to be installed within 48 hours of delivery. Before installation these rolls should be stored off the ground in a cool, dry space to prevent germination.

INDICATIVE PINNING PATTERN

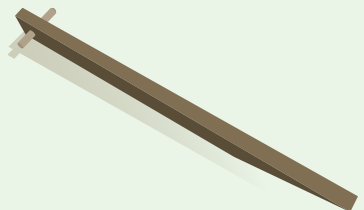
3 PINS PER SQ METRE



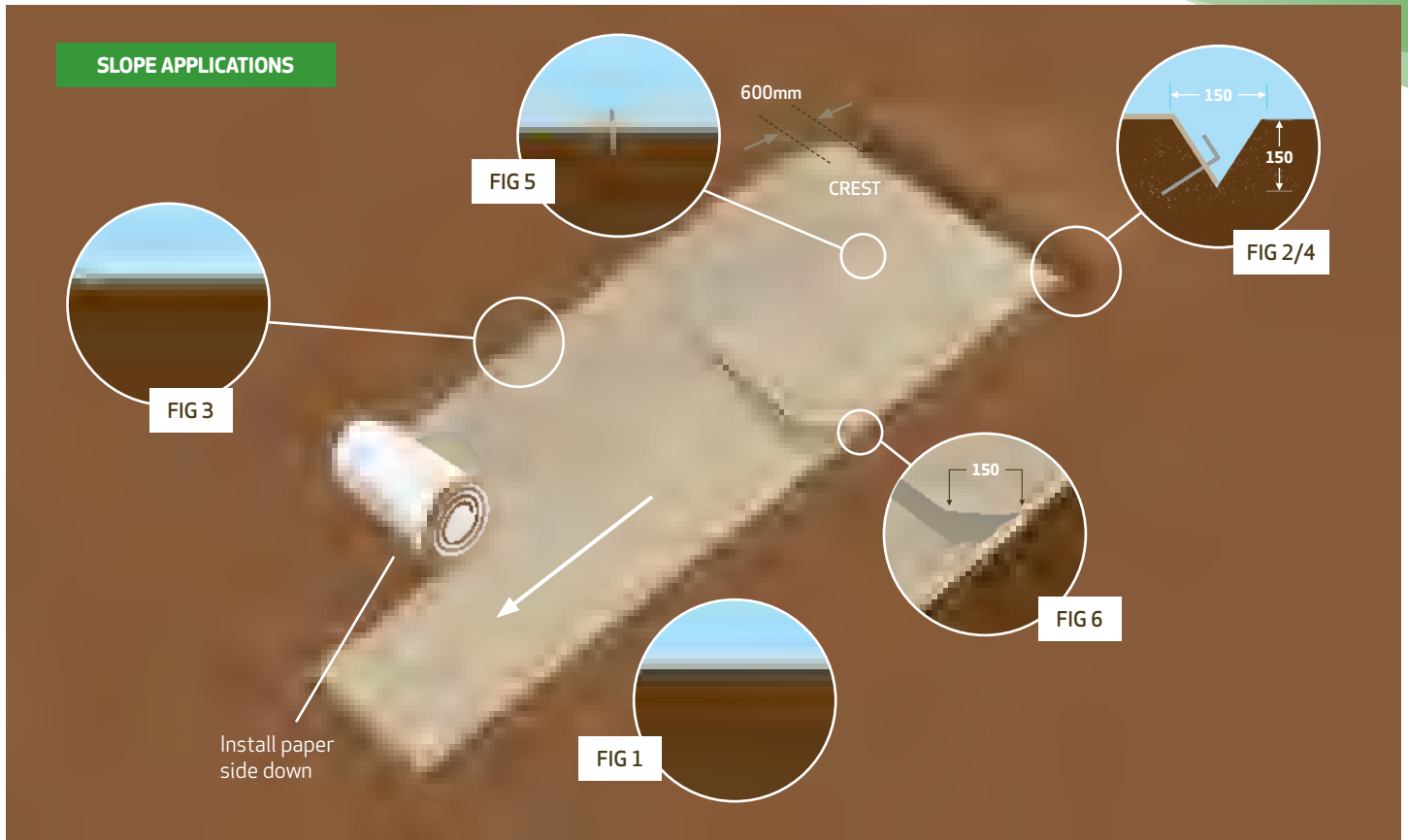
STEEL FIXING PINS



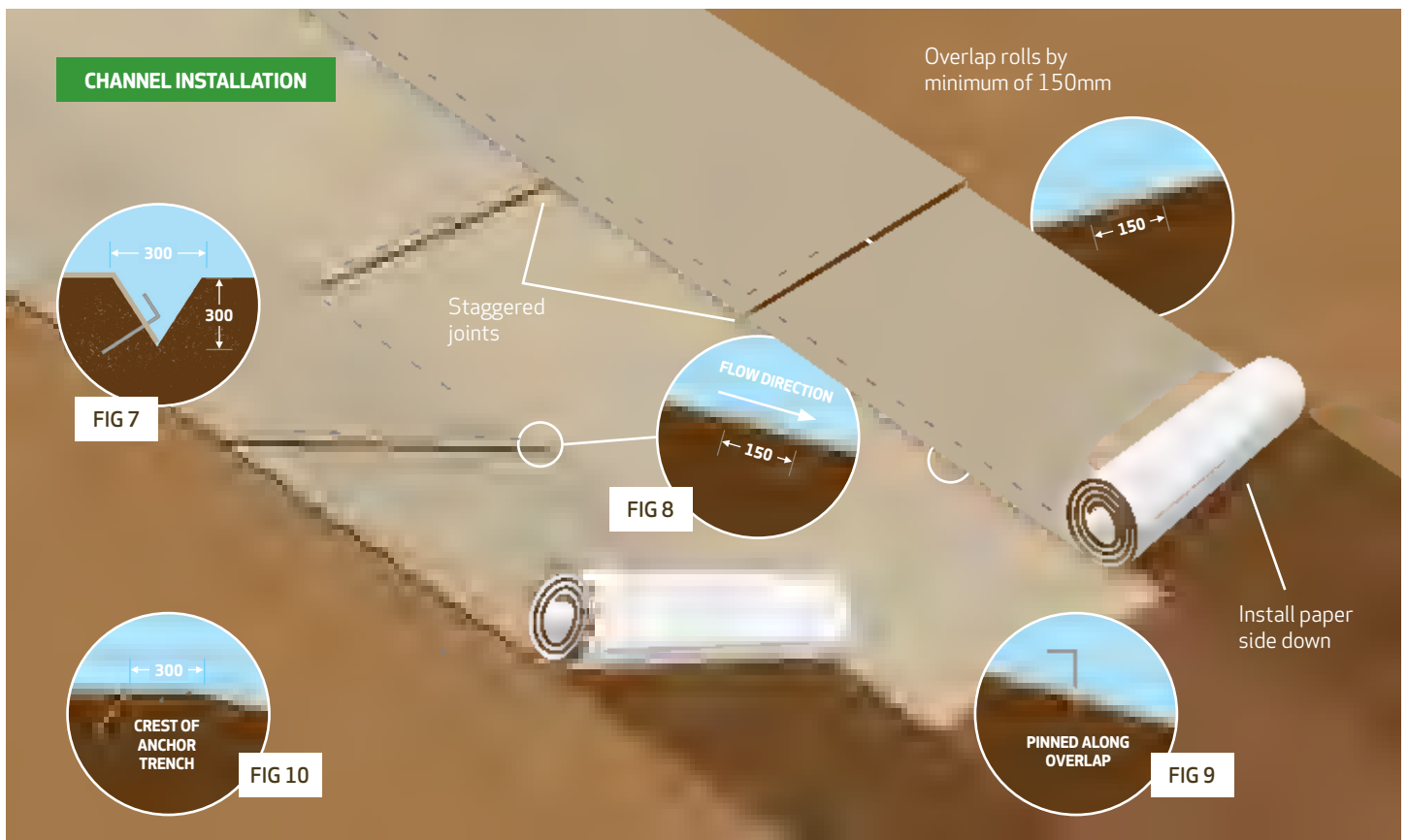
WOODEN FIXING PINS



SLOPE APPLICATIONS



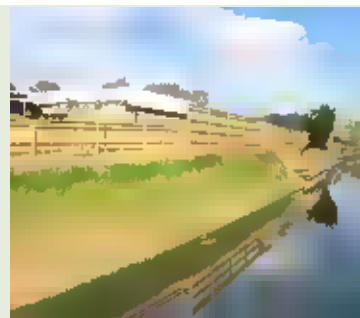
CHANNEL INSTALLATION



Greenfix Covamat™ Plus Type 3 Pre-seeded Erosion Control Blanket

Application and Benefits

Greenfix Covamat Plus Type 3 is an organic, biodegradable, Coir Erosion Control Blanket which is pre-seeded with the choice of one of Greenfix's standard seed mixes. Covamat Plus improves poor soil conditions with the addition of organic fertiliser and micro-organisms within the seed layer. This erosion control blanket is specifically designed for freshly soiled inherently stable embankments, new slope cuttings, lining for watercourses, lake edgings and road ditches.



Product Characteristics

Properties	
Fibre Content	100% Coir
Thickness	10-20mm
Blanket Weight	~650g/m ²
Fibre Weight	~420g/m ²
Seed Mix Weight	~30g/m ²
Mulchlayer Weight	~100g/m ²
Paper Backing Weight	~30g/m ²
Organic Fertiliser Weight	~80g/m ²
Functional Longevity	30-36 Months
Roll Sizes	1.2m x 25m OR 2.4m x 25m
Structure	
Bottom Netting Type	Light
Top Netting Type	Medium
Bottom Netting Size	8 x 9mm
Top Netting Size	12 x 13mm
Bottom Netting Weight	7.1 g/m ²
Stitching Thread	Polypropylene-thread (Brown) UV Degradable
Slope Recommendations	1:1 or > Max 2:1
Flow Recommendations	3.4 m/s
Standards	
Tensile Strength ISO-10319 (kN/m MD X TD)	4.0 x 1.4
D4595 Elongation (%) (MD x TD)	18.5 x 19.1
D4491 Flow Velocities, Short Term	4.26 m/s
Max Permissible Shear Stress	1100 g/m ²
"n" Values Roughness Coefficient	0.014

Greenfix Standard Seed Mixes

The following standard seed mixes are for use within Greenfix Pre-seeded Erosion Control Blankets. Please make Greenfix aware of the seed mix selection when placing an order. A Wildflower Seed Mix can be added to any of the below seed mixes upon request, please note this will incur an extra cost of £0.35m².

Please note clovers and legumes are added where poor soil conditions exist but should not be used in good quality soils as they can dominate. They fix Nitrogen into the soil to improve fertility, which is good for swales and ponds.

Wetland Seed Mix (1A)		
Rapid establishment and hard wearing, good for steep slopes and flood endangered areas. Excellent sod forming and erosion protection, strong root development, salt resistant.		
Mix %	English Name & Advantages	Latin Name
30%	Perennial ryegrass; Quick to establish, wear tolerant and regenerative	Lolium perenne
30%	Creeping red fescue; binds, drought and salt tolerant, good erosion protection	Festuca rubra rubra
30%	Chewings fescue; low maintenance, good for dry low nutrient soil, shade tolerant	Festuca commutata
10%	Smooth stalked meadow grass; binds soil, good wear and regenerative qualities	Poa pratensis

Standard Seed Mix (1C)		
As per 1A and with clover added for poor soils. Most widely used mix. Good for road embankments, swales and coastal applications.		
Mix %	English Name & Advantages	Latin Name
27%	Perennial ryegrass; Quick to establish, wear tolerant and regenerative	Lolium perenne
27%	Creeping red fescue; binds, drought and salt tolerant, good erosion protection	Festuca rubra rubra
27%	Chewings fescue; low maintenance, good for dry low nutrient soil, shade tolerant	Festuca commutata
12%	Smooth stalked meadow grass; binds soil, good wear and regenerative qualities	Poa pratensis
3%	Red Clover; dark pink flower, nitrogen fixing	Trifolium pratensis
2%	White clover, spreads rapidly in moist soil	Trifolium repens
1%	Birdsfoot trefoil; used in dry, sandy soils	Lotus corniculatus
1%	Yellow trefoil; thrives in dry conditions	Medicago lupulina

Low Maintenance Seed Mix (2A)		
Low maintenance, shade tolerant. Use in better quality soils. Strong root development and erosion protection. Salt resistant.		
Mix %	English Name & Advantages	Latin Name
35%	Creeping red fescue; binds, drought and salt tolerant, good erosion protection	Festuca rubra rubra
30%	Chewings fescue; low maintenance, good for dry low nutrient soil, shade tolerant	Festuca commutata
30%	Smooth stalked meadow grass; binds soil, good wear and regenerative qualities	Poa pratensis
5%	Brown top bent; cold tolerant, low maintenance, rhizomous, very dense growth	Agrostis tenuis

Dry and Stony Soil Seed Mix (2B)		
Dry stony soils, strong root development, erosion protection and salt resistant.		
Mix %	English Name & Advantages	Latin Name
25%	Creeping red fescue; binds, drought and salt tolerant, good erosion protection	Festuca rubra rubra
30%	Chewings fescue; low maintenance, good for dry low nutrient soil, shade tolerant	Festuca commutata
20%	Smooth stalked meadow grass; binds soil, good wear and regenerative qualities	Poa pratensis
5%	Brown top bent; cold tolerant, low maintenance, rhizomous, very dense growth	Agrostis tenuis
20%	Sheeps fescue; for poor soils, drought tolerant, densely tufted	Festuca ovina

Poor Soil Seed Mix (2C)		
Low maintenance, shade tolerant. Use in better quality soils. Strong root development and erosion protection. Salt resistant. Added clover for poor soil conditions.		
Mix %	English Name & Advantages	Latin Name
25%	Creeping red fescue; binds, drought and salt tolerant, good erosion protection	Festuca rubra rubra
25%	Chewings fescue; low maintenance, good for dry low nutrient soil, shade tolerant	Festuca commutata
10%	Smooth stalked meadow grass; binds soil, good wear and regenerative qualities	Poa pratensis
5%	Brown top bent; cold tolerant, low maintenance, rhizomous, very dense growth	Agrostis tenuis
28%	Sheeps fescue; for poor soils, drought tolerant, densely tufted	Festuca ovina

2C Seed Mix continued on following page

3%	Red Clover; dark pink flower, nitrogen fixing	Trifolium pratensis
2%	White clover, spreads rapidly in moist soil	Trifolium repens
1%	Birdsfoot trefoil; used in dry, sandy soils	Lotus corniculatus
1%	Yellow trefoil; thrives in dry conditions	Medicago lupulina

Pioneer		
For poor soils with establishment problems. 50 g/m ² Please note: this seed mix will incur an extra cost of £0.20m ² .		
Mix %	English Name & Advantages	Latin Name
25%	Perennial ryegrass; Quick to establish, wear tolerant and regenerative	Lolium perenne
25%	Creeping red fescue; binds, drought and salt tolerant, good erosion protection	Festuca rubra rubra
10%	Brown top bent; cold tolerant, low maintenance, rhizomous, very dense growth	Agrostis tenuis
15%	Sheeps fescue; for poor soils, drought tolerant, densely tufted	Festuca ovina
7%	Red Clover; dark pink flower, nitrogen fixing	Trifolium pratensis
7%	White clover, spreads rapidly in moist soil	Trifolium repens
2%	Birdsfoot trefoil; used in dry, sandy soils	Lotus corniculatus
3%	Yellow trefoil; thrives in dry conditions	Medicago lupulina
2%	Suckling clover (Irish Shamrock)	Trifolium dubium
4%	Alsike clover	Trifolium hybridum

Greenlok Installation Guide

All installation should be conducted referring to design drawings and any site-specific installation guidance. Where unusual soil conditions or patterns of erosion are present, on site supervision should be undertaken by a qualified engineer.

1. Fill and Close Bags

If Bags are supplied unfilled then fill bags with specified fill material and seeded internally if required (Refer to section 9 for vegetation guidance). Bags should be filled consistently and closed with the supplied closure tie. Bags can also be sewn closed or secured with hog rings.

2. Preparation of Base

Prepare a trench to serve as toe stabilisation and scour protection. The embedding depth of wall below ground level will be project specific. A minimum trench depth will be 100mm. Higher structures will require deeper embedding. Compact base of trench with a hand rammer. Where bags are installed transversely (side on) then trench will be 700mm wide. In watercourse applications a deeper trench will be required that sits below the scour line.

3. First Course Bag Placement

Place 2 spikes per bag in the bottom of the trench so that they will sit in the centre of the bag. Place three quarters filled bags transversely (side on) with closed neck end facing inwards and with each bag facing in the same direction. When bottom course is complete lightly tamp the filled bag with a hand rammer to ensure a stable foundation.

4. Additional Bag Course Placement

Bags should be placed in a running bond. Do not allow overlap to line up as this will weaken the structure. Refer to the table below for setback guidance. Insert two spikes evenly spaced in the top of each bag. Spikes are placed according to the slope of wall and 100mm – 150mm from end of bag, following the guidance in the table below. When compacting each course remember to allow for the bags flattening forward when the slope set back is planned. Bags may be placed either seam in or out to installer preference. Bag necks should be placed over the next bag in sequence, so neck is visible. This will give better frictional interlock with the bag above. Each bag should face in the same direction.

The maximum slope angle should be 76 degrees. The lowest angle of slope at which spikes can be used is 28 degrees. Please see suggested spike placement below, although site specific guidance can be sought.

Degrees	Slope	Spike Placement
71	3:1	170mm from rear edge of bag
63	2:1	140mm from rear edge of bag
45	1:1	100mm from rear edge of bag
28	1:2	edge of spike on bag rear edge

5. Termination of Courses

At the end of alternate courses there needs to be an end bag placed transversely (side on) at each end of the structure to keep bag placement aligned for overlap. This also stops a pyramid formation occurring. If there is no space to allow for a transversely placed bag then half fill a bag and place as others in the course.

6. Backfill and Compact

Backfill and compact after each course. Site won fill may be suitable for backfilling. Backfill must be capable of compaction to the design requirements, be free draining and may require inclusion of a growing medium. Compaction of bag courses should be by hand tamper such as a Tarmac Rammer. Backfill can be compacted using a plate compactor immediately behind the wall and heavier plant a minimum of 1.0m from the rear of the wall. Compaction plant should be suitable for the soil classification, conditions and depth of fill (refer to engineer or series 800 specification for highway works).

7. Geogrid

If Geogrid reinforcement is part of the design suggestion begin placement at the front of the bag course, referring to the site-specific design drawing for correct placement. Place spikes on top of the Geogrid before placing the following course. After placing next layer of bags, geogrid should be pulled taut and backfilling carried out from front to rear of the structure.

8. Final Course

The final bag course is turned transversely (side on) to anchor the structure to existing landscape. Embed the rear half of the final course bag in the backfill. Less bag fill material may be required to accommodate this. Refer to site specific instructions and design.

9. Vegetating

The bags rely on vegetation to provide the ultra-violet resistance. Vegetation should be applied to the structure within two weeks of vegetated bag system placement. Bags shall be watered prior to installing any vegetation. Soak bags thoroughly using low pressure water source.

Seeding:

Hydro-seeding is the preferred method of seeding. Apply hydro-seeded material to the wall or slope face of the vegetated structure to achieve complete coverage of the exposed bag face. Use a seed mixture which responds to the specific site environmental conditions of the site. Advice should be sought from a reputable Hydro-seeding contractor. Contact Greenfix for further assistance.

Live Planting:

Planting with locally available native, ornamental or groundcover plants may also be used to re-vegetate the structure. The root ball can be positioned snugly under the Vegetated bags. Depending on the chosen plants and site location, a slow release fertilizer may be required. Plants shall be placed between bags only. DO NOT Puncture bags or place plant material inside the bag.

Greenlok Mechanically Stabilised Earth (MSE) - Vegetated Soil Retention System

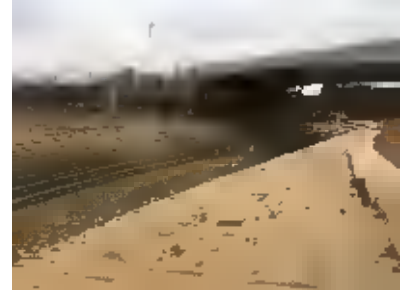
Technical Specification

Greenlok is a modular earth retention system comprising of vegetated geotextile bags. Greenlok is an ideal alternative to hard solutions such as gabions where a softer more conformable solution is required. Most Mechanically Stabilised Earth (MSE) systems work against the existing landscaper where Greenlok works in sympathy with it. Filled with suitable sand or gravel/soil mix, locally planted or hydroseeded on completion Greenlok create an attractive stable slope vegetated with grasses, wildflowers or later plants, while the high-quality Geotextile construction of the bag provides long term stabilisation of the embankment or wall.

Applications

Greenlok is particularly suitable for use in hard to access sites, areas prone to water erosion and situations requiring tightly curved slopes to adapt to watercourses or shorelines. Greenlok can also form part of a Sustainable Drainage System.

Retaining Walls	Unlike hard landscaped solutions Greenlok works by enhancing the existing surroundings providing ecologically sustainable environments that blend with nature. Gravity Walls or MSE retention systems are easy to design and practical to install with Greenlok.
Slope Protection	Greenlok can restore existing slopes that have eroded or slumped over time. It can also be used to create entirely new slopes. To add to the flexibility of Greenlok, earth anchors and Geogrids can be used to stabilise steep slopes and banks.
Storm water Control	The natural permeable surface of Greenlok will allow infiltration of water into the system, helping vegetation growth and controlling erosion caused by rainwater runoff.
Watercourses	The vegetated slopes of Greenlok are ideal for controlling scour, and wave energy, making it suitable for use in rivers subject to wide ranges of water level.
Landscaping	Greenlok is often used to create decorative walls and can be planted in addition to internally or externally applied seeding.



Design Considerations

When planning a Greenlok vegetated system the following points need to be taken into account.

- Slope or Wall height and length
- Soil conditions at the base of the system
- Surcharge to the top of the wall or slope
- Type of vegetated surface required

All types of structure should be designed and installed under the supervision of a qualified engineer. Please speak to our sales office on 01608 666027 for access to our engineering partners.

Infill material

Greenlok bags can be supplied filled or unfilled. When supplied filled there are three standard fills. Compost is not used in Greenlok bags due to its tendency to slump after installation. Silts, clays and larger aggregates are not suitable fill materials.

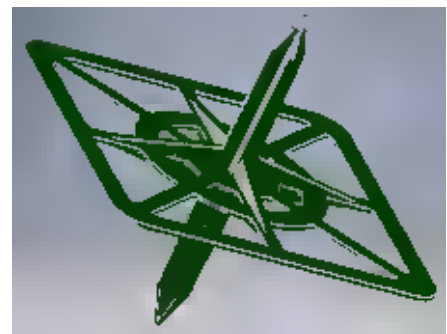
100% 4-20mm Gravel – this fill is used in bags at the base of a slope or wall or in water courses.

70% Sand 30% Soil – this fill is used in bags which will be locally planted or Hydroseeded after installation –

70% 4-20mm Gravel 30% Soil – this fill is used where a greater degree of infiltration is required.

Greenlok Accessories

Greenlok bags are supplied with three spikes and 1 closure tie.



Vegetation Establishment

The Greenlok bags can be seeded at time of filling with local grasses or wildflowers. Alternatively, the system can be Hydroseeded after installation.



Bag Specification

Greenlok vegetated wall system bags are made from a Polypropylene needle punched non-woven geotextile. Non-Woven fabric is preferred due to the random nature of the fibres used, forming a more stable matrix that is less prone to puncture or tearing than woven materials. Polypropylene is an inherently stable material within a pH range of 2 to 13. The material is resistant to ultraviolet light deterioration, and inert to commonly found soil chemicals. The fabric is resistant to rot and mildew and to vermin damage.

Filled bag dimensions 660mm x 380mm x 140mm

