



The Technology Centre

Landscape Maintenance and Management Plan

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01/02 INTRODUCTION, OBJECTIVES, AND SITE INFORMATION

01. INTRODUCTION

1.1 This document has been prepared by The Urbanists on behalf of Morgan Sindall Plc for a development adjacent to Baglan Bay Innovation Centre, Port Talbot. This document outlines the operations needed to ensure establishment of the landscaping proposed, with a five year maintenance and defects liability period included. The first year of the maintenance and defects period will be undertaken by Morgan Sindall. Following year 1, the development will remain in private ownership and maintenance of the landscape areas will be carried out by an appointed maintenance company under a separate agreement. Please refer to the Conveyance drawing/land control plan prepared by the surveyor for all private plot boundaries, Land Control information, for example which areas are managed by a Management company, local authority (if applicable). This report provides information generally on the landscape design rationale and management objectives. Please refer to the following detailed layout drawings produced by The Urbanists for the landscape proposals covered by this maintenance document: 26X003-URB-XX-XX-DR-L-90-0005, 0006, 0007, 0008, 0016 relating to Softworks drawings, 26X003-URB-XX-XX-DR-L-90-0020, 0021, 0023, 0025 Hardworks and Street Furniture drawings. Drawings shown below under management and maintenance objects.

MANAGEMENT AND MAINTENANCE OBJECTIVES

1.2 Please refer to the adjacent pages for maintenance objectives for all POS, paths, and lanes within the site. Each plan provides site specific information. In addition, please ensure:

- The Contractor/Management Company shall be responsible for preparing a yearly maintenance schedule based upon this report and updated to include ongoing Arborist inspections, Landscape Architects instructions/progress reports or approved changes to the landscape.
- All hedges are to be top cut to a height of 1000mm high and to the width shown on the Landscape planting plans. Ensure all hedgrows are pruned square top and sides, evenly shaped to Landscape Architects approval.
- For all grass areas there are several mowing regimes required. Please refer to the corresponding pages and ensure the mowing regimes are incorporated within a Maintenance schedules.
- All trees and shrubs – Please refer to the Landscape Planting plans for a suggestion on clear stemming trees. Where a 2m clear stem has been specified, the contractor/management company shall maintain a clear stem in proportion to the trees growth. It is important this is maintained on a regular basis to avoid vehicle visibility splays becoming blocked, pedestrian visibility and safety potentially affected, or inhibit paths or the use of the site. All

shrubs shall be pruned to allow natural form, do not box cut unless instructed by the Landscape Architect.

PRELIMINARIES

- 1.3 Any plants found to be defective during the five-year Defects Rectification Period as a result of failure, defective materials and/or workmanship, and/or lack of vigour are to be replaced by the Contractor/Management Company (as appropriate within each contract) with plants to match the original specification.
- 1.4 All loss or damage arising from theft or malicious damage prior to Practical Completion is to be made good by the Contractor.
- 1.5 The maintenance of trees and grassland areas after Practical Completion is to be carried out by the Contractor until responsibility is transferred to the appointed successor Management Company.
- 1.6 There shall be no limit on the number of times plant replacement is carried out in order to achieve satisfactory plant growth and establishment and maintain the scheme as designed by the Landscape Architect. If the same replacement trees/plants or group of replacement trees/plants repeatedly fail to establish as a result of the contractor failing to adequately carry out maintenance/management in accordance with this report, the Landscape Architect holds the right to request larger plant stock (of expected growth) or extend the deficiency period to ensure the full 5 years has been achieved.

02. SITE INFORMATION

2.1 SITE SERVICES INFORMATION

Information regarding the nature and location of public and private services/utilities shall be provided upon request. However, it shall be the Contractor's responsibility to satisfy himself prior to commencement of works of the exact position of Statutory Undertakers' and other publicly or privately owned services or supplies affected by or near the works.

2.2 PERNICIOUS WEEDS

The presence of pernicious weeds will be established following a site inspection by a suitably qualified Horticulturist or Landscape Architect.

03 GENERAL CONDITIONS: HORTICULTURAL WORKS

3.1 TIMING OF HORTICULTURAL WORKS

- Planting of container-grown plants can take place at any time, subject to suitable weather conditions.
- Planting of deciduous plants (such as bare root or rootball stock), other than those that are container-grown, shall be between November and March inclusive, subject to suitable weather conditions.
- Grass seeding and turfing operations shall be undertaken when weather and soil conditions are suitable and, where possible, preference shall be given to autumn and early winter operations. No grass seeding operations shall be undertaken in exceptionally dry, or frosty weather, or in other unsuitable weather conditions.
- Suitable weather conditions shall mean open weather, i.e. mild, dull, overcast, even in winter, when the ground is moist and workable.
- Planting, turfing and grass seeding shall be suspended during periods of drought, when soil is frost-bound or waterlogged, during persistent drying, cold winds, or during any weather or ground conditions considered to be unfavourable to successful establishment. Planting turfing and grass seeding may take place at other times, but only on the written authority of the Contract Administrator (CA).

3.2 NOTICE OF INTENTION

The Contractor shall give 48 hours' notice to the CA of his intention to commence any of the following operations:

- Setting out.
- Topsoiling/Approval of imported topsoil/subsoil.
- Cultivations.
- Planting and seeding operations.
- Maintenance Visits.

3.3 CHEMICALS FOR HORTICULTURAL USE

- All pesticides / herbicides to be used must have been authorised by the CA and approved for use in amenity horticulture, in accordance with the Control of Pesticides Regulations 1986 (Amended 1997).
- Recognised Certificates of Competence are required by Contractor using pesticides approved for use in amenity plant protection, unless they are working under direct supervising of a certificate holder. The Contractor will be required to provide written evidence to the CA as to which member(s) of his staff are certified competent to apply pesticides.

3.4 DAMAGE TO PLANTS DURING TRANSIT/ PRIOR TO PLANTING

- The current recommendations of the JCLI "Plant Handling Code" will be observed at all times.
- All plants are to be carefully and adequately packed and protected to survive transportation from the suppliers to the site and final planting positions, so that the plants, after planting, are in optimum condition.
- The form of packaging, protection, and transportation shall be appropriate to the season and the type and size of plant.
- Damaged or broken branches or twigs on shrubs shall be cleanly pruned back to soundwood unless in the opinion of the CA, the ultimate shape of the plant would be affected detrimentally, where upon the plant shall be rejected.
- Plants rejected by the CA shall be replaced with suitable material at the Contractors own expense.

3.5 PROTECTION OF PLANT PRIOR TO PLANTING

- All container-grown material brought onto site but not able to be immediately planted shall be stored securely in an upright position in the Contractor's compound, or another approved safe place, and kept watered.
- All bare-rooted, root-wrapped or root balled plant material brought onto site but not able to be immediately planted, shall be heeled into a topsoil trench in a safe place, or covered by peat or straw and damp hessian and protected from wind and kept moist.

3.6 CONTAMINATION OF AREA TO BE PLANTED OR SEEDED

- Areas to be planted shall be kept free of contamination by oil, petrol, cement, builders' rubble, paint, scaffolding, litter, and any other deleterious material.

3.7 WATERING

- All new planting is to be thoroughly watered after implementation to bring the soil to optimum moisture content appropriate to the work in hand, (i.e. Field Capacity).
- Watering shall be implemented as required up to Practical Completion with all necessary hoses, fittings, sprays, etc. being provided by the Contractor.
- Where mains water is not available, delivery of fresh water shall be by bowser or other method.

03 GENERAL CONDITIONS: HORTICULTURAL WORKS

3.8 MAINTENANCE PERIOD PROVISIONAL

- The Maintenance Period (planning condition) shall be for a period of 60 months from the date of completion of the phase 1 works. The first 12 months carried out by the Contractor, the remaining 48 months by a Management Company appointed by the Client. During the Maintenance Period, the Contractor/Management Company shall carry out periodic (monthly) visits to carry out Maintenance work.

3.9 ACCEPTANCE OF HORTICULTURAL WORKS AT PRACTICAL COMPLETION

- Individual areas shall be protected and maintained as specified in the maintenance schedules until all the works are accepted at Practical Completion.
- The CA shall be notified in writing by the Contractor of the completion of all establishment maintenance works. Subsequent approval for formal handover shall be subject to agreeing on inspection that the work has been carried out to the reasonable satisfaction of the CA.

SOFTWORKS

4.1 HERBICIDES

- The use of Herbicides shall be subject to the written approval of the CA
- Herbicide formulation shall either be liquid, granules, pellets or wettable powders
- Total weed-killers containing Sodium Chlorate shall not be used.
- The type shall be approved by the CA for the situation, the season, and the species.
- Use of both contact and translocated herbicides may be required.

4.2 IMPORTED TOPSOIL (IF REQUIRED)

- Shall be compliant with BS3882: 2015 for landscape purposes. Have been found via a soil scientists interpretive report to be fit for the specific landscape function and contain no contaminants.
- Cultivate to alleviate any compaction and any sharp surface prior to topsoiling
- Shall be from an as-dug source.
- Shall be free from pernicious weeds and other deleterious material.
- Either a sample shall be provided for CA approval, or the CA may elect to inspect the proposed material at source.

4.3 IMPORTED SUBSOIL (IF REQUIRED)

- Shall be compliant with BS8601: 2013 for landscape purposes. Have been found via a soil scientists interpretive report to be fit for the specific landscape function and contain no contaminants.
- Shall be from an as-dug source.
- Shall be free from pernicious weeds and other deleterious material.
- Shall be provided as necessary as a planting substrate for wildflower areas and to make up any deficiency of topsoil on site and to complete the work.

- Either a sample shall be provided for CA approval or the CA may elect to inspect the proposed material at source.

4.4 SITE-WON TOPSOIL

- It is intended to re-use site-won topsoil for planting areas. For all works relating to site-won topsoil please refer to Swansea Bay Technology Centre Topsoil Report as Updated 17/09/2020, produced by ADAS.

4.5 SOIL FERTILISER

- For soil fertiliser details please refer to ADAS's Swansea Bay Technology Centre Topsoil Report.

4.6 TREE PLANTING COMPOST

- Shall be Tree and Shrub Planting Compost.
- Supplier: CPA Horticulture, Llety Coed, St Clears, Carmarthen, SA33 4JR; tel. 01994 231121, or other equal and approved.

4.7 PLANT SUPPLIES

- All trees, shrubs and transplants shall be agreed and approved first by the CA. To be grown, produced and obtained from a UK nursery. Specification must adhere to relevant British Standard BS 3936-1, Nursery Stock Specification for Trees and Shrubs.

4.8 MULCH (PROVISIONAL)

- Type: Wood bark mulch, Medium Ornamental grade, 8-35mm particle size.
- Supplier: CPA Horticulture Tel: (01269 591000), or equal and approved.
- A sample shall be provided for inspection and approval by the CA prior to bulk delivery.

4.9 GRASS SEED & REPLACEMENT GRASS AREAS

- Grass seed shall be EL1 Flowering Lawn Mixture and sowed in accordance with Plant Schedule.
- Supplier: Emorsgate Seeds Ltd.
- Contact the CA prior to ordering for final approval. All new or replacement grass areas shall match this seed mix, unless instructed otherwise by the Landscape Architect.

4.10 WILDFLOWER SEED & REPLACEMENT WILDFLOWER SEED

- Meadow grass seed for attenuation basin shall be EG8 Meadow Grass Mixture for Wet Soils, sow at 5g/sq m in accordance with the plant schedule.
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- Mitigation meadow for areas of retained grassland lost from soil re-profiling: Emorsgate Seeds EM2 Standard General Purpose Meadow Mixture. Sow at 4g/sq. m in accordance with the plant schedule.
- Supplier: Emorsgate Seeds (www.wildseed.co.uk)
- Contact the CA prior to ordering for final approval. All new or replacement meadow areas shall match this seed mix, unless instructed otherwise by the Landscape Architect.
- Swale Wildflower Mix is approved by Neath Port Talbot Council and full details of the mix can be found in drawing 26X003-URB-XX-XX-SH-L-90-0008. Sow at 5g/sq m in accordance with the plant schedule.
- Supplier: Intended supplier to be approved by Landscape Architect
- Contact the CA prior to ordering for final approval. All new or replacement meadow areas shall match this seed mix, unless instructed otherwise by the Landscape Architect.

4.11 GRASSCRETE GRASS SEED & REPLACEMENT GRASS SEED

- Grass seeding for areas of GRASSCRETE to be GRASSCRETE GrassMix No. 2, sowed at 30g/sq. m in accordance with manufacturer's instructions.
- Supplier: Grass Concrete Limited
- Contact the CA prior to ordering for final approval. All new or replacement bulb areas shall match this mix, unless instructed otherwise by the Landscape Architect.

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5.1 GENERAL

- The precise scope of all the works described in the following shall be defined and agreed at the Pre-start Meeting.

SITE CLEARANCE

5.2 ABOVE & BELOW GROUND SERVICES

- Prior to working in any area, the Contractor shall check for below and above ground services in the vicinity.
- Inform the CA if works may be affected and obtain CA's instructions prior proceeding.

5.3 HERBICIDE APPLICATION (PROVISIONAL)

- Prior to commencement of works, agree with the CA areas of vegetation / grass to be cleared. These shall be identified and treated with a suitable total translocated non-residual herbicide. Allow fallow period following treatment as suppliers recommendations before clearance works.

5.4 REMOVAL OF EXISTING VEGETATION

- The Contractor shall remove all the existing vegetation within the site areas. Unless directed otherwise by the CA.
- Vegetation, including roots, shall be cut down or grubbed up/stump ground and all arisings removed from site. The contractor shall propose a method statement if working close to retained hard surfacing, structures, existing trees, existing hedgerows or other vegetation.

EXCAVATIONS

5.5 GENERAL

- Prior to commencement of the works, beginning the Contractor shall agree with the CA the general setting out and scope of work regarding the amended landform and finished levels to be obtained.
- It shall be the intention to minimise the need for the removal of hard and granular materials from site via the re-use of suitable excavated material; consequently the quantities of material for disposal from site shall be re-evaluated on site as the works progress.

5.6 REMOVAL OF SOFT MATERIALS

- Location: To be confirmed.
- The Contractor shall allow the lifting and removal of areas of soft (soils) materials (to depth of c. 200mm) once turf is removed, and stockpiled as a single resource.

- Material suitable for re-use as fill beneath hard areas shall be set aside for re-use as fill on site. Excess material shall be removed from site.

- For all works relating to site-won topsoil please refer to Swansea Bay Technology Centre Topsoil Report as Updated 17/09/2020, produced by ADAS.

5.7 TREE PITS

- The Contractor shall allow the excavation of materials to allow the incorporation of tree pits to Selected Standard Trees to minimum dimensions of 1200mmx1200mm x1150mm deep. Refer to drawing 26X003-URB-XX-XX-DR-L-90-0015 and 0016 for tree pit details.
- Trees must be compliant with Table 1, p.21, BS 8545:2014. This is specific to tree form and is in the format of a checklist that should be ticked off by the landscape architect on delivery (and ideally prior to delivery) of trees.

TOPSOILING/SUBSOILING

5.8 GENERAL

- Locations: To be confirmed.
- The earthmoving operations described above will have provided the underlying landform that will be subject to over-filling with topsoils to the depths specified and monitored/supervised by a soil scientist.
- It is intended to re-use site-won topsoil for planting areas. For all works relating to site-won topsoil please refer to Swansea Bay Technology Centre Topsoil Report as Updated 17/09/2020, produced by ADAS.

5.9 SCARIFICATION

- Immediately prior to topsoiling, the graded subsoil formation levels shall be thoroughly broken up to alleviate any compaction and to allow adequate water penetration and drainage.

5.10 IMPORTATION (IF REQUIRED) & SPREADING TOPSOIL/SUBSOIL

- Any imported topsoil must comply with Clause 4.2 and BS3882:2015.
- Import subsoil that complies with Clause 4.3 and BS8601:2013.
- Do not compact topsoil. Preserve a friable texture of visible crumbs wherever possible. Spread topsoil to specified depths, as follows: Typically soil profiles are as follows; 300mm of topsoil over 600mm of subsoil (trees only),

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300mm of topsoil over 300mm of subsoil (shrubs only) and 150mm of topsoil over 150mm subsoil (grass only).

- Ensure that topsoil is free from pernicious weeds and select plant to minimise disturbance, trafficking and compaction. Avoid contamination by subsoil and other deleterious material and ensure that topsoil is handled in dry conditions.
- For all works relating to site-won topsoil please refer to Swansea Bay Technology Centre Topsoil Report as Updated 17/09/2020, produced by ADAS.

5.11 ENSURE THAT MINIMUM FINISHED TOPSOIL LEVELS ARE:

- 25mm above adjoining paving or kerbs
- 100mm higher for shrub areas than adjoining grassed areas.

SOIL PREPARATION

5.12 GENERAL

- Locations: The following shall apply to all areas of new tree planting, ornamental shrub and scrub planting and grass/wildflower seeding.
- It is intended to re-use site-won topsoil for planting areas. For all works relating to site-won topsoil please refer to Swansea Bay Technology Centre Topsoil Report as Updated 17/09/2020, produced by ADAS.

TREE PITS

5.13 PREPARATION OF PITS FOR TREES

- Excavate pits as specified - as per tree pit details. Please refer to drawing number 26X003-URB-XX-XX-DR-L-90-0015 and 0016

SHRUB AND HEDGE PLANTING

5.14 PRIMARY CULTIVATIONS

- Cultivate all shrub beds to the full topsoil depth of 300mm, picking-off any deleterious matter and all stones greater than 50mm diameter in any one direction. Cart to tip. Rake over to achieve even lines and levels.
- All cultivation and ground preparation operations must be approved by the CA before continuing with the next operation in the planting sequence.
- Hand cultivation shall be carried out to achieve the same finish within areas where machinery access is not

practicable, e.g. adjacent to kerbs, inspection covers and on steep slopes.

- Cultivations must not take place during wet weather, or when the soil is saturated, since this operation may destroy the soil structure. Similarly cultivations should be avoided during excessively dry periods. Soil moisture should be at or around field capacity. Any soil damaged during earthworks/cultivations shall be replaced by the contractor entirely at his own cost.

5.15 FERTILISER APPLICATION AND SECONDARY CULTIVATIONS

- Apply granular fertiliser at a rate of 70 gms per m2 over each ornamental shrub bed and woodland plantation. Cultivate in to a depth of 200 mm to achieve a well-blended mix. Rake over to achieve even lines and levels, picking out any stones greater than 25 mm dia. Fertiliser and compost should only be worked into the top 200mm of soil if soil analysis demonstrates the need.
- All Secondary Cultivations and ground preparation must be approved by the CA before continuing with the next operation in the planting sequence.
- Hand cultivations shall be carried out to achieve the same within the root zone of existing trees, and on areas where machines are impossible, e.g. adjacent to kerbs, inspection covers, and on steep slopes.

GRASSED AREAS (SEED MIX EL1)

5.16 PRIMARY CULTIVATIONS TO GRASS SEEDED AREAS

- Break up any compacted areas of imported topsoil and existing subgrade. Reduce the top 150mm of topsoil to be seeded to a tilth suitable for blade grading (10 mm down particles).
- Remove all stones and clay balls larger than 25mm in any dimension, as well as all roots, rubbish and debris.

5.17 GRADING

- Topsoil shall be in a reasonably dry and workable condition.
- The topsoil shall be graded to achieve smooth flowing lines and levels, with falls adequate for drainage.
- All minor hollows and ridges shall be eliminated.
- After settlement, finished levels shall be 25 mm above adjoining paving, kerbs and inspection covers, etc.

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- Blade Grading may be used to adjust topsoil levels, provided that the depth of topsoil is nowhere less than 100mm.

5.18 PRE-SEEDING FERTILISER

- Fertiliser and compost should only be worked into the top 200mm of soil if soil analysis demonstrates the need. If so, supply, distribute and rake-in pre-seeding fertiliser [Scotts Enmag or similar and approved] to a depth of 200mm, at a rate of 40gms per m² to areas to be seeded within the universal seed mix only.

5.19 FINAL CULTIVATIONS

- After grading and fertilising, reduce the seed bed to a fine tilth with a good crumb structure, and to an even depth of 25mm
- Lightly rake over, to produce an even surface and a fine tilth which is friable and lightly firmed, but not compacted.
- Ensure that all deleterious material and earth clods and stones greater than 25mm in any one dimension are raked off and carted to tip.
- Obtain the CA's approval of the prepared seedbed before commencing seeding operations.

5.20 GRASSCRETE SEEDING PREPARATION

- GRASSCRETE topsoiling to be in line with manufacturer's recommendations, available in detail at grasscrete.com.

WILDFLOWER/MEADOW AREAS

5.21 PRIMARY CULTIVATIONS TO WILDFLOWER AREAS

- Wildflower seeding to be applied to a subsoil, either imported or existing.
- Break-up any compacted areas of subsoil and reduce the top 100mm to an even tilth suitable for blade grading (10 mm down particles).
- Remove all stones and clay balls larger than 25 mm in any one dimension, as well as all roots, rubbish and debris.

5.22 GRADING

- Soil shall be in a reasonably dry and workable condition.
- The soil shall be graded to achieve smooth flowing lines and levels, with falls adequate for drainage.
- All minor hollows and ridges shall be eliminated.

- After settlement, finished levels shall be 25 mm above adjoining paving, kerbs and manholes, etc.

- Blade grading may be used to adjust subsoil levels.

5.23 FINAL CULTIVATIONS

- After grading, reduce the seed bed to a fine tilth with a good crumb structure, and to an even depth of 25 mm.
- Lightly rake over, to produce an even surface and a fine tilth which is friable and lightly firmed, but not compacted.
- Ensure that all deleterious material and earth clods and stones greater than 25mm in any one dimension are raked off and carted to tip.
- Obtain the CA's approval of the prepared seedbed before commencing seeding operations.

06 SOFT LANDSCAPE WORKS

6.1 SETTING OUT

- The Contractor shall set out all beds in accordance with the planting plans and ensuring that each species grouping is evenly spaced avoiding straight lines and geometric patterns.
- No planting shall proceed without the CA's approval of the setting out following inspection on site.

PLANTING TREES

6.2 PLANTING TREES IN PITS

- Refer to drwg 26X003-URB-XX-XX-DR-L-90-0015 for Tree Pit Details, and drwg 0016 for tree pit locations.
- Tree planting operations shall comply with all relevant British Standards including BS4428:1989 C.O.P for General Landscape Operations and BS8545:2014 Trees: From Nursery to Independence in the Landscape.
- Trees must be compliant with Table 1, p.21, BS 8545:2014. This is specific to tree form and is in the format of a checklist that should be ticked off by the landscape architect on delivery (and ideally prior to delivery) of trees.
- The tree shall be set in the centre of the pit. Any damaged roots should be cut back to sound growth. The trees shall be vertical. The bottom of the planting pit shall be covered with 50-70 mm of planting medium before the tree is placed in the hole, and the roots spread and covered.
- The planting medium shall be thoroughly mixed, placed and carefully packed around the roots, in layers not deeper than 150 mm; each layer shall be lightly consolidated in the pit, taking care not to disturb the root-ball. Complete backfilling operations, heeling-in the top layer of planting medium firmly around the root collar. Trees shall be planted at the depth at which they have been previously growing in the plant nursery (nursery soil mark). Planting at nursery level is only appropriate if that does not mean continuing deep planting.
- The depths at the centre of the pits shall be adjusted to ensure that the trees are planted to the depth of the nursery soil mark or the stem, and this shall be maintained on the finished ground level to allow for settlement after planting. All damaged roots shall be cleanly pared back to sound growth.
- All root-ball wrappings and cages should be removed except where they are fully perishable (e.g single layer untreated hessian and narrow gauge non-galvanized wire) and root-ball soil is friable for textural reasons rather than

inadequate root development. In these cases the upper third of the wrapping and cage should be removed at the same time as backfilling.

- Trees with the crown tied-in may have the fastenings removed and the branches freed before or after planing, at the discretion of the contractor.
- Immediately after planting, the Contractor must carefully cut back any damaged, dead or diseased branches to sound growth and remove any weak, thin or malformed stems.
- Where, in the opinion of the CA, the damage is such as to warrant the rejection of the tree, it shall be replaced by the Contractor entirely at his own expense. Trunk wrappings applied by the grower shall not be removed and any subsequent damage during planting shall be made good.

6.3 WATERING OF TREES AFTER PLANTING

- On completion of the backfilling, each tree shall be watered with a minimum of 200 litres of water. Where there is a risk of frost within 24 hours, watering shall be suspended until such risk has passed.
- Any subsequent reduction in soil level due to watering shall be made good immediately.

6.4 PRE-PRACTICAL COMPLETION MAINTENANCE

- Maintain all planting to the standards specified in the Maintenance Schedule until Practical Completion is certified.

ORNAMENTAL SHRUB & HEDGEROW PLANTING

6.5 PLANTING

- All planting operations shall comply with all relevant British Standards including BS4428:1989 C.O.P for General Landscape Operations.
- All containers and wrappings shall be removed immediately prior to planting. Excavate pit in topsoil bed large enough to accommodate the rootball of each plant and to a minimum of 450x450x450mm, carefully placing topsoil arisings to one side. Gently tease the plant out of each container.
- Backfill with topsoil arisings mixed as specified, ensuring that all air pockets are eliminated.

06 SOFT LANDSCAPE WORKS

- Continue backfilling to ground level and lightly around the root collar of each plant.
- Thoroughly water each plant. Cut out damaged growth.
- Cut back any damaged roots to sound growth.
- Bare roots shall be spread evenly in the pit. The plant shall be positioned so that, after firming, each is growing at the same depth as in the nursery.
- All containers and wrappings shall be removed immediately prior to planting.
- Continue backfilling to ground level and lightly around the root collar of each plant. Thoroughly water each plant.
- Each boundary hedgerow plant requires a spiral guard and cane to support it. Hedgerow plants to be planted double-staggered rows 300mm apart and at a planting density of 5 plants/linear metre.

6.6 PLANTING PITS

- Plant pits shall be excavated to a depth and diameter large enough to accommodate the root system, (i.e. minimum of 450x450x450mm) and shall be located at specified planting distances, according to species, in a way that allows plants to be evenly distributed but which avoids straight lines and geometric patterns.
- Topsoil arisings shall be placed carefully to one side for mixing with ameliorates as described and used as backfilling.

6.7 MULCH

- Supply and spread mulch evenly to a depth of 50 mm over the whole of the shrub bed areas. Top up as necessary to ensure continued 50mm depth through the entire maintenance period, (i.e. 36 months).

6.8 PRE-PRACTICAL COMPLETION MAINTENANCE

- Maintain all planting to the standards specified in the Maintenance Schedule until Practical Completion is certified.

GRASS SEEDING

6.9 GRASS SEED

- Grass seed as Clause 4.9.
- Only use seed produced for the current growing season.
- The Contractor shall use blue label certified varieties to EC.

- Samples may be requested by the CA.

6.10 SOWING

- Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture.
- The seed must be surface sown and can be applied by machine or broadcast by hand at 5g/sq. m. To get an even distribution and avoid running out, divide the seed into two or more parts and sow in overlapping sections.
- Do not incorporate or cover the seed, but firm in with a roll, or by treading, to give good soil/seed contact.
- Refer to Emorsgate Seeds guidance for further detail (www.wildseed.co.uk).

6.11 FIRST CUT

- About 48 hours before first cut, stones more than 25 mm in any one dimension shall be removed, and all areas shall be rolled with a light roller to firm grass sward and press in all remaining stones.
- When the grass is established and approximately 100mm high, it shall be topped with a roto-scythe, or similar approved machine, to leave 50 mm of growth. All arisings removed from site.

6.12 SELECTIVE HERBICIDE

- Only when approved by the CA, apply an approved herbicide to control the establishment of weeds in the grass sward. Apply in accordance with the manufacturer's recommendations, and in accordance with the Control of Pesticides Regulations 1986 (Amended 1997).

6.13 OVER-SOWING

- During the establishment period, the Contractor shall over-sow any bare patches to make good the sward. Apply seed at 5 g per sq m.

6.14 EDGING

- Neatly edge cut borders with beds, newly planted trees, etc. to the desired lines, either straight, smoothly curved or circular, as appropriate.

6.15 COMPLETION

- Grass seeded areas shall only be accepted as having reached Practical Completion when germination has proved satisfactory and all weeds have been removed.
- No payment shall be made to the Contractor if the seed fails due to any cause whatsoever.

06 SOFTWARE LANDSCAPE WORKS

- The contractor shall be required to make good the soiling and repeat the seeding until a good sward is established.

6.16 MAINTENANCE TO FINAL COMPLETION

- Maintain up to Final Completion to the same standards as specified in the Maintenance schedule.

WILDFLOWER SEEDING

6.17 WILDFLOWER SEED

- Wildflower and Meadow seed as Clause 4.10
- Only use seed produced for the current growing season.
- The Contractor shall use blue label certified varieties to EC.
- Samples may be requested by the CA.

6.18 SOWING

- Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture.
- The seed must be surface sown and can be applied by machine or broadcast by hand. To get an even distribution, and avoid running out, divide the seed into two or more parts and sow in overlapping sections.
- Do not incorporate or cover the seed, but firm in with a roll, or by treading, to give good soil/seed contact.
- Mix seed to ensure even species distribution.
- Sow seed at a rate of 5 g per sq m. Bulk up with sand/sawdust prior to seeding.
- Refer to Emorsgate Seeds guidance for further detail (www.wildseed.co.uk)

6.19 FIRST CUT

- About 48 hours before first cut, stones more than 25 mm in any one dimension shall be removed and all seeded areas shall be rolled with a light roller to firm grass and press in all remaining stones.
- When the grass is established and approximately 100mm high, it shall be topped with an appropriate mechanical mower, or using a brushcutter/trimmer, to leave 75 mm of growth. All arisings are to be removed from site.

6.20 SELECTIVE HERBICIDE

- Apply an approved herbicide in accordance with the manufacturer's written label recommendations, and in

accordance with the Control of Pesticides Regulations 1986 (Amended 1997), as a spot treatment to control the establishment of pernicious perennial weeds in the grass sward.

6.21 OVER-SOWING

- During the establishment period the Contractor shall over-sow any bare patches to make good the sward. Apply seed at 5 g per sq m.

6.22 COMPLETION

- Seeded areas shall only be accepted as reaching Practical Completion when germination has proved satisfactory and all pernicious weeds have been removed.
- No payment shall be made to the Contractor if the seed fails due to any cause whatsoever.
- The Contractor shall be required to make good the soiling and repeat the seeding until a good sward is established.

6.23 MAINTENANCE TO FINAL COMPLETION

- Maintain up to Final Completion to the same standards as specified in the Maintenance schedule.

GRASSCRETE SEEDING

6.24 GRASSCRETE SEED

- Wildflower and Meadow seed as Clause 4.11
- Only use seed produced for the current growing season.
- The Contractor shall use blue label certified varieties to EC.
- Samples may be requested by the CA.

6.25 GRASSCRETE SOWING

- The grass seed should be sown at 30g/sq. m. as close as possible to the surface and if the topsoil levels are likely to settle significantly then it is best that this settlement is allowed to take place before seeding. If the Grasscrete is over-soiled then the seed can be broadcast within a 0-5mm layer of soil and the natural soil filtration back into the pocket will sustain the germination process. During the period of germination the manual movement of topsoil layers should be avoided as this can disturb germination.
- We recommend that during dry weather a programme of watering is developed for the germination process and earlier stages of growth.
- See full details at grasscrete.com

06 SOFT LANDSCAPE WORKS

6.26 SELECTIVE HERBICIDE

- Only when approved by the CA, apply an approved herbicide to control the establishment of weeds in the grass sward. Apply in accordance with the manufacturer's recommendations, and in accordance with the Control of Pesticides Regulations 1986 (Amended 1997).

6.27 OVER-SOWING

- During the establishment period, the Contractor shall over-sow any bare patches to make good the sward. Apply seed at 5 g per sq m.

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6.28 COMPLETION

- Seeded areas shall only be accepted as reaching Practical Completion when germination has proved satisfactory and all pernicious weeds have been removed.
- No payment shall be made to the Contractor if the seed fails due to any cause whatsoever.
- The Contractor shall be required to make good the soiling and repeat the seeding until a good sward is established.
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- See grasscrete.com for full details relating to ensuring seeding and grass establishment is successful.

6.29 MAINTENANCE TO FINAL COMPLETION

- Maintain up to Final Completion to the same standards as specified in the Maintenance schedule.

07 HARD LANDSCAPE WORKS

7.1 KERBS/EDGINGS

The following kerbs and edgings shall be used. Refer to drawing no. 26X003-URB-XX-XX-DR-L-90-0023 Edging Plan Drawing for reference. Produced to adhere to the requirements of the current version of BS EN1340. All laid to manufacturer's specification.

- Marshalls KeyBlok Concrete Paving Unit 200 x 100 x 80mm, colour to match existing block paving. Laid on edge in soldier course, between carriageway and parking bays.
- British Standard HB2 Battered Concrete kerb, silver grey colour, laid flush, 225 x 125 x 914mm.
- British Standard Pin Kerb, silver grey colour, laid flush 150 x 50 x 915mm. Between paved and areas of vegetation.
- Cutting of kerbs to be neat, accurate and without spalling. Form neat junctions. Minimum length after cutting to be 350mm. Bedding of units to be 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. After bedding, secure with continuous concrete haunching. Concrete to Engineers specification and BS8500-2. Maximum difference in level between adjacent units to be 2mm.
- Timber edging to bound gravel. 150mm tall x 19mm thick treated board. 50 x 50 x 450mm treated and pointed stakes at approximately 1m centres, fixed with 50mm annular nails.

7.2 PAVING MATERIALS

The following paving materials shall be used. Refer to drawing no. 26X003-URB-XX-XX-DR-L-90-0020, 0021, and 0023 Hardworks Drawings for the layout and extent of each element:

Paving type 1: Asphalt Footways

Refer to Civil Engineers' detail/Geotechnical Engineers' report for details.

Paving type 2: Asphalt Parking Bays

Refer to Civil Engineers' detail/Geotechnical Engineers' report for details.

Paving type 3: Block-Paved Carriageway

Manufacturer: Marshalls (or similar approved)

Product: KeyBlok Concrete Paving Unit 200 x 100 x 80mm

Colour: To match existing car park carriageway

Laying Pattern: Herringbone

Refer to Civil Engineers' detail/Geotechnical Engineers' report for details.

Paving type 4: GRASSCRETE

For maintenance access to sprinkler, condensers, and substation.

Manufacturer: Grass Concrete Limited

Product: GRASSCRETE former type GC2

Detail: GRASSCRETE GrassMix No. 2 sowed at 30g/m2 and topped with friable topsoil. Void former size 600 x 600 x 150mm. There must be a 100mm gap between edge formwork and formers. Concrete formwork with steel bar reinforcement to BS4483. Sand over geotextile and Type 1 sub-base. Soaked softwood filler expansion joints. See 26X003-URB-XX-XX-DR-L-90-0022 for full detail.

Paving type 5 - Concrete Slab around utilities and within the bin stores:

Detail: Refer to Civil Engineers' detail/Geotechnical Engineers' report for details

Paving type 6: Maintenance Area Gravel

Refer to Civil engineers' detail/Geotechnical Engineers' report for details.

Paving type 7: Edging Gravel

Product: 10mm sized golden gravel

Manufacturer: To be approved

Detail: 20mm deep layer of gravel above geotextile membrane and subgrade.

Paving type 8: Tactile Paving

Manufacturer: Marshalls

Product: Concrete blister paving 400 x 400 x 50mm

Colour: Buff

Detail: Refer to Civil engineers' detail/Geotechnical Engineers' report for details.

7.3 STREET FURNITURE AND FENCING

Refer to drawing 26X003-URB-XX-XX-DR-L-90-0025 for locations.

- Timber fencing and timber railings to be checked for rotting, failing fixings, and structural integrity twice a year and after periods of high winds. Any issues found are to be repaired appropriately or elements replaced with identical products.
- Cycle shelter and litter bins to have their fixings checked periodically.
- Door guards, bollards, and cycle hoops to be checked periodically that they are still standing in the correct position.

8.1 GENERAL

- All maintenance work is provisional.
- Maintenance of the works as described below shall be for a period of 60 months following the date of Practical Completion.

8.2 DEFECTS LIABILITY AND REPLACEMENTS

- The Defects Liability Period and the Maintenance Period for all plant material shall run concurrently and shall be for a total duration of 60 months from the date when the CA certifies that the works are agreed complete (i.e. Practical Completion is reached).
- Throughout the Maintenance Period, and immediately prior to its conclusion, works shall be inspected periodically by the CA.
- Any plants and areas of grass or wildflower seeding which are found to be missing, dead, dying or in poor health, must be replaced on a like-for-like basis, at the earliest suitable time, unless otherwise instructed.
- The full cost of all replacement planting and associated works, shall be borne by the Contractor for the duration of contract (including 1 year defects period), thereafter, the management responsibility falls to the Client (or Client-appointed management company).
- Defects in plant material which have previously been recorded as being the result of rodent or malicious damage, and agreed by the CA to be outside the Contractor's control, shall be excluded from the Contractor's replacement obligations.

8.3 TIMING OF VISITS FOR MAINTENANCE AND WATERING OPERATIONS

The need for Maintenance and Watering operations will depend on weather conditions and shall be carried out when deemed necessary by the Contractor, or as directed by the CA. Although the CA may instruct the Contractor to carry out an operation at any time during the Maintenance Period it is the sole responsibility of the Contractor to ensure that operations are arranged appropriately, so that weed growth, etc. is always kept in check, that the works are well watered, have a well-maintained appearance and become established in the intended manner.

8.4 MAINTENANCE AND WATERING VISITS / OPERATIONS

Allow for the following operations all as specified:

- 60 Nr. Maintenance Operations to Trees
- 60 Nr. Maintenance Operations to Planting Areas

- 60 Nr. Maintenance Operations to Grass Areas
- 36 Nr. Watering only Operations to Planting and Grass Areas.

8.5 MAINTENANCE SCHEDULE FOR TREES

- Items to be carried out as required; allow 60 Visits.

TREE PLANTING

- Check underground guying is adequate for each tree. Carry out remedial works to adjust, refix or renew guying as appropriate.
- Check that each tree is growing healthily and remove all dead wood and diseased or damaged branches. Tie-back any loose branches onto the frames of pleached trees. The frame can be removed when the tree is established, as agreed by the CA. When pruning to maintain the shape of a pleached tree, first remove diseased/damaged wood and broken branches. This should be done at once or twice a year; late winter is a good time to assess any winter damage and trim before spring growth. All pruning to be removed off site.
- Any wounds shall be neatly pared back to sound tissue.
- Re-firm trees which have been loosened by wind or frost.
- Water sufficiently to allow to fully penetrate the rooting zone.
- Apply Scotts Enmag Fertiliser annually to suppliers instructions.
- Topping up of mulch on all trees specified for a minimum of 3 years and stake a tie removal after no more than two growing seasons.
- Tree planting in proximity to the electrical substation are to be pruned so that no branches enter the space above or immediately around the station.

8.6 MAINTENANCE SCHEDULE FOR ORNAMENTAL SHRUB/HEDGE PLANTING

- Items to be carried out as required, allow 60 visits

SHRUB/HEDGE BEDS

- Keep whole areas free from rubbish, litter, grass and weed growth. All dead weed growth shall be forked out and removed to tip.
- Water sufficiently to allow to fully penetrate the rooting zone.
- Maintain mulched areas at 50mm depth, topping up as necessary, and sweep up mulch from adjacent edgings and paving.

08 MAINTENANCE

d) Apply Scotts Enmag fertiliser each spring as a top dressing to all planting areas, at a rate of 70gms/m² and rake-in lightly.

To Each Plant e) Check that each plant is growing healthily and remove any dead, diseased or damaged branches, water shoots and reversion growth. Prune shrubs to encourage bushiness. Flower stems and foliage of lavender hedge to be trimmed lightly with shears in October-November. All arisings shall be removed off site.

f) Dead-head perennials after flowering, strictly in accordance with programme for specific species, as directed by the CA.

g) Re-firm plants which have been loosened by wind or frost action.

8.6 SPECIES-SPECIFIC MAINTENANCE NOTES

a) The *Fagus sylvatica* hedge should be pruned in late August/September before the leaves turn for autumn. Hedge to be maintained to a height of 1m. Prune with secateurs rather than a hedge trimmer to create a dense hedge, pruning back each shoot to two or three leaves from its base, using sharp secateurs. Cut at an angle next to a bud. Clippings should be appropriately recycled or could be cut into smaller pieces and added to a compost heap if desired. Shaped to natural form, not box-cut.

b) *Hylotelephium* seed heads should not be cut back until early spring because of their value both aesthetically and as a resource for birds. Stems should be cut back in early spring before new growth appears.

c) *Carex* and *Sesleria* grasses are evergreen so only require dead/damaged leaves to be combed out/removed in spring. If needed they can be cut back by up to half almost any time from April to July.

d) *Molinia* and *Deschampsia* are deciduous: cut back stems close to ground level from late February through to the end of March before new growth appears. Cut stems can be left on border as natural mulch or composted. Remove any unwanted seedlings as part of routine border maintenance.

e) Remove *Lavandula* spent flowers in late summer and cut back foliage by around 3cm, being careful not to cut into old woody stems. Cut down *Limonium* stems in autumn.

f) *Rosmarinus* should be lightly pruned in mid-late spring in order to maintain tidy form by removing unwanted shoots.

g) For *Viburnum* and *Skimmia*: To promote bushy growth prune straggly branches in spring and maintain at 1m height maximum. Apply a generous 5-7cm (2-3in) mulch of well-rotted

garden compost or manure around the base of the plant after pruning. Cut out dead stems of *Ruscus* to the base in spring. *Ruscus* spreads via rhizomes, so should be monitored during border maintenance to ensure it doesn't spread further than desired. *Viburnum* and *Hebe* should be pruned in spring if required.

h) *Salvia* to have a generous 5-7cm (2-3in) mulch of well-rotted garden compost or manure around the base of the plant in spring.

i) *Berberis* should be trimmed in winter as required to promote bushy growth. Any pruning on *Sarcococca* should take place in late winter/early spring, and after pruning apply a generous 5-7cm (2-3in) mulch of well-rotted compost around the base of the plant.

j) Any dead/winter-damaged fronds on *Polystichum* and *Asplenium* are to be removed in early spring before new growth appears. Cut back any unwanted *Vinca minor* shoots in spring.

k) Where indicated on Drawing 26X003-URB-XX-XX-DR-L-90-0006, plants are to be maintained to a maximum height of 600mm to account for a visibility splay. *Molinia* flower stems that exceed the 600mm limit in these locations must be checked for and removed regularly throughout the summer and into autumn.

8.7 MAINTENANCE SCHEDULE FOR REEDS

- Phragmites foliage is to be cut as part of the same maintenance regime as the rest of the wildflowers in the swale.
- 2/3 of leaf litter should be removed on a rotational basis in the spring, with the remainder left for wildlife.
- Full protective clothing, gloves, and eyewear to cover the skin must be worn when interacting with reeds, which can grow tall and the leaves can be very sharp.

8.8 MAINTENANCE SCHEDULE FOR GRASSED AREAS

- Items to be carried out as required; allow 60 visits:

a) Close-mown sward: mow at appropriate intervals throughout the growing season, so that the height of the grass does not exceed 100mm and will be gradually reduced to 25-50 mm.

b) All arisings shall be gathered and removed from the site and swept from paved surfaces. Before mowing, remove all litter and rubbish.

c) Reinstatement: reinstate to original condition and within a reasonable period (according to season) any damage or

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disturbance occurring during the work, by vehicles or others, to soil structure and sward during the maintenance period.

d) Litter collection: collect and remove all extraneous rubbish not arising from the contract work and detrimental to the appearance of the site, including paper, packaging materials, bottles, cans and similar debris.

e) Over-sowing: allow for over-seeding patches that has become bare or scalped during mowing.

f) Edging: trim all edges abutting plants, paving, kerbs, roads etc. to leave a smooth, flowing line. Clip around all posts, obstacles and remove all arisings.

g) Water: during periods of dry weather: apply water via sprinklers to thoroughly penetrate areas.

h) Fertilisers: one application of approved Autumn-winter dressing of NPK 3.12.12 granule fertiliser applied at the rate of 10gms/m. sq. during a maintenance visit.

8.10 MAINTENANCE SCHEDULE GRASSCRETE AREA

- For details of GRASSCRETE maintenance please follow manufacturer's recommendations. Information can be found at grasscrete.com.

8.10 MAINTENANCE SCHEDULE FOR WILDFLOWER AREAS

a) During first year after sowing, mowing will be undertaken to promote establishment as follows:

- Grassland will be cut at as and when necessary, between March and the end of October, to 75mm height; subsequent cuts through the maintenance period (i.e. years 2 to 5) the sward shall be cut twice annually. Cut 1 shall be carried out before flowering in March and Cut 2 shall be carried out following setting of seed in late August or September. Mowing may be undertaken using an appropriate mechanical mower, or using a brushcutter / strimmer where access for larger machinery is not possible.

b) Cut material will be removed and disposed of away from the grassland areas, e.g. baled as hay, or sent for composting. Ideally, material will be cut and left on the ground for 2-3 days to allow seed and invertebrates to drop out, but it may be necessary to use a mower / collector for practical reasons. In subsequent years, cutting will be undertaken as follows:

- Cut 75% of the area of grassland to 75mm in March and September, leaving 25% of the area uncut each year, the location of which should be rotated.

- Cut material will be removed as described above.

c) Weed and scrub control will be undertaken twice a year, with more visits if required, so as to prevent pernicious perennial weed species and woody plants from becoming established. The growth of gorse and bramble will be monitored and controlled by manual or chemical means, as required. During the early developmental stages of the grassland, sward some 'undesirable' broadleaved species are to be expected, and should become less dominant as the communities become established and stabilised. Control methods will comprise hand-pulling or spot treatment with a suitable approved selective herbicide, as appropriate; timing will be dependent on the affected species.

d) Control of invasive species will be carried out in accordance with current best practice guidelines published by Natural Resources Wales.

e) The NPT wildflower swale mix shall be cut to a height of between 50 and 60mm, twice a year in March and October. Arisings shall be raked off and removed off site, avoiding any pulling, tearing or causing other damage to the soil surface and retained vegetation.

f) Areas of Retained Grassland to be cut to 50-60mm twice a year. Once in Spring, and another cut with arisings being collected in Autumn. Care must be taken to avoid any pulling, tearing, or causing other damage to the soil surface.

g) Any weed growth that cannot effectively be controlled by chemical means without risk of damage to wild flowers shall be hand weeded. Wild flower areas shall be inspected and hand weeded twice each year, during the growing season.

8.11 LITTER REMOVAL

a) The areas of open space will be kept free of litter and other debris through a regular regime of monitoring, collection and disposal.

b) The Contractor shall take particular care when collecting litter and rubbish, so as to ensure that any discarded sharps/needles are safely removed. Such items must be packaged separately from the remainder of the litter, and contained in labelled, puncture-proof containers supplied by the Contractor.

c) All litter and debris shall be removed from site to an authorised tip, in accordance with the Code of Practice on Litter and Refuse and Associated Guidance 2007 (Welsh Assembly Government) and the Environmental Protection Act (1990).



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