



ECOLOGYSOLUTIONS

Part of the ES Group

TAYLOR WIMPEY SOUTH EAST

STONE PIT, DARTFORD

Discharge of Condition 16

Ecological Mitigation Strategy

October 2022
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1. INTRODUCTION

1.1. An initial ecological assessment and suite of survey work was undertaken at the site in 2008 by Hyder Consulting. The details of this assessment can be found in Chapter 15 of the Environmental Impact Assessment (document ref: 15723/A5/ES2012) submitted as part of the initial planning application.

1.2. Planning permission for the site was granted by Dartford Borough Council in 2017, subject to a number of conditions (reference: DA/19/01289/VCON). This includes condition 16, which relates to ecology. This condition is reproduced below:

“Before commencement of the development in any given phase (including site clearance), details of the following, relating to that phase shall be submitted to and approved by the Local Planning Authority and implemented in accordance with the details approved:

- 1) Dormouse survey;*
- 2) Details of an update to the phase 1 ecological assessment;*
- 3) A further reptile survey to update previous results and to inform a detailed mitigation strategy;*
- 4) A detailed ecological mitigation strategy;*
- 5) Lighting strategy that avoids and minimizes illumination of habitats (particularly boundary vegetation) with bat foraging and commuting potential;*
- 6) Site landscaping that provides ecological enhancements;*
- 7) Design features that are beneficial to wildlife with particular reference to bats and birds.”*

1.3. Since this time, updated survey and assessment work has been undertaken by ECOSA Ltd in 2019, including an Updated Ecological Appraisal (May 2019) and updated reptile and dormouse surveys. In addition, ECOSA Ltd produced a Preliminary Works Ecological Mitigation Strategy (EMS) submitted in relation to the London Road access only that was approved by Dartford Borough Council in May 2020 (planning ref: 20/00182/CDNA).

1.4. Ecology Solutions Ltd was commissioned by Taylor Wimpey South East Ltd in March 2022 to produce an Ecological Mitigation Strategy for the proposed wider development including all phases of development (see Appendix 1).

1.5. With regard to condition 16, this EMS has been written with regard to with previous approved reports produced by ECOSA Ltd. Furthermore, update survey information has been collected at the site by Ecology Solutions in 2022 in respect of habitats, bats, Badgers, reptiles, and Dormouse. The update survey results have been included where relevant.

1.6. This EMS has been written with reference to published guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM) and with regard to relevant guidelines for protected species.

- 1.7. The document is set out as follows:
- Ecological baseline and evaluation of important features within the development site;
 - Aims and objectives in order to safeguard wildlife during construction and maximise the ecological potential of features due to be retained and created within the site; and
 - Mitigation measures that will take place in order to prevent impacts on protected species.
- 1.8. This EMS has been produced to discharge Condition 16 in relation to the all phases of the development site.

2. ECOLOGICAL BASELINE AND EVALUATION

- 2.1 Habitat Surveys were carried out by ECOSA Ltd in May 2019 in order to ascertain the general ecological value of the site and to identify the main habitats and associated plant species. Updated habitat surveys were carried out by Ecology Solutions on 31st March 2022 as well as additional visits throughout 2022.
- 2.2 Ecology Solutions habitat surveys were based on extended Phase 1 survey technique. The habitats and dominant plant species were recorded together with conspicuous faunal activity and evidence of the presence, or potential presence, of protected species.
- 2.3 Specific surveys were also carried out for bats, Badgers, reptiles and Dormice.
- 2.4 The results of these surveys are provided within this EMS, where necessary.

Existing Ecological Features and Wildlife Use of the Site

- 2.5 The existing conditions onsite are described below based on recent update surveys undertaken in respect of habitats and protected species.

Habitats

- 2.6 The Site itself primarily comprises a bare earth, with rough grassy vegetation and scrub habitat at the boundaries.
- 2.7 The grassland habitat present within the Site is species poor and supports common and widespread species, with some areas of grassland supporting a longer sward with occasional patches of ruderal vegetation. Species recorded within the Wider Application site include, False Oat-grass *Arrhenatherum elatius*, Barren brome *Anisantha sterilis*, Yorkshire Fog *Holcus lanatus*, Cleavers *Galium aparine*, Common Ragwort *Senecio jacobaea*, Scentless Mayweed *Tripleurospermum inodorum*, Yarrow *Achillea millefolium*, *Melilotus* sps, and Shepherd's Purse *Capsella bursa-pastoris*.
- 2.8 The Site supports scrub and immature trees on the boundaries of the Site. This habitat is contiguous with trees and scrub along the boundaries of the Wider Development Site. Species recorded within the Site along the boundaries include, Hawthorn *Crataegus monogyna*, Wild Cherry *Prunus avium*, Sycamore *Acer pseudoplatanus*, Field Maple *Acer camperstre*, Blackthorn *Prunus spinosa* and Bramble *Rubus fruticosus* agg. However, the scrub tends to be in poor condition due to a lack of management.

Dormice

- 2.9 Previous survey work for Dormice in 2008 and 2019 found no evidence of this species within the Site. Indeed, the Site has a very limited capability to support a viable population of this species.

- 2.10 An updated appraisal of the Site in March 2022 found no new evidence to suggest Dormice would have colonised the site since 2019.
- 2.11 However, subsequent Dormouse surveys carried out by Ecology Solutions from March to September 2022 on a precautionary basis. As part of this survey 100 Dormouse tubes were distributed across the Site. No evidence of presence of Dormice was recorded during monthly visits over this period.
- 2.12 The Site is not considered to support Dormouse.

Reptiles

- 2.13 Reptile Surveys were originally undertaken in 2008 by Hyder Ltd and recorded populations of Slow Worm *Anguis fragilis* and Common Lizard *Zootoca vivipara*.
- 2.14 ECOSA Ltd also undertook updated reptile surveys in 2019 across all suitable habitat within the Site. These surveys only identified a Slow Worm within the Site, with no instances of Common Lizard recorded.
- 2.15 In order to fully inform the mitigation strategy for reptiles within the Site, a suite of updated reptile surveys was undertaken by Ecology Solutions Ltd between May 2022 and July 2022.
- 2.16 Following an initial assessment to identify areas of suitable reptile habitat within the Site, a total of 60 'tins' (0.5 x 0.5 metre squares of heavy roofing felt which are often used as refuges by reptiles) were distributed throughout all suitable reptile habitat within Site.
- 2.17 These tins were left in place for at least 2 weeks to 'bed in' and subsequently surveyed for reptiles beneath or upon the tins during suitable weather conditions. The tins provide shelter and heat up quicker than the surroundings in the morning and can remain warmer than the surroundings in the late afternoon. Being ectothermic (cold blooded), reptiles use them to bask and raise their body temperature which allows them to forage earlier and later in the day.
- 2.18 As outlined in Table 1 below, a total of seven surveys were undertaken during suitable weather conditions. All surveyors were mindful to record all reptiles present on top of and under the tins, in addition to any observed when walking through the suitable habitats between the tins.
- 2.19 Suitable weather conditions to carry out surveys are when the air temperature is between 9 and 18°C. Heavy rain and windy conditions were avoided. All surveyors were mindful to record all reptiles present on top of and under the tins, in addition to any observed when walking through the suitable habitats between the tins. The results of each visit are also included in Table 1 below.

Survey #	Date	Weather	Common Lizard		Slow Worm		Grass Snake	
			Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
1	06/05/22	Sunny 15 °C	0	0	6	0	0	0
2	12/05/22	Sunny 16 °C	0	0	0	0	0	0
3	16/05/22	Cloudy 14 °C	0	0	7	0	0	0
4	27/05/22	Sunny 17 °C	0	0	12	0	0	0
5	24/06/22	Sunny 17 °C	0	0	0	0	0	0
6	09/07/22	Sunny 18 °C	0	0	3	0	0	0
7	14/07/22	Cloudy 17 °C	0	0	0	0	0	0

Table 1. Reptile Survey Results

Badgers

2.20 The Phase 1 survey carried out by Ecology Solutions in March 2022 found no evidence of badger setts or activity within the Site or Wider Development Site. No previous appraisals/surveys have returned any records of badgers, therefore the Site is not considered to support Badger.

Bats

2.21 No buildings are present within the Site. Trees within the Site were assessed for their potential to support roosting bats.

2.22 During the specific surveys undertaken no trees were observed to have the potential to support roosting bats.

2.23 Through this investigation, it is considered that the Site does not support roosting bats.

2.24 Bat activity surveys (transect and automated surveys) were first undertaken by Ecology Solutions in June 2022 and are still ongoing. The results June, July and August are presented below, with results from the September surveys to follow when completed.

2.25 The July activity survey recorded a total of 56 registrations within the Wider Development Site (from one detector). The majority of these were from Common Pipistrelle *Pipistrellus pipistrellus* (53). The remaining registrations were a Soprano Pipistrelle *Pipistrellus pygmaeus* (1); Nathusius' Pipistrelle *Pipistrellus nathusius* (1); and an unidentified *Nyctalus spp* (1). While a few registrations were recorded on the north-west and north-east site boundary, the vast majority of registrations were recorded in the south-east corner of the Site.

2.26 The July automated survey recorded a total of 183 registrations from one detector over five nights within the Site. The majority of these were of Common Pipistrelle (145). The remaining registrations were of; unidentified *Nyctalus spp* (27); Soprano Pipistrelle (8), Nathusius' Pipistrelle (2), unidentified *Myotis spp*. (1).

2.27 The August automated survey recorded a total of 295 registrations from two detectors over five nights within the Site. The majority of these were

of Common Pipistrelle (242). The remaining registrations were of; unidentified *Nyctalus spp* (31); and Soprano Pipistrelle (22).

- 2.28 It is considered that the update surveys undertaken to date, in addition to the suite of historic surveys undertaken at the site, provide a robust baseline in order to inform the impact assessment of the proposals and are suitable to discharge this element of the planning condition for this phase. Whilst a further survey is to be undertaken in September 2022, this is for completeness only and it is not considered that any significant changes in the baseline will arise in view of the recent and historic bat surveys undertaken at the Site.

3. AIMS AND OBJECTIVES

3.1 The aims and objectives of the EMS are to avoid or mitigate any harm / damage to features of ecological interest as well as to safeguard populations of protected species on site.

3.2 Furthermore, the aims of the EMS are also to enhance features of ecological interest retained within the development, in addition to maintaining populations of protected species on site, whilst providing for ecological / biodiversity enhancements within the proposed development.

3.3 The following aims and objectives have been identified:

- **Aim 1:** Safeguard, maintain and enhance retained and newly created habitats within the development site.

The objectives set out to achieve this aim include:

- To enhance (and create new) areas of grassland, scrub, hedgerow and treeline;
 - To enhance the diversity and interest of the flora of the site; and
 - To ensure the successful establishment of areas of proposed new planting and to maximise their ecological condition.
- **Aim 2:** Safeguard and maintain populations of protected species identified within the development site area at a favourable conservation status; and
 - To protect existing retained features of value to protected species;
 - Safeguard species populations onsite; and
 - To provide enhanced opportunities for protected species within the site, most notably reptiles.
 - **Aim 3:** Increase biodiversity by maximising opportunities for flora and fauna.
 - To enhance the variety and value of other characteristic habitats present in the site including grassland and hedgerow.

3.4 Measures designed to deliver on these aims and objectives are set out within sections 4 of this report.

4. MITIGATION AND MANAGEMENT MEASURES

- 4.1 The impacts identified as well as mitigation and enhance measures to offset these impacts are set out below.

Aim 1: Maintain and Enhance Retained and Created Habitats

- 4.2 Specific habitat, protection and enhancement measures will be provided in respect the areas to be retained. This relates to the areas of retained boundary trees and scrub. Details are also set out below in relation to created habitats.

Native Hedgerows

- 4.3 New native hedgerows will be provided to strengthen the boundaries of the Wider Site. The planting mixture utilises a range of native, berry bearing species found in the local area (see Table 2).

Latin Name	Common Name
<i>Acer campestre</i>	Field Maple
<i>Cornus sanguinea</i>	Common Dogwood
<i>Corylus avellana</i>	Common Hazel
<i>Crataegus laevigata</i>	Midland Hawthorn
<i>Crataegus monogyna</i>	Hawthorn
<i>Ilex aquifolium</i>	Holly
<i>Ligustrum vulgare</i>	Wild Privet
<i>Rosa canina</i>	Dog Rose

Table 2: Native Hedgerow mix

- 4.4 The primary aim of hedgerow management will be to ensure successful establishment, and thereafter ensure development to an optimal structure for screening and biodiversity purposes.
- 4.5 New hedgerows will be planted in double staggered rows 300mm apart and at 500mm centres in each row. Where required, protection will be implemented to ensure young vegetation is not damaged by grazing species such as Rabbits. Planting will be undertaken during the autumn, winter or spring, during suitable weather conditions, with subsequent monitoring required in order to identify any potential gaps where plants have not survived. Should gaps or areas of dead hedgerow be identified, then replacement planting will be undertaken
- 4.6 Once established (anticipated Year 4), native hedgerows will be cut once every two years on a rotational basis where possible, in order to enhance their structure and value to nesting birds. Cuts shall typically be undertaken as late into the autumn / winter period as possible, in order to ensure that these features provide as much of a food resource as possible for birds over the winter period. Cutting should aim to deliver an 'A' shaped hedge structure, maintaining a height of 3m ideally. Where required in order to restore an optimal biodiversity structure, rotational hedge laying may be undertaken as an alternative management option. At this stage it is considered unlikely that hedge laying would be required any more frequently than once every 7th year.

- 4.7 Hedge works should avoid impacts to standard trees. Where existing scrub or trees are being retained, these will be subject to bolster planting as required using native, berry bearing species. The existing trees and scrub that are in poor condition will be subject to maintenance to encourage new growth and the development of a more consistent structure.
- 4.8 Hedgerows should be regularly inspected for gaps, weeds and excess outgrowth. Any management should be undertaken outside of the nesting bird season.

Wildflower Mix

- 4.9 Areas of new meadow grassland are to be provided within the Site. This will comprise a wildflower seed mix. The seed mixture will be utilised and sown at a rate specified by the supplier. Such a seed mix will provide floristic diversity in areas of openspace.
- 4.10 The species composition of seed mix is provided in Table 3 below.

Latin Name	Common Name
<i>Vicia cracca</i>	Tufted Vetch
<i>Trisetum flavescens</i>	Yellow Oatgrass
<i>Silaum silaus</i>	Pepper Saxifrage
<i>Rumex acetosa</i>	Common Sorrel
<i>Rhinanthus minor</i>	Yellow rattle
<i>Prunella vulgaris</i>	Common Self-Heal
<i>Primula veris</i>	Common Cowslip
<i>Poterium sanguisorba sanguisorba</i>	Salad Burnet
<i>Plantago lanceolata</i>	Buckthorn
<i>Phleum bertolonii</i>	Diploid Timothy
<i>Lotus corniculatus</i>	Common Bird's-Foot Trefoil
<i>Leucanthemum vulgare</i>	Ox-eye Daisy
<i>Leontodon hispidus</i>	Bristly Hawkbit
<i>Knautia arvensis</i>	Field Scabious
<i>Geranium pratense</i>	Meadow Cranesbill
<i>Galium verum</i>	Lady's Bedstraw
<i>Galium album</i>	White Bedstraw
<i>Festuca rubra</i>	Red Fescue
<i>Festuca ovina</i>	Sheep Fescue
<i>Cynosurus cristatus</i>	Crested Dogtail Grass
<i>Centaurea nigra</i>	Common Knapweed
<i>Briza media</i>	Quaking Grass
<i>Betonica officinalis</i>	Bishop's Wort
<i>Anthoxanthum odoratum</i>	Sweet Vernal Grass
<i>Agrostis capillaris</i>	Common Bent Grass
<i>Achillea millefolium</i>	Common Yarrow

Table 3: Wildflower Seed Mix

- 4.11 In addition to the above, areas of a grassland seed mix RE9 will be utilised to develop a lush grassy sward with a mix of flowering plants. This will add contrast to the grassland habitats and increase diversity further.
- 4.12 As a species-rich mixture tolerant of a range of conditions, these grassland areas will provide large open spaces for informal recreation (including dogs) and will provide biodiversity benefits for a range of species including foraging birds and bats, invertebrates and reptiles.

Wetland Mix

- 4.13 New attenuation features will be created within the development. The wetland habitat will be seeded with a mix of suitable native species that will provide a new habitat onsite for a range of different species. This feature will provide benefits for invertebrates, reptiles, birds, bats and a range of other species. The wetland planting mix proposed is listed below in Table 4. Such mixtures will be sown at the suppliers specifications.

Latin Name	Common Name
<i>Succisa pratensis</i>	Devil's Bit Scabious
<i>Silene flos-cuculi</i>	Ragged Robin
<i>Schedonorus arundinaceus</i>	Tall Fescue
<i>Sanguisorba officinalis</i>	Great Burnet
<i>Rhinanthus minor</i>	Yellow Rattle
<i>Ranunculus repens</i>	The Creeping Buttercup
<i>Ranunculus acris</i>	Meadow Buttercup
<i>Pulicaria dysenterica</i>	Common Fleabane
<i>Poterium sanguisorba sanguisorba</i>	Salad Burnet
<i>Poa trivialis</i>	Rough Bluegrass
<i>Phleum bertolonii</i>	Diploid Timothy
<i>Lythrum salicaria</i>	Purple Loosestrife
<i>Lycopus europaeus</i>	Gypsywort
<i>Lotus pedunculatus</i>	Greater Birdsfoot Trefoil
<i>Leucanthemum vulgare</i>	Oxeye Daisy
<i>Leontodon autumnalis</i>	Autumn Hawkbit
<i>Juncus inflexus</i>	Hard Rush
<i>Iris pseudacorus</i>	Yellow Flag Iris
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Festuca rubra juncea</i>	Red Fescue
<i>Eupatorium cannabinum</i>	Hemp Agrimony
<i>Deschampsia cespitosa</i>	Tussock Grass
<i>Cynosurus cristatus</i>	Crested Dogstail
<i>Caltha palustris</i>	Marsh-marigold
<i>Alisma plantago-aquatica</i>	European Water Plantain

Table 4: Wetland Seed Mix

- 4.14 This new habitat will link with other grassland types and scattered shrubs and trees to create a mosaic of habitats across the Site. This will provide greater habitat diversity as well as connectivity through the Site.

Amenity Planting

- 4.15 The proposals include new areas of amenity planting (i.e. hedging, shrubs, climbers and herbaceous plants) surrounding new buildings and the inclusion of trees throughout the site.
- 4.16 New planting consists of native species of local provenance or species of known value to wildlife wherever possible. The new landscape planting will provide additional habitats for invertebrates, birds and bats within the development footprint.
- 4.17 Any management e.g. pruning / lopping will be carried outside the bird nesting season (**March – August inclusive**) to avoid any potential offence, or after a suitably qualified ecologist has undertaken checks to ensure no nesting birds are present. Where possible any dead wood produced will be retained as an ecological feature, either as standing deadwood or as log piles, offering new habitat for saproxylic invertebrates.

Amenity Grassland

- 4.1 Any new areas of amenity grassland turf will be managed regularly in line with good horticultural practices.
- 4.2 The areas of amenity grassland will be cut on a regular basis. Checks will be made monthly and the grass will be cut when it reaches **c.100mm** long, back to a length of **c.35mm**. Mowing will be required more frequently during the spring / summer seasons.

Native Shrub and Tree Planting (including retained trees)

- 4.3 New native shrub and trees are to be planted within the Site. These will provide additional opportunities for invertebrates, small mammals and birds.
- 4.4 The mix of native shrub and trees are included below within Tables 5.

Latin Name	Common Name
<i>Acer campestre</i>	Field Maple
<i>Cornus sanguinea</i>	Dogwood
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Euonymus europaeus</i>	Spindle
<i>Ilex aquifolium</i>	Holly
<i>Ligustrum vulgare</i>	Wild Privet
<i>Sambucus nigra</i>	Elder
<i>Viburnum opulus</i>	Guelder Rose

Table 5: Native Shrub Mix

- 4.5 A selection of standard trees will be planted within the green spaces and along streets as part of the landscape strategy.
- 4.6 Planting of new trees will be undertaken during the **autumn, winter or spring**. For the first five years after planting, regular health checks of the trees will be undertaken to ensure successful establishment especially during periods of dry weather, to ensure that they are not affected by drought and to identify any potential gaps where plants have not survived. Any failed new tree planting will be replaced with native species of local provenance and of similar species content to that within the site.
- 4.7 Appropriate management of any new native shrub and trees will be undertaken in order to enhance their ecological value, and this will include trimming being only undertaken during **winter months**, when berries are no longer present to maximise foraging opportunities for birds in autumn.
- 4.8 New native hedgerows will be trimmed annually, and the hedgerow maintained at a suitable height. The shrubs will be managed with a thick structure, and should the shrubs become gappy or with sparse growth at their bases, the shrubs will be subject to bolster planting.
- 4.9 Shrubs will be cut back every **January / February** in order to maintain healthy growth and a good structure and to also avoid the main bird-nesting season, March-August (inclusive).
- 4.10 For the first five years after planting, regular health checks of the hedgerows will be undertaken especially during periods of dry weather, to ensure that the hedgerows are not affected by drought. Any failed specimens will be replaced with similar species content and size to that within the site.
- 4.11 All retained and new trees within the site will be subject to appropriate arboriculture maintenance where necessary, to help prolong their life and ensure they are safe. The condition of the maturing trees within the site will be monitored during the first five years following completion of the development, to ensure a favourable condition is maintained.

Aim 2: Maintain Populations of Protected Species at a Favourable Conservation Status

Bats

- 4.12 A Ground Level Tree Assessment was undertaken on the trees along Spine Road, including those requiring removal for the A226 London Road Access works and areas where site levelling requires existing vegetation to be removed. No suitable bat roosting features were observed as present within the Site.
- 4.13 A proposed lighting plan has been produced for the development, produced by DFL Ltd. The type and position of luminaires have been selected in order to avoid / minimise light spill on adjacent areas where light is not necessary, namely the boundary features and areas of openspace. However, given the nature of the scheme, consideration had

also been given to the standards and guidance related to delivering a lighting strategy that is safe in relation to pedestrian and road traffic. Notwithstanding this, the proposed lighting strategy is effective in ensuring that the majority of boundaries and open space areas within the north and south of the development area illuminated by 1lux or less. In light of the survey results for bats it is considered that no significant impacts to bats are considered to arise and that connectivity through the boundaries of the Site will be retained.

- 4.14 New luminaries are of an LED design which is preferred over other types due to them being recognised to have a lower impact on bats. Again, it should also be noted that the majority of the bat activity onsite is related to common and widespread species that are less sensitive to lighting. On this basis it is considered that the proposed lighting strategy will not significantly affect bats using the Site.
- 4.15 In line with the previously agreed strategy new native shrub, wildflower and wetland grasslands and tree planting will provide foraging and commuting features as part of the development.
- 4.16 Retained and enhanced boundary vegetation will maintain existing foraging and navigational opportunities.
- 4.17 The creation of new areas of wildflower grassland, wetland and shrub planting, will also provide new and enhanced foraging and navigational opportunities for bats that will more than offset any minor losses resulting from the proposals.
- 4.18 As previously approved as part of the Ecological Mitigation Strategy produced by ECOSA (dated 14th October 2020) new roosting opportunities will be created with the erection of a mix of roost boxes both on buildings and on retained trees. 30 bat boxes are to be installed on new buildings and 10 bat boxes are to be installed on retained trees. It is proposed that boxes on retained trees are Schwegler type 1FF, 2F and 2FN boxes (or similar), which will be erected on suitable retained semi-mature trees within the site (see Plan ECO1).
- 4.19 On buildings roost features will be integrated into buildings with the use of Istock type boxes (or similar). The locations have been selected based on the proximity to retained semi-natural habitat and away from direct illumination and are therefore, primarily proposed for buildings on the boundaries of the development site (see Plan ECO1).
- 4.20 Bat boxes will be checked **annually** to ensure they are in place and replacements supplied if necessary.

Badger

- 4.21 While no Badgers are known to be present onsite consideration of the species is necessary due to their highly mobile nature. Where deep, steep sided excavations are required timber ramps should be inserted into excavations that are left over night, to allow a badger to escape of its own accord, in the unlikely event that they become trapped.

Birds

- 4.22 Vegetation clearance will be undertaken outside the breeding bird season of March to August, inclusive, or if this is not possible, an ecologist will be present immediately prior to clearance to check vegetation. Active nests will be left undisturbed with a 5-10 metres buffer until nesting ends.
- 4.23 The development proposals will retain existing foraging and nesting opportunities for birds within the site, i.e. the boundary trees and scrub. Moreover, the provision of a new native hedgerow, shrub and tree planting, as part of the landscape proposals will provide new suitable nesting and foraging opportunities for birds to offset any losses. The provision of new berry/fruit-bearing species will also provide seasonal resources for birds.
- 4.24 The proposed development will incorporate new opportunities for breeding birds also. 10 Schwegler (or similar) bird boxes will be erected on suitable retained trees (see Plan ECO1). Old nesting material to be removed from bird boxes in **January** and treated to remove any remaining parasites. These boxes will maximise the species complement attracted to the site. Any damaged or lost bird boxes will be replaced.
- 4.25 On buildings nesting boxes will be provided in the form of 10 Sparrow Terraces and Swift boxes (or similar). The locations have been selected based on the proximity to retained semi-natural habitat and away from direct illumination and are therefore, primarily proposed for buildings on the boundaries of the development site (see Plan ECO1).
- 4.26 Management of habitats will be undertaken with due consideration for potential use by birds. Cutting of vegetation, particularly those features that provide important nesting habitats (including hedgerows and trees) will be undertaken during the winter months. Should the above timing constraints conflict with any timetabled works, it is recommended that works commence only after a suitably qualified ecologist has undertaken checks to ensure no nesting birds are present. If nesting birds are found to be present during checks then clearance would need to be delayed until young have fledged.

Reptiles

- 4.27 A population of slow worm has been recorded within the Site, which are mainly restricted to the suitable reptile habitat along south eastern boundary as well as the north western boundary of the Development Site. To ensure that no reptiles are killed or injured as a result of the preliminary works, a precautionary method of works will be employed.
- 4.28 In light of the sub-optimal ground conditions present within the majority of the works area, clearing reptiles from the Site will utilise habitat manipulation to persuade active reptiles to move of their own accord.
- 4.29 As part of site preparation, the limited areas of grassland and scrub such as within the Spine Road works area will be cut and stripped by an excavator under the supervision of an ecologist. This work will be

undertaken in the reptile active season which runs from April to October (subject to weather conditions), inclusive.

- 4.30 Any reptiles found during the site clearance works will be relocated by the supervising ecologist to retained habitat on the eastern boundary of the Site, within the proposed retained grassland and scrub (see Plan ECO1).
- 4.31 However, it is noted that more suitable habitat is present and due to the linear nature of the habitat it would not be possible to utilise manipulations to robustly move reptiles into secure locations. A detailed reptile strategy has been provided below that will be followed in relation to the wider development, where significant suitable habitat has to be removed.

Detailed Reptile Strategy

- 4.31.1 In order to safeguard reptiles from harm which could arise as a result of the development works in its entirety, a translocation exercise will be undertaken. This exercise will need to be completed prior to the commencement of works affecting significant areas of suitable reptile habitats within the Site (i.e. areas of longer grassland and scrub / immature trees).
- 4.31.2 Reptiles will be captured from the development footprint and translocated to the receptor area on the eastern boundary (see Plan ECO1). The receptor site is to be subject to long-term management for the benefit of reptile species (as outlined further below).
- 4.31.3 In 1998 the Herpetofauna Groups of Britain and Ireland (HGBI) produced the advisory note entitled 'Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards'. This advisory note presents a series of best practice guidelines and makes recommendations in regard to all aspects of herpetofauna translocations including those for partially protected reptile species. The reptile mitigation strategy outlined below has due regard to this guidance.
- 4.31.4 The following information is set out further below:
- I. Duration of Exercise;
 - II. Capture Method;
 - III. Location of Refuges;
 - IV. Size of Refuges
 - V. Density of Refuges;
 - VI. Trapping Procedure;
 - VII. Data Collection;
 - VIII. Welfare of Trapped Animals;
 - IX. Reptile Exclusion Fencing;
 - X. Habitat Manipulation; and
 - XI. Destructive Search.

Duration of Exercise

- 4.31.5 The guidance produced by HGBI suggests that a density of 50 tins per hectare, checked once daily for 60 days, would be likely to be

- needed to carry out a translocation of a low population. For this site, an increased density of tins (100 tins/ha) and more than one check per day is proposed, as well as habitat manipulation (see below), in order to achieve the required trapping effort.
- 4.31.6 The main test of the success of an exercise is whether a significant proportion of reptiles have been removed from the site, and the aim of this translocation exercise is to achieve this objective.
- 4.31.7 Translocation of reptiles will only be undertaken when reptiles are active and out of hibernation. Typically, this will be in the period mid March – October, with April, May and late August – September generally being optimal months for capture. Translocation would not commence before mid March 2023 (weather permitting) and would continue through to completion (ahead of the hibernation period). Depending on the prevailing weather, trapping visits will be undertaken two times per day by an experienced ecologist.
- 4.31.8 Trapping and translocation would only be undertaken once the receptor area has been deemed suitable for release. In the case of the eastern boundary of the Site, optimal habitat is already present in the form of grassland and scrub, however further enhancements will be delivered with some scrub removal and new wildflower and wetland grassland seeding and scrub planting. Five bespoke hibernacula would still be delivered ahead of any release at the site.
- 4.31.9 The translocation exercise will proceed until a period of at least five days' of no capture during suitable weather conditions is achieved. Whilst there is no accepted standard in relation to the number of no capture days required to give confidence as to the effectiveness of the exercise, Ecology Solutions has regard to guidance issued by Natural England in relation to Great Crested Newt capture effort and uses professional judgement and experience regarding such matters. Given the higher number of survey visits and greater tin density to be undertaken, and that surveys of the translocation site identified low populations of reptiles, it is anticipated that this will be achieved in fewer than the specified 60 days. On the basis that twice the minimum required effort would be employed (increased tin density and two daily checks of refugia), it is considered that a minimum of 30 days of trapping would be applicable in this instance, however the results of the ongoing exercise will inform the final duration.

Capture Method

- 4.31.10 A number of methods of catching reptiles are well documented and in common use at the present time in Britain. These include techniques such as noosing, pitfall trapping, tinning (use of artificial refugia such as roofing felt) and grass or grass/brush refugia trapping.
- 4.31.11 The recommended survey and trapping methodology for common reptiles is the use of corrugated metal sheets and/or felt mats (collectively known as tins), which act as artificial refuges. Tins are

favoured, as reptiles are ectothermic (cold blooded), and will preferentially use such refuges to raise their body temperature at certain times of day. Reptiles typically take advantage of the fact these refuges warm up more quickly than the surrounding areas and during certain times of the day, depending on weather conditions, will sit directly beneath the tins. By checking these refuges at appropriate times reptiles can be seen and captured by hand.

Location and size of artificial refuges

- 4.31.12 A larger quantity of tins will be located in areas identified as the most suitable reptile habitat and good coverage will be achieved throughout the site.
- 4.31.13 Refuges will be approximately 0.5m² in size.

Density of Refuges

- 4.31.14 The density of tins will significantly exceed that recommended by HGBI for a low population. At least 100 tins per ha will be used in this instance.

Trapping Procedure

- 4.31.15 Tins will be checked in the morning as they are heating up, but before they become too hot, and as they cool down in the afternoon/evening, but before they become cold. As previously stated, these are the optimal times of the day to catch reptiles. The best trapping times will vary according to the prevailing weather conditions on any particular day and precise surveying times will be adjusted accordingly.
- 4.31.16 The HGBI guidelines recommend that refugia should be checked once a day. The tins will be checked twice daily wherever possible, giving an effective doubling of trapping effort over the period of the exercise.

Data Collection

- 4.31.17 A recording form will be used to keep records of the data collected throughout the exercise. Information to be recorded during each visit will include:
 - I. Date of trapping visit;
 - II. Visit number of the day;
 - III. Time of visit;
 - IV. Weather (percentage cloud cover/rain/sun);
 - V. Temperature;
 - VI. Species of individual captured;
 - VII. Sex of individual captured;
 - VIII. Age of individual captured (adult/juvenile);
 - IX. Area on site from which individual captured;
 - X. Individuals of species seen but escaped capture; and

XI. Other - general observations.

Welfare of Trapped Animals

- 4.31.18 The welfare of captured reptiles will be paramount at all times throughout the exercise.
- 4.31.19 Upon capture, reptiles will be placed in cloth bags or suitable vivaria with soft vegetation providing them with an appropriate environment in which they will be temporarily held until the trapping round is completed. No more than three animals will be held in the same bag / vivaria at any time and these will always be of the same species and roughly equal size.
- 4.31.20 After completion of the round, trapped reptiles will be immediately transported to the receptor site, whereupon the captured reptiles will be released at one of the five proposed bespoke hibernacula.

Reptile Exclusion Fencing

- 4.31.21 In line with best practice, to prevent any possible inward migration, a temporary herpetofauna fence will be installed within the proposed development footprint. The receptor site will be fenced as shown on Plan ECO1. The fence will accord with accepted specifications and will be erected prior to the commencement of the translocation exercise. It facilitates the trapping out of the development footprint within which reptile habitat will be subject to damage by machinery during construction operations.
- 4.31.22 It is proposed that a supervised habitat manipulation exercise can be undertaken in some areas where suitable, rendering that area devoid of reptile habitat, forcing any reptiles into suitable retained habitat along the boundary. Short lengths of additional fencing could be used to further secure this area from reptile ingress if deemed necessary by the supervising ecologist.
- 4.31.23 Site personnel will be made aware of their responsibilities in relation to the herpetofauna fencing. Any breaks in the herpetofauna fencing will be promptly repaired.
- 4.31.24 The herpetofauna fencing will remain in place throughout the translocation exercise and will only be removed following completion of development works which have potential to give rise to an offence (e.g. killing or injuring of reptiles).

Habitat Manipulation

- 4.31.25 Habitat manipulation will be employed where appropriate during the translocation exercise, at the discretion of the supervising ecologist. This will consist of removal of refugia and debris by hand as well as targeted, stepwise strimming or cutting of vegetation (firstly to a height of 15cm and subsequently to a maximum height of 5cm) in order to concentrate reptiles in particular areas and thereby help to

focus the trapping effort. Habitat manipulation works will be overseen by a suitably qualified ecologist.

Destructive Search

- 4.31.26 A destructive search is a further capture method that can be used to locate and capture any reptiles that remain on the site after the trapping exercise has been completed. This shall only be undertaken after the completion of the minimum trapping effort as detailed above. It is important to note that reasonable effort will already have been demonstrated by the translocation exercise, and the use of a destructive search (which is a capture method in its own right) constitutes further trapping effort still.
- 4.31.27 Any features which may provide refuge for reptiles will be teased apart by hand or by appropriate machinery and thoroughly searched to ensure no reptiles are present. All areas of suitable habitat will be stripped in a systematic manner with the use of machinery with all site arisings to be thoroughly searched for the presence of reptiles prior to their removal from site.
- 4.31.28 A supervising ecologist will be in place during these works in order to capture any reptiles.
- 4.31.29 Following the destructive search there will be no suitable habitat present for the reptiles to return to within the development footprint. Construction works may therefore begin without any further reptile constraint in the cleared area.

Invertebrates

- 4.32 The proposed new wetland grassland, tree and shrub planting will offer new opportunities for invertebrates. A variety of plant species will be used as part of the landscape scheme which will increase the attractiveness of the site for a range of different invertebrate species.
- 4.33 In addition, log piles will be created from vegetation removal required as part of the proposed development to create habitats for invertebrates.

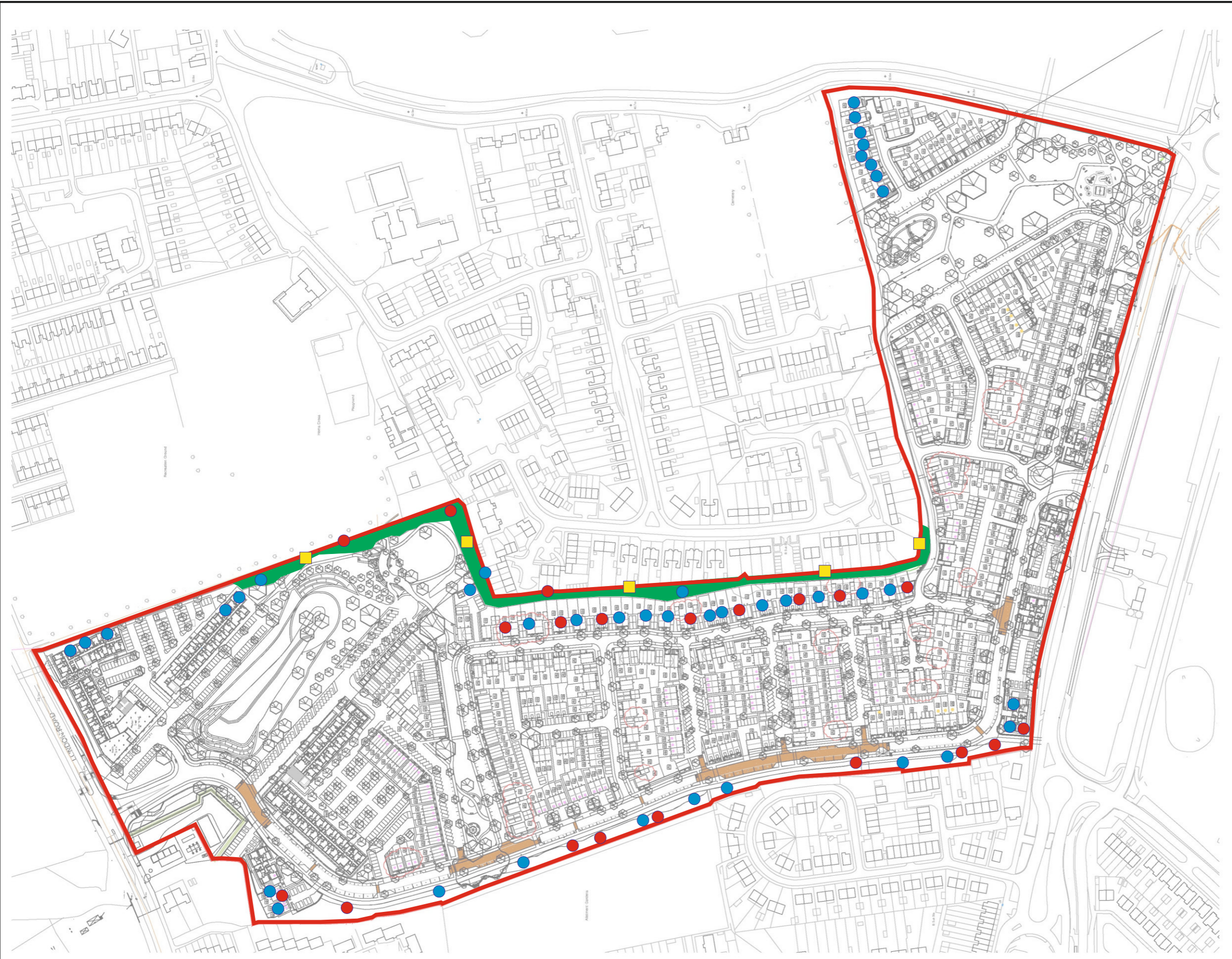
Aim 3: Increase Biodiversity by Maximising Opportunities for Flora and Fauna






- 4.34 The new planting within the proposed development will comprise native species of local provenance or those of benefit to wildlife and will increase the floristic diversity of the site. The attenuation areas, new tree/hedgerow planting and enhanced retained areas of woodland will provide enhanced foraging and nesting resources for birds, foraging and navigational resources for bats and terrestrial habitats for Badgers and reptiles.

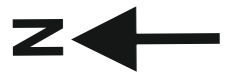
PLANS

PLAN ECO1

Ecology Mitigation Plan



- KEY:**
-  DEVELOPMENT SITE BOUNDARY
 -  REPTILE RECEPTOR AREA
 -  INDICATIVE LOCATION OF BIRD BOXES
 -  INDICATIVE LOCATION OF BAT BOXES
 -  INDICATIVE LOCATIONS OF REPTILE HIBERNACULA



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ECOLOGY
MITIGATION PLAN

Rev: A
Oct 2022

APPENDICES

APPENDIX 1

Development Phasing Plan

PH 0

LONDON ROAD ACCESS

PHASE 0

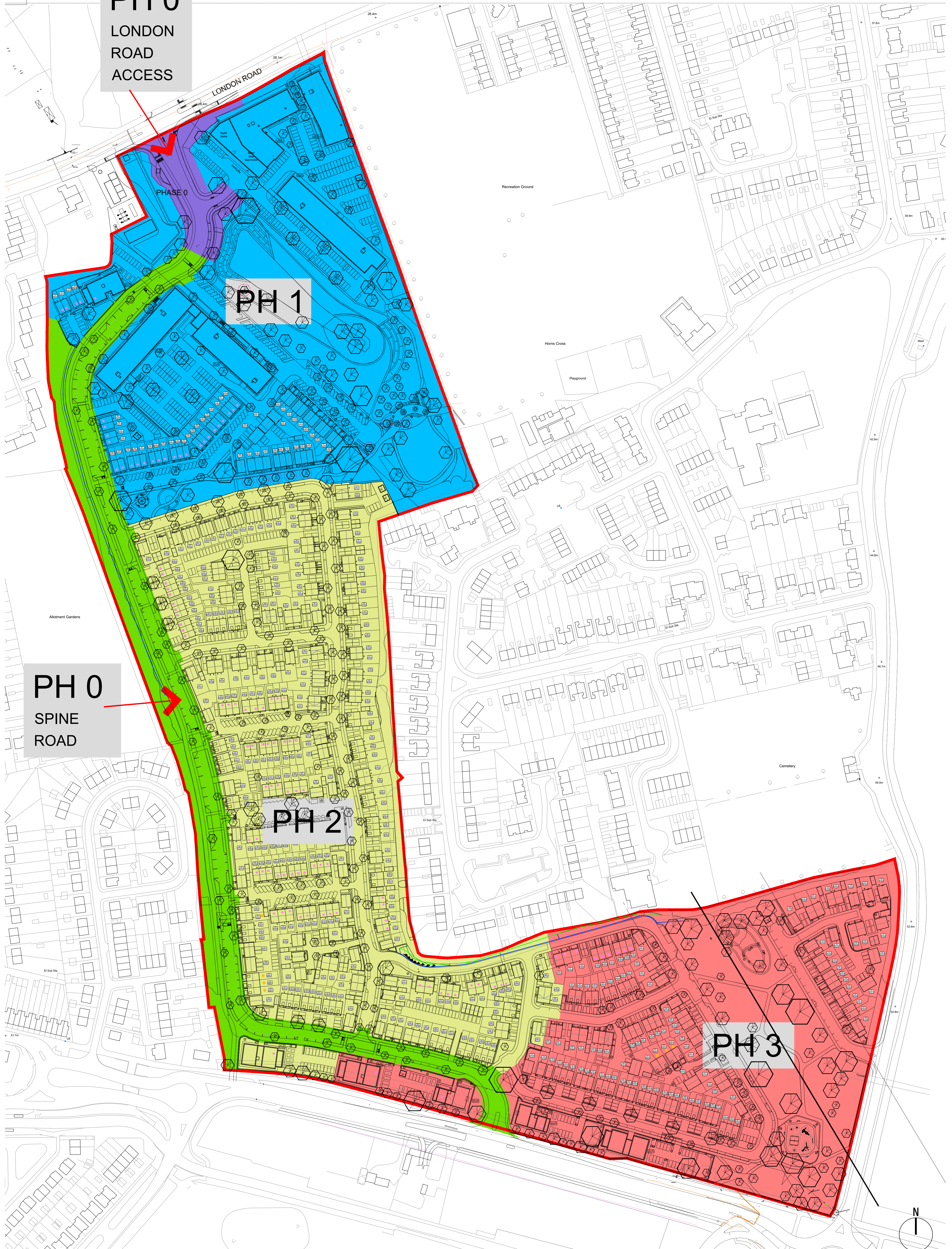
PH 1

PH 0

SPINE ROAD

PH 2

PH 3



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- Contractors and consultants are to advise BM3 Architecture Limited of any discrepancies.

Revision
Rev A - Phase 0 Spine Road updated

Date
04.10.2022

By
JJB

Check
JJB

CDM Notes

0m 25m 50m 75m 100m 125m
1:1250 Scale Bar

Project
STONEPIT 2,
DARTFORD

Drawing
PHASING PLAN

Client
Taylor Wimpey

Scale
1:1250@A1

Date
29.09.2022

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A

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