WHLandscape
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LAND AT THE FORMER SIPSON GARDEN CENTRE, SIPSON, WEST DRAYTON, HILLINGDON, LONDON

LANDSCAPE IMPLEMENTATION AND MAINTENANCE PLAN

FOR

CENTRE OF EXCELLENCE FOR AIRSIDE SUPPORT VEHICLES

Prepared by:

WHLandscape

On behalf of:

Lewdown Holding Ltd

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APPOINTMENT

WH Landscape Consultancy Ltd (WHLandscape) has been appointed by Lewdown Holdings Ltd to produce a Landscape Implementation and Maintenance Plan (LIMP) for the proposed development of a Centre of Excellence for Airside Support Vehicles on land at the former Sipson Garden Centre, Sipson, West Drayton, Hillingdon, London.

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DWG-1621-01: LANDSCAPE PROPOSALS

1. INTRODUCTION

1.1 This document, along with the associated illustrative material, provide the LIMP to accompany the proposed development of a Centre of Excellence for Airside Support Vehicles on land at the former Sipson Garden Centre (totaling approximately 2.8 hectares), to the north of the village of Sipson. The proposals include the construction of a combined service and office buildings, including associated staff and visitor parking, as well as external storage areas.

1.2 Proposals will mainly focus on detailing and enhancing the indicative landscaping proposals, introducing distinct structural elements around the site boundary as well as creating structure within the development itself through the use of strategic tree planting. Where appropriate existing vegetation will be retained, managed and enhanced but not at the expense of improving the local green infrastructure network. The aim is to not only integrate the proposed development into the landscape, but also provide landscape and ecological enhancements through a comprehensive scheme of new planting and management using native species characteristic of the area, as well as select domestic species where appropriate.

1.3 The aim is to not only integrate the proposed development into the landscape but also provide enhancements to the area's landscape structure and green infrastructure network through a comprehensive scheme of new planting and management of existing vegetation.

1.4 Appointment of a suitably qualified contractor(s) to complete the role of implementing the landscape scheme, and the management of the landscaping thereafter will be undertaken by the client/project manager prior to the commencement of development. Planting will be undertaken during the first planting season after the completion of the proposed development and the implementation of hard landscaping proposals.

1.5 It is important to note that the specification tables show the sizes of vegetation at planting. Their eventual size will depend on growing conditions and appropriate management.

2. EXISTING VEGETATION

2.1 In October 2023, SJ Stephens Associates undertook a survey of the trees and other vegetation across the development site and surrounding land. The report identifies individual trees and groups, both within and adjacent to the site, which could potentially affect development, as well as determining their Retention Category.

2.2 TREES

ON-SITE TREES

2.2.1 As regards on-site trees, 25 individual trees and 2 tree groups have been identified for retention as part of the development proposals, with them being integrated into the landscape scheme for the site. 6 trees and 1 tree group have been identified for removal, either being of a low (U grade) retention category, or in the case of the group because they are crowding out higher quality surrounding trees.

OFF-SITE TREES

2.2.2 As regards off-site trees, management is limited to the vegetation that overhangs the site. Furthermore, as these trees lie outside of the site, while they will be protected during construction, their retention is at the discretion of the relevant landowners.

Existing Trees – Maintenance Operations

a. All trees to be retained will be inspected before development begins on the site, and remedial work, (e.g. thinning, crown raising, etc), will be undertaken where necessary in the interest of site safety and general management.
b. Removal of trees marked for felling will take place before any demolition or development takes place on site.
c. Post-construction any trees within or bordering publicly accessible areas must be checked on an annual basis for signs of deterioration or distress, and the appropriate actions taken where a potential safety hazard is identified.
    - Heavy branches should be removed in sections and undercut to avoid the tearing of the bark, and thereafter lowered by slings. No branch stumps should be left and no cuts should be capable of holding water.
    - Any dense ivy infestation should be removed if evident on site or during the maintenance period.

- All diseased wood, pruning's and rubbish should be removed from the site, and the site left clean and tidy.

d. All works shall be carefully carried out to avoid damage to the tree being treated, or neighbouring trees. No trees to be retained shall be used for anchorage or winching.

e. All tree works will be undertaken by a suitably qualified arborist in accordance with the BS 3998:2010 British Standard Tree Work - Recommendations. Proof of experience and insurance provision will be required. All work shall be undertaken at the appropriate time and with the consent of the Management Company.

3. PROTECTION OF EXISTING VEGETATION

3.1 The retained trees are vulnerable to damage during demolition and construction, and should be protected during the construction period in accordance with the requirements of BS5837 (2012). Trees to be retained will be protected taking account of the Tree protection Fence locations and Ground protection Area calculated by SJ Stephens Associates (See SJ Stephens Associates Drawing: 2179–01).

- Protection Barriers will be used to provide a Construction Exclusion Zone (CEZ) to prevent construction activity within the RPAs of the retained trees and hedging both on-site and off-site directly boarding construction areas.
- The protection barriers are to be constructed from weldmesh panels of at least 2.00m height and securely fixed with wire or scaffold clamps fixed to a rigid framework. This framework must be constructed from horizontal and vertical scaffold tubes during the construction period, in accordance with the requirements of BS5837:2012.
- Where tree protection fencing falls outside of the RPAs of the retained trees and other vegetation, a robust high visibility plastic mesh barrier is recommended in place of the above-mentioned fencing. This will create a visual deterrent and signify the extent of the CEZ.
- All services should be directed outside the retained tree's RPAs.
- No unplanned construction activity whatsoever must be allowed within the RPAs of trees to be retained. This includes the storage of materials, unplanned re-routing of underground services or incursions by vehicles or site operative unless specified and accompanied by specialist protection measure.
- Mixing of concrete or cement, or the storage of fuels must not take place within 10m of the retained trees, nor in any location where a slope in the ground could lead to the contamination of the RPA of any tree to be retained.
- Fires must not be lit in a position where flames could extend within 10m of the foliage, branch framework or trunk of any tree to be retained.
- Landscape works undertaken within the RPAs must be done so as not to damage shallow roots and are to be agreed by the arboricultural consultant. Heavy mechanical cultivation of the soil must not be undertaken within the RPAs of trees to be retained.
- Changes in soil levels should not be undertaken within the RPAs of retained trees, unless otherwise agreed in writing with the Local Planning Authority (LPA). This is in order to ensure that the rooting systems, including the delicate non-woody roots, are not inadvertently severed, or the rooting zones are not compromised by compaction.

4. PROPOSED SOFT LANDSCAPING

4.1 PRELIMINARIES

GENERAL

- Planting will be undertaken during the first planting season after the completion of the proposed development and the implementation of hard landscaping proposals.
- Failure of Plants (pre-practical completion): the Contractor entirely at his own cost shall replace any trees, shrubs or other plants other than those found to be missing or maliciously damaged.
- Malicious Damage or Theft prior to Practical Completion: the Contractor at his own expense shall make all loss and damages arising from theft or malicious damage prior to practical completion of the entire project good.
- Post Practical Completion: the Contractor will carry out the maintenance of trees, shrubs and grasslands after the date of practical completion until the responsibility is transferred to the new owners or by the appointed management company.
- Replacements of plants shall take place as many times as is necessary in order to maintain a complete cover of plants and to maintain the scheme as designed by the Landscape Architect, and within the correct season for the type of plant, tree, shrub and grassland mix.
- Appointment of a suitably qualified contractor(s) to complete the role of implementing the landscape scheme, and the management of the landscaping thereafter will be undertaken by the client/project manager prior to the commencement of development.
- The developer shall ensure that any landscape contractor employed by the developer shall carry out the periodic maintenance of all planted areas, other than any areas for which the appointed Management Company becomes responsible during the said Maintenance Period. Inspection checks shall be carried out at monthly intervals and the appropriate work carried out.
- The developer shall ensure that any landscape contractor employed by the developer shall carry out in all areas any tree, shrub, grass and other plants replacements that may be necessary until transfer of responsibility to the Management Company.
- The Management Company shall be responsible for all periodic maintenance and replacement thereafter for all planted areas to which its management agreement relates and shall ensure that any landscape contractor employed by it carries out periodic maintenance of all such areas in accordance with the general management details provided. Either inspection checks shall be carried out by a competent person, a member of British Association of Landscape

Industries (BALI) or the Landscape Institute (LI), acting for the Management Company, at minimum monthly intervals and the appropriate work carried out.

- No existing, trees shrubs or grass shall be removed or cut without specific instructions from the Contract Administrator and written agreement of the Wiltshire Council Tree Officer. Any existing trees on the site are to be retained, protected and undisturbed throughout the contract.
- On hand-over to the new domestic owners of the properties an outline of the management plan should be made available to provide the principles of the landscaping and encourage the future management of the domestic setting in perpetuity.
- Any landscaping beyond the boundaries of domestic ownership will be maintained in perpetuity by the Management Company(ies).

TREE ROOT BARRIERS

4.1.1 Root barrier to be ReRoot600 to be installed to supplier specification as supplied by Greenblue Urban or similar where necessary to protect services, structures and surfaces. (Precise locations of trees to be determined on site to avoid conflict with services).

BIODEGRADABLE SHEET MULCH DETAIL

4.1.2 Biodegradable sheet mulch is a woven, natural fibre, biodegradable fabric of sufficient strength to last 3 – 6 months to ensure weed suppression and successful plant establishment when newly disturbed soil triggers weed generation. The water porous product helps the ground stay moist and weed free, speeding growth and establishment.

Specification

- Prepare and cultivate imported or existing topsoil excluding fertilizers as necessary and water to field capacity (N.B. *Ensure that the finished soil level is at least 65mm below adjacent pavement or grass levels to receive sheet and bark mulch. For sloping beds ensure that soil levels are 65mm below pavements or grass areas within 600mm of bed edges*.)
- Place suitable biodegradable sheet mulch over soil to be planted. Unroll materials, placing in overlapping rows (overlap to be no less than 50mm).
- Bury 200mm flap of material at the extreme edges of the planting bed, or nail to concrete haunch of path edging with masonry nails at 1.00m centres.
- Secure material in position by hammering in 300mm plastic pegs at 500mm centres. (300mm centres at edges of beds).

- Place plants on beds in intended positions.
- Cut the fabric with scissors in '+' shape for each plant position, 400mm across.
- Pit plant the plants, holding back the flaps of fabric, and carefully replace around the stem. Spread topsoil under sheet if friable. Remove all compacted topsoil clods from site, ensure no soil is left on top of sheet.
- Once all plants are planted, cover the fabric all over with 50mm of course, graded, free of fines, large wood chip mulch.
- Water the bed thoroughly to field capacity. Ensure that each plant receives 2 gallons of water if the soil is dry or in warm weather conditions, otherwise apply 25L/m2.

WATERING

4.1.3 This document is not able to give precise recommendations with regard to species-specific watering requirements, however the following should be considered in respect of watering for all new planting:

- Use a watering can with a rose attachment on the end to water or a sprinkler or other such method that will administer water slowly and at a low pressure, mimicking rainfall.
- Water should be applied to the base of the plant, evenly distributed over the entirety of the root-ball to encourage even root development.
- Ensure that water is draining well away after 10 minutes of application of water.
- A newly planted tree/shrub should be watered in when planted, and at the point of bud burst in the spring and should be continued throughout the spring and summer until the leaves have fallen in autumn (for deciduous trees).
- Watering is advised for the first 2 summers after planting, further to this the trees and shrubs should be able to access water from the surrounding soil.
- During the height of summer when there are extended dry periods (i.e. 10 days with no rain), water should be applied at a rate of 2 domestic bucket fulls (or 20 litres of water) every other day until dry conditions are alleviated. This figure is the aim to reach during the height of summer and can be gradually increased to this in the spring and decreased before ceasing watering in the autumn. (***Note:*** *Be mindful that newly planted trees do need watering, even if it has been raining as often rainwater will not reach the rootball*).
- Evergreens may need to be watered a little during the winter months if it is particularly dry, this does not need to be done routinely, and can be a response to a period of dry weather.
- Use organic mulch at the base of the plants to help retain water, prevent weed growth and also give you an indication of where you need to water.

4.2 WOODLAND PLANTING AND MANAGEMENT

4.2.1 It is proposed that the woodland planting incorporate the existing group of elm (G14 on the Tree Survey) along the site's eastern boundary, as well as the four trees (T4, T5, T6, T13 on the Tree Survey) to the north, in the interests of habitat retention.

Ground Preparation and Planting

a. The woodland belt will be an average of 12.00m in width, with a 3.00m maintenance strip along the eastern boundary, between the proposed woodland area and the edge of the field.
b. All trees are to be pit-planted in an area cleared of all vegetation within 1.00m^2 around each tree. All trees will comprise pot grown or bare-rooted stock and will be planted during the first planting season following completion of development (i.e. between November and March) when the ground is neither frozen nor waterlogged. If the ground is dry, the plants will be watered to ground capacity on planting.
c. Trees are to be planted at 4.00/6.00m (avg. 5.00m) centres, in square pits, avoiding a 'grid structure'.
d. Shrubs will be planted amongst the trees (minimum distance of 1.00m) at 2.50/3.50m (avg. 3.00m) centres (grouping 4-7 specimens of the same species) and avoiding a 'grid structure'.
e. Tree pits will be square and will be 200mm wider in diameter and 200mm deeper than the root spread.
f. All trees will be individually staked using (Ht) 75cm (Dis) 25cm square tree stakes. (Note: These stakes can be cut from timber from the existing on-site structures).
g. All shrubs will be staked using (Ht) 60cm bamboo canes.
h. All plants will be guarded with spiral guards to prevent damage by vermin.

Planting Specifications

Woodland Belt Species Mix – Total Area: 1716.50m^2								
Scientific name	**Common name**	**Specification**	**Girth (cm)**	**Approx. height (m)**	**Clear stem height (m)**	**%**	**C/U***	**No.**
Trees								
Acer campestre	Field maple	Whip	-	90-120cm	-	25	C/T	22
Betula pendula	Silver birch	Transplant	-	80-100cm	-	20	U/T	17
Carpinus betulus	Hornbeam	Whip	-	90-120cm	-	15	C/T	13
Prunus avium	Wild cherry	Transplant	-	80-100cm	-	12.5	U/T	11
Quercus robur	English oak	Whip	-	90-120cm	-	10	C/T	9

Sorbus aucuparia	Rown	Transplant	-	80-100cm	-	7.5	U/T	6
Tilia cordata	Small-leafed Lime	Whip	-	90-120cm	-	10	C/T	9
Total:								**87**
Shrubs								
Corylus avellana	Hazel	Transplant	-	60-80cm	-	40	U	77
Crataegus monogyna	Hawthorn	Transplant	-	60-80cm	-	30	U	58
Euonymus europaeus	Spindle	Transplant	-	60-80cm	-	15	U	29
Ilex aquifolium	Holly	Pot-grown (2L)	-	30-40cm	-	10	U	19
Ligsutrum vulgare	Wild privet	Transplant	-	60-80cm	-	5	U	10
Total:								**193**
*** Canopy/Understory (T – Tree)**								

Maintenance Operations

a. The planting will be checked at regular intervals and any damaged stakes, canes and ties replaced. Plants will be firmed up following planting and, if necessary, until established. Any plants which die, become diseased or damaged will be replaced.
b. For the first year, when there are extended dry periods (i.e. 10 days with no rain), plants should be watered at a rate of 2 domestic bucket fulls (or 20 litres of water) every other day until dry conditions are alleviated.
c. For subsequent years, during dry periods plants should be watered to ground capacity on a weekly basis until dry conditions are alleviated.
d. Weeding around trees will be carried out by hand or by on the spot application of glyphosate, taking care not to spray the tree stems, until the plants are well established.
e. Any losses should be replaced during the following planting season to achieve a stocking rate of 95% by the end of the 5-year period.
f. The stakes and guards should be removed when the trees are established, after 3 to 5 years.

<u>Tree Pruning</u>

g. Limited formative pruning will be necessary to ensure healthy and balanced crowns develop, avoiding 2 weeks either side of bud burst and leaf fall, at which time the stakes, guards and tree ties should be checked to ensure that the trees are not being damaged by them.
h. Mature and established trees will be inspected on an annual basis and any necessary work performed.

Shrub Pruning

i. Pruning will be required to ensure the growth of strong shrub planting and will be carried out once the plants are well established, normally after 2 years but dependent on growth rates.
j. Pruning should take place in February to maximise retention of any berries for bird foraging.

4.3 INDIVIDUAL TREE PLANTING AND MANAGEMENT

Ground Preparation and Planting

a. All trees are to be pit-planted in an area cleared of all vegetation within 1.00m^2 around each tree. All trees will comprise pot grown or root-balled stock and, where necessary, will use the rootstocks listed below to determine the vigour of fruit trees.
b. Trees will be planted during the first planting season following completion of development (i.e. between November and March) when the ground is neither frozen nor waterlogged. If the ground is dry, the plants will be watered to ground capacity on planting.
c. Root barriers will be required in locations where necessary to protect services, structures and surfaces.
d. Trees are to be planted at, at least 5.00m centres in square tree pits. Tree pits will be no more than 200mm wider in diameter and 200mm deeper than the root spread.
e. *'Heavy Standard'* trees will be double staked using (Ht) 180cm (Dis) 32cm square tree stakes.
f. *'Selected Standard'* and *'Standard'* trees will be single staked using (Ht) 120cm (Dis) 32cm square tree stakes.
g. All trees will be mesh guarded to prevent damage by vermin.

Planting Specifications

Feature Tree Species							
Plan Ref.	**Scientific name**	**Common name**	**Specification**	**Girth (cm)**	**Approx. height (m)**	**Clear stem height (m)**	**No.**
Cb	*Carpinus betulus*	Hornbeam	Heavy Standard	12-14	3.50/4.00	Min 2.00	6
Qr	*Quercus robur*	English Oak	Heavy Standard	12-14	3.50/4.00	Min 2.00	4
Txe	*Tilia × europaea*	European lime	Heavy Standard	12-14	3.50/4.00	Min 2.00	5
Total:							**15**

Open Space/Boundary Tree Species							
Plan Ref.	**Scientific name**	**Common name**	**Specification**	**Girth (cm)**	**Approx. height (m)**	**Clear stem height (m)**	**No.**
Ac	*Acer campestre*	Field Maple	Selected Standard	10-12	3.00/3.50	Min 2.00	16
Bp	*Betula pubescens*	Downy birch	Standard	8-10	2.50/3.00	1.75/2.00	6
Ms	*Malus sylvestris*	Crab apple	Standard	8-10	2.50/3.00	1.75/2.00	10
Pp	*Prunus padus*	Bird cherry	Standard	8-10	2.50/3.00	1.75/2.00	6
Pc	*Pyrus communis*	Wild pear	Standard	8-10	2.50/3.00	1.75/2.00	4
St	*Sorbus torminalis*	Wild service tree	Selected Standard	10-12	3.00/3.50	Min 2.00	4
U'S'	*Ulmus 'Sapporo Autumn Gold'**	Elm 'Sapporo Autumn Gold'	Standard	8-10	2.50/3.00	1.75/2.00	8
Total:							**54**

*** *Ulmus* 'Sapporo Autumn Gold' possesses a very high resistance to Dutch elm disease and will be added around the site as a biodiversity enhancement (i.e. to support the life cycle of rare White Letter Hairstreak butterfly). However, if trees do succumb to Dutch elm disease, they will be replaced with an appropriate species from one of the three tree species tables.**

Domestic Tree Species							
Plan Ref.	**Scientific name**	**Common name**	**Specification***	**Girth (cm)**	**Approx. height (m)**	**Clear stem height (m)**	**No.**
Ac'QE'	*Acer campestre* 'Queen Elizabeth'	Field Maple 'Queen Elizabeth'	Selected Standard	10-12	3.00/3.50	Min 2.00	7
Ar	*Acer rubrum*	Red maple	Selected Standard	10-12	3.00/3.50	Min 2.00	4
Bp'D'	*Betula pendula 'Dalecarlica'*	Ornäs birch	Standard	8-10	2.50/3.00	1.75/2.00	5
Cl	*Crataegus laevigata 'Paul's Scarlet'*	Hawthorn 'Paul's Scarlet'	Standard	8-10	2.50/3.00	1.75/2.00	4
S'S'	*Sorbus 'Sunshine'*	Mountain Ash 'Sunshine'	Standard	8-10	2.50/3.00	1.75/2.00	10
Total:							**30**

Maintenance Operations

a. The planting will be checked at regular intervals and any damaged stakes, canes and ties replaced. Plants will be firmed up following planting and, if necessary, until established. Any plants which die, become diseased or damaged will be replaced.
b. For the first year, when there are extended dry periods (i.e. 10 days with no rain), trees should be watered at a rate of 2 domestic bucket fulls (or 20 litres of water) every other day until dry conditions are alleviated.
c. For subsequent years, during dry periods, trees should be watered to ground capacity on a weekly basis until dry conditions are alleviated.
d. Weeding around trees will be carried out by hand or by on-the-spot application of glyphosate, taking care not to spray the tree stems, until the plants are well established. Mulch will be applied annually, using 50mm of matured wood bark, or wet straw, for the first three years after planting to suppress weed growth and contain the moisture.
e. Limited formative pruning will be necessary to ensure that healthy and balanced crowns develop, avoiding 2 weeks either side of bud burst and leaf fall, at which time the stakes, guards and tree ties should be checked to ensure that the trees are not being damaged by them.
f. Stakes and guards should be removed when the trees are established, after approximately 3 to 5 years depending on species. *Prunus avium 'Early Rivers'* should remain permanently staked, however the mesh guard can be removed after 5 years.
g. Any losses should be replaced during the following planting season to achieve a stocking rate of 100% by the end of the 5-year period.
h. Mature and established trees will be inspected on an annual basis and any necessary work performed.

4.4 MIXED NATIVE HEDGE PLANTING AND MANAGEMENT

Ground Preparation and Planting

a. Planting of bare-rooted stock is to be carried out between November and March; however, pot-grown plants can be planted throughout the year. Planting shall take place during frost free conditions when the site is not waterlogged. No machinery will over-run the grassed and treed areas adjacent to the planting or hedged areas.
b. All invasive and pernicious weeds will be removed from the site before works commence. Clearance will be restricted to glyphosate weed killers and hand weeding.
c. All planting beds will be free from weeds and waste materials. The ground will be cultivated to full depth. All plants are to be thoroughly soaked immediately prior to planting.

d. All hedging material will be planted as bare-rooted transplants and are to be notch-planted in a double staggered row at 45cm centres using 5 plants per linear metre.
e. Plants will be individually staked using (Ht) 60cm bamboo canes and guarded with spiral guards to prevent damage by vermin.

Site Frontage Mixed Native Hedge Species Mix – Total Length: 88.35m					
Scientific name	**Common name**	**Specification**	**Approx. height (cm)**	**%**	**No.**
Acer campestre	Field maple	1 + 1 transplants	90-105	25	111
Corylus avellana	Hazel	1 + 1 transplants	90-105	15	66
Carpinus betulus	Hornbeam	1 + 1 transplants	90-105	35	155
Ilex aquifolium	Holly	Pot-grown (3ltr)	60-90	5	22
Ligustrum vulgare	Wild privet	1 + 1 transplants	100-125	10	44
Lonicera periclymenum	Common honeysuckle	Pot-grown (2ltr)	-	5	22
Viburnum opulus	Guelder rose	1 + 1 transplants	90-105	5	22
Total:					**442**

Standard Mixed Native Hedge Species Mix – Total Length: 697.50m					
Scientific name	**Common name**	**Specification**	**Approx. height (cm)**	**%**	**No.**
Acer campestre	Field maple	1 + 1 transplants	60-80	5	175
Corylus avellana	Hazel	1 + 1 transplants	60-80	25	872
Crataegus monogyna	Hawthorn	1 + 1 transplants	60-80	40	1395
Euonymus europaeus	Spindle	1 + 1 transplants	60-80	5	175
Ilex aquifolium	Holly	Pot-grown (3ltr)	40-60	2.5	87
Prunus spinosa	Blackthorn	1 + 1 transplants	60-80	15	523
Viburnum lantana	Wayfaring tree	1 + 1 transplants	60-80	5	175
Viburnum opulus	Guelder rose	1 + 1 transplants	60-80	2.5	87
Total:					**4289**

Maintenance Operations

a. The planting will be checked at regular intervals and any damaged stakes, canes and ties replaced. Plants will be firmed up following planting and, if necessary, until established. Any plants which die, become diseased or damaged will be replaced.
b. Until the plants are established they will be watered to ground capacity during dry periods. Weeding around planted areas will be carried out by hand or by the spot application of

glyphosate, taking care not to spray the tree and shrub stems, until the plants are well established.

c. Pruning will be required to ensure the growth of strong, dense hedging and will be carried out once the plants are well established, normally in the second year, but dependant on growth rates.
d. Hedgerow management will take place between mid-December and early March. This will avoid the dormice active period and bird-nesting season and allow berries to be used for foraging wildlife.
e. The hedging along Sipson Lane should be maintained at 2.00-2.50m in height.
f. The hedging around the reminder of the site boundary and alongside the M4 should be maintained at 3.00-3.50m in height.
g. All hedging will be maintained at a minimum of 2.00m in width once established.
h. In order to encourage wildlife mixed native hedgerows must only receive a light pruning and should be cut in an "A" shape or a "topped A" shape to create tall bushy hedges with maximum wildlife potential.
i. Guards and stakes will be removed once the plants are well established.
j. Any losses should be replaced during the following planting season to achieve a stocking rate of at least 95% by the end of the 5-year period.

4.5 COMPENSATORY SCRUB PLANTING AND MANAGEMENT

Ground Preparation

a. The belt of compensatory scrub planting will be 7.50m in width and will be established adjacent to the section of mixed native hedging adjacent to the M4 (outside of the site but within land under the applicant's control).
b. Planting shall take place during frost free conditions when the site is not waterlogged. Planting is to be carried out either during the spring between March and May, or Autumn between October and November. Note: Container-grown plants can be planted at any time of the year but are easier to care for if planted in autumn, as they need less watering than those planted in spring or summer.
c. All invasive and pernicious weeds will be removed from the site before works commence. Clearance will be restricted to non-residual herbicide in accordance with manufacturers specifications and hand weeding.

d. All planting beds will be free from weeds and waste materials. The ground will be cultivated to full depth with the additional of slow release fertiliser or well-rotted manure. All plants are to be thoroughly soaked immediately prior to planting.
e. Plant in a hole just deep and wide enough to set the rootball in, leaving the bases of the stems, or the shoots above ground. Hand firm soil back around stem.
f. Water the ground well even if already moist as this will settle the soil and prevent desiccation.
g. Scrub species will be planted at 1.50/2.50m (avg. 2.00m) centres (grouping 4-7 specimens of the same species) and avoiding a 'grid structure'.
h. Plants will be individually staked with bamboo and guarded with spiral guards to prevent damage by vermin.

Planting Specifications

Compensatory Scrub Species Mix – <u>Total Area: 1594.85m</u>					
Scientific name	**Common name**	**Specification**	**Approx. height (cm)**	**%**	**No.**
Cornus sanguinea	Dogwood	1 + 1 transplants	60-80	10	43
Corylus avellana	Hazel	1 + 1 transplants	60-80	22.5	96
Crataegus monogyna	Hawthorn	1 + 1 transplants	60-80	25	107
Euonymus europaeus	Spindle	1 + 1 transplants	60-80	10	43
Ligustrum vulgare	Wild privet	1 + 1 transplants	60-80	5	21
Prunus spinosa	Blackthorn	1 + 1 transplants	60-80	10	43
Rosa canina	Dog rose	1 + 1 transplants	60-80	5	21
Viburnum lantana	Wayfaring tree	1 + 1 transplants	60-80	7.5	32
Viburnum opulus	Guelder rose	1 + 1 transplants	60-80	5	21
Total:					**427**

Maintenance Operations

a. The planting will be checked at regular intervals and any damaged stakes, canes and ties replaced. Plants will be firmed up following planting and, if necessary, until established. Any plants which die, become diseased or damaged will be replaced.
b. Until the plants are established they should be watered to ground capacity during dry periods.
c. Weeding around planted areas will be carried out by hand.
d. Mulching will take place in spring using well-rotted manure.
e. Pruning will be required to ensure the growth of strong shrub planting and will be carried out once the plants are well established, normally in the second year, but dependent on growth rates. Cutting should take place in February.

f. Guards and stakes will be removed once the plants are well established.

g. Any losses should be replaced during the following planting season to achieve a stocking rate of at least 95% by the end of the 5-year period.

4.6 AMENITY SHRUBS PLANTING AND MANAGEMENT

Ground Preparation and Planting

i. Planting shall take place during frost free conditions when the site is not waterlogged. Planting is to be carried out either during the spring between March and May, or Autumn between October and November. Note: Container-grown plants can be planted at any time of the year but are easier to care for if planted in autumn, as they need less watering than those planted in spring or summer.

j. All invasive and pernicious weeds will be removed from the site before works commence. Clearance will be restricted to non-residual herbicide in accordance with manufacturers specifications and hand weeding.

k. All planting beds will be free from weeds and waste materials. The ground will be cultivated to full depth with the additional of slow-release fertiliser or well-rotted manure. All plants are to be thoroughly soaked immediately prior to planting.

l. Plants to be planted at densities as shown in the planting specifications below.

m. Plant in a hole just deep and wide enough to set the rootball in, leaving the bases of the stems, or the shoots above ground. Hand firm soil back around stem.

n. Water the ground well even if already moist as this will settle the soil and prevent desiccation.

o. Plants will be individually staked using (Ht) 60cm bamboo canes and guarded with spiral guards to prevent damage by vermin.

Planting Specifications

Amenity Shrub Planting – Total Area: 83.00m²					
Scientific name	**Common name**	**Min. Pot Size (L)**	**Density (m²)**	**%**	**No.**
Choisya ternata	Mexican Orange Blossom	5	2	12.5	21
Cornus alba 'Sibirica'	Siberian Dogwood	5	2	22.5	37
Fatsia japonica	Japanese aralia	5	2	12.5	21
Forsythia x intermedia 'Lynwood Variety'	Forsythia 'Lynswood Variety'	5	2	17.5	29
Photinia x fraseri 'Red Robin'	Christmas Berry 'Red Robin'	5	2	17.5	29

Viburnum opulus 'Roseum'	Snowball Tree	5	2	17.5	29
Total:					**166**

Maintenance Operations

a. The planting will be checked at regular intervals and any damaged stakes, canes and ties replaced. Plants will be firmed up following planting and, if necessary, until established. Any plants which die, become diseased or damaged will be replaced.
b. Until the plants are established they will be watered to ground capacity during dry periods. Weeding around planted areas will be carried out by hand or by the spot application of glyphosate, taking care not to spray the tree and shrub stems, until the plants are well established.
c. Pruning will be required to ensure the growth of strong, dense shrubs and will be carried out once the plants are well established, normally in the second year, but dependant on growth rates. Cutting should take place in February.
d. Guards and stakes will be removed once the plants are well established.
e. Any losses should be replaced during the following planting season to achieve a stocking rate of at least 95% by the end of the 5-year period.

4.7 RIPARIAN HERBACEOUS PLANTING AND MANAGEMENT

Ground Preparation and Planting

a. Planting shall take place during frost free conditions when the site is not waterlogged. Planting is to be carried out either during the spring between March and May, or Autumn between October and November. Note: Container-grown plants can be planted at any time of the year but are easier to care for if planted in autumn, as they need less watering than those planted in spring or summer.
b. All invasive and pernicious weeds will be removed from the site before works commence. Clearance will be restricted to non-residual herbicide in accordance with manufacturers specifications and hand weeding.
c. All planting beds will be free from weeds and waste materials. The ground will be cultivated to full depth with the additional of slow-release fertiliser or well-rotted manure. All plants are to be thoroughly soaked immediately prior to planting.
d. Ensure plants are not located in areas that are likely to be fully submerged during the winter.
e. Plant in a hole just deep and wide enough to set the rootball in, leaving the bases of the stems, or the shoots above ground. Hand firm soil back around stem.

f. Water the ground well even if already moist as this will settle the soil and prevent desiccation.

g. Plants to be planted at densities as shown in the planting specifications below.

Planting Specifications

Riparian Herbaceous Species Mix – Total Area: 109.40m²				
Note: Herbaceous species to be planted at equal percentages, with beds being approximately 1.50m in width.				
Scientific name	**Common name**	**Min. Pot Size (L)**	**Density (m²)**	**No.**
Butomus umbellatus	Flowering Rush	3	3	33
Caltha palustris	Marsh Marigold	2	3	33
Carex acuta	Slender Tufted-sedge	2	3	33
Geum rivale	Water Avens	1	4	44
Iris pseudacorus	Yellow Iris	2	3	33
Juncus effuses	Corkscrew Rush	2	3	33
Lythrum salicaria	Purple Loosestrife	3	3	33
Mentha aquatica	Water Mint	1	4	44
Myosotis palustris	Water Forget-Me-Not	2	4	44
Veronica beccabunga	Brooklime	1	4	44
Total:				**374**

Maintenance Operations

a. The planting will be checked at regular intervals and any damaged stakes, canes and ties replaced. Plants will be firmed up following planting and, if necessary, until established. Any plants which die, become diseased or damaged will be replaced.

b. Until the plants are established they will be watered to ground capacity during dry periods.

c. Weeding around planted areas will be carried out by hand.

d. Mulching will take place in spring using well-rotted manure.

e. Old flower stems are to be cut down to the ground in early November. Removing the flower heads (dead-heading) as they mature will encourage the plant to produce more flowers, extending the flowering period. This is to be done using secateurs.

f. Every 3 – 4 years the clumps of plants will need to be divided into smaller plants and replanted. Early flowering plants are to be divided in the autumn and late flowering plants are to be divided in the spring.

g. Any losses should be replaced during the following planting season to achieve a stocking rate of at least 95% by the end of the 5-year period.

4.8 AQUATIC SPECIES PLANTING AND MANAGEMENT

Preparation and Planting

a. Planting shall take place during frost free conditions when the pond is free from ice. Planting is to be carried out from mid spring to summer as the water is warming up.
b. Floating plants will be removed from their pot and placed gently on the water's surface with the roots pointing towards the bottom of the pond.
c. Container-grown plants will be repotted into larger aquatic baskets lined with hessian and large stones placed in the bottom of the basket to act as weights and an aquatic compost will be used. Each plant should be planted to the same depth as in the original container.
d. Each plant will be submerged to the correct depth as shown on the planting specifications. Some plants may need to sit on placed rocks/stones to achieve the optimal planting depth.

Planting Specifications

Aquatic Species – Total Area: 131.40m²						
Note: The number of plants required is calculated using 40% of the total open water area (excluding marginals).						
Scientific name	**Common name**	**Min. Pot Size**	**Planting Depth (cm)**	**Density (m²)**	**%**	**No.**
Callitriche stagnalis	Water starwort	1L	15-60	3	20	79
Ceratophyllym demersum	Hornwort	9cm	30-100	5	10	66
Hottonia palustris	Water violet	9cm	20-40	7	15	138
Hydrocharis morsus-ranae	Frogbit	9cm	*Floats*	5	15	98
Nuphar lutea	Yellow water lily	1L	30-60	3	25	98
Potamogeton natans	Broad-leaved pondweed	1L	20	2	15	40
Total:						**519**

Maintenance Operations

a. The planting will be checked at regular intervals, removing dead or damaged foliage and dead flower heads. Any plants which die, become diseased or damaged will be replaced.
b. Feed with an aquatic slow-release fertiliser during the growing season following manufacturer's instructions.
c. Once the growing season has ended prune the plants and any overhanging vegetation that may fall into the pond during the winter.

d. Every 3 – 4 years the clumps of plants will need to be divided into smaller plants and replanted. Plants are to be divided in the spring.
e. Any losses should be replaced during the following planting season to achieve a stocking rate of at least 95% by the end of the 5-year period.

4.9 SPECIES-RICH GRASSLAND SEEDING AND MANAGEMENT

4.8.1 It is proposed that the majority of the existing areas of hardstanding around the site (see DWG-1621-01 for locations), which are not to be incorporated into the development, be restored as a species rich grassland.

Ground Preparation

To prepare the seed bed weeds must first be removed using repeated cultivation or a herbicide. The ground should be ploughed or dug to bury any unwanted ground cover, then cultivated with a rotovator, finally the soil should be harrowed or raked to produce a medium tilth. After the initial cultivation and levelling the ground should be left to settle for several days/weeks; this gives another opportunity to control any residual weeds which emerge during this time, such as docks, thistles, mare's tail or brambles.

To achieve an even surface, the ground should be lightly re-cultivated, and any large stones or bricks removed from the surface. Once prepared the ground should be raked and rolled, moving soil if needed to smooth out minor humps and depressions, to produce a firm surface. The final raking and rolling should produce a seed bed with a medium-fine tilth ready for seeding. Cultivation work will be carried out when the soil moisture level is reasonably low, allowing the soil to crumble.

Sowing Specifications

Species-Rich Grassland Seed Mix – Total Area: 3288.00m²			
Seed Mix	**Sowing Rate (g/m2)**	**%**	**Quantity (g)**
Emorsgate EG2 (or equivalent)	4	100	≈13,152
Note: This area is based on the area of existing hardstanding that is to be restored to grassland. If there is considerable overrunning of the existing grass around the proposed development, then more grass seed may be required for restoration			

Sowing

a. 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 in the soil. Moisture may be supplied artificially by

watering but must be thorough enough to penetrate at least 100mm and continued after sowing if dry weather follows.

b. Seed should be surface sown onto a freshly prepared seed bed and can be applied by machine or broadcast by hand (do not drill). To get an even distribution, divide the seed into two or more parts and sow in overlapping sections.
c. After sowing lightly rake or harrow the surface to settle the seed in. Take care not to bury the seed at depth. Firm with a roller, or by treading, to give good soil/seed contact.

Maintenance Operations

First Year

a. Growth and establishment of grasses may be slow initially, and there will often be a flush of annual weeds from the soil in the first growing season.
b. Top all plant growth at least three times through the first season (removing cuttings if dense) to prevent weeds and grasses smothering the slow-growing flowers. More frequent and regular topping will minimise the number of toppings produced each time so they can be left to disperse.

Continued Management

c. Each spring if plant growth is more than 15cm in height cut (and remove cuttings if dense) to achieve a plant height of between 5cm and 10cm tall. Cut before the end of March.
d. Do not cut or disturb grassland from the end of March to mid-August to provide habitat and foraging sites for invertebrates (including wild pollinators) and birds.
e. Cut back the main summer growth from mid-August and remove cuttings so not to leave a mulch and to help reduce soil fertility.
f. Cut up to the end of October aiming to leave a plant height of between 10cm and 20cm. Remove cuttings if they are too dense to disperse easily and quickly.
g. Leave 10% of the area uncut or ungrazed to provide over-winter nesting and safe refuges for insects and other wildlife.

4.10 WEAR TOLERANT GRASS PLANTING AND MANAGEMENT

4.9.1 It is proposed that the existing grass/ruderal vegetation to the north of the proposed development be managed as wear tolerant grassland so as to ease of access around the building, as well as to reduce the maintenance requirements of this fairly well contained area of the site.

Ground Preparation

To prepare the seed bed weeds must first be removed using repeated cultivation or a herbicide. The ground should be ploughed or dug to bury any unwanted ground cover, then cultivated with a rotovator, finally the soil should be harrowed or raked to produce a medium tilth. After the initial cultivation and levelling the ground should be left to settle for several days/weeks; this gives another opportunity to control any residual weeds which emerge during this time, such as docks, thistles, mare's tail or brambles.

To achieve an even surface, the ground should be lightly re-cultivated, and any large stones or bricks removed from the surface. Once prepared the ground should be raked and rolled, moving soil if needed to smooth out minor humps and depressions, to produce a firm surface. The final raking and rolling should produce a seed bed with a medium-fine tilth ready for seeding. Cultivation work will be carried out when the soil moisture level is reasonably low, allowing the soil to crumble.

Sowing Specifications

Wear Tolerant Grass Seed Mix – Total Area: 712.85m²			
Seed Mix	**Sowing Rate (g/m2)**	**%**	**Quantity (g)**
Emorsgate EG22 (or equivalent)	25	100	≈17,821

Sowing

d. 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 in the soil. Moisture may be supplied artificially by watering but must be thorough enough to penetrate at least 100mm and continued after sowing if dry weather follows.
e. Seed should be surface sown onto a freshly prepared seed bed and can be applied by machine or broadcast by hand (do not drill). To get an even distribution, divide the seed into two or more parts and sow in overlapping sections.
f. After sowing lightly rake or harrow the surface to settle the seed in. Take care not to bury the seed at depth. Firm with a roller, or by treading, to give good soil/seed contact.

Maintenance Operations

a. Protect the newly sown seed from birds and prevent public access onto the soil. Keep grass watered in dry conditions and weed the area by hand, removing any weeds before they flower.

b. Once seedling grasses are established, (typically in good growing conditions after about three to four weeks), lightly roll or tread to firm and level the soil around the grass roots ready for the first cut. Do not roll if the ground is saturated with water.
c. When the grass has picked up again (typically after a few days) the first cut can be undertaken with the mower set on a high setting (50mm +). The aim is to trim the sown grass back by about one-third of its height and cut back any weeds.
d. Thereafter the lawn can be mown regularly as needed, progressively reducing the mowing height over its first spring/summer to the desired height.
e. A new sown lawn will take a full year or more to reach full strength and ground cover and knit together as a turf. It can be walked on during establishment but heavy use that might cause wear and tear should be avoided.

4.11 GRASSLAND RESTORATION SEEDING AND MANAGEMENT

4.10.1 It is proposed that the remaining existing grass/ruderal vegetation around the site (see DWG-1621-01 for locations) be seeded with yellow rattle (*Rhinanthus minor*), with the aim being to reduce the competition from above ground grasses and legumes and allow other flowering species to grow through. The resulting growth is then to be managed as species-rich grassland.

Ground Preparation

To prepare the seed bed weeds must first be removed using repeated cultivation. After the initial cultivation the existing grassland should be cut very short (25mm) and the site 'opened up' for germination by harrowing, raking or lightly discing, aiming to create up to 50% bare soil. This is best done when the ground is dry.

The ground should then be left to settle for several days/weeks; this gives another opportunity to control any residual weeds which emerge during this time, such as docks, thistles, mare's tail or brambles.

Sowing Specifications

Grassland Restoration Seed Mix – Total Area: 15,039.55m^2			
Seed	**Sowing Rate (g/m2)**	**%**	**Quantity (g)**
Yellow rattle (*Rhinanthus minor*)	1	100	≈15,039

Sowing

g. Yellow rattle is best sown in the autumn as it needs a prolonged period of chilling through the winter to trigger its germination the following spring. Moisture may be supplied artificially by watering but must be thorough enough to penetrate at least 100mm and continued after sowing if dry weather follows.
h. Seed should be surface sown onto a freshly prepared seed bed and can be applied by machine or broadcast by hand (do not drill). To get an even distribution, divide the seed into two or more parts and sow in overlapping sections.
i. After sowing lightly rake or harrow the surface to settle the seed in. Take care not to bury the seed at depth. Firm with a roller, or by treading, to give good soil/seed contact.

Maintenance Operations

<u>First Year</u>

h. Growth and establishment of grasses may be slow initially, and there will often be a flush of annual weeds from the soil in the first growing season.
i. Top all plant growth at least three times through the first season (removing cuttings if dense) to prevent weeds and grasses smothering the slow-growing flowers. More frequent and regular topping will minimise the number of toppings produced each time so they can be left to disperse.

<u>Continued Management</u>

j. Each spring if plant growth is more than 15cm in height cut (and remove cuttings if dense) to achieve a plant height of between 5cm and 10cm tall. Cut before the end of March.
k. Do not cut or disturb grassland from the end of March to mid-August to provide habitat and foraging sites for invertebrates (including wild pollinators) and birds.
l. Cut back the main summer growth from mid-August and remove cuttings so not to leave a mulch and to help reduce soil fertility.
m. Cut up to the end of October aiming to leave a plant height of between 10cm and 20cm. Remove cuttings if they are too dense to disperse easily and quickly.
n. Leave 10% of the area uncut or ungrazed to provide over-winter nesting and safe refuges for insects and other wildlife.

4.12 BULB PLANTING AND MANAGEMENT

Ground Preparation

Ground preparation is limited to the removal of any unwanted ground cover, the ground should be left for several days/weeks; this gives another opportunity to control any residual weeds which emerge during this time, such as docks, thistles, mare's tail or brambles. This should not be necessary within areas of recently established grass, and removal of weeds should have already been undertaken prior to sowing.

Planting specifications

Bulbs – Total Area: 340.45m²				
Scientific name	**Common name**	**Sowing Rate**	**%**	**No.**
Crocus sativus	Crocus	5	25	425
Eranthis Hyemalis	Winter Aconite	5	20	340
Galanthus nivalis	Common snowdrop	5	25	425
Narcissus pseudonarcissus	Wild daffodil	5	30	102
Total:				**1292**

Sowing

a. Bulbs are best planted in the autumn or spring but can be planted at other times of the year if there is sufficient warmth and moisture in the soil. Where bulbs are to be planted into recently sown seed beds, the seed should be allowed to establish before planting.
b. Bulb mixes are to be combined at the percentages shown above prior to sowing.
c. Bulbs are to be planted randomly on a grid at an average of 45.00cm centres (avg. 5 blubs per m^2) to allow for natural infilling.
d. The bulbs should be planted at a depth of 2½ to 3 times the diameter of the bulb. The bulbs should not be planted too shallow as this can encourage frost heaving.
e. Once planted bulbs should be covered with soil and lightly firmed in in with a roller, or by treading, to give good soil contact.

Maintenance Operations

f. Protect the newly planted bulbs from birds and vermin, and prevent public access onto the soil. Keep grass watered in dry conditions and weed the area by hand, removing any weeds before they flower.

g. Normal rainfall should provide enough moisture for bulbs, however bulbs should be kept watered in dry conditions.
h. Weeding around the bulbs will be carried out by hand, until the plants are well established.
i. Where bulbs are planted within areas with a mowing regime (in particularly amenity grass which is regularly cut back), mowing around bulbs should be left until the bulb foliage has begun to die back.

4.13 GREEN ROOF PLANTING AND MANAGEMENT

4.12.1 It is beyond the scope of this document to provide construction details as to how the proposed building will support the weight of the green roof. Details of this will be provided by the architect.

4.12.2 It is important to note that the building should be designed to accommodate the weight of the proposed green roofs, including the various layers and membranes required, the substate, the plants themselves and any irrigation systems; allowances should be made for the weight of the roof when the soil is wet.

Site preparation

a. An 'extensive green roof' is to be installed in late September/early October or late March/early April, whichever comes first once the construction of the lodge is complete.
b. Prior to the commencement of the green roof installation the integrity of the waterproof covering must be tested and approved.
c. All drainage works, flashings etc. should be completed prior to the application of the green roof covering.
d. Adequate provision for watering the planting must be in place on site before green roof is installed.

Installation

a. Waterproof membrane, root barrier, drainage layers and filter layers should be installed edge to edge across the entire area to be greened, as per the manufacturer's specification.
b. Ensure waterproofing and drainage layers function correctly and consistently, as per the manufacturer's specification.
c. Substrate to be applied to depths between 80-100mm using grading bars. Depth checking should be undertaken throughout the installation.
    - Keep handling of the substrate to a minimum.

- Do not handle or apply when wet or frozen.
- Handle in the driest conditions possible.
- Apply two equal layers, building up to the required depth. Gently firm each later before spreading the next and allow for any settlement to occur.
- Using measuring stick markers to ensure the required substrate depths are achieved.

d. Once the substrate has been applied and required depths are achieved, the substrate drainage layer and any moisture mats are to be saturated to capacity. This is to be done using suitable temporary irrigation equipment prior to on-going temporary irrigation depending on the time of year.

Planting Specifications

Green Roof Seed Mix – Total Area: 519.10m²				
Scientific name	**Common name**	**Sowing Rate (g/m2)**	**%**	**Quantity (g)**
Blackstonia perfoliata	Yellow wort	4	7	≈145
Erigeron acer	Blue fleabane	4	7	≈145
Geranium robertianum	Herb robert	4	7	≈145
Plantago coronopus	Buck's horn plantain	4	7	≈145
Sedum acre	Biting stonecrop	4	13	≈270
Sedum album	White stonecrop	4	13	≈270
Sedum anglicum	English stonecrop	4	13	≈270
Sedum fosterianum	Rock stonecrop	4	13	≈270
Sedum rosea	Roseroot stonecrop	4	13	≈270
Thymus polytrichus	Wild thyme	4	7	≈145

Sowing

a. Seed should be sown from late summer to mid-autumn at a rate of 4gm/m^2.
b. Seed can be sown in spring or late summer at temperatures around 10 to18°C (50 to 65°F). Cold temperatures will increase the cultivation time.
c. Prepare a fine weed free free-draining bed. Mixing seed with fine sand or the green –roof soil mix will aid even distribution. Sow seed evenly over the surface. Gently rake the seed bed so the seed comes into contact with the soil mix and gently water in. For wintering the root development should be very good, small seedlings need to be frost free at around 3 to 5°C (37 to 41°F). For over-wintering fleece cover will be needed to keep them frost free.

Maintenance Operations

a. Protect newly sown seed from birds.
b. Establishment of a good vegetation cover on the roof can take up to two years.
c. Post-establishment, irrigation should not be required, although water storage capacity of the system and the plants' water needs should be appropriately assessed for the local climate and weather conditions.
d. Weed the area by hand, removing any weeds before they flower and fallen leaves twice a year.
e. Drainage outlets (including inspection chambers) should be cleared of vegetation twice yearly.
f. Inspect the waterproofing system visible at all upstands to ensure it is firmly adhered.
g. Cut back vegetation in the autumn and remove cuttings.
h. Reseed bare areas with the specified plants if necessary.
i. All inspections and maintenance carried out on the green roofs should be recorded by the Management Agency. Any signs of damage and degradation should be reported immediately so arrangements can be made for remedial work to be carried out if necessary. Signs of damage or degradation of the green roof should also be reported as this may affect the future integrity of the waterproofing.

ILLUSTRATIVE MATERIAL

KEY:

- Site
- Other land under applicant's control

Existing

- Buildings and hardstanding to be removed
- On-site trees (as surveyed by SJ Stephens Associates) to be removed
- On-site trees (as surveyed by SJ Stephens Associates) to be retained and managed, and protected as detailed in the Arboricultural ImpactStatement
- Indicative locations of off-site trees (not surveyed)
- Grass/ruderal vegetation to be sown with yellow rattle to aid restoration

Proposed

- Mixed native woodland belt
- Individual trees
- Site frontage mixed native hedge
- Standard mixed native hedge
- Compensatory scrub planting
- Amenity shrub planting
- Riparian herbaceous planting
- Open water with 40% aquatic species
- Species-rich grassland Emorsgate EG2 (or equivalent)
- Wear tolerant grass Emorsgate EG22 (or equivalent)
- Bulb planting
- Sedum rich green roof
- Recommended root barrier locations

NOTES:

This plan should be read in conjunction with the Landscape Implementation and Maintenance Detail document prepared by WHLandscape. REF: 23.1621

Drawing not for construction.

Responsibility is not accepted for errors made in scaling from this drawing. All construction information should be taken from construction drawings with figured dimensions only.

Planting proposals assume premium grade topsoil as defined by BS3882:2007, provided to a minimum depth of 450mm for shrub areas and 150mm for grass areas.

Green roof proposals assume a substrate of a minimum settled depth of 80mm.

Root barriers (GreenBlue Urban design or similar) should be used where necessary to protect services, structures and surfaces.

Woodland Belt Species Mix – Total Area: 1716.50m²

Scientific name	Common name	Specification	Girth (cm)	Approx. height (m)	Clear stem height (m)	%	C/U*	No.
Trees								
Acer campestre	Field maple	Whip	-	90-120cm	-	25	C/T	22
Betula pendula	Silver birch	Transplant	-	80-100cm	-	20	U/T	17
Carpinus betulus	Hornbeam	Whip	-	90-120cm	-	15	C/T	13
Prunus avium	Wild cherry	Transplant	-	80-100cm	-	12.5	U/T	11
Quercus robur	English oak	Whip	-	90-120cm	-	10	C/T	9
Sorbus aucuparia	Rown	Transplant	-	80-100cm	-	7.5	U/T	6
Tilia cordata	Small-leafed Lime	Whip	-	90-120cm	-	10	C/T	9
Total:								**87**
Shrubs								
Corylus avellana	Hazel	Transplant	-	60-80cm	-	40	U	77
Crataegus monogyna	Hawthorn	Transplant	-	60-80cm	-	30	U	58
Euonymus europaeus	Spindle	Transplant	-	60-80cm	-	15	U	29
Ilex aquifolium	Holly	Pot-grown (2L)	-	30-40cm	-	10	U	19
Ligsutrum vulgare	Wild privet	Transplant	-	60-80cm	-	5	U	10
Total:								**193**

*** Canopy/Understory (T – Tree)**

Feature Tree Species

Plan Ref.	Scientific name	Common name	Specification	Girth (cm)	Approx. height (m)	Clear stem height (m)	No.
Cb	*Carpinus betulus*	Hornbeam	Heavy Standard	12-14	3.50/4.00	Min 2.00	6
Qr	*Quercus robur*	English Oak	Heavy Standard	12-14	3.50/4.00	Min 2.00	4
Txe	*Tilia × europaea*	European lime	Heavy Standard	12-14	3.50/4.00	Min 2.00	5
Total:							**15**

Open Space/Boundary Tree Species

Plan Ref.	Scientific name	Common name	Specification	Girth (cm)	Approx. height (m)	Clear stem height (m)	No.
Ac	*Acer campestre*	Field Maple	Selected Standard	10-12	3.00/3.50	Min 2.00	16
Bp	*Betula pubescens*	Downy birch	Standard	8-10	2.50/3.00	1.75/2.00	6
Ms	*Malus sylvestris*	Crab apple	Standard	8-10	2.50/3.00	1.75/2.00	10
Pp	*Prunus padus*	Bird cherry	Standard	8-10	2.50/3.00	1.75/2.00	6
Pc	*Pyrus communis*	Wild pear	Standard	8-10	2.50/3.00	1.75/2.00	4
St	*Sorbus torminalis*	Wild service tree	Selected Standard	10-12	3.00/3.50	Min 2.00	4
U'S'	*Ulmus 'Sapporo Autumn Gold'**	Elm 'Sapporo Autumn Gold'	Standard	8-10	2.50/3.00	1.75/2.00	8
Total:							**54**

*** *Ulmus* 'Sapporo Autumn Gold' possesses a very high resistance to Dutch elm disease and will be added around the site as a biodiversity enhancement (i.e. to support the life cycle of rare White Letter Hairstreak butterfly). However, if trees do succumb to Dutch elm disease, they will be replaced with an appropriate species from one of the three tree species tables.**

Domestic Tree Species

Plan Ref.	Scientific name	Common name	Specification*	Girth (cm)	Approx. height (m)	Clear stem height (m)	No.
Ac'QE'	*Acer campestre* 'Queen Elizabeth'	Field Maple 'Queen Elizabeth'	Selected Standard	10-12	3.00/3.50	Min 2.00	7
Ar	*Acer rubrum*	Red maple	Selected Standard	10-12	3.00/3.50	Min 2.00	4
Bp'D'	*Betula pendula 'Dalecarlica'*	Ornäs birch	Standard	8-10	2.50/3.00	1.75/2.00	5
Cl	*Crataegus laevigata 'Paul's Scarlet'*	Hawthorn 'Paul's Scarlet'	Standard	8-10	2.50/3.00	1.75/2.00	4
S'S'	*Sorbus 'Sunshine'*	Mountain Ash 'Sunshine'	Standard	8-10	2.50/3.00	1.75/2.00	10
Total:							**30**

Site Frontage Mixed Native Hedge Species Mix – Total Length: 88.35m

Scientific name	Common name	Specification	Approx. height (cm)	%	No.
Acer campestre	Field maple	1 + 1 transplants	90-105	25	111
Corylus avellana	Hazel	1 + 1 transplants	90-105	15	66
Carpinus betulus	Hornbeam	1 + 1 transplants	90-105	35	155
Ilex aquifolium	Holly	Pot-grown (3ltr)	60-90	5	22
Ligustrum vulgare	Wild privet	1 + 1 transplants	100-125	10	44
Lonicera periclymenum	Common honeysuckle	Pot-grown (2ltr)	-	5	22
Viburnum opulus	Guelder rose	1 + 1 transplants	90-105	5	22
Total:					**442**

Standard Mixed Native Hedge Species Mix – Total Length: 697.50m

Scientific name	Common name	Specification	Approx. height (cm)	%	No.
Acer campestre	Field maple	1 + 1 transplants	60-80	5	175
Corylus avellana	Hazel	1 + 1 transplants	60-80	25	872
Crataegus monogyna	Hawthorn	1 + 1 transplants	60-80	40	1395
Euonymus europaeus	Spindle	1 + 1 transplants	60-80	5	175
Ilex aquifolium	Holly	Pot-grown (3ltr)	40-60	2.5	87
Prunus spinosa	Blackthorn	1 + 1 transplants	60-80	15	523
Viburnum lantana	Wayfaring tree	1 + 1 transplants	60-80	5	175
Viburnum opulus	Guelder rose	1 + 1 transplants	60-80	2.5	87
Total:					**4289**

Compensatory Scrub Species Mix – Total Area: 1594.85m

Scientific name	Common name	Specification	Approx. height (cm)	%	No.
Cornus sanguinea	Dogwood	1 + 1 transplants	60-80	10	43
Corylus avellana	Hazel	1 + 1 transplants	60-80	22.5	96
Crataegus monogyna	Hawthorn	1 + 1 transplants	60-80	25	107
Euonymus europaeus	Spindle	1 + 1 transplants	60-80	10	43
Ligustrum vulgare	Wild privet	1 + 1 transplants	60-80	5	21
Prunus spinosa	Blackthorn	1 + 1 transplants	60-80	10	43
Rosa canina	Dog rose	1 + 1 transplants	60-80	5	21
Viburnum lantana	Wayfaring tree	1 + 1 transplants	60-80	7.5	32
Viburnum opulus	Guelder rose	1 + 1 transplants	60-80	5	21
Total:					**427**

Amenity Shrub Planting – Total Area: 83.00m²

Scientific name	Common name	Min. Pot Size (L)	Density (m²)	%	No.
Choisya ternata	Mexican Orange Blossom	5	2	12.5	21
Cornus alba 'Sibirica'	Siberian Dogwood	5	2	22.5	37
Fatsia japonica	Japanese aralia	5	2	12.5	21
Forsythia x intermedia 'Lynwood Variety'	Forsythia 'Lynswood Variety'	5	2	17.5	29
Photinia x fraseri 'Red Robin'	Christmas Berry 'Red Robin'	5	2	17.5	29
Viburnum opulus 'Roseum'	Snowball Tree	5	2	17.5	29

Riparian Herbaceous Species Mix – Total Area: 109.40m²

Note: Herbaceous species to be planted at equal percentages, with beds being approximately 1.50m in width.

Scientific name	Common name	Min. Pot Size (L)	Density (m²)	No.
Butomus umbellatus	Flowering Rush	3	3	33
Caltha palustris	Marsh Marigold	2	3	33
Carex acuta	Slender Tufted-sedge	2	3	33
Geum rivale	Water Avens	1	4	44
Iris pseudacorus	Yellow Iris	2	3	33
Juncus effuses	Corkscrew Rush	2	3	33
Lythrum salicaria	Purple Loosestrife	3	3	33
Mentha aquatica	Water Mint	1	4	44
Myosotis palustris	Water Forget-Me-Not	2	4	44
Veronica beccabunga	Brooklime	1	4	44
Total:				**374**

Aquatic Species – Total Area: 131.40m²

Note: The number of plants required is calculated using 40% of the total open water area (excluding marginals).

Scientific name	Common name	Min. Pot Size	Planting Depth (cm)	Density (m²)	%	No.
Callitriche stagnalis	Water starwort	1L	15-60	3	20	79
Ceratophyllym demersum	Hornwort	9cm	30-100	5	10	66
Hottonia palustris	Water violet	9cm	20-40	7	15	138
Hydrocharis morsus-ranae	Frogbit	9cm	*Floats*	5	15	98
Nuphar lutea	Yellow water lily	1L	30-60	3	25	98
Potamogeton natans	Broad-leaved pondweed	1L	20	2	15	40
Total:						**519**

Species-Rich Grassland Seed Mix – Total Area: 3288.00m²

Seed Mix	Sowing Rate (g/m2)	%	Quantity (g)
Emorsgate EG2 (or equivalent)	4	100	≈13,152

Note: This area is based on the area of existing hardstanding that is to be restored to grassland. If there is considerable overrunning of the existing grass around the proposed development, then more grass seed may be required for restoration

Wear Tolerant Grass Seed Mix – Total Area: 712.85m²

Seed Mix	Sowing Rate (g/m2)	%	Quantity (g)
Emorsgate EG22 (or equivalent)	25	100	≈17,821

Grassland Restoration Seed Mix – Total Area: 15,039.55m²

Seed	Sowing Rate (g/m2)	%	Quantity (g)
Yellow rattle (*Rhinanthus minor*)	1	100	≈15,039

Bulbs – Total Area: 340.45m²

Scientific name	Common name	Sowing Rate	%	No.
Crocus sativus	Crocus	5	25	425
Eranthis Hyemalis	Winter Aconite	5	20	340
Galanthus nivalis	Common snowdrop	5	25	425
Narcissus pseudonarcissus	Wild daffodil	5	30	102
Total:				**1292**

Green Roof Seed Mix – Total Area: 519.10m²

Scientific name	Common name	Sowing Rate (g/m2)	%	Quantity (g)
Blackstonia perfoliata	Yellow wort	4	7	≈145
Erigeron acer	Blue fleabane	4	7	≈145
Geranium robertianum	Herb robert	4	7	≈145
Plantago coronopus	Buck's horn plantain	4	7	≈145
Sedum acre	Biting stonecrop	4	13	≈270
Sedum album	White stonecrop	4	13	≈270
Sedum anglicum	English stonecrop	4	13	≈270
Sedum fosterianum	Rock stonecrop	4	13	≈270
Sedum rosea	Roseroot stonecrop	4	13	≈270
Thymus polytrichus	Wild thyme	4	7	≈145

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Project: Land at the Former Sipson Garden Centre
On behalf of: Lewdown Holdings Ltd
Drawing title: Landscape Proposals
Drawing number: DWG-1621-01
Rev:
Date: Dec 23
Scale: 1:500 @ A0
DB: GH
CB: WH