

LAND SOUTH OF CORNFIELD CLOSE LITTLEHAMPTON

LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN



Ecology
Archaeology
Arboriculture
Landscape Architecture



Written By:	HR
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Date:	29.08.2019
Document File Ref:	THA21635_LEMP
Revision:	A

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1.0 INTRODUCTION

- 1.1 On the 14th August 2019, full planning consent was granted by Arun District Council to develop an area of land off of Cornfield Close, Littlehampton BN17 6HY (**Image 1**). The planning permission allows for the construction of 77 new residential dwellings with associated parking and landscaping (**Image 2**).



Image 1: Location of the Approved Development Site



Image 2: Layout of the Approved Development Site

1.2 The Landscape and Ecological Management Plan (LEMP) has been commissioned to address Condition 6 of the planning permission for the approved development, which states:

“Prior to the commencement of development a Construction Environmental Management Plan (CEMP) and Landscape and Management Plan (LEMP) including full details of the habitat management and enhancements to take place on site shall be submitted to and approved by the Local Planning Authority and the development shall proceed in accordance with the details so approved.”

1.3 This report addresses the condition for a LEMP, with the CEMP to be submitted separately. The LEMP Contains the following:

- Details of the mitigation measures;
- Details of the enhancement measures;
- Requirements for ongoing maintenance; and

- A location plan detailing ecological enhancement on site.

2.0 BACKGROUND INFORMATION

2.1 The baseline ecological interest of the Approved Development Site, is set out in the Ecological Impact Assessment provided by ACD Environmental Ltd¹, which identifies and values habitats currently at the site of the Approved Development.

2.2 The habitats identified comprise:

- Buildings - a total of six single storey buildings were identified on the Approved Development Site and comprise ship-lap elevations, with the exception of a weatherboard garden. The garden shed (Building 6) and Building 3 featured flat bitumen felt roofs. Building 5, features a single pitched roof with a mixture of translucent and opaque corrugated sheeting. Only Building 2 features a tiled roof, with the tiles being interlocking clay tiles in good condition. The two properties outside of private residence include the reception building (Building 1), which comprises shiplap elevations, a pitched bitumen felt roof and uPVC window and door frames. The second building (Building 4), has since been demolished by the previous owners. The building was a toilet and shower facility with shiplap elevations and a single pitched roof comprising a mixture of opaque and translucent corrugated sheeting;
- Dense Scrub - dense scrub is located on the western boundary and is dominated by bramble *Rubus fruticosus* agg. with scattered buddleia *Buddleja davidii* and young trees of elder *Sambucus nigra*, Norway maple *Acer platanoides*, Monterey pine *Cupressus macrocarpa* and cherry *Prunus* sp. A thin strip of bramble scrub is also present on the northern boundary. On the south-east corner of the Approved Development Site is a less dense and lower lying area of bramble scrub with a small amount of holly *Ilex aquifolium*.
- Introduced Shrub - Patches of introduced shrub are scattered throughout the Approved Development Site, predominantly located within the circular tarmac road. Species are typically but not exclusively non-native ornamentals including *cotoneaster* sp., rosemary *Rosmarinus officinalis* and snowberry *Symphoricarpos albus*. Native species include yew *Taxus baccata* with single

¹ S Lancaster (2018) *THA21635 Ecological Impact Assessment*, Rodbourne Rail Business Centre, Grange Lane, Malmesbury, Wiltshire SN16 0ES.

young specimens of ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus*. A large Stand of Japanese knotweed *Fallopia japonica* is located at the western half of the northern boundary. This is a Schedule 9 species. The introduced shrub is of **site value** and the Japanese knotweed of negligible ecological value.

- Species-poor hedgerow - An unmanaged species-poor hedgerow of **site value** extends along the western boundary and is obscured by the dense scrub within the Approved Development Site. The hedgerow comprises a native mix of blackthorn *Prunus spinosa*, elder and hawthorn *Crataegus monogyna* with bramble and ivy *Hedera helix*. Additional hedgerows within the Approved Development Site are short *Leyland cypress* X *Cuprocyparis leylandii* hedgerows located on the north-east corner. This hedgerow is not considered a wildlife corridor and is not a hedgerow of importance under the hedgerow regulations 1997.
- Species poor semi-improved grassland – The grassland is managed at a short sward with species typical of semi- improved grassland, including perennial rye-grass *Lolium perenne*, dove's-foot crane's-bill *Geranium molle*, white clover *Trifolium repens*, creeping buttercup *Ranunculus repens*, cleaver's *Galium aparine*, annual meadow-grass *Poa annua*, cock's-foot *Dactylis glomerata*, daisy *Bellis perennis*, lesser trefoil *Trifolium dubium*, common ragwort *Senecio jacobaea*, creeping cinquefoil *Potentilla reptans*, scarlet pimpernel *Anagallis arvensis*, ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, and smooth sow-thistle. The grassland was considered to be of **site value**;
- Scattered trees and tree line - The scattered trees on site vary in age and condition, as detailed in the Tree Report by ACD Environmental and are predominantly located around the site boundaries. The highest density of trees is along the southern boundary which also comprises a large number of mature specimens and is defined as a tree line within this report. Tree species include grey poplar *Populus canescens*, sycamore, Lombardy poplar *Populus nigra 'Italica'*, hybrid black poplar *Populus x canadensis*, Norway maple, elder, whitebeam *Sorbus aria* and hornbeam *Carpinus betulus*.

Category A-C trees are of **Local Value** and all other trees of **site value**.

- Tall ruderal – Tall ruderal makes up a small area of the site and is mixed in with the dense scrub that extends along the western boundary. A comprehensive species list of the tall ruderal vegetation was not possible at the time of the site visit due to the winter timing, however, burdock *Arctium* sp., common nettle *Urtica dioica* and a dense matting of ivy was recorded.

Amphibians

2.3 Great crested newt *Triturus cristatus* and widespread amphibians are considered reasonably likely to be absent from the Approved Development Site, due to spatial separation and habitat isolation. The A259 and residential developments act as a barrier to dispersal for great crested newts between the Approved Development Site and suitable ponds. No water bodies are located in the Approved Development Site itself, and no records within 2km were identified. No incidental amphibian sightings were recorded during surveys. Amphibians are **likely absent** and will not feature any further in this report.

Badger

2.4 No evidence of badger *Meles meles* setts or activity were observed during the survey, although the Approved Development Site offers limited potential foraging habitats. During construction reasonable precautions should be taken to protect badgers as outlined in Section 3.

Bats

2.5 The buildings' shiplap elevations and corrugated sheeting and bitumen felt roofs do not offer opportunities for bats to roost. Building 2 was also in good condition and no lifted tiles were recorded during the site visit. Overall, no potential bat-roosting features were recorded on the buildings within the Approved Development Site.

2.6 Various trees on the Approved Development Site provide features with potential to support roosting bats, with two trees with bat roosting features to be felled, as outlined in the EcIA¹. These are identified as TN3 and TN10. Endoscopic surveys were undertaken and TN3 assessed as low suitability and TN10 as medium

suitability. No bats or evidence of bats was identified and precautionary felling methods recommended, and appropriate compensation measures implemented.

- 2.7 Boundary vegetation is largely being retained and may be used by migrating and foraging bats. Measures are recommended to ensure that boundary vegetation as well as all retained trees with bat roosting features are not reduced in suitability by light pollution, including planting of a new tree line at the northern boundary.

Birds

- 2.8 The removal of dense scrub, trees, introduced shrub and hedgerows to facilitate the development will result in the loss of suitable nesting bird habitat. Inherent mitigation has been incorporated into the development in the form of tree and hedgerow retention. However, the minor loss of suitable nesting bird habitat can be compensated for via the habitat compensation measures detailed within this report.

Reptiles

- 2.9 A low population of slow-worm has been recorded within the Approved Development Site. The dense scrub, tall ruderal vegetation, refuse-tips, hedgerows and bases of mature trees are suitable for supporting widespread species of reptile. The removal of these habitats risk harming slow-worm and will result in a net loss of slow-worm habitat. Precautionary methods and enhancement measures are recommended in the EcIA, and are detailed in this report.

Other Wildlife

- 2.10 The development proposals will result in the loss of suitable hedgehog habitat on site and there is a risk of deadwood (TN3 and TN10) being removed of suitability for stag beetle. There is also potential for the development to result in the loss of nectar resource for pollinating invertebrates.

- 2.11 The baseline audit has recommended the creation of new wildlife habitats within the Approved Development Site (**Image 2**) to include:

- Wildflower meadows;
- New tree planting;
- Wildlife friendly planting schedules;
- Bat tubes; and
- Bird boxes.

2.12 The aim of these ecological enhancements is to provide a net increase in biodiversity on site by providing suitable habitats for wildlife.

2.13 An ongoing maintenance schedule is also detailed by the LEMP.

3.0 PRECAUTIONARY METHODS OF WORK

3.1 This section details the precautionary methods of work, which will be adopted throughout the preparation and construction phases of the development. These aim to protect wildlife from harm or excessive disturbance during the development of the Approved Development Site.

General Ecological Measures

3.2 A 'Toolbox Talk' by an appropriately qualified ecologist, will be given to ensure workers are aware of restrictions relating to wildlife within the Approved Development Site and of the wildlife protection measures that are to be put in place.

3.3 All chemicals will be stored in well-sealed containers and stored away from boundary vegetation to prevent spillage or ingestion by wildlife.

3.4 The hedgerows to be retained will be protected in accordance with BS5837:2012 *Trees in Relation to Design Demolition and Construction*.

Badger

3.5 Whilst no evidence of badger setts or activity was found within the Approved Development Site, it is important to note that they are a highly mobile species, which continually dig new setts. Therefore, it is possible that badgers may enter the Approved Development Site in the future.

3.6 During the site preparation and construction phases of the development, good practice measures will be adopted to protect commuting and foraging badgers that may enter the Approved Development Site. The following mitigation measures will be implemented:

- Trenches will be covered overnight wherever possible; however, when this is not possible, a means of escape will be provided, for example a plank angled between the bottom and the top of the trench. All trenches will be checked each morning. Should a badger be found, work will stop and the advice of an appropriately qualified ecologist will be sought;
- Any temporarily exposed pipes will be capped to prevent badgers gaining

entry overnight;

- Use of noisy machinery will be minimised after dark to reduce potential disruption to foraging activity; and
- If a large D-shaped hole is found during preparation or construction phases, work will stop immediately and the advice of an appropriately qualified ecologist will be sought.

Bats

- 3.7 For trees which have features appropriate for supporting roosting bats (TN3 and TN10), a precautionary 'soft-felling' methodology is to be undertaken. This includes cutting the tree in sections, avoiding cutting through suitable roosting features and gently lowering to the ground and leaving the sections to rest overnight.
- 3.8 If a bat roost is confirmed to be present within a tree requiring removal, a Natural England EPS mitigation licence will be required in order to allow the proposed redevelopment works to proceed without contravening current legislation. A protected species licence application can only be made once planning permission and all the relevant conditions have been granted.
- 3.9 Consideration will be taken with respect to lighting to ensure foraging and commuting bats along the boundary vegetation are not unduly impacted by the development. The following measures will be implemented to avoid lighting disturbance to bats²:
- Careful aiming, positioning and selection of luminaires. LEDs with no UV component are to be installed at a distance from retained habitats i.e. the hedgerows and watercourse. The brightness of a luminaire is a deterrent even where there is no light spill and directional lights can still result in a small amount of light spill behind;
 - Avoid white light. Lighting will utilise warm colours (preferably 3000°k to 2700°k with peak wavelengths greater than 550nm);

² Ferguson, J., Smith, N., Fox, H., (2018) *Bats and Artificial Lighting in the UK*. The Bat Conservation Trust, London.

- 0% upward light output and no tilting of the light head;
- Motion sensors incorporated for security lighting;
- For street lighting part night lighting and dimming will be applied according to the local councils current policy, the latter viable with LED's only;
- Use of shields, baffles and cowls will be applied along the boundaries to prevent light spillage into the adjacent hedgerows and watercourse; and
- Any lit site compounds will be located away from retained habitats i.e. boundary vegetation, to ensure no light spill.

3.10 Habitats of value to bats identified in the Approved Development Site (as detailed in the EcIA) are to be retained and where possible enhanced. This ensures the foraging and commuting interest of the Approved Development Site is maintained through the site preparation and construction phases as well as when the development is complete.

Birds

3.11 Areas of the vegetation are anticipated to be removed to allow access to the development for both construction and residents once the development is complete.

3.12 Should any vegetation require removal, it will be done outside of the bird nesting season wherever possible (March-August inclusive). However, if it becomes necessary to clear any further vegetation during the bird nesting season it will be checked by an ecologist for active nests prior to removal. If no nests are found sectional clearance using hand tools can begin and must be completed within 48 hours of the completed check.

3.13 Should the above ground clearance be undertaken during winter, the roots must remain in place until the following summer to allow any hibernating reptiles to disperse. Stump and root removal can then only be undertaken when reptiles are fully active at a minimum of 10°C.

3.14 If a nest is found at any stage, clearance work must stop and the advice of an appropriately qualified ecologist sought. A suitable buffer, as determined by the

ecologist (usually 5m but this may vary depending on which species is identified), will be established around the nest with high visibility tape and appropriate signage. Loud machinery will be kept 10m away from the nest where possible. Before clearance can resume an ecologist must confirm that the nest is no longer in use and that no new nests have been established within the vegetation whilst the buffer was in place. Clearance will be completed within 48 hours after establishing that no active nests are present.

Reptiles

- 3.15 A low population of slow worm were identified using the Approved Development Site, using the tall ruderal, brash piles and hedgerows.
- 3.16 Japanese knotweed removal and installation of hibernacula (see **Enhancements** Section) should be undertaken prior to the clearance of tall ruderal and scrub. This ensures that any displaced reptiles have somewhere safe to go.
- 3.17 To prevent the risk of harming reptiles it is recommended that the tall ruderal vegetation and dense scrub is methodically strimmed over two days, with the first strim undertaken to a height of no less than 10-20cm and the second strim down to ground level. The strimming will also be directed towards the retained boundaries. Strimming will be undertaken under the supervision of a suitably qualified ecologist and on warm sunny days between April to September (inclusive), when reptiles would be active. Strimming may be carried out in October if temperatures remain above 10°C at night and only with approval from the supervising ecologist.
- 3.18 Where the dense scrub is too thick to be strimmed it is recommended that these areas are cut to approximately 15-30cm from ground level and the remainder removed on a separate day. Such clearance is also to be undertaken when reptiles are active and under the supervision of a suitably qualified ecologist.
- 3.19 The existing refuge-tip is to be removed by hand and/or using hand tools only, under the supervision of a suitably qualified ecologist. In the circumstance that larger equipment is required a digger with a toothed bucket can be used to slowly remove layers of material under an ecologists supervision.

- 3.20 If winter tree removal is to occur in order to avoid the nesting bird season, it is

recommended that the stumps are retained and removed during April to September, when reptiles are no longer hibernating, at a minimum of 10°C.

3.21 Clearance of logs, brash, stones, rocks or piles of similar debris, will be undertaken carefully when common reptiles are likely to be fully active i.e. during April to September.

3.22 The grassland will be kept short by regular mowing or strimming prior to commencing construction work on the Approved Development Site to discourage reptiles colonising.

3.23 If reptiles are found, work must stop and advice of a suitably qualified ecologist sought.

Other Wildlife

3.24 Hedgehogs will be protected during the site preparation and construction phases by adopting the same methodology detailed for the protection of badgers.

4.0 GENERAL MAINTENANCE

- 4.1 Following installation and after transfer, the landscape shall be the responsibility of and maintained in perpetuity by:
- Domestic Owners; and
 - The appointed Management Companies (should these be contracted out). The agreement for which shall be set up by the Developer, who shall confirm in writing to the Principal Planning Officer when the maintenance agreement is operative.
- 4.2 Refer to Soft Landscape Proposals for planting and grassland locations (THA21635_11).
- 4.3 The Developer shall ensure that any landscape contractor they employ 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.
- 4.4 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 horticultural schedules below. 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.
- 4.5 No existing trees, shrubs or grass shall be removed or cut without specific instructions from the Contract Administrator and written agreement of the Local Planning Authority Tree Officer. Existing trees are to be retained, protected and undisturbed throughout the contract.

5.0 TREES AND VEGETATION

Existing Trees and Vegetation

- 5.1 All works should be undertaken in accordance with the British Standard BS3998:2010 *Tree Work Recommendations*, by recognised tree contracting companies from the Arboricultural Association's list of registered contractors. 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.
- 5.2 No trees to be retained shall be used for anchorage or winching purposes.
- 5.3 The trees should be checked annually for signs of deterioration or distress and the appropriate actions taken, where a potential safety hazard is identified.
- 5.4 The under storey should remain undisturbed with little pro-active management. Where there is a need for surface treatment, refer to the Landscape Proposal Plans for details.
- 5.5 All diseased wood, pruning's and rubbish should be removed from site and the site left clean and tidy.
- 5.6 Heavy ivy infestation is not recommended in development situations, where wind risk may be a concern. The form of the tree can also be affected and it is therefore proposed to remove any dense infestation of ivy if evident on site or during the maintenance period.
- 5.7 Japanese knotweed is a Schedule 9 species and is to be removed by a specialist contractor. This is to be undertaken prior to the clearance of any other vegetation, unless specifically directed by the specialist contractor. The specialist contractor is responsible for ensuring appropriate removal of the Japanese knotweed.

Hedgerows

- 5.8 Hedgerows at the boundary of the Approved Development Site will be retained and protected in accordance with the Arboricultural Method Statement and protected in accordance with BS 5837 *Trees in Relation to design, demolition and construction*. The northern hedgerow is to be subject to supplementary planting as outline in the

section below.

- 5.9 Planting of new hedgerows within the new development will include wildlife friendly or native species, which are of benefit to wildlife, as detailed in the soft landscape proposals. These will be planted in double staggered rows at 300mm apart and 400mm width. Species to be included are hornbeam *Carpinus betulus* and *Pittosporum tenuifol*, which is particularly beneficial to moths and other night flying invertebrates.
- 5.10 Hedgerows should be maintained at a height no less than 2.5m high and 3-4m wide to maximise provision of nesting habitats for birds and dark corridors for commuting bats, with the exception of hedgerows marking domestic boundaries.. Hedgerow management should be light and undertaken rotationally i.e. cutting/trimming different sections of hedgerow once every 2-3 years. This must only be done outside of the peak nesting bird season once the fruit crop has been eaten (March-August inclusive). This will ensure the ecological value of the hedgerows are maintained and that the Approved Development Site remains permeable to bats.

Shrub and Tree Planting

- 5.11 The Management Company will maintain all shrubs and trees beyond the boundaries of domestic ownership in perpetuity. New planting is to include a new tree line at the northern boundary of the Approved Development Site (**Appendix 1**). Species will include crab apple *Malus sylvestris*, wild cherry *Prunus avium*, English whitebeam, pear *Prunus* sp., rowan *Sorbus aucuparia*, silver birch *Betula pendula* and field maple *Acer campestre*.
- 5.12 All tree works are to be undertaken by an Arboricultural Association approved contractor to BS3998:2010 *Tree Work Recommendations*.
- 5.13 Formative tree pruning is not to be undertaken until a permanent, structurally sound scaffold system of branches typical of the species and appropriate to the site circumstances is produced.
- 5.14 Post-planting management and maintenance of trees shall be in accordance with BS8545:2014 section 11 *Trees: from nursery to independence in the landscape-recommendations*.

- 5.15 A formal assessment of young tree health and development shall be undertaken annually. This assessment shall include foliar appearance, leaf size and leaf canopy density, extension growth and incremental girth development. Trees shall also be assessed continually throughout the year on an *ad hoc* basis. Wherever practical the performance of young trees shall be assessed by testing leaf fluorescence and leaf chlorophyll content.
- 5.16 The density of planting will require that all weeding is carried out by hand, using the appropriate tools. All resultant material should be removed from site.
- 5.17 All plants shall be inspected monthly for wind firmness and firmed as necessary. Stakes shall likewise be checked for firmness and all tree and plant ties inspected and made good as required.
- 5.18 All stakes and ties shall be removed as soon as the developing root system is strong enough to support the tree, usually after two full growing seasons.
- 5.19 The soil around newly planted trees shall be regularly inspected for soil capping or compaction and remedial action taken if needed.
- 5.20 All trees shall be checked regularly for mammal, human or other external damage and remedial action taken where necessary.
- 5.21 Minor pruning of dead or damaged wood will be carried out annually.
- 5.22 Plants will be watered as required to maintain healthy growth following planting, during the maintenance period and subsequently in cases of extreme drought. The Management Company is to provide a bowser for watering.
- Trees - 5Ltr's per tree
 - Shrubs - 1Ltr each
 - Grass - 5Ltr's/m²
- 5.23 Watering to commence following ten consecutive days of no rainfall, during the months of June to August. Following bowser watering a weekly visit should be carried out until the onset of natural rainfall.

- 5.24 Any failures due to drought shall be replaced by the Management Company at their own cost.
- 5.25 All planted areas shall be given an application of an approved top dressing at the rate of 40g/m² in May. This should be in slow release form e.g. Enmag or similar. This should be worked lightly into the soil, without disturbing the roots, before the bark mulch is re-spread. Unless specific nutritional deficiencies are identified, no fertiliser shall be applied to newly planted trees in the first season. If visual inspection points to nutrient deficiency further investigation of causes will be necessary. Remedial action may include addition fertiliser application, pH testing, assessment of organic content and levels of compaction.
- 5.26 Shrubs shall be maintained in a balanced shape and shall be annually pruned to allow for this. Any growth which will obscure windows, signs or sight-lines shall be removed. Once established, any support canes shall be removed from the shrubs. Trailing and climbing material shall be assisted in its growth by securing growing leaders where necessary.
- 5.27 Groundcover planting species have been specified so as not to exceed 600mm in height. However, should planting exceed expectations, this should be carefully cut down to below 600mm in height to avoid interference with visibility.
- 5.28 The bark mulch should be maintained at an even spread, 75mm deep, of consistent thickness, to ensure that it is effective as a weed suppressant and moisture conserver. Following any maintenance operations and on a bi-annual basis, the mulch shall be supplemented to allow for any material which may have been lost.
- 5.29 No plant substitutions to be made without the prior written agreement of the Local Authority.

6.0 AMENITY GRASSLAND

- 6.1 Areas of amenity grassland are provided at the east of the Approved Development Site with community grassland in various regions (see soft landscape plans THA21635_11). These will be seeded with a lawn mix tolerant of regular mowing, such as EG22 Strong Lawn Mixture from Emorsgate. This is to be applied at a rate of 25 grams per metre squared. This is due to the potential for heavy use by the new occupants.
- 6.2 During the first year, grass shall be cut at intervals of not more than 10-14 days during the growing season (generally April - October) using a sharp cutter to leave about 40mm of growth and cuttings will be removed from site. Any residual perennial weeds should be dug out.
- 6.3 Once established, the grass should be regularly mown but not too short (25mm - 40mm). To permit flowering, mowing can be relaxed from late June. The sward should be cut again when it gets untidy (after 4-8 weeks). Mowing may be suspended earlier in the year to allow cowslips *Primula veris* to flower. Heavy quantities of cuttings should be collected and removed from site.
- 6.4 Grassed areas beyond the boundaries of domestic ownership will be maintained in perpetuity by the Management Company.
- 6.5 This management plan should be made available to the new owners to help outline the principles of the retained habitats and encourage the future management of these areas in perpetuity.

7.0 WILDFLOWER MEADOW

- 7.1 The wildflower meadow planting will be located in the pockets at the north east boundary, most of the southern boundary, and an area along the western boundary of the Approved Development Site. This will be created using seed mix EM3 Special General Purpose Meadow Mixture from Emorsgate Seeds at a rate of 4g per meter squared. This seed mix is dominated by wildflowers, which are of value in their own right and because they attract and support invertebrates. This seed mix comprises: yarrow *Achillea millefolium*, common knapweed *Centaurea nigra*, greater knapweed *Centaurea scabiosa*, wild carrot *Daucus carota*, meadowsweet *Filipendula ulmaria*, hedge bedstraw *Galium album*, lady's bedstraw *Galium verum*, field scabious *Knautia arvensis*, rough hawkbit *Leontodon hispidus*, oxeye daisy *Leucanthemum vulgare*, birdsfoot trefoil *Lotus corniculatus*, hoary plantain *Plantago media*, salad burnet *Poterium sanguisorba*, cowslip, selfheal *Prunella vulgaris*, meadow buttercup *Ranunculus acris*, bulbous buttercup *Ranunculus bulbosus*, yellow rattle *Rhinanthus minor*, common sorrel *Rumex acetosa*, red campion *Silene dioca*, bladder campion *Silene vulgaris* and tufted vetch *Vicia cracca*. Shaded areas are to be seeded with EH1 Hedgerow seed mix as supplied by Emorsgate and sown at 4 grams per metre squared to include more shade tolerant species.
- 7.2 To successfully establish the species rich grassland, it is essential that ground preparation and management is appropriate. To prepare a seed bed, weeds should be removed through repeated cultivation. The area should then be ploughed or dug to bury the surface vegetation, harrowed or raked to produce a medium tilth, and rolled to produce a firm surface.
- 7.3 Seed is best sown in the autumn or spring but can be sown at other times of the year if there is sufficient warmth and moisture. The seed must be surface sown either by machine or hand.

First Year Management

- 7.4 Most sown meadow wild flower and grass species are perennial; they will be slow to germinate and grow and will not usually flower in their first growing season. There will often be a flush of annual weeds from the soil in the first growing season, which may grow up and obscure the meadow seedlings beneath. This annual weed growth

is easily controlled by topping or mowing.

- 7.5 The area should be cut 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 a balance between faster growing grasses and slower developing wild flowers. Any residual perennial weeds such as docks *Rumex* spp. should be dug out.
- 7.6 Going forward, the grassland should not be cut from spring through to late July/August to give the sown species an opportunity to flower.
- 7.7 Areas of tussocky grassland should be maintained along the base of hedgerows within the public spaces, through annual management with a strimmer or mower with a blade height set to at least 15cm. This will benefit invertebrates, birds, reptiles (slow worms) and hedgehog *Erinaceus europaeus*.

8.0 MITIGATION AND ENHANCEMENTS

Bats

- 8.1 To compensate for the loss of suitable bat roosting features from the Approved Development Site (trees TN3 and TN10), two Habitat boxes will be incorporated into the external walls of the new homes at a minimum of 4m high (**Appendix 1**). These should be on a south east/west facing elevation and not installed directly above windows or doors. These boxes are unobstructive and require no ongoing maintenance.
- 8.2 To compensate for an increase in lighting a new tree line is to be planted at the northern boundary of the Approved Development Site. Strategic planting can reduce light spill onto some of the boundary vegetation and minimise the impact of increased light pollution by maintaining the Approved Development Sites permeability to bats. Details are given in the **Shrub and Tree Planting** section, and include species of value to invertebrates, which subsequently provides increased foraging opportunities for bats.

Birds

- 8.3 Compensation for the loss of habitats is detailed in the EcIA and this report, and includes the incorporation of new areas of planting, including various hedgerows across the development and the strengthening of the northern boundary with a new tree line. The new planting compensates for the minor loss of suitable nesting habitats required to facilitate the development, ensuring no significant impacts on nesting birds.
- 8.4 Nesting boxes will be included in the Approved Development to secure a net gain in biodiversity. Three Terraced Sparrow Boxes or Schwegler 1SP Sparrow Terrace Boxes (dependent on whether integrated or external fixtures are preferred) are to be installed. The boxes are to be installed on northern or eastern elevations of the new properties at least 3m from the ground, away from window ledges and doors.

Reptiles

- 8.5 Slow-worm are known to be present on the Approved Development Site and are

similarly known to utilise residential gardens. Inclusion of appropriate hibernacula such as log and brash piles will ensure appropriate habitat is present on the Approved Development Site. The hibernacula should utilise the deadwood arising from the removal of trees TN3 and TN10.

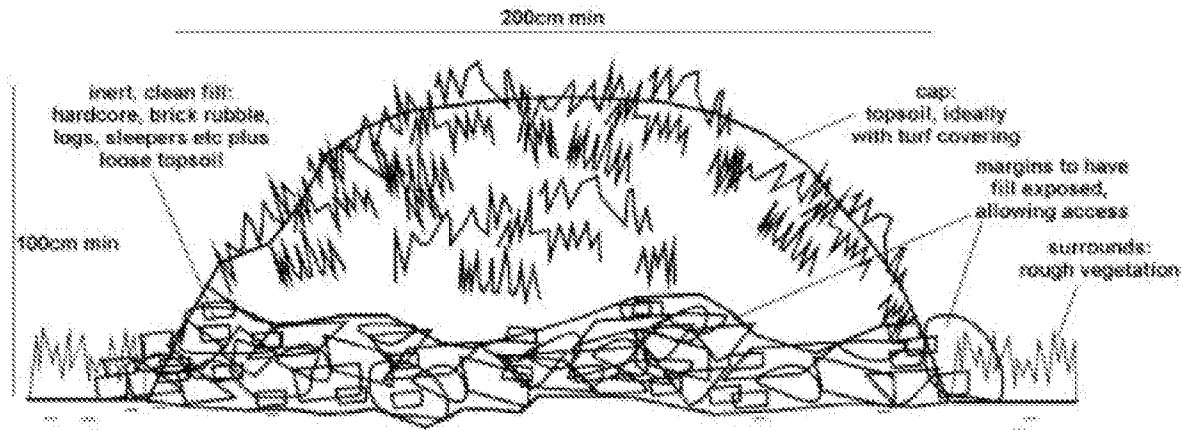


Image 3: Specifications for hibernacula construction

Other Wildlife

8.6 At least three invertebrate boxes are to be installed along the southern boundary tree line and/or the western boundary hedgerow, well hidden from the public to prevent vandalism. The Schwegler Clay and Reed box is recommended and should be installed in or near vegetation at approximately 1m from the ground.

8.7 Hedgehog passes must be included to allow hedgehogs and other small fauna to pass through the Approved Development. These must be at least 5 x 5 inches, and should provide connectivity through the gardens and to the Approved Development Site's boundaries. **Appendix 1** indicates appropriate locations for hedgehog passes.

9.0 MANAGEMENT SCHEDULES

9.1 The management schedule is summarised in **Appendix 2** and as follows:

Weekly

- All plants shall be watered following 10 days without rain. Then weekly until natural rainfall during June - August.

Fortnightly

- Amenity Grass to be cut every 10-14 days.
- Fortnightly litter pick over the entire site within areas covered by the Management Company.

Monthly

- Weed control shall be allowed for at monthly intervals. All areas to be weeded by hand.
- All plants shall be inspected monthly for wind firmness and firmed as necessary at the same time. Stakes shall likewise be checked for firmness and tree ties checked.

Bi-Annual/ Annual

- The bark mulch should be topped up bi-annually.
- Grass cutting to wildflower areas.
- Hedgerows to be managed (rotationally).
- After two years tree stakes and ties are usually ready to be removed.

Annual

- Replacement of any failed trees or shrubs will be allowed for annually to ensure that the planting areas are fully stocked at all times.

- Any hollows which appear due to settlement shall be top dressed annually, early in the growing season.
- An application of a residual weed killer shall be allowed for on shrub areas.
- Minor pruning of dead or damaged wood shall be allowed for annually.
- All planted areas and trees shall be given an application of an approved top dressing in May. Not in Wildflower areas.
- Shrubs shall be maintained in a balanced shape and prevented from obscuring signs, windows and encroaching on paths.
- Check for invasive species as and remove from site.
- Undertake a formal assessment of young tree health and development.
- Bird nesting box to be emptied of old nesting material and cleaned with hot water (outside of the bird nesting season).

Every 5 Years

- A suitably qualified person employed by the Management Company to undertake a review of the condition, success and long-term maintenance of the planting.
- Any amendments to the management plan required to ensure a good planting scheme should be submitted to the LPA for approval. The LPA may draw the Management Company's attention to defects in the maintenance or failure to comply with the landscape management plan and require that the Management Company rectify these defects or apply for a variation to the landscape management plan.

APPENDIX 1

MITIGATION AND ENHANCEMENT PLAN



APPENDIX 2 INSTALLATION AND MAINTENANCE SCHEDULE SUMMARY

Task	Details	Timing Restrictions	Responsible Party
Removal of Japanese knotweed	Prior to removal of any other vegetation	N/A	Thakeham Client Ltd. to appoint a specialist contractor
Installation of new planting	N/A	During construction	Thakeham Client Ltd.
Watering of plants	Following 10 days of no rain plants will be watered weekly until rainfall	June-August	Management Company
Maintenance of trees outside of private properties	Annual assessment of health of all planting and pruning where recommended	Following BS3998:2010 Tree Work Recommendations	Management Company responsible for appointing an appropriately qualified professional to assess and address plant health.
Maintenance of shrubs in a balanced shape	Annual	Outside of the bird nesting season (March-August inclusive)	Management Company
Maintenance of new hedgerows	Annual -Rotational thinning and pruning on a 2-3 year cycle. Replacement of any dead or dying plants	Pruning to be carried out outside bird nesting season and after fruiting has finished.	Management Company
Top up of top dressing	Annually	In May	Management Company
Check for and removal of invasive species	Annually	N/A	Management Company and any appointed removal specialists
Maintenance of amenity grassland	1st year- cut 10-14 days in growing season to 40mm(April to October) Once established cut as required to 25-40mm.	N/A	Management Company
Maintenance of wildflower meadows	1st year- topping of weeds as required to 40-60cm. Thereafter once annually post flowering.	Not before July-August to allow flowering and seed dispersal.	Management Company
Checking plants and stakes for wind firmness	Monthly until the plants are secure (usually 2 growing seasons). These can then be removed	N/A	Management Company
Weed control	Monthly by hand	N/A	Management Company
Installation of bat boxes	Minimum height of 4m on a south-east/west elevation	During construction	Thakeham Client Ltd.
Maintenance of bat boxes	No maintenance required-it is an offence to disturb a bat roost without a licence	N/A	N/A
Installation of Schwegler 1SP boxes	Clustered at a minimum height of 3m on a north or east elevation	During construction	Thakeham Client Ltd.
Installation of log piles/hibernacula	See reptiles section for specifications. To be added to annually	Prior to ruderal/scrub clearance	Thakeham Client Ltd.
Maintenance of all nest boxes	Annually remove old nesting material and clean with hot water	Outside of bird nesting season (March-August inclusive)	Management Company
Removal of litter/fly tipping	As required	As required	Management Company
Review of LEMP	Five years	N/A	Management Company to appoint appropriate professional.



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