



**Symmetry Park,
North Oxford**

**Landscape and
Ecological
Management Plan**

Prepared by:
**The Environmental
Dimension
Partnership**

On behalf of:
**Tritax Symmetry Ltd
and Siemens
Healthineers**

March 2023
Report Reference
edp2425_r012g

Contents

Section 1	Introduction	1
Section 2	Scope, Aims and Responsibilities	3
Section 3	Biodiversity Interest	5
Section 4	Ecological Method Statement.....	9
Section 5	Habitat Creation and Landscape Planting (Construction Phase)	19
Section 6	Establishment and Management Regime – Years 1-5 (Operation Phase)	29
Section 7	Management Regime – Years 6-10 (Operation Phase)	37
Section 8	Monitoring and Timetable of Works.....	41
Section 9	Summary and Conclusions.....	43

Appendices

Appendix EDP 1	Detailed Landscape Proposals (edp2425_d017f 18 October 2022 LTi/BC)
Appendix EDP 2	Entrance Detailed Landscape Proposals (edp2425_d041b 06 December 2022 LHa/BC)
Appendix EDP 3	Extended Phase 1 Survey (edp2425_d036c 24 November 2021 DJ/JM)
Appendix EDP 4	Maintenance Schedule
Appendix EDP 5	Landscape Management and Maintenance Summary

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	Report Ref: edp2425_r012			
	Author	Formatted	Peer Review	Proofed by/Date
012_DRAFT	LCH/JM	CL	BC	-
012a	LCH/JM	-	-	JM 091121
012b	LCH/JM	-	-	DL 160822
012c	LCH/JM	-	-	-
012d	JMo	-	-	CRo 230922
012e	BCo	-	-	CLa 181022
012f	JMo	-	-	CLa 091222
012g	CHa	-	-	SCh 230323

Section 1

Introduction

- 1.1 This Landscape and Ecological Management Plan (LEMP) has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Tritax Symmetry Ltd and Siemens Healthineers (hereafter referred to as 'the Developer') in relation to Land at Symmetry Park, North Oxford (hereafter referred to as 'the Site').
- 1.2 The document should be read in conjunction with the Detailed Soft Landscape Design drawings, included at **Appendix EDP 1**.
- 1.3 The Site forms part of a wedge of land flanked on its west and east by major highway infrastructure. It is situated 2.5 miles south of Bicester and 13 miles north of Oxford adjacent to Junction 9 of the M40. The site extends to approximately 19.22 hectares (ha) and is in use predominantly as agricultural land.
- 1.4 The Site predominantly comprises improved grassland fields along with one semi-improved grassland field, with smaller areas of bare ground, tall ruderal vegetation, wet ditches, semi-natural woodland, trees and hedgerows. Areas of hardstanding and buildings are present in the north of the site.
- 1.5 The aim of this LEMP is to provide a management framework for the conservation and enhancement of site ecology specific to all areas of soft landscaping associated with the detailed design of the proposed development. This LEMP provides details of long-term design objectives, management responsibilities, maintenance schedules and procedures for the replacement of failed planting for all landscape areas.

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Section 2

Scope, Aims and Responsibilities

Scope

- 2.1 This LEMP will extend over the lifetime of the development, requiring subsequent monitoring and review of all operations set out within this document at five-year intervals post-development, so as to take account of any changes to the Site or other influencing factors which may become evident as ecological features become established and approach maturity. It will also further the design principles established at the time of the outline application for this development.
- 2.2 As above, a desk study exercise, covering a wider land parcel to that of the proposed development, was undertaken in June 2021 and an Extended Phase 1 Habitat survey was originally undertaken 12 April 2018, which was updated on 30 June 2021. This LEMP covers all land included on the Detailed Soft Landscape Design drawings, included at **Appendix EDP 1**.
- 2.3 The LEMP addresses all habitats and features of ecological value to be affected by the enabling/pre-construction and construction phases of the development works and sets out the management tasks to be undertaken prior to and during the construction phase and post-construction phase of the development. In particular, it details those management recommendations for all features of ecological interest located within the development footprint including areas of green open space, and boundary features to be retained, enhanced and created.
- 2.4 The management scheme defined within this LEMP is structured to take into account the following phases of the development works:
- Any enabling and pre-construction phases;
 - The construction phase; and
 - Long-term management and maintenance.

Aims

- 2.5 The rationale for this LEMP is to facilitate the establishment and management of those ecological components specific to the proposed development. Specifically, this LEMP aims to:
- Set out measures for the appropriate and effective protection of retained features of landscape and ecological value during the pre-construction and construction phases;

- Detail the measures to be implemented to ensure the successful establishment/installation of new habitats and features;
- Ensure the appropriate management of any tree/vegetation works including clearance, planting and establishment during each phase of development; and
- Set out measures for the long-term management and maintenance of all areas of soft landscaping associated with the development to ensure that such features are protected and enhanced over the long-term such that all benefits to biodiversity and visual amenity are delivered successfully throughout the lifetime of the scheme.

Responsibilities

- 2.6 The responsibility for carrying out the functions of this LEMP will vary throughout the duration of the management period as follows:
- Enabling and Pre-construction Phases – All management and maintenance works of those features and species of ecological importance are the responsibility of the Principal Contractor appointed by the Developer, and are to be completed by the Principal Contractor until sign-off of the relevant part by the Developer prior to the start of the Construction Works Phase of each development plot;
 - Construction Works Phase – All management and maintenance works of all features and species of ecological importance are the responsibility of the Developer, and are to be continued through to practical completion; and
 - Long-term Management – The responsibility for the management and maintenance works of all features and species of ecological importance associated with the development post-construction will lie with the Private Management Company appointed by the Developer.
- 2.7 All measures detailed within this LEMP covers provision, management, inspection, maintenance, repair and replacement measures as necessary, taking into account factors including ecological, landscape, social, wildlife and amenity use for the land.

Review Period

- 2.8 The provisions and responsibilities for the plan should be reviewed on an annual basis during the first five years (known as the establishment period), by those responsible for landscape management and maintenance as well as an ecologist, with adjustments made as required. A review by an ecologist as well as those responsible for landscape management and maintenance will then be completed every five years thereafter, or as required. Any substantial amendments should be approved in writing by Cherwell District Council.

Section 3

Biodiversity Interest

- 3.1 This LEMP incorporates pertinent baseline information and recommendations documented within the Ecology Baseline Report (report reference edp2425_r007), and the Ecology Chapter of the Environmental Statement prepared by EDP in November 2021.

Ecology Baseline

- 3.2 As set out above, a desk study exercise, covering a wider land parcel to that of the proposed development, was undertaken in June 2021 and an Extended Phase 1 Habitat survey was originally undertaken 12 April 2018, which was updated on 30 June 2021.
- 3.3 The majority of the site comprises improved grassland fields, with smaller areas of bare ground, tall ruderal vegetation, buildings and hardstanding. The site also includes a semi-improved grassland field, a pond, broad-leaved semi-natural woodland (part of which comprises ancient semi-natural woodland), hedgerows and trees, and wet ditches that are of local ecological importance.
- 3.4 The following valued ecological resources considered of local importance or above were identified for the Site during baseline ecological investigations:
- Statutory designations within the potential zone of influence of the Site of International/National/District level importance, including:
 - Bowlers Copse semi-natural community woodland.
 - Non-statutory designations within the potential zone of influence of the Site of County level importance, including:
 - Priority Habitats¹ within and adjacent to the Site. Area of semi-natural woodland surrounding a pond, the southern part of which comprises ancient semi-natural woodland;
 - Habitats of local importance comprising semi-improved grassland, species-poor hedgerows and trees, stream and wet ditches;
 - Potential bat roosting in several mature trees and confirmed roost in two trees;
 - Habitats supporting a foraging and commuting bat assemblage; and

¹ Habitats considered of key significance to sustain and improve biodiversity in Wales, as defined under Section 7 of Part 1 of the Environment (Wales) Act 2016

- Low population of grass snake within tall ruderal vegetation and western boundary margins.

Ecological Features to be Lost/Impacted

- 3.5 Land take associated with the proposed development includes improved and semi-improved grassland, hedgerows and the realignment of a wet ditch that are of site-level importance. In addition, areas of existing development comprising hardstanding and buildings, as well as pockets of dense and scattered scrub, tall ruderal vegetation and bare ground are also to be lost, and these habitats are considered to be of negligible ecological importance.

Ecological Features to be Retained and Enhanced

- 3.6 In line with those baseline conditions and recommendations detailed within the Ecology Baseline report (report reference edp2425_r007) and Ecology Chapter of the Environmental Statement, the development has been designed to retain, protect and further enhance those valued ecological features detailed above within the scheme as far as possible.
- 3.7 This has been achieved through the following design principles:
- Minimising pre-construction and construction impacts upon habitats and species through the implementation of sensitive working methods throughout the construction period;
 - Felling of trees with confirmed bat roosts in accordance with a European Protected Species (EPS) Licence from Natural England (NE);
 - Retention of mature trees and broadleaved woodland across the Site as far as possible, whilst ensuring their future protection, enhancement and maintenance over the long-term;
 - The creation and long-term management of an ecological buffer zone alongside the Wendlebury Brook, comprising species rich meadow grassland and native tree planting;
 - The creation and long-term management of formal and informal areas of green space, to include tree and grassland planting for the benefit of both amenity value and wildlife whilst further protecting and enhancing ecological connectivity across the Site to the wider landscape;
 - The creation of sustainable drainage features (swales and watercourses) which will be subject to new planting with an appropriate wetland flora, so as to diversify habitats suitable for protected species;

- The inclusion of formal tree, hedgerow and shrub planting; and
- The inclusion of habitat features to enhance the Site for nesting birds and roosting bats.

3.8 Subject to implementation of the above, it is considered that the landscape strategy proposed for the Site, upon which this LEMP is based, is consistent with those biodiversity objectives previously established.

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Section 4

Ecological Method Statement

- 4.1 This section sets out the appropriate working practices and safeguards to be deployed throughout the pre-construction phase of the development, including all associated enabling works, to protect the ecological and landscape interests of the Site as discussed in **Section 3**. Measures relating to ecological supervision, the protection of retained habitats, vegetation clearance and pollution prevention/control, along with specific measures relating to wildlife, are discussed to ensure the appropriate protection, maintenance and management of all valued features prior to and during construction.

Pre-commencement Site Check

- 4.2 Prior to commencement of all pre-construction and construction works, the development footprint shall be checked by a suitably qualified ecologist to ensure that there has been no significant material changes to the existing ecological interest of the Site and that no protected or notable species, which could be harmed by the development, have moved on-site since the previous surveys were carried out. Should any protected species be found during this check, full details of mitigation measures to prevent their harm shall be submitted to and approved in writing by the Local Planning Authority. Where additional mitigation and/or precautionary working methods are required, this document will be updated accordingly.

Site Briefings and Ecological Clerk of Works

- 4.3 The appointed Ecological Clerk of Works (ECoW) will be responsible for the provision of site briefings and information to the Principal Contractor and all relevant sub-contractors and site personnel, on all potential ecological receptors and constraints associated with the land area comprising the development footprint, including all species-specific control measures to be adhered to during the construction phase.
- 4.4 Specifically, and prior to the commencement of pre-construction and construction phases, 'toolbox talks' will be provided by the ECoW to the Principal Contractor appointed by the Developer, and all relevant sub-contractors and site personnel, to ensure that the identification and protection of protected species and their habitats is fully understood and appropriate, and that agreed mitigation is implemented.
- 4.5 Where proposed pre-construction and construction activities comprise licensable actions (i.e. felling of trees confirmed to or potentially supporting roosting bats), a task-specific briefing will be given to the Principal Contractor appointed by the Developer by a bat licensed ecologist named on the Mitigation Licence, and qualified Arboricultural Contractor where necessary. The task-specific briefing will include all required sensitive working methodologies and legal obligations to be met, particularly with respect to those

methodologies and timing constraints set out within any Mitigation Licence granted by NE, given the presence of roosting bats on site.

- 4.6 More generally, the ECoW will supervise all pre-construction works impacting upon habitats and species, including vegetation clearance, soft demolition and habitat creation (as required), in addition to undertaking any necessary pre-commencement surveys for protected species, as discussed in further detail below.

Temporary Protective Fencing

- 4.7 Temporary protective fencing will be erected along all habitats to be retained in accordance with the measures detailed within the Tree Report compiled by EDP, and *BS 5837: 2012 Trees in relation to design, demolition and construction* or similar.
- 4.8 Protective fencing will incorporate the full root protection area of the feature to be retained, with fencing maintained throughout the duration of all site-enabling and pre-construction activities; this remains the responsibility of the Principal Contractor appointed by the Developer.
- 4.9 No works (other than planting), including the storage of materials, plant and machinery, will be carried out within or immediately adjacent to all areas of protective fencing/areas marked for protection as described above, so as to ensure no detrimental impacts to sensitive features arising from physical damage and/or pollution.
- 4.10 Where proposed tree loss overlaps with the root protection zones of retained trees, clearance will be undertaken sensitively and will be overseen by a suitably qualified arboriculturist. Similarly, the digging of trenches and pits for new tree and scrub planting adjacent to areas of protective fencing, where this lies inside root protection areas, will also be carried out by hand only and supervised where necessary, in accordance with best practice guidance as stipulated within *BS 5837:2012*.

Control of Weeds and Invasive Species

- 4.11 Ecological surveys undertaken by EDP did not identify any invasive plant species² within the Site. Nevertheless, given their likely presence within the locality, and vigorous nature of their spread, a prior inspection of the construction footprint for the presence of invasive species is advised before the commencement of any vegetation clearance on site. Where identified, such areas will be marked out and subjected to prior treatment and control in accordance with those methodologies prescribed by a specialist contractor, so as to avoid accidental disturbance and spread.

² Invasive species comprise those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended), for which it is an offence to plant or otherwise cause these species to grow in the wild. Such species are also classed as 'controlled waste' under the Environmental Protection Act 1990, requiring for their safe disposal at a licensed landfill site if taken off site.

Sensitive Vegetation Clearance

- 4.12 Construction of the development footprint will result in the clearance of amenity grassland and selective clearance of tree, shrub and scrub habitat. Such habitats have the potential to support protected and notable species, including bats, nesting birds, badger, common reptiles and other notable mammal species including European hedgehog (*Erinaceus europaeus*). As such, precautionary measures will be adopted during clearance to ensure the avoidance of harm/injury and disturbance to such species and are detailed below.

Tall Ruderal Vegetation and Grassland Habitat

- 4.13 Clearance of tall ruderal vegetation and grassland habitat is required to accommodate the development footprint, and will be undertaken as follows:
- The clearance of tall ruderal vegetation and grassland habitat located across the demolition footprint will be undertaken between April and October (when temperatures are above 9°C) so as to avoid the main hibernation period of common reptiles and mammals. As such works will coincide with the bird breeding season (typically March to August inclusive), a pre-commencement check for active bird nests, particularly with respect to ground nesting birds, will be undertaken by a suitably qualified ecologist/ECoW immediately prior to the commencement of works. Where an active bird nest is identified, a 5-10m buffer (dependent on individual species requirements, and potentially greater, as specified by the ecologist at the time) will be established around the active nest, with no clearance works permitted within this buffer until all young have fledged and the nest confirmed inactive by the ECoW;
 - Should the above seasonal constraint be considered impracticable, then clearance works between November and early March inclusive may require pre-commencement checks and/or supervision by the ECoW to ensure no disruption to potential hibernacula, with the adoption of additional precautionary measures as appropriate;
 - Tall ruderal vegetation and grassland habitat will be subjected to directional cutting over two phases to passively encourage common reptiles and small mammals potentially present to move outside of the construction and demolition footprint. Specifically, an initial cut of grassland habitat will be undertaken reducing vegetation height down to a minimum of 175mm, with clearance undertaken in a direction towards adjacent retained habitat (i.e. retained vegetative boundaries). A second cut of the proposed footprint areas will be undertaken immediately thereafter, with vegetation cut to ground level and no greater than 30mm in height;
 - During clearance, any potential refugia located within the construction footprint suitable for common amphibians, reptiles and small mammals will be carefully dismantled using hand tools, hand-held machinery or untracked, light machinery to facilitate efficient supervision and relocated to reptile receptor areas/retained reptile

habitat to ensure suitable refuge/hibernation opportunities are retained across the Site;

- All arisings will be removed from the construction footprint and vegetation will be maintained thereafter at a height no greater than 20mm through regular mowing or as bare ground to discourage common amphibians and reptiles from returning; and
- In the event that any notable species are identified during site clearance, these will either be captured by hand by the attending ECoW and immediately released into retained habitat adjacent, or otherwise left to disperse of their own accord.

Tree, Shrub and Scrub Habitat

- 4.14 A phased approach to the clearance of trees, shrubs and scrub will be undertaken, with above-ground vegetation clearance of woody habitats ideally confined to the period between October and February inclusive, so as to avoid bird breeding season. Trees, shrubs and scrub to be removed will be cut down to heights of between 30cm and 50cm above ground level, in a direction towards retained vegetation. Where this is unfeasible and clearance between March and September is unavoidable, then a pre-commencement check for active bird nests will be undertaken by a suitably qualified ecologist/ECoW immediately prior to the commencement of works. Where an active bird nest is identified, a 5-10m buffer (dependent on individual species requirements, and potentially greater, as specified by the ecologist at the time) will be established around the active nest, with no clearance works permitted within this buffer until all young have fledged and the nest confirmed inactive by the ECoW.
- 4.15 Prior to clearance, trees and shrubs considered suitable for future translocation will be identified and marked-up prior to commencement. With respect to the translocation of suitable specimens identified, such material will be excavated to a depth appropriate to root depth during the below-ground clearance works. Identified specimens will be gently lifted to ensure the root ball is fully intact and transferred to the receptor trench for replanting at similar heights as previous. Specimens will be backfilled with topsoil ensuring no roots are left exposed, with the area firmed and sufficiently watered in.
- 4.16 Prior to clearance, all mature trees to be felled will also be subject to an update ground-level inspection by a suitably qualified ecologist to determine their current potential to support roosting bats. Where trees are identified as having moderate or greater potential, then such trees will be subject to a further detailed aerial inspection whereby all suitable roosting features will be checked at height for the presence of bats. Aerial surveys will be undertaken by a suitably qualified and NE bat licensed ecologist, or an arboricultural contractor with a NE bat survey licence or experience of working with bats and under the supervision of a NE bat survey licence holder.
- 4.17 If any bats are discovered during the aerial inspection, owing to the strict legal protection afforded to bats and their roosts, works are likely to require a Mitigation Licence from NE before works can continue.

- 4.18 If no evidence of roosting bats is uncovered during the aerial inspection, works may proceed without a Mitigation Licence from NE. However, regarding those trees identified as having negligible or low potential to support roosting bats, a 'soft felling' technique, involving the sectional dismantling of the tree will be adopted, involving the following:
- Tree felling will avoid cutting through any cracks, cavities, limb/knot holes or any other potential roosting features – i.e. by cutting above and below the feature when removing sections with suitable features;
 - Any sections to be cut that have suitable roosting features are to be suitably harnessed and supported before cutting using industry-standard rigging equipment, and gently lowered to the ground once cut, to avoid violent shaking of potential roosting features; and
 - Any cut sections with potential roosting features will be retained on site by one of the following methods:
 - (i) Strapping to existing, retained mature trees and appropriately secured in position;
 - (ii) Retained on site at ground level within an area of retained woodland; or
 - (iii) Retained on site for minimum 48 hours, with potential entrances not blocked i.e. facing away from ground, before they are removed or chipped.
- 4.19 Thereafter, trees, shrubs and scrub to be removed will be cut down to heights of between 30cm and 50cm above ground level and in a direction towards retained vegetation.
- 4.20 Below-ground vegetation clearance, including the removal of roots and/or stumps of shrubs and trees remaining, or of buried rubble and spoil, will be undertaken between April and September/mid-October inclusive (when temperatures are above 9°C) so as to avoid harm to protected species during the hibernation period. Where this is not possible, such works can only be undertaken at the discretion of the ecologist, under supervision and/or following pre-commencement checks to rule out hibernation potential.
- 4.21 Large root balls will be grubbed out in a sensitive manner to ensure no significant disturbance to soil and adjacent, retained planting. Any such excavations that occur within the root protection zone of retained vegetation will be undertaken by hand and backfilled as soon as possible or temporarily lined with polyethylene sheet to reduce evaporation.
- 4.22 All arisings from any vegetation clearance will be taken away from the vicinity of the development footprint as soon as possible following vegetation clearance.
- 4.23 Should there be a delay between the completion of vegetation clearance and commencement of construction such that colonisation of the Site by vegetation occurs,

then such vegetation will be maintained at heights less than 20mm or as bare ground through frequent mowing or disturbance to deter wildlife from the construction footprint.

Species-specific Measures: Bats

- 4.24 Trees **T18** and **T30** are confirmed to support bat roosts and will be subject to all prescriptive methodologies detailed within a future Mitigation Licence approved by NE.
- 4.25 With respect to remaining on-site trees with potential to support roosting bats, an update assessment by an NE bat licenced ecologist be undertaken immediately prior to felling, particularly should no works be undertaken within 12 months of the previous assessment. If roosting bats are discovered during the inspection, owing to the strict legal protection afforded to bats and their roosts, it will then be necessary to obtain a Mitigation Licence from NE prior to works commencing, with sufficient replacement roosting habitat provided. If no evidence of roosting bats is uncovered during the update surveys, works may proceed without an NE Mitigation Licence.
- 4.26 Site contactors will be subject to a 'tool-box talk' by an NE licenced bat ecologist prior to commencement of any felling works. The briefing will outline the protected status of bats and breeding birds, alongside relevant legislation, and detail all methods and sensitive working practices to be employed throughout the felling works, given the presence of features considered suitable for roosting bats. Any trees with potential to support roosting bats will be subject to 'soft-felling' techniques, as set out above.
- 4.27 The contractor(s) will be advised to carry out all work with care and vigilance for bats and to adhere to the following procedures in the unlikely event bats are found during works:
- In the unlikely event that a bat and/or its roost is located during felling, works will be halted and the NE bat licenced ecologist contacted immediately for advice. Bats should be allowed to disperse of their own accord; and
 - If the roost has been exposed, and especially if bats have been injured, works will be halted and the NE bat licenced ecologist contacted immediately for advice.

Species-specific Measures: Badger

- 4.28 There are no badger setts within the Site itself, although badgers are known from the wider area, and the habitats within the Site provide suitable foraging and sett building opportunities for this species.
- 4.29 Due to the mobility and widespread nature of these species, in addition to the presence of suitable foraging habitat on site, a badger survey of the Site by a suitably qualified ecologist prior to the commencement of development is recommended to determine whether any setts have been established during the interim period.

- 4.30 If identified, development will avoid direct impacts to, and disturbance of, active badger setts through establishment of an appropriate working buffer (10-30m as advised by an ecologist), in which no vegetation clearance or movement of machinery will be permitted. Where this is not possible, sett closure will be required under licence from NE and restricted to between the months July and November.

Other Protected/Notable Species

- 4.31 Common toad were identified on site during ecological surveys, and habitats inherent within and adjacent to the Site provide suitable refugia/hibernacula for this species. Clearance of suitable habitats will be undertaken in accordance with those measures detailed under paragraph 4.14 to avoid harm/injury to Priority Species that may be present. As above, any suitable refugia for common reptiles as well as common toad will be carefully dismantled using hand tools, hand-held machinery or untracked, light machinery to facilitate efficient supervision. More generally, however, the following precautionary measures will be adhered to during the construction phase:

- All machinery will be operated by trained personnel only;
- Working at night will be avoided as far as possible;
- All trenches/excavations will be covered up overnight and/or a means of escape provided (such as mammal ramps) to avoid wildlife becoming trapped; and
- Any open pipework with an outside diameter of greater than 120mm must be covered at the end of each working day to prevent animals entering/becoming trapped.

Maintenance of Areas Cleared of Vegetation

- 4.32 Should there be a delay between the end of the pre-construction phases and the beginning of the construction works phase such that vegetation begins to re-colonise the construction footprint, then such vegetation will be subjected to regular cutting to ensure heights are maintained at c.20mm or less, or else maintained as bare ground to deter the return of wildlife to the construction area.
- 4.33 Any remedial or formative pruning required of trees will be undertaken between October and February inclusive in accordance with good horticultural and arboricultural practice with thinning, trimming and shaping of specimens undertaken as appropriate to species, location, season, and stage of growth. All arisings from any vegetation clearance will be taken away from the vicinity of the development footprint no later than the day after vegetation clearance.
- 4.34 Demolition/damage to retained boundary vegetation will be avoided, with the exception of small sections where repairs, new planting, or site access is required.

- 4.35 Any spoil, rubble, brash and/or debris collected as a result of the construction works will be removed from the Site or stockpiled within the centre of the Site and away from the vegetated boundaries.

Topsoil and Mulch

- 4.36 To ensure that all available topsoil from the Site is protected and retained for future re-use on site, or for use in a sustainable manner, all temporary topsoil storage will be in accordance with *BS 3882:2007 Specification for topsoil and requirements for use*.
- 4.37 Machinery used for earthworks will be selected to minimise disturbance and compaction. Topsoil will not be mixed with subsoil, stone, hardcore or rubbish.

Pollution Incidents

- 4.38 To protect water quality of the wet ditches that run through the Site, which in turn are hydrologically connected to the Bowlers Copse CDWS, appropriate pollution control measures will be employed, with reference to available guidance including the rescinded Pollution Prevention Guidelines (PPGs) and Guidance for Pollution Prevention (GPPs) documents³, namely PPG1, *General guide to the prevention of pollution*, PPG5/GPP5 *Works and maintenance in or near water*, PPG6 *Pollution prevention guidance for working at construction and demolition sites* and PPG21 *Pollution incident response planning*, to ensure that detrimental impacts to the watercourse as a result of surface run-off, spillage and pollution arising throughout the construction phase are avoided.

Temporary Lighting

- 4.39 Temporary lighting, if required, will be kept to the lowest permissible level through the use of sensitive lighting design. This will include:
- The reduction in height of lighting columns employed across the construction footprint to allow for low-level lighting or, where appropriate, the use of tall columns designed to allow light to be directed downwards more acutely so as to reduce horizontal spill;
 - The use of light spill accessories such as hoods, shields and filters to allow for lighting to be directed to the intended area only such that light spillage is avoided elsewhere;
 - The use of timed and/or sensor lighting across the construction footprint; and

³ PPGs were withdrawn in December 2015; however, they remain the main source of information regarding best practice with respect to pollution prevention. A replacement guidance series, comprising Guidance for Pollution Prevention (GPPs), is currently in development. Pollution advice listed at <https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg> should also be referred to.

- The programming of timed lighting to ensure adequate dark periods between dusk and dawn across the construction footprint, and particularly along site boundaries.
- 4.40 Such sensitive lighting strategies will seek to avoid light spill upon retained vegetated boundaries and scattered trees, particularly along north-eastern and eastern edge of the Site, thereby maintaining dark corridors along sensitive habitats to ensure minimum disturbance to notable and protected species utilising those habitats for commuting, foraging and dispersal during the pre-construction and construction phases.

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Section 5

Habitat Creation and Landscape Planting (Construction Phase)

- 5.1 This section sets out the appropriate habitat creation and landscape planting to be completed within the construction phase (up to the first available planting season following completion of construction), to ensure that appropriate measures to provide biodiversity enhancement and visual amenity are implemented from the early stages of the scheme.

Habitat Creation and New Planting Areas

- 5.2 A range of new habitats and landscape features will be established during the construction phase of the development or in the first planting season. The exact locations, planting densities and species incorporated into the new planting areas are illustrated within the Detailed Soft Landscape Plan and Entrance Landscape Proposals at **Appendices EDP 1** and **2** respectively.
- 5.3 The following paragraphs detail the ground preparation and establishment procedures to follow in the creation of the proposed landscape features and habitats.
- 5.4 Planting will be undertaken in accordance with those specifications stated therein. Additional measures are further provided as follows.

General Measures

- 5.5 All work to be carried out in accordance with the following:
- All materials and workmanship are to be to the highest possible standards in accordance with relevant good practice and British Standards;
 - All work to be carried out by appropriately skilled, qualified and experienced operatives for the type and quality of the work, and in accordance with good horticultural practice and contemporary legislation, regulations and codes of practice;
 - All work will be undertaken when weather conditions are suitable, avoiding moving, handling and tracking over very wet soils. Soils for planting will be warm, moist, friable and not waterlogged;
 - Planting should be undertaken using topsoil recovered from the construction footprint, incorporating soil conditioner as required;

- Only tools suited to site conditions and work carried out are to be used. Hand tools to be used around existing and newly planted trees and shrubs. Boards to be used where required while working, to protect grass/plant beds;
- Work is only to be carried out while soil and weather conditions are suitable. Planting, turfing, seeding etc, will not be undertaken during periods of frost, strong winds, when topsoil is frozen, snow-covered or waterlogged, or in drought conditions;
- Materials will not be stock-piled adjacent to newly planted trees or shrubs;
- All waste materials, including plant wrappings and temporary labels, will be removed off site at the contractors' own expense. No waste materials will be buried or burnt on site;
- All hard and soft landscape materials will conform to the relevant British Standards and codes of practice. All plants will be true to name, type and character, and to comply with the National Plant Specification;
- Plants will be vigorous, weed, pest and disease-free, and not suffering from drought, waterlogging, windburn, damage or nutrient deficiency. Fresh grass seed and turf produced for the current growing season will be used. Any substitutes will otherwise be approved by the project landscape architect;
- Transport and handling of plants shall comply with 'Handling and Establishing Landscape Plants' (Horticultural Trades Association), including protection from desiccation or any other damage prior to planting out;
- Prior to undertaking planting or seeding, all rubbish, debris and surface stones exceeding 75mm in any direction are to be removed from site. Any substance or materials injurious to plant growth, including any rubble, fuel or lubricants, will be removed prior to commencement of planting;
- Watering will be undertaken as necessary by the Developer to ensure the establishment and thriving of all planted areas. Watering will be to the full depth of the topsoil. If supply is restricted by emergency legislation, watering will not be carried out unless instructed to do so;
- All areas where plants or trees have failed to thrive (through death, damage or disease), will be identified by the Developer and plants will be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season, as frequent as necessary. The advice of the project's Landscape Architect will be sought wherever possible;
- All plants will be pruned to promote healthy growth and natural shape, and any dead, dying or diseased wood and suckers will be removed. Overhanging branches will be pruned to ensure that growth is prevented from encroaching onto paths, signs,

sightlines and road lighting. Pruning will be undertaken annually or as appropriate to each species between October and February inclusive, to avoid the main bird breeding season, and undertaken according to best practice. All arisings will be removed for composting; and

- In planted beds, compaction of soil to be relieved to a minimum depth of 450mm, or the full depth of compaction, whichever is the greater, taking special care in any areas of underground services. Soil to be uplifted and fractured through the profile to the full treatment depth. Soil to be cultivated to loosen, aerate and break it up into particles of 2–8mm in the top 150mm of planting beds within a few days before planting. Remove any weeds, roots, rubbish and tufts of grass, as well as any stones and clods larger than 50mm in any one dimension. Areas to be planted are to be graded to smooth contours and slopes avoiding depressions. Soil levels to planted beds to finish 125mm below adjacent kerbs/edgings/grassed lawns, to allow incorporation of bark mulch as set out in this document.

Habitat Creation Areas

Grassland

5.6 Grassland planting will include the following mixtures:

- Emorsgate Seed mix EM3: Special General Purpose Meadow Mixture⁴, incorporating a diverse mixture of wildflower (nine species) and grass species (five species), to be sown across areas of grassland across the wider site;
- Emorsgate Mixture for Hedgerow and Woodland EH1⁵, incorporating seven grass species, to be sown along the southern boundary of the Site adjacent to retained trees;
- Emorsgate Flowering Lawn Mixture⁶, incorporating a mixture of slow growing grasses (five species) with a selection of wildflowers that respond well to regular mowing (eight species) to be sown within areas of the car park;
- Emorsgate Meadow Grass Mixture for Wet Soils EG8⁷, incorporating a diverse mixture of grass species (eight species), to be sown across sustainable drainage features; and
- Rolawn Medallion Turf⁸ mix, comprising amenity grass proposed along the entrance road, around the unit and car park.

⁴ <https://wildseed.co.uk/product/mixtures/complete-mixtures/general-purpose-meadow-mixtures/special-general-purpose-meadow-mixture/>

⁵ <https://wildseed.co.uk/mixtures/view/42/grass-mixture-for-hedgerows-and-woodland>

⁶ <https://wildseed.co.uk/mixtures/view/36>

⁷ <https://wildseed.co.uk/mixtures/view/41/meadow-grass-mixture-for-wet-soils>

⁸ <https://www.rolawn.co.uk/turf/rolawn-medallion-turf>

5.7 Preparation of ground will include the removal of weeds and other vegetation, to reduce fertility whilst ensuring its future establishment. Weeds will be controlled by cultivation or herbicide before sowing if necessary. Where required, topsoil will also be reduced by around 150mm, so as to reduce the long-term fertility of the soil and facilitate competition within the established grassland sward aimed at achieving and sustaining medium- to long-term species diversity. Prior to sowing, all large debris, litter, stones and earth clods will be removed. The following should apply:

- Sowing should take place in the late summer/autumn (late August-October) or spring (April-May);
- Seeds must be surface sown at a rate of c.4g/m², using a seed broadcaster or by hand; and
- Seed must not be covered but should be 'firmed in' to give good soil/seed contact using either a roller or by treading.

5.8 Cultivation adjacent to established vegetation will take care to ensure no damage to existing root systems, with disturbance kept to the minimum necessary to expose fresh soil. Thereafter, grassland seed mix will be sown in accordance with the supplier's specifications.

Sustainable Drainage Features (Swales and Attenuation Basins)

5.9 Sustainable drainage features (including swales) proposed on site in association with the boundaries of the construction footprint will be planted with Emorsgate Meadow Grass Mixture for Wet Soils EG8 as described above and will be managed as wet meadow grassland.

Amenity Grassland

5.10 Areas of amenity grass seeding (close-mown grass) without wildflowers include formal areas of the site, largely at the Site frontage and primary access point.

5.11 The main objectives for the management of these areas are:

- To establish and maintain grass areas in a healthy, vigorous, attractive condition; and
- Provide suitable conditions, including appropriate grass length, appropriate to the intended use: rest and informal recreation and visual amenity.

Tree and Shrub Planting

5.12 A range of new trees and shrubs including a diverse mix of native species, and/or those of value as a foraging resource for wildlife have been selected as species to be used for the tree and shrub planting within the Site, along with introduced species commonly used in parks, gardens and built areas. Mitigation planting of native trees and shrubs will also

be undertaken along the A41 boundary to the south and the M40 boundary to the west to provide a screening buffer to the Site and enhance the linear connectivity around the periphery of the development. The proposed planting schedules are provided at **Appendices EDP 1 and 2**.

- 5.13 Trees should be planted within the autumn/winter months when the ground is frost-free and at a suitable time to avoid competitive exclusion by rapid growing species. All products to support growth of trees should be supplied and fitted in accordance with the manufacturer's guidelines and whips protected using transparent spiral tree guards and shrub shelters.
- 5.14 Trenches and pits dug for new tree and shrub planting across the Site and within gaps of retained trees should be dug by hand only, following current best practice. Maintenance of the vegetation should only occur within the months of September to February to avoid the nesting bird season.
- 5.15 All tree/shrub whips to be planted in accordance with the details provided in the Detailed Soft Landscape Design drawings, included at **Appendices EDP 1 and 2**. Protection methods must not impede natural movement of trees or restrict growth.
- 5.16 All plants are to be planted in accordance with BS 3936:1992 *Nursery Stock*. A mycorrhizal inoculant to replace naturally occurring fungi in soil is to be applied to roots of bare plants before planting and backfilling to stimulate plant growth and accelerate root development. Prior to planting, ground is to be well-broken and free draining using an auger. Soil ameliorants/conditioners are to be to BSI PAS 100 – Compost Specification. A slow release fertilizer (e.g. Scotts UK Professional 'Enmag', or similar) is to be used at a rate of 70g/m² for shrub planting, and up to 140g/m² for tree planting.
- 5.17 Well-composted bark mulch is to be applied to trees in grassed areas to 800mm radius around the base of trees, 100mm depth; to 75mm depth around ornamental shrubs/hedges and whip planted areas; and finished level of 50mm below adjacent grassed or paved areas.

Hedgerows

- 5.18 A number of new hedgerows are to be planted within formal planting areas surrounding new parking bays and within areas of green space around the periphery of the commercial units. Selected species include English yew, used within sections of single-species amenity hedgerows, and a native hedgerow mix comprising hazel, hawthorn, blackthorn and holly within areas of green space.
- 5.19 Planting instructions for new hedgerow trees and shrubs should follow those provided above in relation to proposed tree and shrub planting.
- 5.20 In addition, new tree whips within hedgerows are to be planted in two rows at 0.3 to 0.5m centres allowing for at least 0.5m between rows. Whips within single-species amenity hedgerows are to be planted in single rows at 0.3m centres.

- 5.21 Ground preparation for hedgerow seeding must rid the soil of perennial weeds, through repeated cultivation or herbicide application, prior to sowing. Cultivation of the ground prior to sowing must take into consideration the existing tree stock within the hedgerow and be careful not to damage the root system. Cultivation should only go to the minimum depth required to expose fresh soil, into which new seeds are to be sown.
- 5.22 Once the ground has been suitably rid of perennial weeds and a fine tilth to sow into has been prepared, seeding will take place in the autumn or spring, subject to sufficient soil warmth and moisture to aid germination. Seeds will be surface sown by machine or broadcast by hand. Seeds will not be compressed into the soil but will be firmed in with a roller, or by treading. A slow release fertiliser will also be applied where appropriate. Topsoil trenches shall be mulched with amenity bark mulch up to a depth of 75mm.

Swales and Watercourses

- 5.23 Measures to enhance the existing woodland pond and watercourses will include removal of encroaching scrub to reduce shade, and aquatic planting (comprising a mixture of emergent, submerged and marginal aquatics) to improve water quality and habitat to encourage a diverse macroinvertebrate community. In addition, it is anticipated that by limiting the access of cattle to these features, and the associated negative effects of cattle poaching, urination and defecation into the watercourse, the value of the existing woodland pond and watercourses will improve.
- 5.24 Furthermore, new permanent waterbodies and watercourses comprising attenuation basins, swales and the realigned ditch will be created in the Site's green spaces as part of the landscape strategy, offering long-term enhancement of aquatic habitat availability within the Site and enhancement for the local great crested newt population.
- 5.25 The following design principles should be implemented:
- Bank profile and depth should be variable throughout the attenuation features and watercourse, with at least one section of shallow edge incorporated to create amphibian egg laying/display areas;
 - Attenuation features and watercourses should include a broad, undulating 'draw-down' zone around the margins with long low-angled banks (this draw-down zone will be ever-changing as water levels rise/fall naturally and is a rich habitat for plants and invertebrates, and a feeding area for birds and small mammals); and
 - To encourage wetland/marshy species around each attenuation feature, a suitable seed mixture (such as Emorsgate EG8 Meadow Grass Mixture for Wet Soils) should be sown within the attenuation basin and swale areas.

General Measures

5.26 The installation, maintenance and material standards for the landscape works will be undertaken in line with the following:

- Planting stock will be handled in accordance with the Horticulture Trade Association guidelines and will follow landscape specifications as provided by a Chartered Landscape Architect;
- Planting of landscaped areas with tree and shrub planting will be undertaken during the optimal window of between November and March or in accordance with the advice of the project landscape architect. Planting outside of this time will require the use of containerised stock and may involve additional irrigation arrangements;
- Any seeding will be carried out in mid to late spring or early autumn, depending on seasonal variations, in accordance with the advice of the project landscape architect;
- All planting and seeding is to be undertaken in accordance with the construction for that specific development area, and will conform to *BS 3936-1 Nursery Stock: Specification for Trees and Shrubs*;
- Cultivation adjacent to established vegetation will take care to ensure no damage to existing root systems, with disturbance kept to the minimum necessary to expose fresh soil;
- Newly-planted tree and shrub plants to be protected by individual spiral/netting guards, as specified. The condition of all tree stakes, ties and guards will be checked by the Developer and all broken items will be replaced and items regularly adjusted to accommodate plant growth and prevent rubbing. Any bark damage will be cut back neatly with a sharp knife. All plants will be straightened and the ground at the base to be firmed up. All shelters will be hand-weeded;
- Watering will be undertaken as necessary by the appointed Landscape Contractor or Developer to ensure the establishment and thriving of all planted and translocated areas. Watering will be to the full depth of the topsoil. If supply is restricted by emergency legislation, watering will not be carried out unless instructed to do so;
- Cultivation adjacent to established vegetation will take care to ensure no damage to existing root systems, with disturbance kept to the minimum necessary to expose fresh soil;
- Within the establishment phase, watering will be undertaken as necessary by the Developer to ensure the establishment and thriving of all planted and translocated areas. Watering will be to the full depth of the topsoil. If supply is restricted by emergency legislation, watering will not be carried out unless instructed to do so;

- All areas where plants or trees have failed to thrive (through death, damage or disease), will be identified by the Developer with specimens removed and replaced with equivalent or more appropriate species to match the size of adjacent nearby plants in the next appropriate planting season, as frequent as necessary. The advice of the project Landscape Architect will be sought wherever possible;
- All plants will be pruned to promote healthy growth and natural shape, and any dead, dying or diseased wood and suckers will be removed. Pruning will be undertaken annually or as appropriate to each species between October and February inclusive, to avoid the main bird breeding and active dormouse season and undertaken according to best practice. All arisings will be removed for composting;
- Spot weed control of all broad-leaved and injurious weed species listed in the Weeds Act 1959 will be undertaken using a suitable non-residual herbicide as and when required annually. The specification and use of herbicides or pesticides, including their use in proximity to water bodies, is to comply with all contemporary regulations, British Standards and codes of practice; and
- Soil debris and arisings will be swept from adjacent hard surfaces after each maintenance operation. All extraneous rubbish not arising from the contract works will be collected and recycled (where feasible) or else removed from site at each maintenance visit.

Bat Boxes

- 5.27 New bat roosting features are recommended for installation to further enhance the Site for roosting bats. A total of 10 bat boxes¹² will be installed upon suitable, mature trees to be retained along the peripheries of the Site where appropriate. Boxes will be erected with a south-east/south-west facing aspect where possible at c.4–7m heights, avoiding features that would obstruct access for bats and away from sources of artificial lighting.
- 5.28 Bat box design to be installed across the Site will include the following or similar:
- Four Schwegler 2F;
 - Four Schwegler 1FD; and
 - Two Miramare Bat Box.
- 5.29 The maintenance and repair of bat boxes installed across the Site during the pre-construction and construction phases will remain the responsibility of the Developer.

¹² <http://www.nhbs.com/browse/search?title-type-facet%5B%5D=&term=bat+boxes>.

Bird Boxes

- 5.30 To further enhance bird nesting opportunities across the Site, a total of ten bird nest boxes will be installed on retained mature trees and/or buildings as appropriate. A variety of new nest boxes are suggested to accommodate different bird species and include:
- Four Schwegler 1B (or similar) nest boxes with 26mm holes for blue tit and coal tit;
 - Four Schwegler 2M (or similar) nest boxes with 32mm hole, used by great-, blue-, marsh-, coal- and crested tit, redstart, nuthatch, collared and pied flycatcher, wryneck, tree and house sparrows, and occasionally bats; and
 - Two Schwegler 3S (or similar) nest boxes for starling.
- 5.31 Bird boxes will be installed in accordance with manufacturer's specifications, on suitable aspects so as to be protected from strong wind, rain and sunlight, and at suitable heights of 3–6m above ground level. Entrances will face away from prevailing winds and sources of light and within or immediately adjacent to good tree or hedge cover to increase the shelter and food source available.
- 5.32 The maintenance and repair of bird boxes installed upon across the Site during the pre-construction and construction phases will remain the responsibility of the Developer.

Hibernacula and Refugia

- 5.33 To enhance the Site for a common reptile population, at least two hibernacula will be constructed at the margins of rough grassland and scrub grassland habitat to be created on the new landscaped bunds. Hibernacula will be constructed in accordance with the following specifications:
- Finished size approximately 2m long, by 1m wide and 1m high, capped with topsoil and covered with turf;
 - Hibernacula to be partially buried in a pit up to c.0.5-1m deep and located within uncut areas of rough grassland vegetation;
 - The body of each hibernaculum to contain a range of materials including cut timber, brash, inert hardcore, bricks, rocks, grubbed-up tree roots or building rubble;
 - Materials that will decompose will not be placed beneath heavy components such as bricks or rocks, to avoid the risk of collapse;
 - Wood chippings or loose topsoil will be incorporated into the construction, to pack some of the larger cavities;

- Hibernacula to be located within uncut areas of grassland and/or woodland edges, covered with topsoil and seeded using a wildflower seed mix;
 - Hibernacula to be temporarily fenced off when situated in more accessible areas so as to avoid disturbance whilst vegetation is allowed to develop; and
 - Access points for amphibians and other wildlife will be created by ensuring that some timber or rubble protrudes from the edge, creating crevices that allow reptiles and amphibians to get deep inside.
- 5.34 Additionally, logs and brash generated from clearance of trees and scrub will be retained where possible and used to create informal hibernacula within wooded areas along the boundaries of the Site. Deadwood should also be retained (taking into account any health and safety implications), to provide suitable habitat for invertebrates.

Section 6

Establishment and Management Regime

Years 1–5 (Operation Phase)

- 6.1 This section details the management which will be undertaken for the retained and newly created ecological habitat features including areas of grassland, tree and shrub planting and wetland features across the Site (**Appendices EDP 1 and 2**). This section sets out the measures required to ensure that the habitats and features created successfully establish as required by Planning Condition 11. The establishment and management regime for all created and enhanced habitats will require subsequent monitoring and review of all operations at five yearly intervals.

General Measures - Establishment and Maintenance

- 6.2 Soil debris and arisings will be swept from adjacent hard surfaces after each maintenance operation. All extraneous rubbish not arising from the contract works will be collected and recycled (where feasible) or else removed from site at each maintenance visit.
- 6.3 Watering will be undertaken as necessary by the developer to ensure the establishment and continued thriving of all planted areas. Watering will be to the full depth of the topsoil. If supply is restricted by emergency legislation, watering will not be carried out unless instructed to do so.
- 6.4 All areas where plants or trees have failed to thrive (through death, damage or disease) will be identified and plants will be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season as frequently as necessary. The advice of the project landscape architect will be sought wherever possible. Any variation of this will only occur upon consent by the Local Planning Authority (LPA).
- 6.5 Spot weed control of all broad-leaved and injurious weed species listed in the Weeds Act 1959 will be undertaken using a suitable non-residual herbicide as and when required annually. The specification and use of herbicides or pesticides, including their use in proximity to water bodies, will comply with all contemporary regulations, British Standards and codes of practice.
- 6.6 Bark mulch on all planted areas is to be topped-up to appropriate levels at least once in spring, with a second application in autumn as required.
- 6.7 Any damage to hard or soft landscape areas arising from the contractors' work is to be repaired at the contractor's own expense.

- 6.8 Soil debris and arisings should be swept from adjacent hard surfaces after each maintenance operation. All extraneous rubbish not arising from the contract works should be collected and recycled (where feasible) or else removed from site at each maintenance visit.

Long-term Maintenance, Management and Monitoring

Species-rich Grassland (Wildflower)

- 6.9 Areas of species-rich grassland planting will be subject to the management regime provided below to promote a structurally and botanically diverse grassland sward.
- 6.10 During the first year of establishment, perennial weeds within areas of species-rich wildflower or wetland grassland will be removed through repeated cutting, hand-pulling or spot-spraying. This will be undertaken to promote establishment as follows:
- Mow newly sown meadows regularly throughout the first year of establishment to a height of 40–60mm, removing cuttings if dense. This will control annual weeds and help maintain balance between faster growing grasses and slower developing wild flowers; and
 - Mowing may be undertaken using an appropriate mechanical mower or using a brushcutter/trimmer where access for larger machinery is not possible.
- 6.11 Areas of grassland with bulbs will be left un-mown in early spring. The cut will be made when the bulbs have died down (approximately six weeks after flowering). After this, the management will revert to that of the surrounding grassland.
- 6.12 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 two to three days to allow seeds and invertebrates to drop out, but it may be necessary to use a mower or collector for practical reasons.
- 6.13 Weed and scrub control by manual or chemical means will be undertaken as required, so as to prevent pernicious perennial weed species from becoming established. 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 stabilized. 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. Control of any invasive species will be carried out in accordance with the advice of a specialist contractor.
- 6.14 In the second and subsequent years following establishment, areas of species-rich grassland will be subject to a first summer hay cut undertaken in late July to mid-August, followed by a second cut at the end of the growing season (October/November) to

between 40–75mm in height. Cutting will avoid the months of May to early July, to enable the majority of species to have flowered and set seed.

- 6.15 After flowering, in July or August, a hay cut is to be taken – cut back with a scythe, petrol trimmer or tractor mower to c.50mm. Hay is to be left to dry and shed seeds for 1-7 days then remove from site.
- 6.16 More generally, the Landscape Architect will undertake an assessment of all informal areas of grassland, meadow and bulb planting on site at Years 1, 3 and 5 from the first spring following planting, to ensure the adequate establishment of all plants, identify the presence of any undesirable species and disease, and determine whether remedial action is required. This could include replacement seeding/bulb planting for any lost/-damaged specimens and additional management prescriptions necessary to ensure successful development. Additional monitoring will also be necessary during prolonged dry periods when new planting has a greater chance of failure. Thereafter, management measures will require subsequent assessment at five yearly intervals.
- 6.17 Any scrub encroachment should be closely controlled.
- 6.18 All vegetation cuttings (arisings) should be removed from the grassland area and either composted on site or removed. It is important to remove all cuttings to progressively reduce the soil fertility and thereby prevent weed dominance.

Amenity Grassland

- 6.19 Amenity grassland will be cut as necessary between March and the end of October to required heights of c.25–75mm. Cutting will be suspended in periods of drought. All litter and debris to be removed before each cut.
- 6.20 At the time of each cut, all grass edges round the base of trees, manholes, etc., will be trimmed, taking precautions not to damage the tree trunks. All arisings will be removed, and all adjoining hard areas will be swept clear of cuttings and swept material removed.
- 6.21 The sward will be kept substantially free of broadleaved weeds where required, by applying a suitable approved selective herbicide. Fallen leaves will be removed in autumn.
- 6.22 Grassland will be watered as necessary to ensure a healthy sward until it has become established. Any areas of extreme wear, bare patches or wheel ruts will be reinstated by means of re-cultivation and re-seeding.

Sustainable Drainage Features (Swales and Attenuation Basins)

- 6.23 Management of newly created swales and attenuation basins, which will comprise wet meadow grassland, throughout the establishment phase will involve annual inspections for the presence of invasive alien plant species, and aggressive native/naturalised plant species. The inspection will be undertaken by a suitably qualified specialist, with remedial

works required to control the spread of these species (if present) implemented immediately. Control measures will involve cutting and removal, mechanical control through excavation if plants become well-established, hand removal for shallow-rooted plants, or treatment by herbicides suitable for use near water following guidance from NE.

- 6.24 The extent of colonisation of swales in particular will be reviewed every two years following creation by a Chartered Landscape Architect/Contractor. In the event that colonisation by target habitats of such features has been slow to the extent that margins remain as bare mud and/or devoid of desirable plants, then low-density plug planting of native flora will be undertaken where this will not interfere with drainage and attenuation.
- 6.25 Bankside cutting of swale features is best carried out in late summer (mid-July to mid-September), with the flail cutters set to retain vegetation at c.15cm heights. Variable cutting will encourage diversity, thereby increasing the ecological value of this attenuation features. In addition, the following measures will be adhered to:
- Ensure a fringe of vegetation is left along the water's edge on at least one of the swale banks;
 - Leave sections of swales uncut in any one year;
 - De-silting without interfering with banks using appropriately sized machinery where required; and
 - At least one third of the swale will remain untouched at any one time.
- 6.26 Vegetation cutting is best carried out in short sections in different years. For bank vegetation, a late autumn cut every one or two years would simulate a rich grassland sward, without affecting the drainage function of the swales.
- 6.27 With respect to attenuation features comprising a wet meadow grassland mix, management will be undertaken in accordance with those measures for species-rich grassland above.
- 6.28 Encroaching scrub will be removed from swales and attenuation basins on an annual basis to prevent terrestrial succession, whilst maintaining their drainage function.

Tree and Shrub Planting

- 6.29 All newly planted tree and shrub planting will be managed to ensure the stock establishes and thrives in accordance with the detailed landscape scheme provided at **Appendices EDP 1** and **2**. New planting will be watered as required, particularly during the first three years of establishment.
- 6.30 Inspections of new tree, hedgerow and shrub planting should be carried out annually for a period of five years from the first spring following planting to ensure the adequate

establishment of all plants, identify the presence of any undesirable species and disease and to determine whether remedial action is required.

- 6.31 The condition of all stakes, ties and guards should be checked by the Developer/Management Company during each monthly visit and all broken items should be replaced and items regularly adjusted to accommodate plant growth and prevent rubbing. Any bark damage should be cut back neatly with a sharp knife. All plants are to be maintained upright and the ground at the base to be firmed up. All shelters should be hand-weeded.
- 6.32 All planting will be maintained in such a way as to exclude aggressively competitive plants from around the base of each plant for a period of three years from the end of the season in which the stock was planted. Any herbicides should avoid areas of newly established grassland.
- 6.33 Weeding will be undertaken during the main growth period (April to June, inclusive) for three years, achieving and maintaining a weed-free area around each of a minimum of 1m radius. Weed control will be by strimming (using appropriate guards to avoid damage to the plant) and/or herbicide application. Care will be taken to avoid damage to trees themselves.
- 6.34 Watering should be undertaken as necessary by the Developer to ensure the establishment and thriving of all planted areas. Watering should be to the full depth of the topsoil. If supply is restricted by emergency legislation watering should not be carried out unless instructed to do so.
- 6.35 A weed-free area around each shrub, of a minimum of 1m in diameter, should be maintained through the application of a non-residual herbicide twice annually during the growth season. Weed control should ensure that weed cover is less than 5% and that no weeds exceed 1m in height.
- 6.36 An assessment of the condition of all retained and newly planted tree, shrub and scrub plants will be made by a qualified and experienced arboriculturist annually for a period of five years from the first spring following planting to ensure the adequate establishment of all plants, identify the presence of any undesirable species and disease and to determine whether remedial action is required, including replacement planting for any lost/-damaged specimens and additional management prescriptions necessary to ensure its successful development. Additional monitoring will also be necessary during prolonged dry periods when new planting has a greater chance of failure. Thereafter, an assessment will be undertaken every two years.
- 6.37 All areas where newly planted plants have failed to thrive (through death, damage or disease) will be identified and plants will be removed and replaced with equivalent species to match the size of adjacent nearby plants in the next appropriate planting season, as frequent as necessary. The advice of a Chartered Landscape Architect or suitably qualified arboriculturist will be sought wherever necessary.

- 6.38 All plants will be pruned to promote healthy growth and natural shape, and any dead, dying or diseased wood and suckers will be removed. Overhanging branches will be pruned to ensure that growth is prevented from encroaching onto paths, signs, sightlines and road lighting. All pruning will be undertaken in accordance with BS 7370-4.
- 6.39 The requirement for selective thinning of all newly planted trees/shrubs will be assessed and undertaken as necessary to ensure that: overcrowding is reduced with increasing species maturity; that slower growing climax species are not outcompeted; and that diseased and dying plants are removed.
- 6.40 All management and remedial work should avoid the main bird nesting season (March to August inclusive). Where this is not possible, a pre-commencement check for nesting birds to be undertaken by a suitably qualified operative will be required prior to commencement of management/remedial works. Minor works required during this period should otherwise follow the advice of a suitably qualified ecologist, landscape architect or arboriculturist.

Trees

- 6.41 To ensure the long-term viability of all retained mature trees and hedgerows on site, an annual inspection of all retained mature trees should be undertaken by an Arboricultural Association approved arboriculturist contractor or professional arboriculturist, with all recommendations implemented in full within three months of initial inspection. Where damage is identified, consideration should be given to the inclusion of protective fencing. Dead/dying/damaged limbs should be removed only if they pose a hazard to public health and safety. In these instances, a bat licenced ecologist should inspect any limbs prior to their removal to check for the presence of roosting bats. Once removed, the limb, as well as any dead wood, should be left at the base of the tree to provide a refugia and food resource for invertebrates.
- 6.42 Where remedial work to mature trees is required, an update ground-level inspection by a suitably qualified ecologist will be undertaken to determine its current potential to support roosting bats. Where remedial works proposed are considered likely to impact upon potential bat roosting features, a detailed aerial inspection will be undertaken to further inspect suitable roosting features to be impacted for the presence of bats, prior to any commencement of tree works. Aerial inspections will be undertaken by a suitably qualified and NE bat licensed ecologist, or an arboricultural contractor with an NE bat survey licence or with experience of working with bats and under the supervision of an NE bat survey licence holder. Thereafter, works will only progress in accordance with the advice of the suitably qualified and NE bat licensed ecologist.
- 6.43 All tree works are to be undertaken in accordance with *BS 3998:2010 Tree Work*. Retained trees will be allowed to develop naturally where feasible, subject to Health and Safety considerations.
- 6.44 Monitoring and maintenance of newly planted tree species should be undertaken in accordance with the above prescriptions for shrubs.

Hedgerows

- 6.45 Monitoring and maintenance of retained and newly planted hedgerows should be undertaken in accordance with the above prescriptions for shrubs and trees. In addition, new growth of tree whips planted in new native hedgerows should be topped by approximately 30% on all sides, on an annual cycle up to the first three years after planting to encourage low lateral growth of branches, thereby establishing a thick hedgerow at the base. In subsequent years, lateral branches and shoots should be trimmed to an 'A' shaped cross-section, with greater width at the base of the hedgerow.
- 6.46 With respect to proposed hedgerows, management will be undertaken in accordance with those measures given above for the construction phase of development (to ensure establishment). For hedgerows associated with formal open space, responsibility for management will remain with the Developer and/or appointed Managing Agent. In addition to the above, hedgerow will be cut annually to maintain a maximum 1.2m height.
- 6.47 Thereafter, hedgerows should be cut back on a three-year rotation, avoiding the breeding bird season (March to August inclusive).
- 6.48 As brown hairstreak's eggs and caterpillars can occur on young blackthorn twigs year-round, the rotational cutting of blackthorn scrub and hedgerow habitat should benefit the local brown hairstreak butterfly population. On no one occasion should more than a third of available habitat be trimmed.

Swales and Watercourses

- 6.49 Once every two years, selective clearance of dense vegetation will be undertaken to maintain both the drainage function of the swales and the form and function of watercourses. Swales and watercourses will be cleared on a rotational basis whereby sections of scrub are left uncut in any one year. Bankside cutting is best carried out in late summer (mid-July to mid-Sept), with any cutting set to retain 10 to 15cm of vegetation. Variable cutting will encourage diversity, thereby increasing the ecological value of the ditch system from reed-dominated sections to open areas.

Bird and Bat Boxes

- 6.50 Bird and bat boxes will be checked two years following installation. In the case of the latter, boxes will need to be inspected by a bat licensed ecologist, with damaged boxes repaired/replaced where necessary. The maintenance and repair of bat boxes installed across the Site will remain the responsibility of the Developer, or any appointed Management Company. Five-yearly replacement checks will continue long term.

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Section 7

Management Regime

Years 6–10 (Operation Phase)

- 7.1 The following section sets out broad management and maintenance tasks for the long-term care and protection of landscape and ecological features on site. Given the dynamic nature of habitats and their ability to change over time, it is both inappropriate and impractical to set out a fixed and prescriptive set of management tasks to be implemented ‘regardless of progress’. A key element of the plan is flexibility. It is, therefore, considered that this plan should be reviewed after five years with any necessary changes to management documented within an updated LEMP. However, the recommendations for management discussed below should be broadly adopted during the management regime of years 6 to 10 and included within an updated LEMP as required.

Amenity Grassland

- 7.2 Once the grassland has established and the first-year cut has been taken, routine grass maintenance should be undertaken from spring, with grass cutting on-going through the growing season, in order to fulfil the management objectives.

General

- 7.3 Operations are to be carried out in accordance with *BS 7370 Part 3:1991*.

Grass Cutting

- 7.4 The growing season (spring) is to be started at a high cut (50–75mm), mowing as necessary before increasing the frequency and reducing the height as specified:
- Litter rubbish and debris to be removed before mowing;
 - General amenity grassland in open space areas to be cut to 25–75mm;
 - Grass to be left in a neat and even finish without surface rutting, compaction or damage to grass;
 - Edges to be left neat and well defined. Grass to be neatly trimmed or strimmed where it abuts fences, walls and around other objects, but no closer than 100cm from tree trunks and plant stems; and
 - All non-grass areas are to be kept free of arisings created by any grass cutting operations.

Bulbs/Corms

- 7.5 Areas of grassland with bulbs to be left un-mown in early spring. First cut to take place when the bulbs have died down (approximately six weeks after flowering). After this, the management should revert to that of the surrounding grassland.

Weed Control

- 7.6 Non-grass species to be removed by treatment with a suitable selective herbicide as necessary. Wildflower or bulb and corm planted areas are not to be treated. Alternatively, specific weeds to be spot treated with a suitable herbicide.

Fertiliser

- 7.7 Grass areas to be fed as necessary to maintain the vigour of the grass, using a proprietary spring or autumn lawn fertiliser judged suitable for the on-site soil conditions, as well as for use in a residential area. Do not apply to meadow areas. Application rate is to be in accordance with manufacturers guidelines.

Watering

- 7.8 Grass to be watered as necessary to maintain good condition.

Wildflower Meadow

- 7.9 Once the meadow grassland is established, routine grass maintenance is to be undertaken to fulfil the management objectives.

Cutting

- 7.10 Meadows to be cut twice yearly, with the first cut to take place after flowering and seed drop (late July to mid-August). Height of cut to be 75–100mm. Cut grass should be left to dry for 3–7 days dependent on weather conditions, and then collected and removed to a designated composting area on or off-site. The second cut to take place at the end of the growing season (October/November) prior to winter dieback. All arisings to be collected and removed. It is important to collect and remove mowings, to retain low soil fertility and high floral diversity.

Weed Control

- 7.11 Clover and all unwanted invasive, vigorous weeds (such as thistles and nettles, as well as all injurious weed species listed in the *Weeds Act 1959* and *Wildlife and Countryside Act 1981* (as amended)), including roots, to be removed by hand or by spot treatment with appropriate weed killer. Selective lawn killers should not be used.

Trees/Shrubs

- 7.12 To ensure the long-term viability of all retained and newly planted trees on site, regular inspections should be undertaken, with all recommended tree surgery works implemented in full within three months of the inspection.
- 7.13 Formative pruning of all shrubs should be undertaken as necessary to sustain healthy, bushy growth, and to ensure no encroachment into adjacent habitats. If any retained tree is cut down, uprooted, destroyed or dies, another tree shall be planted in the same place in the next planting season following the removal of that tree.
- 7.14 From Year 5 after planting, or once plants are established, all tree/shrub/climber stakes, ties, supports and shelters can be removed and disposed of off-site.

Hedgerows

- 7.15 The management of newly established hedges, mature hedges and hedgerows shall include the operations listed below.

Re-firming

- 7.16 Re-firm plants loosened by frost heave, wind rock or vandalism by treading around base.

Trimming

- 7.17 Carry out the following tasks:
- Native hedges:
 - Trim annually each winter (November–February) on a three-year rotation in sections of 50–100m;
 - Avoid flailing native boundary hedgerows on all sides by retaining one natural side in rotation to maintain foraging and nesting opportunities;
 - Trim to maintain an ‘A’ shaped profile and final trimmed size of about 3m high and 3m wide at base, unless specified otherwise, using suitable mechanical cutters;
 - Remove current growth rather than new wood; and
 - Remove arisings.
 - No hedge trimming to be carried out during the bird nesting season (March–August inclusive);

- All branches to be neat and clean, and no jagged ends or tears to be left;
- Hedgerow trees are not to be lopped or cut off. These should be clearly tagged and identified for full maturity. However, lower branches should be removed to prevent excessive shading to hedgerow species; and
- No hedgerow trimming to be carried out during the bird nesting and breeding season (March to August inclusive). Where boundary hedgerow growth extends within the perimeter of residential properties, these may be trimmed back during January to maintain a 1m maintenance path along the inside face of the hedgerow.

Removal of Dead Plant Material

- 7.18 At the end of the growing season, all shrubs to be checked and all dead foliage, dead wood, and broken or damaged branches and stems removed.

Weed Control

- 7.19 The following tasks are to be carried out:
- Following the establishment period, normally around two to three years, hedge plants should have established, and mulch will no longer be required. Bark mulch should not be topped up and mulch mats should be removed; and
 - Aggressive species (trees and shrubs that have invaded and are suppressing long-term species, i.e. bramble) should be cleared. Unwanted climbers that are suppressing trees and shrubs should also be removed.

Watering

- 7.20 Watering is to be to field capacity, and then as necessary to maintain in a healthy vigorous condition.

Swales and Watercourses

- 7.21 Swales and watercourses should continue to be monitored once every two years and vegetation cleared as necessary to ensure succession of an aquatic plant community and prevent subsequent drying out of wetland areas.

Section 8

Monitoring and Timetable of Works

Monitoring

- 8.1 The Developer will have responsibility for implementation of the landscape proposals based on the attached plans and in accordance with the planning consent. When the landscaping is completed as part of the construction of the Proposed Development, the Management Company will take over responsibility for the maintenance and management of the landscaping described here in the Landscape Management Plan.

Timetable of Works

- 8.2 The creation of soft landscaping works is to be undertaken within the first available season following completion of the construction period.
- 8.3 **Appendix EDP 4** illustrates optimal times of year to undertake site clearance, habitat creation, as well as optimal times of year to undertake subsequent monitoring and management of created/enhanced habitats.

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Section 9

Summary and Conclusions

- 9.1 It is considered that the management and maintenance measures outlined within this LEMP are sufficient in protecting and conserving the key landscape and ecological features of the Site, as summarised within **Appendix EDP 5**. Detailed measures have been provided to ensure that existing and retained features of landscape and ecological interest within the Site are suitably protected during the construction phase of the development.
- 9.2 Management prescriptions for the maintenance of the viability of retained and newly created habitats located across the development footprint and with respect to the woodland and trees forming the peripheries of the Site have been provided, including timings for when operations should occur. Such prescriptions are considered to be in line with the broader recommendations made for the continued long-term maintenance and protection of the Site's ecological interests.
- 9.3 The responsibility of the undertakings set out within this LEMP rests with the Principal Contractor and/or Developer for the pre-construction and construction works phases and for the period up to handover to the Private Management Company. Any deviation from that prescribed within this LEMP is to be agreed in writing with the Local Planning Authority.

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