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Bellway Homes (East Midlands) Ltd.

Land off Ashland Road, Sutton-in-Ashfield

ECOLOGICAL APPRAISAL

February 2020

FPCR Environment and Design Ltd

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1.0 INTRODUCTION

- 1.1 On behalf of Bellway Homes (East Midlands Ltd), DLP Planning Ltd. commissioned FPCR Environment and Design Ltd. to undertake an Ecological Appraisal for a parcel of land, 10.137 ha in size, located off Ashland Road, on the northern border of Sutton-in-Ashfield, Nottinghamshire (central grid reference SK 47788 59511).
- 1.2 The objective of the study was to determine habitats and species presence/potential presence within the site to allow an assessment of their ecological value, along with any potential ecological constraints to future development of the site for residential housing.
- 1.3 Additional objectives were to identify the need for additional surveys where appropriate, and to consider opportunities for ecological mitigation and enhancements within any future development design.
- 1.4 Ashland Road runs adjacent to the south-eastern site boundary while the south western section is abounded by residential gardens set at an elevation compared to the proposed development site itself. More residential gardens lay adjacent to the western and eastern site boundaries while Brierley Forest Park Country Park and Local Nature Reserve (LNR) lies alongside the entire northern site boundary, stretching across the nearby countryside to the north, meeting with Brierley Forest Golf Club in the north west.
- 1.5 The majority of the wider landscape within 1km to the north east, south and south west is made up of the residential area of Stanton Hill, Sutton-in-Ashfield and Huthwaite as well as pockets of industrial areas. The wider landscape to the west and north consists of arable and grazed fields, intersected by hedgerows, tree lines and small patches of woodland. A number of small waterbodies and waterways are also present.
- 1.6 The proposed development of the site will provide up to 300 residential properties with associated residential gardens, hardstanding and areas of green infrastructure.

2.0 METHODOLOGY

2.1 The Ecological Appraisal is based on the standard best practice methodology provided by the CIEEM¹. The assessment identifies important sites, habitats, species and other ecological features that are of conservation value based on factors such as legal protection, statutory or local site designations such as Sites of Special Scientific Interest (SSSI) or Local Wildlife Sites (LWS) or inclusion on Red Data Book Lists or Local Biodiversity Action Plans.

Desk Study

2.2 A consultation exercise was completed with statutory and non-statutory nature conservation organisations for baseline ecological information from the preceding 20 years. The search area for biodiversity information was related to the significance of sites, species and potential zones of influence, as follows:

- 15km around the application area for statutory sites of international importance (e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites). These sites may also carry national or regional statutory designations, as well as other non-statutory designations.
- 2km around the application site area for statutory sites of national or regional importance e.g. Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).
- 1km around the application site area for non-statutory sites of county or local importance (e.g. Sites of Importance for Nature Conservation (SINC), Local Wildlife Sites (LWS) and species records (e.g. legally protected or notable species and invasive species).

2.3 Organisations consulted included:

- Natural England via the Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk)
- Nottinghamshire Biological and Geological Record Centre (NBGRC)

2.4 Further inspection, using colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs using Google Earth Pro, was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider area.

Field Survey

Overview

2.5 The survey technique adopted for the habitat assessment followed the Extended Phase 1 habitat survey technique as recommended by Natural England². This comprised a walkover of accessible areas of the site undertaken on 29th July 2019 by an experienced botanist of FISC level 3, mapping and broadly describing the principal habitat types and identifying the dominant plant species present within each habitat type and any invasive weeds (where present).

2.6 The abundance of species in habitats that could be assessed was quantified using the DAFOR scale, ranging from Dominant (>75%) to Abundant (75-51%), through Frequent (50-26%) and Occasional (25-11%) to Rare (10-1%). Whilst the plant species lists obtained should not be regarded as exhaustive, sufficient information was obtained to determine broad habitat types.

¹ CIEEM 2018. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Chartered Institute of Ecology and Environmental Management, Winchester.

² JNCC 2010. *Handbook for Phase 1 habitat survey - a technique for environmental audit*, ISBN 0 86139 636 7

2.7 Throughout the walkover survey consideration was given to the actual or potential presence of protected species, such as, although not limited to those protected under the Wildlife and Countryside Act 1981 (*as amended*)³, the Protection of Badgers Act 1992⁴ and the Conservation of Habitat and Species Regulations 2017 (*as amended*)⁵.

Habitats

2.8 Were possible, hedgerows were surveyed using the Hedgerow Evaluation and Grading System (HEGS)⁶. The aim of the assessment was to allow the rapid recording and ecological appraisal of any given site in the UK, and to allow the grading of the individual hedges present, in order to identify those which are likely to be of greatest significance for wildlife. This method of assessment includes noting down: canopy species composition, associated ground flora and climbers; structure of the hedgerow including height, width and gaps, and associated features including number and species of mature tree and the presence of banks, ditches and grass verges.

2.9 Using the HEGS methodology each hedgerow can then be given a grade. These grades are used to assign a nature conservation value to each hedgerow as follows:

- Grade -1, 1, 1+ High to Very High Value
- Grade -2, 2, 2+ Moderately High to High Value
- Grade -3, 3, 3+ Moderate Value
- Grade -4, 4, 4+ Low Value

2.10 Hedgerows graded -2 or above are suggested as being a nature conservation priority.

2.11 The hedgerows were also assessed for their potential ecological value under the Hedgerow Regulations 1997 (Statutory Instrument No: 1160)⁷ to determine whether they qualified as 'Important Hedgerows' under the Regulations. This was achieved using a methodology in accordance with both the Regulations and DEFRA guidance⁸. An assessment of archaeological importance as defined under the Hedgerow Regulations 1997 was beyond the scope of this assessment.

2.12 Additionally, hedgerows were assessed as to whether they qualified as Habitats of Principal Importance (Priority Habitats) under Section 41 of the Natural Environment & Rural Communities (NERC) Act 2006⁹, i.e. whether they consisted of 80% or more native species.

³ *The Wildlife and Countryside Act 1981 (as amended)*. [Online]. London:HMSO Available from <http://www.legislation.gov.uk/ukpga/1981/69> [Accessed 09/03/2015]

⁴ *The Protection of Badgers Act 1992 (as amended)*. [Online]. London: HMSO Available from: <http://www.legislation.gov.uk/ukpga/1992/51/contents> [Accessed 09/03/2015].

⁵ <http://www.legislation.gov.uk/uksi/2017/1012/contents/made>

⁶ Clements, D.K .and Tofts, R.J. 1992. *Hedgerow Evaluation and Grading Systems (HEGS): A Methodology for the Ecological Survey, Evaluation and Grading of Hedgerows*. Countryside Planning and Management.

⁷ *The Hedgerow Regulations 1997 – Statutory Instrument 1997 No. 1160*. [Online]. London: HMSO. Available at: <http://www.legislation.gov.uk/uksi/1997/1160/contents/made> [Accessed 09/03/2015].

⁸ DEFRA. 1997. *The Hedgerow Regulations 1997. A Guide to the Law and Good Practice*. London: HMSO

⁹ <https://www.legislation.gov.uk/ukpga/2006/16/contents>

Fauna

Bats

Tree Assessment

- 2.13 Trees were assessed for potential to support roosting bats from ground level, with the aid of a torch and binoculars where required. During the survey Potential Roosting Features for bats such as the following were sought (based on p16, British Standard BS 8596:2015)¹⁰:
- Natural holes (e.g. knot holes) arising from naturally shed branches or branches previously pruned back to a branch collar.
 - Man-made holes (e.g. cavities that have developed from flush cuts or cavities created by branches tearing out from parent stems.
 - Woodpecker holes.
 - Cracks/splits in stems or branches (horizontal and vertical)
 - Partially detached, loose or platy bark.
 - Cankers (caused by localised bark death) in which cavities have developed.
 - Other hollows or cavities, including butt rots.
 - Compression of forks with occluded bark, forming potential cavities.
 - Crossing stems or branches with suitable roosting space between.
 - Ivy stems with diameters in excess of 50mm with suitable roosting space behind (or where roosting space can be seen where a mat of thinner stems has left a gap between the mat and the trunk).
 - Bat or bird boxes.
 - Other suitable places of rest or shelter not listed above.
- 2.14 Certain factors such as orientation of the feature, its height from the ground, the direct surroundings and its location in respect to other features, may reduce enhance or reduce the potential value.
- 2.15 Based on the above, trees were classified into general bat roost potential groups based on the presence of these features. Table 1 broadly classifies the potential categories as accurately as possible as well as discussing the relevance of the features. This table is based upon Table 4.1 and Chapter 6 in the Bat Conservation Trust (BCT) Good Practice Guidelines¹¹.
- 2.16 Although the British Standard document groups trees with moderate and high potential, these have been separated (as per Table 4.1 in the BCT Guidelines) to allow more specific survey criteria to be applied.

Activity Transect Surveys – Foraging and Commuting Bats

- 2.17 Seasonal activity transects (Summer and autumn) were completed in 2019. The primary objectives of the transect survey was to identify foraging areas, commuting routes and species utilisation of the development and adjacent area. The methodology used takes into account the statutory guidance from English Nature (now Natural England)¹² and further guidelines introduced by BCT¹³ and JNCC¹⁴.

¹⁰ British Standard BS 8596:2015. *Surveying for Bats in Trees and Woodland – Guide*, October 2015.

¹¹ BCT 2016. *Bat Surveys for Professional Ecologists*, Good Practice Guidelines. 3rd Edition, BCT.

¹² English Nature, 2004. *Bat Mitigation Guidelines*

¹³ Bat Conservation Trust, 2016. *Bat Surveys for Professional Ecologists Good Practice Guidelines* 3rd edition.

¹⁴ JNCC, 1999. *Bat Workers Manual* 3rd Edition. Eds A.J. Mitchell-Jones and A. McLeish

Table 1: Bat survey protocol for trees

Classification of Tree	Description of Category and Associated Features (based on Potential Roosting Features listed above)	Likely Further Survey work
Confirmed Roost	Evidence of roosting bats in the form of live / dead bats, droppings, urine staining, mammalian fur oil staining, etc.	A Natural England derogation licence application will be required if the tree or roost site is affected by the development or proposed arboricultural works. This will require nocturnal survey during appropriate periods (e.g. nocturnal survey - May to August) to inform on the licence. Works to tree undertaken under supervision in accordance with the approved good practice method statement provided within the licence. However , where confirmed roost site(s) are not affected by works, work under a precautionary good practice method statement may be possible.
High Potential	A tree with one or more Potential Roosting Features that are obviously suitable for larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat. Examples include (but are not limited to); woodpecker holes, larger cavities, hollow trunks, hazard beams, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers (if appropriate) and / or nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. If roost sites are confirmed and the tree or roost is to be affected by proposals a licence from Natural England will be required. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate.
Moderate Potential	A tree with Potential Roosting Features which could support one or more potential roost sites due to their size, shelter protection, conditions (height above ground level, light levels, etc.) and surrounding habitat but unlikely to support a roost of high conservation status (i.e. larger roost, irrespective of wider conservation status). Examples include (but are not limited to); woodpecker holes, rot cavities, branch socket cavities, etc.	Where the tree(s) will likely be affected by development a combination of aerial assessment by roped access bat workers and / or nocturnal survey during appropriate period (May to August). Following additional assessments, a tree may be upgraded or downgraded based on findings. After completion of survey work (and the presence of a bat roost is discounted), a precautionary working method statement may still be appropriate. If a roost site/s is confirmed a licence from Natural England will be required.
Low Potential	A tree of sufficient size and age to contain Potential Roosting Features but with none seen from ground or features seen only very limited potential. Examples include (but are not limited to); loose/lifted bark, shallow splits exposed to elements or upward facing holes.	No further survey required but a precautionary working method statement may be appropriate.
Negligible/ No potential	Negligible / no habitat features likely to be used by roosting bats	None.

* The Conservation of Habitats & Species Regulations 2017 (as amended) affords protection to “breeding sites” and “resting places” of bats. The EU Commission’s Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC, February 2007 states that these are places “where there is a reasonably high probability that the species concerned will return”.

- 2.18 The transect route was determined prior to survey in order to sample all areas of the site (Figures 5 and 6). Point count stops were incorporated into the transect to provide further information regarding bat activity levels. Each point count was a minimum of five minutes long, during which time all bat activity was recorded. The transect commenced at sunset and lasted approximately two hours in duration.
- 2.19 The transect was walked at a steady pace and when a bat passed, the species, time and behaviour was recorded on a site plan. This information helps to form a general view of the bat activity present within the site and highlights what habitats types are associated with bat activity. Wildlife Acoustics Inc. Echo Meter Touch® bat detectors were used in conjunction with Echo Meter Touch® app and Apple Inc. iPad®.
- 2.20 The transect was undertaken when conditions were suitable (i.e. when the ambient air temperature exceeded 10°C and there was little wind and no rain).

Table 2: Bat Activity Transect Survey Conditions

Survey date	Sunset	Temperature °C	Rain	Wind (0-5)	Cloud %
22.08.2019	20:18	21°	0	1	100%
16.09.2019	19:19	18°	0	1	80%

- 2.21 Post-survey, bat calls were analysed using Kaleidoscope© (Wildlife Acoustics) software package, by taking measurements of the peak frequency, inter-pulse interval, call duration and end frequency. From this, the level of bat activity across the site in relation to the abundance of individual species foraging and commuting along habitats was assessed.

Automated Surveys – Foraging and Commuting Bats

- 2.22 A static passive recording broadband detector was deployed within the site in August and September 2019.
- 2.23 Passive monitoring was undertaken using an automated logging system (Wildlife Acoustics Inc. Song Meter® SM2BAT+ bat detectors, herein referred to as SM2BAT+ detectors) with the output saved to an internal storage device. A single SM2BAT+ device was placed along suitable linear habitats (feature of value to bats to be affected by the proposals) during each survey period.
- 2.24 The detector was programmed to activate 30 minutes before dusk and recorded continuously until 30 minutes following sunrise over an extended period of time (minimum of five consecutive nights) of suitable and/or typical weather conditions.
- 2.25 The recorded data was analysed using the Kaleidoscope© software package. The automated static detector survey timings and weather conditions are provided Table 3.

Table 3: Automated Survey Conditions

Dates	Sunset Times	Sunrise Times	Weather conditions
29.08.2019 – 02.09.2019	19:59 to 19:50	06:12 to 06:19	Temperatures ranged 15 - 21°C Average wind speed ranged 5 - 11km/h Light rainfall was recorded during the night on 02.09.2019
03.09.2019 – 08.09.2019	19:47 to 19:38	06:21 to 06:27	Temperatures ranged 8 - 19°C Average wind speed ranged 2 - 11km/h Light rainfall was recorded during the night on 03.09.2019, 04.09.2019 and 08.09.2019.

Badger

- 2.26 All hedgerows and other suitable habitats within the site and accessible land within 30m were searched for evidence of badger *Meles meles* activity. The methodology employed followed that outlined by Harris and Creswell and Jefferies¹⁵.
- 2.27 Evidence of badger occupation and activity sought included:
- Setts: including earth mounds, evidence of bedding and runways between setts
 - Latrines: often located close to setts, at territory boundaries or adjacent to favoured feeding areas
 - Prints and paths or trackways
 - Hairs caught on rough wood or fencing
 - Other evidence including snuffle holes, feeding and playing areas and scratching posts
- 2.28 The identification of these latter signs on their own does not necessarily provide conclusive evidence of the presence of badgers. Several such signs need to be seen in conjunction before badgers can be confirmed as being present.
- 2.29 Where badger setts are found, their level of activity is noted with level of activity described as:
- Active: clear of debris, trampled spoil mounds and obviously active e.g. presence of prints, dislodged guard hairs
 - Partially active: some associated debris/moss/plants in the entrance. Could be used with minimal amount of excavation usually with signs in the vicinity of the sett e.g. badger paths
 - Disused: partially or completely blocked/collapsed

Reptiles

- 2.30 Habitats present within the site were considered for their potential suitability to support reptile populations, including presence of features which provide opportunities for reptiles to bask, forage and/or hibernate and areas of varied vegetation structure in sheltered locations with sunny aspects and connectivity to other suitable reptile habitats. This assessment was based on the methodology detailed in the Herpetofauna Workers Manual and the Froglife Advice Sheet.

Great Crested Newt (GCN)

- 2.31 As part of the phase 1 habitat survey, a search for waterbodies within 500m of the site boundary was undertaken using OS mapping and aerial photographs. Five ponds were identified off-site, within this 500m radius, however access could be obtained for only one of these ponds P5.
- 2.32 A Habitat Suitability Index (HSI) assessment was undertaken on 30th July 2019 for this off-site pond. This assessment provides a measure of the likely suitability that a waterbody has for supporting great crested newts *Triturus cristatus* (GCN)^{16,17}. Whilst not a direct indication of whether or not a waterbody will support great crested newts, generally those with a higher score are more likely to support GCN than those with a lower score, and there is a positive correlation between HSI scores and ponds in which GCN are recorded. Ten separate attributes are assessed for each pond to calculate the suitability of the ponds to support GCN:

¹⁵ Harris, S., Creswell, P. & Jefferies, D. 1989. *Surveying for badgers*. Occasional Publication of the Mammal Society No. 9.

¹⁶ Oldham et al., 2000. *Evaluating the Suitability of Habitats for the Great Crested Newt (Triturus cristatus)*, *Herpetological Journal* 10 (4).

¹⁷ ARG UK Advice Note 5 Great Crested Newt Habitat Suitability Index, *Amphibian and Reptile Groups of the UK*, May 2010.

- Location within the UK
- Pond area
- Frequency of pond drying
- Water quality
- % shade
- Presence of waterfowl
- Presence of fish
- Number of other ponds within 1km
- Quality of surrounding terrestrial habitat
- % cover by macrophytes

2.33 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Pond suitability is then determined according to the scale set out in Table 4. Using the index score the predicted presence of GCN being found within a pond can be made, based on the proportion of ponds typically occupied at that suitability level.

Table 4: HSI Score and Suitability for Supporting Great Crested Newts

HSI score	Pond Suitability
<0.5	Poor
0.5 - 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

Other Species

2.34 The potential for other protected and/or notable species was assessed during the Phase 1 desk study and field survey.

Limitations

2.35 Whilst the plant species lists obtained should not be regarded as exhaustive, it is considered that sufficient information was obtained to determine broad habitat types present and their relative ecological value.

2.36 Where bat species calls could not be identified to species level, for example due to the lower quality of those recordings or where there are similarities between species echolocation calls (particularly for *Myotis* and *Nyctalus* bats) making definite identification difficult, contacts were identified to family only. It is however considered that the overall dataset obtained is representative of the level of bat activity within the application site. It is unlikely that the above limitations have resulted in a significant detrimental impact on the quality of the data and will have minimal effect on the subsequent conclusions and recommendations provided within the ecological assessment. Therefore, it is considered that the data collected is sufficient to inform the application and its potential impacts upon bats.

3.0 RESULTS

Desk Study

- 3.1 Several records of statutory and non-statutory designated sites were returned from within a radius of 15km around the proposed development site (Figure 1), along with a number of protected species records from a radius of 1k around the proposed development site (Figure 2).
- 3.2 A summary of the records considered to be of particular relevance to the proposed development is provided below.

Statutory Designated Sites

- 3.3 No statutory designated sites for nature conservation were located within the proposed development site boundary.
- 3.4 One statutory site of international importance for nature conservation was located within a 15km search radius of the site. Birklands and Bilhaugh SAC was located at c.14.6km north east from the proposed development site boundary and overlaps with two sites of national statutory importance: Birklands West and Ollerton Corner SSSI and Sherwood Forest NNR.
- 3.5 One statutory site of national importance for nature conservation, Teversal Pastures SSSI was located approximately c.2.0km from the site to the north east (Figure 1).
- 3.6 One further statutory site of local conservation importance lay directly adjacent to the northern site boundary (Figure 1). Habitats present within Brierley Forest Park LNR/LWS/Country Park include species rich calcareous grassland, neutral grassland, mixed and broadleaved plantation woodlands, standing water and running water.
- 3.7 Further details of these three statutory designated sites are provided in Tables 5 and 6 below.

Table 5: Statutory Designated Sites of International Importance within 15km

Site Name	Designations and Area	Orientation from Site	Summary of Reasons for Designation
Birklands and Bilhaugh	SAC (270.5ha)	c. 14.6km NE	The most northerly site selected for old oak woodlands that support rich invertebrate fauna (particularly spiders) and a diverse fungal assemblage. Forms part of Sherwood Forest County Park, and as such is crossed by a network of forest paths.
Key: SAC – Special Area of Conservation			

Table 6: Statutory Designated Sites of National and Local Importance within 2km

Site Name	Designations and Area	Orientation from Site	Summary of Reasons for Designation
Teversal Pastures	SSSI (17.92ha)	c. 2km NE	Western pastures consist of species-rich neutral grasslands and still retains 'ridge and furrow' topography. Additional interest is provided by the calcareous grassland community of the adjacent railway cutting, and also by areas of flushed woodland.
Brierley Forest Park	LNR (80.6ha) Country Park (75ha) LWS (8ha)	Adjacent to northern site boundary	Major habitats present are species rich calcareous grassland, neutral grassland, springline flushes, old species-rich hedgerows, tall herb communities, mixed and broadleaved plantation woodlands, standing water and running water. Overlaps five LWS (see Table 7 below).
Key: LNR - Local Nature Reserve LWS – Local Wildlife Site SSSI - Site of Special Scientific Interest			

Non-Statutory Designations

- 3.8 While no sites of non-statutory designation were located within the proposed development site itself, ten non-statutory sites of local importance were located within, or partially within a 1km search radius of the proposed development area (Figure 1). Five of these sites lay within Brierley Forest Park LNR/Country Park: Sutton-Ashfield District Grassland, Brierley Forest Marsh, Brierley Park Marshy Grassland, Stubbinghill Farm Meadow, and Stanton Hill Colliery Spoil.
- 3.9 Limited information regarding the designation of these sites is available, summarised in Table 7.

Table 7: Non-statutory Designated Sites of Local Importance (within a 1km search radius)

Site Name	Designations and Area	Orientation from Site	Summary of Reasons for Designation
Sutton-Ashfield District Grassland	LWS (0.94ha)	Adjacent to eastern site boundary	<i>Overlaps Brierley Forest Park LNR (see Table 5 above).</i> Situated in between the southern edge of Brierley Forest Park and the urban area of Sutton-in-Ashfield - a relict area of coal measured grassland has many notable and characteristic plant species. Marshy areas increase the floristic diversity. (This site is also known as SINC Ref 96 Grassland, Sutton-in-Ashfield)
Brierley Forest Marsh	LWS (2.48ha)	Adjacent to northern site boundary	<i>Overlaps Brierley Forest Park LNR (see Table 5 above).</i> No further information available, however see description of Brierley Park Marshy Grassland below for potentially similar habitat.
Brierley Park Marshy Grassland	LWS (0.41ha)	Adjacent to northern site boundary	<i>Overlaps Brierley Forest Park LNR (see Table 5 above).</i> A triangular piece of land adjacent to a stream within Brierley Forest Country Park supporting a remnant tall-herb fen community. (This site is also known as SINC Ref 95 Huthwaite Park Marshy Grassland).
Crossley Avenue Grassland	LWS (1.31ha)	c. 423m SE	Situated on a south-facing hillside on the edge of Huthwaite. Bounded by pastures to the south and housing to the north, it has a sward containing grasses which include tor-grass <i>Brachypodium pinnatum</i> , red fescue <i>Festuca rubra</i> and sweet vernal grass <i>Anthoxanthum odoratum</i> .
Stubbinghill Farm Meadow	LWS (2.49ha)	c. 500m N	<i>Overlaps Brierley Forest Park LNR (see Table 5 above).</i> This old meadow comprises semi-improved grassland with areas of botanical interest being restricted to the slopes in the middle section. The site is bordered by ancient hedgerows.
Stanton Hill Relict Grassland	LWS (2.13ha)	c. 503m NE	This small relict unimproved calcareous grassland is situated on a north-west facing slope hidden away in a shallow valley with other pony-grazed pastures between an industrial estate, some housing and a country park. The sward contains a high number of forbs while characteristic grasses include yellow oat-grass <i>Trisetum flavescens</i> and downy oat-grass <i>Avenula pubescens</i> . The field is bordered by mature hedgerows.
Stanton Hill Colliery Spoil	LWS (1.69ha)	c. 503m NE	<i>Overlaps Brierley Forest Park LNR (see Table 5 above).</i> This colliery spoil site comprises hills, mounds and hollows which have been partially planted with deciduous woodland and areas of species rich grassland with scattered scrub. A damp flush supports further species diversity.
Stanton Hill Colliery	LWS (3.26ha)	c. 565m N	Comprises a section of disused mineral railway with a varied track bed flora and relict meadow species on the

Site Name	Designations and Area	Orientation from Site	Summary of Reasons for Designation
Dismantled Railway Line			track sides. Wetter areas along the track bed are dominated by rushes <i>Juncus sp.</i> , while ancient woodland indicator species reflect the close proximity of Spring Wood LWS which lies to the north.
Spring Wood, Stanton Hill	LWS (3.71ha)	c. 585m N	Mixed broadleaved woodland situated in a shallow valley. Where the spring rises, the ground flora is similar to that of carr woodland. Elsewhere the ground flora supports ancient woodland indicators and the pools within the woodland have a good marginal vegetation.
Herod's Hill Grassland	LWS (9.43ha)	c. 915m NW	A series of five fields of varying sizes situated on a north-west facing slope and divided by mature outgrown hedgerows with ridge and furrow evident on the largest central field. The site is horse grazed and the unimproved neutral grasslands are species rich with the vegetation reflecting the changes in the underlying soils and geology.
Key: LWS - Local Wildlife Sites			

Species Records

Bats

- 3.10 Twelve bat records were returned from within the 1km search area (dating 2002 – 2014), detailed in Table 8 below and Figure 2. The majority of records came from dusk emergence and dawn re-entry surveys and transects undertaken by ecological consultants, while some records were from field surveys and observations by local residents. The majority of bat records were recorded in association with residential areas to the south of the proposed development site.

Table 8: Summary of Bat Records within a 1km radius of the Study Area

Species	Number of records	Dates	Shortest Distance from Site
Bat species <i>Chiroptera sp.</i>	1	2002	c. 400m N
Pipistrelle species <i>Pipistrellus sp.</i>	2	2003 - 2004	c. 440m SE
Noctule <i>Nyctalus noctule</i>	4	2013-2014	c. 110m W
<i>Nyctalus sp.</i>	1	2014	c. 750m SW
Common pipistrelle <i>Pipistrellus pipistrellus</i>	4	2013 - 2014	c. 110m W

Other Terrestrial Mammals

- 3.11 One badger record was returned (2019), recorded c.800m north east from the proposed development site boundary. The exact locations of badger records are confidential for animal welfare reasons, however all other terrestrial mammal records are shown in Figure 2.
- 3.12 Five hedgehog *Erinaceus europaeus* records were returned (2013 – 2016), the closest of which was located c.400 m north of the site boundary, within Brierley Forest Park LNR/LWS. One other record originated in Brierley Forest Park LNR/LWS, near the golf club. The other records were associated with residential areas and roads to the south and east of the site.

- 3.13 One water vole *Arvicola amphibious* record (2000) was returned from c.200m north of the proposed development site boundary, from within Brierley Forest Park LNR/LWS, and consisted of several latrines found near a stream.

Birds

- 3.14 Sixteen bird records were returned from around three central locations, for a total of fourteen species within a radius of 1km of the application site, ranging between 2015 – 2017. Most notable were barn owl *Tyto alba* (2015) and hobby *Falco subbuteo*, (2015) both of which are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).
- 3.15 Other notable species include willow tit *Passer montanus* (2015-2016), yellowhammer *Emberiza citrinella* (2015) and bullfinch *Pyrrhula pyrrhula* (2015). These three species all appear on the Birds of Conservation Concern (BoCC) red or amber lists and are considered Species of Principal Importance under Section 41 of the NERC Act. One record of a kestrel *Falco tinnunculus* (2015) was also returned, a BoCC amber-listed species.
- 3.16 The remaining bird records returned were of common, widespread species that are not of conservation concern, including sparrowhawk *Accipiter nisus*, robin *Erithacus rubecula*, nuthatch *Sitta europaea*, jay *Garrulus glandarius* and woodpigeon *Columba palumbus*.
- 3.17 All bird records were located 280-740m west of the site, with the exception of willow tit that was also recorded a c.600m north of the site (see Figure 2).

Reptiles

- 3.18 One common lizard *Zootoca vivipara* record (2001), five grass snake *Natrix helvetica* records (2004 – 2014) and one slow-worm *Anguis fragilis* record (2009) were returned. The common lizard record was taken from the southern boundary of Brierley Forest Park LNR/LWS c.100m east of the site boundary. One of these records was from within residential gardens to the west of the proposed development site while four of the grass snake records were from the north of the site, and associated with the LNR and LWSs in this vicinity, with the closest being at c.20m north west from the proposed development site boundary. The slow-worm record was located c.500m north of the site boundary, also associated with the LNR and LWSs in this area.

Amphibians

- 3.19 A single GCN record was returned from within a 1km search radius (dating 2009). This was taken from c. 600m north of the application site, on the northern boundary of Brierley Forest Park LNR/LWS. Three smooth newt *Lissotriton vulgaris* records were also returned (2001-2011). The closest of these was from c.110m north east of the site boundary, from within Brierley Forest Park LNR/LWS. The other two records lay c.460-860m south of the proposed development site.
- 3.20 Seven common frog *Rana temporaria* records (2001-2015) and three common toad *Bufo bufo* records (2001-2011) were returned from within the 1km search radius. Three of the common frog records were scattered c.600m from the site boundary, to the north of Brierley Forest Park LNR/LWS, and three were scattered to the south between 610-910m from the site boundary, however one record was taken from c.10m north of the proposed development site boundary, from within Brierley Forest Park LNR/LWS. Common toad record was also recorded c.110m north west

of the survey boundary, also from within Brierley Forest Park LNR/LWS, and the other two records were from between 780-870m south of the site boundary.

Invasive Species

- 3.21 Several records of invasive plant species were returned, including five Japanese knotweed *Reynoutria japonica* records (2002-2014) and one Himalayan balsam *Impatiens glandulifera* record (2013). The closest Japanese knotweed record was c.760m south west of the site and the Himalayan balsam record was c.700m south of the site.

Phase 1 Field Survey – Habitats

Overview

- 3.22 The majority of the site was surrounded by wooden post and rail fencing with some sections of residential garden fencing. Two site entrances existed off Ashland Road, one via a gate opposite Evans Avenue and one via a track opposite Keats Avenue.
- 3.23 The site comprised two fields separated by a central hedgerow (Figures 3 and 4). The western field consisted of arable land with very wide poor semi-improved grassland margins, and the eastern field consisted of poor semi-improved grassland. At the time of survey, most of the poor semi-improved grassland had been recently mown.
- 3.24 Other habitats included two further hedgerows along the eastern and northern site boundaries, trees set within dense and scattered scrub, tall ruderal vegetation and two ditches that were wet at the time of survey. Full species lists for each habitat type are provided in Appendix A.

Arable Field

- 3.25 The western half of the site consisted mainly of an arable field planted with a wheat *Triticum* sp. crop at the time of survey. On each side of this area were poor semi-improved grassland field margins of c.10m in width (Photos 1 and 2) that had been mowed recently (see below for detailed description of poor semi-improved grassland habitat type).
- 3.26 The crop was densely planted, and almost no other species occurred within the wheat with the few additional species encroaching from the adjacent poor semi-improved grassland habitat.



Photograph 1: Westerly view of the arable land (wheat crop), bound on all sides by a c. 10m wide, recently mown poor semi-improved grassland margin.



Photograph 2: Recently mown poor semi-improved grassland margins between the arable field and the northern site boundary, adjacent to dense scrub and woodland of Brierley Forest Park.

Tall Ruderal Vegetation

- 3.27 A continuous band of tall ruderal vegetation, of variable width, ran along the site boundary from the south eastern site corner, along the entire southern and western boundaries and into the north western site corner. Species composition varied according to water and light availability. Along the eastern section of the southern boundary (Photo 3), dominant species were cleavers *Galium aparine*, common nettle *Urtica dioica*, rosebay willowherb *Chamaenerion angustifolium*, creeping thistle *Cirsium arvense*, false oat grass *Arrhenatherum elatius*, and rough meadow grass *Poa trivialis*.
- 3.28 Other species frequently occurring within the tall ruderal habitat included broadleaved dock *Rumex obtusifolius*, clustered dock *Rumex conglomeratus*, common ragwort *Jacobaea vulgaris*, cow parsley *Anthriscus Sylvestris*, creeping cinquefoil *Potentilla reptans*, hogweed *Heracleum sphondylium*, large bindweed *Calystegia sepium*, red clover *Trifolium pratense*, teasle *Dipsacus fullonum*, white dead nettle *Lamium album*, wood avens *Geum urbanum* and Yorkshire-fog *Holcus lanatus*.
- 3.29 As this habitat progresses towards the west, along the southern boundary and across a steep incline and surrounding a wet ditch at the base, species diversity increased, and species dominance, though much the same as along the eastern section, occurred in more localised patches (Photo 4). Additional species included a buckler fern species *Dryopteris sp.*, coltsfoot *Tussilago farfara*, common comfrey *Symphytum officinale*, hedge woundwort *Stachys sylvatica*, soft rush *Juncus effuses*, and wild strawberry *Fragaria vesca*. This habitat narrowed but continued northwards along the western site boundary along another wet ditch.
- 3.30 Two smaller areas of tall ruderal vegetation were also present on the northern boundary, directly north of hedgerow H3 and in the north eastern site corner. Here the dominant species were bramble *Rubus fruticosus agg.*, nettles, broadleaved dock and meadowsweet *Filipendula ulmaria*.



Photograph 3: Tall ruderal habitat on the eastern side of the southern boundary.



Photograph 4: Tall ruderal habitat progressing west along the southern boundary with increase in species and structural diversity.

Poor Semi-improved Grassland

- 3.31 The eastern half of the site consisted predominantly of poor semi-improved grassland that had been recently mowed to a sward height of c.10cm (Photo 5). The margins of this field were not recently mowed and varied in width between c.0.5-2m around the field (e.g. Photo 4 and Photo 6). The c.10m wide margins of the western field also consisted of poor semi-improved grassland that had been recently mowed (e.g. Photo 2).
- 3.32 Across the site, poor semi-improved grassland was typified by dominant and frequent cock's foot *Dactylis glomerata*, false oat grass *Arrhenatherum elatius*, perennial ryegrass *Lolium perenne* and Yorkshire fog *Holcus lanatus*. Occasionally and rarely recorded grass species included fescue species *Festuca sp.*, meadow foxtail *Alopecurus pratensis*, rough meadow-grass *Poa trivialis*, timothy *Phleum pratense*, and couch grass *Elymus repens*.
- 3.33 The most frequently occurring herbaceous species included dandelion *Taraxacum officinale agg.*, meadow buttercup *Ranunculus acris*, ribwort plantain *Plantago lanceolata*, and white clover *Trifolium repens*.
- 3.34 Herbaceous species distribution reflected variations in sun exposure and moisture levels across the site. Two areas of damper grassland were present (TN2), one area in the west of the site along the southern boundary, and one area along the western boundary spreading into the north western site corner. Here additional species occurred, such as soft rush *Juncus effuses*, tufted vetch *Vicia sativa*, creeping buttercup *Ranunculus repens*, and a variety of mosses *Bryophyta sp.*
- 3.35 To the east of the site, along part of the northern site boundary (Photo 11), additional herbaceous species were present which were not observed across the rest of the site (TN3), including common vetch *Vicia sativa*, meadowsweet, meadow vetchling *Lathyrus pratensis* and great burnet *Sanguisorba officinalis*.
- 3.36 The wooden post and rail fencing along this boundary, and the fact that the hedgerow base here was not very dense, provided some connectivity between this patch of poor semi-improved grassland and the grassland outside the site to the north, which is part of Brierley Forest Park LNR/LWS. As such it is likely that these additional species localised only to grassland along this part of the site boundary, occurred as a result of natural dispersal from areas of higher species richness that are known to occur to the north within Brierley Forest Park LNR/LWS.



Photograph 5: Eastern field consisting of poor semi-improved grassland that had undergone recent management by being mown to approx. 10cm in sward height.



Photograph 6: Margin of the eastern poor semi-improved grassland field which remained unmanaged.

Dense and Scattered Scrub

- 3.37 Two large strips of dense scrub were present along the southern site boundary. The strip to the east consisted partly of a previous hedgerow which had been cut on only the side facing Ashland Road (Photo 7). Lack of management to the other face of this hedgerow or to the top, has resulted in merging with the dense and scattered scrub directly adjacent (Photo 8).
- 3.38 The strip of dense scrub on the southern boundary was situated further to the west on a steep incline, the base of which was fringed with a strip of tall ruderal vegetation and here a wet ditch was present (see description below).
- 3.39 An additional narrow strip of dense scrub was present along the western boundary, also fringed by a strip of tall ruderal vegetation, with another wet ditch running along the boundary. Some scattered scrub was present at the edges of the areas of dense scrub, and within tall ruderal vegetation (see descriptions below).
- 3.40 All scrub habitat was dominated by common woody species including blackthorn, bramble, common elder, common hawthorn *Crataegus nonogyna*, and fruiting plum *Prunus* sp. Dominant herbaceous species included common nettle and large bindweed. Less frequently occurring woody species were also present including shoots and multi-stemmed saplings of ash *Fraxinus excelsior*, common hazel *Corylus avellane*, field maple *Acer campestre*, goat willow *Salix caprea*, holly *Ilex aquifolium*, privet *Ligustrum vulgar* and sycamore *Acer pseudoplatanus*.



Photograph 7: Eastern strip of dense scrub along the southern site boundary – hedgerow that has grown out, managed for road visibility on the side facing Ashland Road only.



Photograph 8: Eastern strip of dense scrub with trees along the southern site boundary .



Photograph 9: Western strip of dense scrub with trees along the southern site boundary at the top of an incline with a fringe of tall ruderal vegetation towards the base of the incline.

Scattered Trees

- 3.41 A number of scattered trees were present on the site peripheries ranging from young to mature in age. Main early-mature and mature trees are indicated in Figures 3 and 4 of this report (also refer to the FPCR Ltd. Arboricultural Assessment (November 2019) for a full description of trees on site).
- 3.42 One mature ash tree was set within hedgerow H1 and the rest of the early mature and mature trees were situated within dense scrub (see description below). The scattered trees on the western site boundary screened the site from the neighbouring gardens and were interspersed with dense scrub.
- 3.43 Two mature ash trees were also present in very close proximity to the site boundary, within the edge of the woodland directly adjacent to the site.
- 3.44 The majority of the scattered trees were broadleaved species and included ash, pedunculate oak *Quercus robur*, common hawthorn, copper beech *Fagus sylvatica* var. 'Autopurpurea', horse chestnut *Aescelus hippocastanum* and sycamore. Norway spruce *Picea abies* was rarely present and some young trees of similar species composition were also scattered between the larger trees or within the dense scrub.

Hedgerows

- 3.45 Three hedgerows formed part of the site. H1 was c.145m in length and formed the eastern site boundary (Photo 10), connecting with H2 in the north eastern site corner. It was dominated by common hawthorn and blackthorn *Prunus spinosa*, with ash, common hazel, rose species *Rosa sp.*, elder *Sambucus nigra* and goat willow also present. Occasional climbing species present were bramble and large bindweed. This hedgerow had not undergone any heavy or recent management and no gaps were present along its length.
- 3.46 H2 (c.250m in length) ran on the outside of part of the northern site boundary fence line (Photos 11 and 12) and consisted mainly of blackthorn, and common hawthorn with stands of young horse chestnut planted at regular intervals (Photo 12). Also present were ash, bramble, common elder *Sambucus nigra*, common hazel, field maple, goat willow, large bindweed *Calystegia sepium*, pedunculate oak and sycamore. This hedgerow was managed, but not intensively, and had not been recently cut at the time of survey. It grew less densely towards the western end, with some gaps in the understory. This hedgerow forms a connection with H1 on its eastern end and with woodland situated in Brierley Forest Park LNR/LWS on its western end.



Photograph 10: Hedgerow H1 on the eastern site boundary – Native species poor with trees, of moderate ecological value as scored under the HEGS, and a Habitat of Principal Importance.



Photograph 11: Hedgerow H2 on the northern site boundary – Native species poor with trees, of moderate ecological value as scored under the HEGS, and a Habitat of Principal Importance



Photograph 12: Hedgerow H2 - on the boundary between Brierley Forest Park LNR/LWS (in the far distance) and the eastern poor semi-improved grassland field of the site. Stands of horse chestnut planted at regular intervals along its length.

- 3.47 H3 (c.95 in length) ran north to south across the centre of the site (Photos 13 and 14). Blackthorn was the dominant species while common hawthorn was abundant. The central section of the hedgerow was made up of some stands of hops *Humulus lupulus*, while the rest of the hedgerow also consisted of bramble, common elder, common hazel and field maple. This hedgerow showed signs of some previous management but had not been cut back recently. Its southern end sat within 10m of dense scrub habitat while its northern end was within 10m of Brierley Forest Park LNR/LWS woodland as well as H2 on the northern site boundary.
- 3.48 Each hedgerow qualified as a Habitat of Principal Importance as described in Section 41 of the NERC Act 2006 since all three comprised at least 80% native woody species. Each hedgerow was also assessed under the Hedgerow Regulations criteria and scored under the HEGS assessment. A summary of the extent and ecological value of H1, H2 and H3 is provided in Table 9.

Table 9: Summary of the Extent of the Hedgerows and their Ecological Value

Hedge	Length (m)	Important (Hedgerow Regs)	HEGS SCORES					Value
			Structural	Connectivity	Diversity	Associated Features	Grade	
H1	145	No	10	5	6	0	3	Moderate Value
H2	250	No	11	5	6	0	3+	Moderate Value
H3	95	No	7	2	5	0	-3	Moderate Value



Photograph 13: Hedgerow H3 splitting the site in two – Native species poor, of moderate ecological value as scored under the HEGS, and a Habitat of Principal Importance.



Photograph 14: Hedgerow H3 - between the eastern poor semi-improved grassland field, and the western wheat crop field with poor semi-improved grassland margins.

- 3.49 The hedge base flora of all the hedgerows at this site was largely species poor. That of H1 was typically dominated by ruderal species such as common nettle, creeping thistle, hogweed, great willowherb, creeping buttercup, cleavers and wood avens with some meadowsweet. Grass species present included false oat grass, Yorkshire fog and couch grass
- 3.50 The hedge base flora of H2 and H3 contained similar species as that of H3 but was more grass dominated and with a larger number of common grass species present. These included false oat grass, Yorkshire fog, cock's foot, rough meadow grass, perennial ryegrass, Italian ryegrass *Festuca perennis* and couch grass.
- 3.51 The herbaceous species present in the hedge base flora of H3 was very limited, consisting mainly of creeping thistle, cut-leaved crane's-bill, ribwort plantain, common ragwort and common nettle. In contrast, the herbaceous species present at the base of H2 were more varied and included common vetch, meadowsweet, meadow vetchling and great burnet. These species were not observed at other locations across the site but are known to occur within the grassland on the other side of H2 (within Brierley Forest Park LNR/LWS). As such it is likely that these additional species localised only to grassland along this part of the site boundary, occurred as a result of natural dispersal from areas of the adjacent LNR/LWS that are specifically managed of higher grassland species richness.

Broadleaved Plantation Woodland

- 3.52 Directly adjacent to the site, along the stretch of northern site boundary between H3 and the western site boundary lay a small broadleaved woodland area of plantation origin. This woodland consisted of a mix of tree species including ash, field maple, white poplar *Populus alba*, blackthorn, common dogwood *Cornus sanguinea*, elder, hawthorn, hazel, crack willow *Salix fragilis*, goat willow, pedunculate oak, sessile oak *Quercus petraea*, white willow *Salix alba* and wild cherry *Prunus avium*.
- 3.53 A footpath ran through this woodland and as such, some of it was managed for public access and safety. Here, a short stretch of wet ditch ran parallel with the northern boundary and the footpath. In areas close to the footpath, woodland understory was sparse, however in other less frequented areas additional climbing and herbaceous species made for a dense but species poor understory consisting mainly of bramble and cleavers.
- 3.54 Climbers and tall ruderal species fringed some of the outer edges of the woodland along the northern boundary fence-line where management of the woodland and its understory had previously taken place to prevent encroachment of the woodland onto the site itself. Species included black bryony *Tamus communis*, bramble, guelder rose *Viburnum opulus*, cleavers, clustered dock, common nettle, creeping thistle, great willowherb, hogweed, and some common tall grasses such as false oat-grass and Yorkshire fog.

Ditches

- 3.55 Two ditches were recorded on the site that held water at the time of survey, one adjacent to part of the southern site boundary, at the base of a steep incline, and one along the western site boundary. Here the surrounding tall ruderal habitat and grassland habitats was damper as a whole, become increasingly so towards the north western site corner.
- 3.56 Both ditches were relatively shallow, largely overgrown, and set within tall ruderal vegetation as described above, with no sign of recent management. The associated vegetation did not indicate that these ditches held large amounts of water for prolonged periods of time throughout the year.

Phase 1 Field Survey – Fauna

Bats

Foraging / Commuting Habitat

- 3.57 Although the poor semi-improved grassland and arable field patches provide low value habitat for bats, the hedgerows, scrub and tree lined site boundaries provided potential foraging and commuting corridors for bat species. These linear habitats provided good connectivity across the site towards the variety of potential bat foraging habitats that exist to the north of the site.
- 3.58 Adjacent tall ruderal vegetation and areas of un-cut grassland provided further structural and resource diversity and therefore foraging opportunities for bats by providing habitat for a range of invertebrate prey.

Summer Transect Survey – 22nd August 2019 (Figure 5)

- 3.59 The transect survey recorded a total of 22 registrations. Common pipistrelle *Pipistrellus pipistrellus* was the dominant species accounting for 17 of the registrations recorded, with three *Myotis* sp. registrations and a single noctule *Nyctalus noctula* registration. These were recorded at regular intervals throughout the transect, which focused mainly on the site peripheries and central hedgerow H3. The first registration was recorded at 20:14 (a common pipistrelle foraging in the north eastern corner of the site). Bat behaviour during the survey predominantly comprised foraging activity, with several commuting passes.

Autumn Transect Survey - 16th September 2019 (Figure 6)

- 3.60 During this transect survey a total of 21 registrations were recorded. Common pipistrelle was again the dominant species, accounting for 18 of the registrations. These were recorded at regular intervals throughout the transect route, with the first registration recorded at 19:41 (a common pipistrelle commuting along the scrub and tree boundary in the south western corner of the site).
- 3.61 Soprano pipistrelle *Pipistrellus pygmaeus* was recorded once, near the south of H3, close to dense scrub and tall ruderal habitat on the southern site boundary (at 20:02). A noctule was recorded once, at 20:49, passing over the north western corner of the site, and a brown long-eared bat *Plecotus auritus* was also recorded once, at 21:07, commuting over the north eastern corner of the site.
- 3.62 Fewer foraging individuals were recorded during this survey, however the majority of activity recorded still consisted of commuting and foraging behaviour.

Summer Static Detector Survey 29th August – 3rd September 2019

- 3.63 The static detector was deployed along hedgerow H3, near the centre of the hedgerow. This recorded a total of 2245 registrations. Bat activity was dominated by common pipistrelle, accounting for 1959 registrations (87.3% of total recorded bat activity). The remaining registrations recorded consisted of:
- *Myotis* sp. with 258 registrations (11.5%)
 - *Pipistrellus* sp. with 3 registrations (0.1%)
 - noctule with 9 registrations (0.4%)
 - brown long-eared bat with 8 registrations (0.4%)
 - soprano pipistrelle with 8 registrations (0.4%)

Autumn Static Detector Survey 3rd September – 8th September 2019

3.64 The static detector was deployed along hedgerow H3, towards the centre of the hedgerow. This detector recorded a total of 1232 registrations. Bat activity was again dominated by common pipistrelle, accounting for 1047 registrations (85% of total recorded bat activity). The remaining registrations recorded consisted of:

- *Myotis* sp. with 119 registrations (9.7%)
- *Pipistrellus* sp. with 30 registrations (2.4%)
- noctule with 22 registrations (1.8%)
- brown long-eared bat with 6 registrations (0.5%)
- soprano pipistrelle with 5 registrations (0.4%)
- *Nyctalus* sp. with 3 registrations (0.2%)

3.65 Bat activity was generally higher during the first half of each recording event, i.e. between sun set and midnight, after which activity died down and showed no significant pre-dawn peak. No other significant patterns in bat activity were identified in the data.

Ground Level Roost Assessment - Trees

3.66 Several semi-mature, early mature and mature trees were located within or directly adjacent to the site (see FPCR Ltd. Arboriculture Assessment, November 2019 for tree descriptions). Four of these trees, T1, T2, T3 and T4 were identified as having low potential for roosting bats, in accordance with Table 1 (see Figures 3 and 4), exhibiting suitable features such as dead and split wood, and split limbs and dense ivy cover. These features were assessed using binoculars with no evidence of bat activity recorded (see Table 10 below).

3.67 In addition, a group of approximately six semi-mature sycamore trees (G1, Figure 3) were overgrown with a heavy layer of ivy and thus, this group was also assessed as having low potential for roosting bats.

Table 10: Tree Assessment for Bat Roosting Potential

Tree Ref	Species	Potential bat roost features	Bat Roost Potential	Retained /Lost
T1	Pedunculate oak <i>Quercus robur</i>	Dieback within crown with major deadwood observed. Rot holes and elder growing through the crown, obscuring the view of the entire tree stem/crown.	Low Potential	Retained as per Illustrative Master Plan P19-1014 007B (Appendix B)
T2	Pedunculate oak <i>Quercus robur</i>	Dead and split wood from ground level up to 2m and hollowing of stem.	Low Potential	Retained as per Illustrative Master Plan P19-1014 007B (Appendix B)
T3	Sycamore <i>Acer pseudoplatanus</i>	Crossing branches, dense ivy cover on main stem.	Low Potential	Retained as per Illustrative Master Plan P19-1014 007B (Appendix B)
T4	Ash <i>Fraxinus excelsior</i>	Situated offsite by circa 5m (within potential Zone of Influence) Broken branches and branch stubs and dense undergrowth obscuring view of entire stem.	Low Potential	Retained as per Illustrative Master Plan P19-1014 007B (Appendix B)

- 3.68 The other mature/early-mature/semi-mature trees recorded within the site boundary were not considered to provide any suitable features that could be utilised by roosting bats and were therefore classed as having negligible potential.

Badger

- 3.69 The arable land, poor semi-improved grassland and tall ruderal vegetation provided potential suitable foraging opportunities for badgers, and evidence of badger foraging activity was recorded in the south of the site in the form of snuffle holes within the grassland.
- 3.70 The bands of dense and scattered scrub along the site peripheries offered potential sheltering, foraging and commuting opportunities for this species and the three hedgerows on the site provided commuting corridors with reasonable connectivity to suitable badger habitat occurring in the wider landscape, such as that within Brierley Forest Park LNR/LWS to the north of the site.
- 3.71 Badger prints were also noted along a muddy track on the southern boundary coming off Ashland Road, while numerous mammal runs, of the size and shape characteristic of badger, were recorded within tall ruderal vegetation and unmanaged grassland throughout the site. Some of these mammal runs were within in the northern site boundary, underneath the wooden post and rail fencing and through the adjacent woodland and hedgerow.
- 3.72 A single active badger sett was situated along the southern site boundary. This sett displayed recent excavation of the majority of the five holes that were present around a central location, with recently used and well-established badger runs within the surrounding tall ruderal habitat leading to each hole.
- 3.73 The accessible land within a 30m radius of the site was also surveyed for badger, but no further evidence of badger activity nor badger setts was identified within this radius.

Other Terrestrial Mammals

- 3.74 Despite providing some suitability for use by brown hare *Lepus europaeus*, no field signs of this species were observed during the field survey. Moreover, the footfall experienced by the site from local dog walkers is considered sufficient to reduce the suitability of this habitat for brown hare.
- 3.75 No field signs were observed for hedgehog, however the scrub with threes, and tall ruderal vegetation at the site was suitable for use by this species for foraging, commuting and hibernating. Off-site connectivity was also good, with well used mammal runs observed along all the site boundaries, leading off site.
- 3.76 An unidentified hole was observed at the base of T2 with nesting material within the hollowing trunk. This suggests some use by an unidentified mammal species. No field signs confirming the use of the site by any other mammals were observed, however it is likely that common urban mammals such as foxes make use of this site.

Water Vole and Otter

- 3.77 Suitable habitats for water vole were highly limited and no suitable otter habitat was present within the site. The ditches present were unlikely to hold water on a permanent basis and were too narrow and shallow to support the aquatic needs of these species, while also lacking connectivity to any other local watercourses or waterbodies. Habitats that may be suitable for these species in the wider local area did not fall within a zone of influence of the proposed development.

Birds

- 3.78 Suitable nesting and foraging habitat for common bird species was present within the site comprising scrub, hedgerows, and scattered trees, as well as tall ruderal vegetation. Due to management by mowing, grassland was of sub-optimal suitability.
- 3.79 Bird species observed during the surveys included blackbird *Turdus merula*, woodpigeon *Columba palumbus*, robin *Erithacus rubecula*, great tit *Parus major*, wren *Troglodytes troglodytes* and dunnock *Prunella modularis*. No active bird nests or bird nesting behaviour were observed during the field survey, though this was undertaken towards the end of the nesting season (July).

Reptiles

- 3.80 The hedgerows and scrub with adjacent tall ruderal habitat provided structural diversity and therefore represent potential foraging and refuge areas for reptiles, while the poor semi-improved grassland and arable field that made up the majority of the site were of limited value to foraging reptiles. Basking opportunities within the site were limited and no reptile evidence was recorded during the field survey.

Great Crested Newts and Other Amphibians

Terrestrial Habitats

- 3.81 Suitable terrestrial habitats for amphibians, including GCN, included hedgerow bases and areas of dense scrub which provided potential habitat for foraging and commuting, rest and shelter. The denser areas of tall ruderal vegetation provided additional potential foraging habitat and refuge.
- 3.82 The managed, poor semi-improved grassland and arable field within the site held limited value to amphibians with only the unmanaged strips around the margins potentially providing some minor additional foraging habitat.

Aquatic Habitats – HSI Assessment

- 3.83 No waterbodies were present within the proposed development site however, two ponds (P1 and P2, Figure 7) were identified within a 500m radius of the site, both situated in Brierley Forest Park LNR/LWS to the north of the site. Access was open to survey both these ponds.
- 3.84 P1 (also known as Brierley Waters) was a permanent pond located c.4m north from the proposed development site and was assessed as having 'poor' suitability for GCN, with an HSI score of 0.43 (see Table 11 for details). This was a very large fishing pond with an area of c.8350m², stocked with fish and maintained by Brierley Pond Fishing Club (Photos 14 and 15). This pond has full public access and was surrounded by heavily managed amenity grassland and public access paths. Approximately half of the pond's perimeter was vegetated with dense scrub and trees while the rest was managed to allow angling. The water surface was entirely open with less than 1% aquatic vegetation present at the time of survey. Small numbers of waterfowl were present but no obvious signs of impact by waterfowl were noted. Approximately 20% of the pond received shade at any one time during the day, due to the presence of dense scrub and trees on some of the pond banks. No aquatic invertebrates were noted present.



Photograph 15: Pond P1 Brierley Waters fishing pond; c.8350m²; never drying; good water quality; 20% shaded water surface; waterfowl present but little sign of impacts; very limited aquatic vegetation.



Photograph 16: Pond P1 Brierley Waters fishing pond; stocked with good fish population to allow daily angling opportunities; moderate terrestrial habitat in surroundings.

- 3.85 P2 was a naturally forming field pond c.20m north of the proposed development site, and from aerial imagery appears to have been present since 2010. This pond had an area of c.260m², formed due to the presence of a small, slow running stream in this area of the park, and heavily vegetated banks (Photos 16), and was considered to have potential to dry up on occasion.
- 3.86 Approximately 50% of the pond was shaded and water quality was good. Areas of open water were extremely limited with approximately 80% of the pond containing aquatic vegetation at the time of survey. The surrounding habitat consisted of rough grassland and scrub, with nearby young woodland and hedgerow.
- 3.87 P2 was slightly off-set from a public footpath that ran through the adjacent rough, semi-improved neutral and wet grassland. While much of the pond banks were overgrown with willow scrub, meadowsweet, Yorkshire fog, great burnet and willowherb species, signs of dogs making use of the pond were present and in some areas footfall from visitors to one side of the pond had resulted in deterioration of the surrounding grassland closer to the footpath. The absence of fish in this pond could not be ruled out. No waterfowl were present at the time of survey.
- 3.88 Pond P2 was assessed as having 'good' suitability for GCN, with an HSI score of 0.77 (Table 11).



Photograph 17: Pond P2 – 260m²; sometimes drying; good water quality; 50% shaded water surface; waterfowl presence unlikely; 80% aquatic vegetation; minor potential for fish presence; good terrestrial habitat in surroundings.

3.89 No further ponds were identified within a 500m radius of the site.

Table 11: GCN Habitat Suitability Index Scores, calculated as per standard guidance¹⁶

	P1	P2
Index	Score (0-1)	SCORE (0-1)
SI 1 - Location	1	1
SI 2 – Pond Area	0.8	0.5
SI 3 – Pond Drying	0.9	0.5
SI 4 – Water Quality	0.33	1
SI 5 – Shade	1	1
SI 6 - Fowl	0.67	0.67
SI 7 - Fish	0	0.7
SI 8 - Ponds	0.65	0.65
Si 9 – Terrestrial Habitat	0.67	1
SI 10 – Macrophytes	0.3	1
his Result	0.43	0.77
Suitability	Poor	Good



Photograph 18: Stands of Japanese knotweed within dense scrub of western site boundary, at c.10m in height and growing across a linear distance of c.6m along the boundary.

Invertebrates

- 3.90 The combination of dense scrub fringed with tall ruderal vegetation of variable species composition adjacent to cut and uncut areas of grassland provides structural diversity to the site peripheries which have the potential to benefit a range of common terrestrial invertebrate species. The hedgerows and scattered trees at the site provide additional habitats to be utilised by invertebrates. During the field survey a number of common butterfly species were observed making use of the above described habitats along the site peripheries as well as central hedgerow, H3. These included brimstone *Gonepteryx rhamni*, speckled wood *Pararge aegeria*, peacock *Aglais io*, and ringlet *Aphantopus hyperantus*.
- 3.91 No suitable habitat for white-clawed crayfish or any other aquatic invertebrates was present within the site because, although the ditches present were wet at the time of survey, these did not show evidence of containing water throughout the year sufficient to support such species. There were also no waterways that connected to the site and neighbouring habitats with possible suitability for aquatic invertebrate species did not fall within the zone of influence of the proposed development.

Invasive Species

- 3.92 Some stands of Japanese knotweed were present within the dense scrub and tall ruderals on the western boundary (TN1). This highly invasive species was previously reported at this location, however it now appears to be increasing in extent and spreading along the western site boundary.
- 3.93 No other invasive species were observed during the field survey.

4.0 DISCUSSION AND RECOMMENDATIONS

Proposals

- 4.1 The proposals referred to within this report are shown within the illustrative master plan created by Pegasus Group (P19-1014 007B dated 24.01.2020; see Appendix B).
- 4.2 The proposed development will result in the loss of mainly poor semi-improved grassland, arable land and some tall ruderal vegetation to facilitate a development comprising up to 300 dwellings with associated hardstanding, residential gardens and amenity planting, and construction of an attenuation basin designed to retain water and with species rich wetland and marginal planting, providing a site enhancement for a range of wildlife .
- 4.3 The removal of existing scrub and trees will be kept to a minimum and the majority of existing habitats on the site peripheries will be retained and enhanced. While a small section of the central hedgerow (H3) will be lost to allow for a primary access route through the site, all other hedgerows on site will remain intact.

Statutory Designated Sites

Brierley Forest Park LNR/LWS

- 4.4 Brierley Forest Park LNR/LWS, a statutory site of local conservation importance, was located directly adjacent to the northern boundary of the proposed development site. This site encompasses areas of rich calcareous grassland, neutral grassland, woodland, standing water and running water.
- 4.5 The proposed development includes four points of public access via the northern site boundary into Brierley Forest Park LNR/LWS. As a result, an increase in visitor pressure on the woodland is expected through informal recreational use, resulting in a localised minor impact on the woodland along this boundary line.
- 4.6 Habitat-specific recommendations are made below to protect and enhance the woodland structure along the northern site boundary by directing public footfall to the official points of access while also discouraging any unofficial access routes being created which may lead to unnecessary damage to the surrounding habitat.
- 4.7 It is recommended that signage be implemented at the points of public access into Brierley Forest Park LNR/LWS to inform the public of the nature conservation status and value of the site, as well as promoting use of footpaths and good dog walking conduct.
- 4.8 In addition, the provision and maintenance of bins at the proposed public entry points to Brierley Forest Park LNR/LWS for use by walkers and dog owners is recommended in order to reduce risks of litter and dog-waste pollution of the LNR/LWS habitats.

Teversal Pastures SSSI

- 4.9 Teversal Pastures SSSI is a statutory site of national conservation importance located c.2km from the proposed development site. This SSSI was designated for its botanical and habitat significance (old unimproved species rich grassland, neutral marsh and areas of flushed woodland). The application site falls within one of the wider SSSI Impact Risk Zones (IRZ) of this SSSI, however

at this distance residential developments are not considered to pose a risk to the SSSI, particularly due to the barrier between the site and the SSSI made up by the residential area of Stanton Hill.

Birklands and Bilhaugh SAC

- 4.10 Birklands and Bilhaugh SAC was the only statutory site of international importance for nature conservation within the 15km search area, located c.14.6km to the northeast, to the opposite side of Sutton-in-Ashfield and Mansfield market towns. The SAC was designated for its old oak woodland which supports a rich invertebrate fauna and diverse fungal assemblage. It forms part of Sherwood Forest County Park, and as such is crossed by a network of forest paths.
- 4.11 Due to the relatively moderate scale of the proposed development, and the significant intervening distance, no impact on this SAC is anticipated as a result of the proposed development.

Non-Statutory Designated Sites

- 4.12 Ten non-statutory sites of local importance are present within 1km of the proposed development area, designated for a combination of rare, endangered and/or relic habitats and/or notable species assemblages.
- 4.13 Five of these are LWSs that form part of Brierley Forest Park LNR/LWS and a further three directly adjoin the north of Brierley Forest Park LNR/LWS. As such the precautionary measures discussed above will also work towards minimising impacts on these sites.
- 4.14 The remaining two Local Wildlife Sites that lay within a 1km radius of the proposed development area are not anticipated to experience any impact from the proposed development due to sufficiently large intervening distances.

Habitats

- 4.15 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:
- Inclusion within a specific policy, for example veteran trees, ancient woodland and linear habitats within the National Planning Policy Framework (NPPF)
 - A non-statutory site designation (e.g. Local Wildlife Site)
 - Habitats considered as habitats of principal importance for the conservation of biodiversity as listed within Section 41 of the NERC Act 2006
 - Habitats identified as being a Priority Habitat within the local Biodiversity Action Plan (Nottinghamshire Local BAP)
- 4.16 The only on-site habitat identified during the survey, which falls within the above listed categories was hedgerow habitat.

Arable Field

- 4.17 Approximately 5ha of the 10.137ha application site consisted of arable land that will be lost as a result of the proposed development plans. This has been managed as a wheat field with a densely planted crop and is of low-negligible intrinsic ecological value and is also common in the wider local area, particularly in more rural areas to the west. Thus, the loss of arable land is not a constraint to the proposed development plans at this site.

Tall Ruderal Vegetation

- 4.18 It is likely that most of the tall ruderal habitat will be lost as a result of the proposed development, however tall ruderals habitat is not a Habitat of Principal Importance and was assessed as being of low intrinsic ecological value due to being of:
- limited extent
 - common and wide-spread species composition
 - generally low species diversity although with a slight increase in species numbers in damper areas of the site.
- 4.19 Additionally, despite representing a foraging resource for a variety of local wildlife species, this habitat type is widespread and commonly available in the local area. Mitigation for the loss of the foraging resource represented by tall ruderals from the site is incorporated in the species-specific recommendations made below and this loss is not a constraint to the proposed development plans.

Poor Semi-improved Grassland

- 4.20 The poor semi improved grassland habitat totalled c.4.3ha and will be lost as a result of the proposed development. However this grassland consisted of common and wide-spread species, had low species diversity and is not a notable or protected habitat, though it is noted that three small areas had slightly elevated species richness due to the presence of water or close proximity to grassland with a higher species diversity.
- 4.21 Unmanaged areas of poor semi-improved grassland habitat provided a foraging and commuting resource for a variety of local wildlife species. This habitat was however extremely limited in extent, and is well represented in the wider landscape, with higher quality semi-improved grassland being present in the local proximity. As such this habitat type is of low ecological value within the site, and its loss from the site is not a constraint to the proposed development plans.
- 4.22 Suitable mitigation for the minor loss of poor semi-improved grassland will be provided via the establishment of higher quality native species rich neutral grassland around the attenuation basin area of the new development, and via the implementation of a long-term site-specific ecological management scheme.

Dense and Scattered Scrub

- 4.23 The majority of scrub habitat will be retained as part of the development proposals, apart from two access points that will be created along the southern site boundary.
- 4.24 The scrub consisted of widespread and common native woody and herbaceous species of very low in species diversity. This habitat does however provide a foraging, commuting, shelter and reproductive resource for a wide range of local wildlife species. As such, mitigation for the minor loss of dense scrub habitat is provided in the species-specific recommendations made below.

Scattered Trees

- 4.25 Young trees at the site held little intrinsic ecological value and can be easily replaced in the short to medium term. As such the loss of young trees or saplings is not considered a constraint to the proposed development of the site.

- 4.26 Semi-mature and mature trees held moderate ecological value as these trees are hard to replace in the short to medium term and provide a well-established foraging, commuting and reproductive habitat for a range of local wildlife at the site, including bats and bird (species-specific recommendations regarding this habitat are made below).
- 4.27 The proposed scheme will retain the majority of existing semi-mature and mature trees as part of the retained peripheral habitat. These should be suitably protected during construction activities i.e. working methods should adhere to standard best practice guidance, including BS5837 Trees in Relation to Construction – Recommendations: 2012 for trees and hedgerows.
- 4.28 Any minor loss of semi-mature trees should be mitigated for via the planting and appropriate management of new trees on the site peripheries, particularly along the northern and western site boundaries. These trees should consist of a variety of locally occurring native tree species that are flower-, fruit- and seed-bearing in order to enhance the value of the site for foraging wildlife.

Hedgerows

- 4.29 None of the hedgerows were assessed as being important under the Hedgerow Regulations criteria. All three however were scored as being of moderate ecological value under the HEGS assessment and each qualified as a Habitat of Principal Importance as described in Section 41 of the NERC Act 2006 since all three comprised at least 80% native woody species.
- 4.30 The on-site hedgerows thus hold intrinsic ecological value, as well as value to local wildlife, forming part of a network of local commuting corridors and providing habitats for foraging, rest and shelter.
- 4.31 The scheme proposals include the retention of hedgerows H1 (eastern boundary) and H2 (northern boundary) but will require the removal of a central section of hedgerow H3 to facilitate the construction of a main access route from the east to the west of the site. It is proposed that hedgerows H1 and H2 are enhanced via gapping up using mixed locally native hedgerow species and are managed for the benefit of biodiversity in the long-term. Mitigation for the minor loss of hedgerow habitat from H3 will be provided as below.
- 4.32 Any retained hedgerows should be suitably protected during construction activities i.e. working methods should adhere to standard best practice guidance, including BS5837 Trees in Relation to Construction – Recommendations: 2012 for trees and hedgerows.

Broadleaved Plantation Woodland – Adjacent to Northern Site Boundary

- 4.33 Broadleaved plantation woodland is not a Habitat of Principle Importance and there was very little herbaceous woodland understory present. This woodland is however considered to hold moderate intrinsic ecological value due to the time required for trees to reach semi-mature age.

This woodland also provides a range of foraging, commuting, shelter and reproductive habitats for wildlife due to:

- the presence of a wet ditch,
- the presence of a range of fruit and seed-bearing tree species,
- the structural diversity resulting from the variable rate at which the different tree species grow, as well as suckers and saplings present due to natural dispersal these species

- the additional structural variation added by the presence of some woody climbers and herbaceous understory (particularly on the woodland fringes).
- 4.34 As this woodland is situated off-site, impact to it is expected to be very minimal, limited to the creation of footpath connections from the proposed development site to the closest footpath in Brierley Forest Park LNR/LWS via the woodland. The resulting increase in recreational access has potential to result in a minor impact in terms of increased disturbance, but is not expected to impact the ecological integrity of the woodland or associated resources that it provides to local wildlife.
- 4.35 Any trees along the edge of the woodland along this northern site boundary should be suitably protected during construction activities i.e. working methods should adhere to standard best practice guidance, including BS5837 Trees in Relation to Construction – Recommendations: 2012 for trees and hedgerows.
- 4.36 If any individual semi-mature or mature trees need to be removed to facilitate public access, these trees should be subject to a ground level roost assessment by a suitably experienced ecologist prior to removal. This assessment will aim to identify whether the trees to be removed have the potential to support roosting bats. Specific ecological advice will be provided following the inspection.
- 4.37 It is recommended a buffer area consisting of densely planted native species scrub such as blackthorn, common hawthorn and holly *Ilex aquifolium* is planted within the site boundary, along the woodland edge between official access points. The prickly nature of such planting would act to encourage the public to adhere to the official access routes and would provide protection of the surrounding woodland from footfall related damage as a result of informal access creation.

Ditches

- 4.38 The two ditches present on site held some water at the time of survey, however the associated flora was much the same as was present throughout other areas of tall ruderal habitat and thus there was no indication that these ditches contained water for prolonged periods of time throughout the year. Both ditches were shallow, overgrown and showed no signs of recent management.
- 4.39 It is likely that the two ditches will be lost as a result of the proposed development. Due to their condition and lack of connectivity to a wider ditch network these ditches are likely to offer only ephemeral opportunities to protected species, and hold low intrinsic ecological value.

Fauna

Bats

- 4.1 All native bat species and their roosts are legally protected under both the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). This makes it an offence to deliberately take, injure or kill a wild bat; intentionally or recklessly disturb a bat or group of bats; damage or destroy a bat roost (place of rest or breeding) even if bats are not occupying the roost at the time; intentionally or recklessly obstruct access to a bat roost; and possess or advertise/sell/exchange a bat or any part of a bat. In addition, some species of UK bat are listed as a species of principal importance to the conservation of biological diversity under the provisions of the NERC Act 2006.

- 4.2 Twelve records exist for at least three species of bat within a 1km range of the site, with the majority of the records being taken between 2013 – 2014

Foraging / Commuting Habitat

- 4.3 Common pipistrelle was identified as the dominant species using the habitats on site as part of their natural foraging range. Other species found to be making less frequent use of the habitat on site, for foraging and potentially for commuting, were noctule, soprano pipistrelle and brown long-eared bat as well as unidentified *Myotis* sp., and *Nyctalus* sp.
- 4.4 The field data indicates the site is used by small numbers of bats, primarily the hedgerows and linear scrub and treelines at the site perimeter for foraging and commuting purposes. These habitats are also well connected to the wider landscape which includes good bat foraging and commuting habitat, such as native species woodland near water, species rich grasslands and hedgerows that comprise Brierley Forest Park LNR/LWS to the north.
- 4.5 The above on-site habitats will be largely retained, with the exception of small sections of dense scrub and hedgerow H3, and as such will continue to provide suitable habitat around the site.
- 4.6 To mitigate for the minor loss of bat foraging resources it is recommended that hedgerow H2 be enhanced via the gapping up of the current structure with native hedgerow species that reflect the rest of the hedgerow, and that hedgerows and structural planting throughout the site green infrastructure is managed appropriately to promote biodiversity.
- 4.7 The planting of native species-rich neutral grassland and of scattered seed-and fruit-bearing scrub species is recommended around the attenuation basin area of the new development, along with creation of log piles. This habitat creation will not only mitigate for the loss of bat foraging habitat elsewhere on the site but will also provide potential foraging and sheltering opportunities to other wildlife species such as birds, reptiles, amphibians, hedgehogs and a range of common invertebrates.
- 4.8 To further minimise potential effects to the local bat population, a site-specific sensitive lighting scheme should be designed and implemented as part of the detailed scheme to minimise light spill onto any created and retained habitat on the site boundaries, the retained hedgerow H3 and the off-site woodland directly adjacent to the northern site boundary. This will help create dark commuting corridors around the site for use by commuting and foraging bat species as well as other nocturnal animals.
- 4.9 To provide long-term enhanced roosting opportunities for bats within the site it is recommended that 10 integrated bat roost boxes (for example Schwegler 1FR or 2FR models) are incorporated within the new development. The above designs are self-cleaning and as such require no ongoing management.

Ground Level Roost Assessment - Trees

- 4.10 Four mature trees within the site peripheries or directly adjacent to the site, consisting of two pedunculate oaks, a sycamore and an ash tree were identified as having low potential to support roosting bats. In addition, a group of approximately six semi-mature sycamore trees within scrub on the southern site boundary were also identified as having low potential for roosting bats.
- 4.11 The above trees are all set to be retained within the existing green infrastructure, which at the site perimeter will consist mainly of retained scrub and trees and new structural planting.

Badger

- 4.12 The active badger sett is located in an area which will fall within 30m of the proposed development works and as such badgers are considered to be a material consideration in the proposed development.
- 4.13 Badgers and their setts are protected by statute under Schedule 6 of the WCA and the Protection of Badgers Act 1992. They are a wide-ranging and dynamic species which can establish new setts quickly.
- 4.14 It is recommended that an updated badger survey is undertaken before commencement of any proposed activities in order to establish the status of badgers within the site and accessible land within a 30m radius of the site. This updated badger survey should ideally be undertaken during the optimal times of year for badger survey which is February to April, or October to December. Should an active sett be present within 30m of proposed groundworks a licence may be required from Natural England to allow works to proceed. Specific mitigation would be agreed as part of the terms of the licence.

Hedgehog

- 4.15 Hedgehogs are protected under Schedule 6 of the Wildlife and Countryside Act 1981, making it illegal to kill or capture them using certain methods. They are also protected under the Wild Mammals Protection Act (1996), prohibiting cruelty and mistreatment. In addition, they are listed as a Species of Principle Importance under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.
- 4.16 As part of the proposed development, a large proportion of suitable hedgehog shelter and foraging habitat will be retained at the site peripheries. Along with this, it is recommended that the minor removal of suitable hedgehog habitat is mitigated for via incorporating log piles into the green infrastructure. These should be constructed using natural materials, where possible materials produced by the ecological management of trees and hedgerows on site, and provision of hedgehog access points within perimeter garden fences and hedgerows.
- 4.17 Further enhancement that should be considered include creation within the development plans of habitats such as new native species rich neutral grassland and native species scrub planting, which will provide foraging habitat and shelter for a variety of species including hedgehog.

Other Mammals*Brown Hare*

- 4.18 Despite providing some suitability for use by brown hare, there was a lack of field evidence and records for this species in the local area, while disturbance from local dog walkers may reduce the suitability of this habitat for brown hare. As such, this species is not a material consideration with regard to the proposed development.

Water Vole

- 4.19 Water vole are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to intentionally kill, injure or take water voles, possess or control live or dead water voles or derivatives, intentionally or recklessly damage, destroy and obstruct access to any structure or place used by water voles for shelter or protection, intentionally or recklessly

disturb water voles whilst they are using such a place, sell water voles or offer to expose for sale or transport for sale, publish or cause to publish any advertisement which conveys the buying or selling of water voles

- 4.20 Although one water vole record was returned within 200m of the proposed development site, habitats within the site were largely unsuitable for this species, with a lack in connectivity to suitable habitat outside the site boundary. As such, the proposed development is not anticipated to significantly affect the local population of water vole and this species is not a notable consideration in respect to the proposed development.

Otter

- 4.21 Otter are afforded full protection under Schedule 5 and 6 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended) thus, the deliberate capturing, disturbing, injuring or killing of an otter is prohibited, as is damaging or destroying a breeding site or resting place (e.g. an otter holt).
- 4.22 No records for otter were returned for within a 1km radius of the site boundary, no suitable habitat for otter was present within the site and habitat connectivity to areas of otter suitability was lacking. Thus, this species is not a material consideration with the regard to the proposed development.

General Wild Mammal

- 4.23 Signs of unidentified mammal use of the site was observed during the field survey and although habitats within the proposed development site were assessed as being largely unsuitable for brown hare, water vole and otter, the complete absence of all of these species at the site cannot be assumed, in light of previous local records and site connectivity to areas of good suitability for these species to the north.
- 4.24 Brown hare, water vole and otter are also Species of Principal Importance under Section 41 of the NERC Act 2006, and all wild mammals in the UK are afforded protection under the Wild Mammals (Protection) Act 1996, which makes it an offence for any person to harm a wild animal in certain ways with the intend to inflict unnecessary suffering.
- 4.25 Thus, to ensure that wild mammals that may make use of the site are not harmed, appropriate precautionary working measures are recommended for any activity taking place at this site:
- During construction, any pipes greater than 250mm in diameter should be capped if they are left open overnight, thereby preventing wildlife from becoming trapped;
 - Any pits or trenches should be similarly covered overnight, or left with a suitable means of escape, e.g. sturdy wooden planks.

Birds

- 4.26 All wild bird species are protected while nesting by the Wildlife and Countryside Act 1981 (*as amended*). This legislation protects wild birds and their eggs from intentional harm, and makes it illegal to intentionally take, damage, or destroy a wild bird nest while it is in use or being built.
- 4.27 The proposals will result in the loss of areas of poor semi-improved grassland, arable land and tall ruderal vegetation habitats with minor impact anticipated on some trees, scrub and some short sections of hedgerow which provide and nesting habitat for common and widespread bird species.

These habitats represent nesting and foraging resources that can potentially be used by a variety of generalist bird species, including those identified during the field survey.

- 4.28 These habitats are widespread and well represented in the wider local area however, and the majority of suitable nesting and foraging habitats at the site peripheries will be retained and enhanced for the benefit of local wildlife, including birds. Thus the site will continue to provide nesting and foraging habitats for bird species, while the creation of domestic gardens within the residential development will create areas of additional suitable habitat for urban edge species.
- 4.29 It is recommended that suitable bird nesting, foraging and sheltering habitat loss be further mitigated by incorporation of native fruit- and seed-bearing species within the landscaping scheme, particularly around the attenuation basin area in the north eastern corner of the site, to provide a varied foraging resource to birds and to improve habitat connectivity around the site.
- 4.30 Any removal of suitable nesting habitat (hedgerow, scrub, trees, buildings) should occur outside of the bird breeding season (March to August/September inclusive) to minimise the risk of disturbance to breeding birds. If this is not possible, such vegetation should be checked within 48-24hrs prior to removal by a suitably experienced ecologist to confirm the absence of active nests. If active nests are found, vegetation must be left undisturbed and suitably buffered from works until all birds have fledged. Specific advice should be sought prior to undertaking any vegetation clearance including that which has been recommended above for allowing full access of the site.
- 4.31 It is recommended that a range of bird boxes is provided on suitable retained trees throughout the green infrastructure to provide further enhancement in terms of suitable nesting resources. Suitable designs include: Schwegler 2GR, 1B, and 2M boxes, and Vivara Pro 28mm, 32mm, and open fronted designs.

Reptiles

- 4.32 All common reptiles are protected from killing or injury under the Wildlife & Countryside Act 1981 (*as amended*) and are Species of Principal Importance under Section 41 of the NERC Act 2006.
- 4.33 The hedgerows and scrub with adjacent tall ruderal habitat represent some potential foraging and refuge areas for reptiles while the poor semi-improved grassland and arable field that made up the majority of the site were of low value to foraging reptiles while basking opportunities were limited and no reptile evidence was found during the field survey.
- 4.34 Habitat retention on the site peripheries will benefit common reptile species, should they be present, and will also create and enhance wildlife corridors and connectivity of habitats within the local landscape.
- 4.35 It is further recommended that additional reptile habitat be created in the form new species rich grassland and native species scrub planting around the proposed attenuation basin. The addition of log piles at appropriate locations within retained habitat along the northern site boundary and near the attenuation basin will further increase reptile shelter and foraging opportunities.
- 4.36 In order to ensure no breach of the relevant legislation takes place it is recommended that site clearance takes place under ecological supervision in a directional manner as outlined in the Reptile Method Statement below.

Great Crested Newts and Other Amphibians

- 4.37 GCN and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (*as amended*), and by the Conservation of Habitats and Species Regulations 2017 (*as amended*). These make it an offence to damage, destroy or obstruct any place used by GCN for breeding or shelter, disturb a GCN, or kill, injure or take any GCN. In addition, GCN and common toad are listed as a species of principal importance to the conservation of biological diversity under the provisions of the NERC Act 2006.
- 4.38 Pond P1 was a stocked fishing pond with “poor” suitability to support breeding GCN (HSI of 0.43), and this species is considered highly unlikely to breed within this pond, whereas pond P2 had “good” suitability (HSI of 0.77), supporting a good aquatic vegetation coverage and lacking a significant predator presence.
- 4.39 The site provided suitable terrestrial habitats for GCN and other amphibians in the form of hedgerow/tree bases, and areas of dense scrub and tall ruderal vegetation. The majority of these habitats will be retained and enhanced as part of the proposed development including site boundary habitats that will buffer to the ponds to the north from the development footprint. The habitats that will be lost to the development largely comprise heavily managed arable land and poor semi-improved grassland, which offers very limited foraging and commuting opportunities for GCN and other amphibians.
- 4.40 The green infrastructure will encompass an attenuation basin, to be created in the south west corner of the site, directly south from pond P2, where recommended habitat creation includes new native species rich grassland and scrub planting. To provide further enhancement for amphibians it is recommended that log piles also be incorporated in this area to provide additional foraging and sheltering opportunities and enhance general habitat connectivity for such species. The landscaping will additionally maintain connectivity to suitable amphibian habitat within Brierly Forest Park LNR/LWS) to the north of the site.
- 4.41 Despite the close proximity of the development footprint to ponds P1 and P2, only minor losses of suitable GCN terrestrial habitat is therefore anticipated. To further reduce this risk, it is recommended that site clearance be undertaken using reasonable avoidance measures as outlined in the GCN Method Statement in Section 5 of this report.

White-Clawed Crayfish and Other Invertebrates

- 4.42 No suitable waterways or waterbodies for white clawed crayfish or other aquatic invertebrates were present within the site itself or any accessible areas in close proximity to the site, therefore white-clawed crayfish and other aquatic invertebrate species are not considered to be a constraint to the development.
- 4.43 Whilst plant species diversity was low across the site, the structural diversity present within habitats at the site peripheries and along central hedgerow H3 provided a variety of suitable foraging, resting and reproductive habitats for a range of common terrestrial invertebrate species, including the butterfly species that were observed during the field survey. These habitats make up only a small proportion of the site however and are set to be largely retained as part of the proposed green infrastructure.
- 4.44 Minor losses of such habitats can be adequately mitigated for within the landscaping via the planting of new native trees, shrubs and flowering grassland or lawn mixes, along with the incorporation of

enhancement features such as log piles, particularly along the northern site boundary. Terrestrial invertebrate species are therefore not considered to be a constraint to the development.

Invasive species

- 4.45 It is an offence to plant or otherwise cause to grow in the wild, any of the species that are listed on Schedule 9 of the Wildlife and Countryside Act in England and Wales, such as those discussed below.
- 4.46 Japanese knotweed grows rapidly and reproduces via underground rhizomes. It poses a risk to local biodiversity and to the integrity of building foundations and is notoriously tough to eradicate. It is most commonly spread via contaminated soil (particularly near waterways), equipment and machinery and suppresses all other plant growth as well as causing structural damage to buildings.
- 4.47 Several Japanese knotweed stands were recorded present within the dense scrub and tall ruderal vegetation along the western site boundary, therefore it is recommended that a specialist Japanese knotweed removal company be contacted to eradicate this plant from the site.

5.0 METHOD STATEMENT: GREAT CRESTED NEWT & COMMON REPTILES

Introduction

- 5.1 The presence of GCN and reptile species has been recorded within the area local to the development site. The following working method statement provides details of the working methods to be employed during vegetation clearance works in preparation for the proposed development works, as shown in the illustrative (P19-1014 007B dated 24.01.2020; see Appendix B).
- 5.2 This method statement is to be followed to ensure no breach in legislation in relation to reptiles or amphibians (in particular GCN).

Legislation

- 5.3 GCN are afforded international protection under Regulation 43 of the and the Conservation of Habitats and Species Regulations 2017 (*as amended*) and this makes it illegal to:
- Deliberately capture, injure or kill any wild animal of a European Protected Species (EPS) such as a GCN
 - Deliberately disturb wild animals of an EPS (affecting ability to survive, breed or rear young) – disturbance of animals includes in particular any disturbance which is likely to impair their ability to survive, to breed or reproduce, or to rear or nurture their young
 - Deliberately disturb wild animals of an EPS (impairing ability to migrate or hibernate) – disturbance of animals includes in particular any disturbance which is likely to impair their ability in the case of hibernating or migratory species to hibernate or migrate
 - Deliberately disturb wild animals of an EPS (affecting local distribution and abundance) – disturbance of animals includes in particular any disturbance which is likely to affect significantly the local distribution or abundance of the species to which they belong
 - Damage or destroy a breeding site or resting place of a wild animal an EPS
- 5.4 GCN are also afforded national protection under the Wildlife & Countryside Act 1981 (*as amended*) and thus it is illegal to:
- Recklessly or intentionally obstruct access to any structure or place which any GCN uses for shelter or protection
 - Recklessly or intentionally disturb any GCN while it is occupying a structure or place which it uses for shelter or protection
- 5.5 In addition, all common reptiles are protected from killing or injury under Section 9 of the Wildlife & Countryside Act 1981 (*as amended*) and are Species of Principal Importance under Section 41 of the NERC Act 2006, making it illegal to:
- Intentionally kill, injure or taking by any method a wild reptile species
 - Be in possession of, or trade in a wild reptile species
- 5.6 It is possible to avoid offences under the above-mentioned legislation through the provision of mitigation which minimises the likelihood of an offence being committed. Such mitigation may

include undertaking works at an appropriate time of the year and completing works in accordance with methods that will minimise or avoid potential disturbance or destruction of habitats.

Precautionary Working Methods

- 5.7 All site works must proceed in accordance with the method statement as outlined below, to minimise the potential for the commitment of an offence under any of the above described wildlife legislation. This method statement includes precautionary works methods for the protection of great crested newts and reptiles:

Prior to Works Commencement

- Grassland / tall ruderal vegetation / scrub / hedgerow / tree clearance should occur during the reptile active season which runs between March to September inclusive (during temperatures above 10°C).
- Prior to any commencement of works a toolbox talk must be presented to site management and contractors by an appropriately qualified and experienced ecological clerk of works (ECoW).
- Upon completion of the toolbox talk the extent of the habitat to be retained as part of the proposed development (trees, hedgerows and dense scrub) will be marked out and provided with appropriate protection.
- Once areas of habitat retention are marked, the areas of vegetation to be removed (poor semi-improved grassland, arable land and tall ruderal vegetation, plus some small sections of hedgerow and scrub) will undergo a finger-tip search by the ECoW to search for GCN/reptiles.

Lowering of Vegetation

- Prior to site clearance, grassland / scrub / tall ruderal vegetation / hedgerows should be strimmed / cut to a minimum height of c.150mm, with strimming/cutting undertaken in a directional manner towards appropriate areas of natural refuge for reptiles and amphibians, and as directed by the ECoW.
- The ECoW should then undertake a walkover / hand search of the habitats before these are strimmed a second time, this time to ground level.

Site Clearance and Ground Works

- Following strimming to ground level as above, habitats should be maintained as a short sward or as bare ground.
- Any trenches left overnight within this area must have a sloping end or a stout plank ramp provided to prevent animals from becoming trapped within them.
- The site should be kept free from piles of rubble / soil as these can provide temporary suitable areas of shelter or rest for reptiles and amphibians, including GCN.

- 5.8 In the unlikely event that a GCN or reptile is found all operations will be stopped immediately and the animal allowed to disperse naturally. Completion of the works will be delayed until the site has been re-assessed for the need of a Natural England derogation licence.

- 5.9 It is considered that with the above precautionary working measures, any significant effects on the reptile and amphibian populations, including GCN, will be avoided and the risk of causing a breach of legislation will be minimised.

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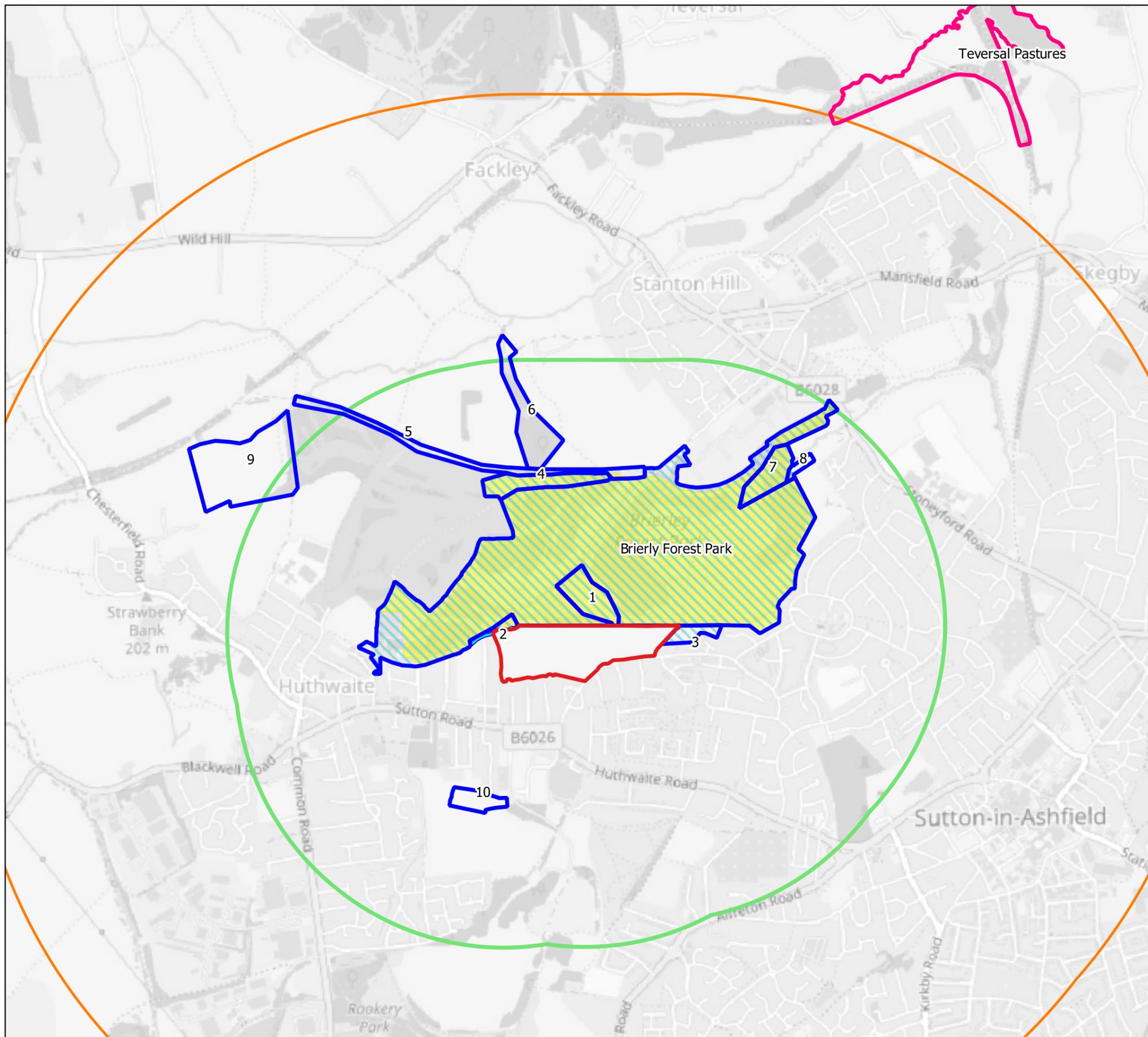
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Key

- Site Boundary
- 2km Buffer
- 1km Buffer
- Country Park
- Local Nature Reserve (LNR)
- Local Wildlife Site (LWS)
- Site of Special Scientific Interest (SSSI)

LOCAL WILDLIFE SITES KEY:

1. Brierly Forest Marsh
2. Brierly Park Marshy Grassland (a.k.a Huthwaite Park Marshy Grassland)
3. Sutton-in-Ashfield District Grassland (a.k.a Grassland, Sutton-in-Ashfield)
4. Stubbinghill Farm Meadow
5. Stanton Hill Colliery Dismantled Railway Line
6. Spring Wood, Stanton Hill
7. Stanton Hill Colliery Spoil
8. Stanton Hill Relect Grassland
9. Herod's Hill Grassland
10. Crossley Avenue Grassland



client
Bellway Homes (East Midlands) Ltd.

project
Land off Ashland Road, Sutton-in-Ashfield, Nottinghamshire

drawing title
CONSULTATION PLAN - DESIGNATED SITES

scale
1:15000

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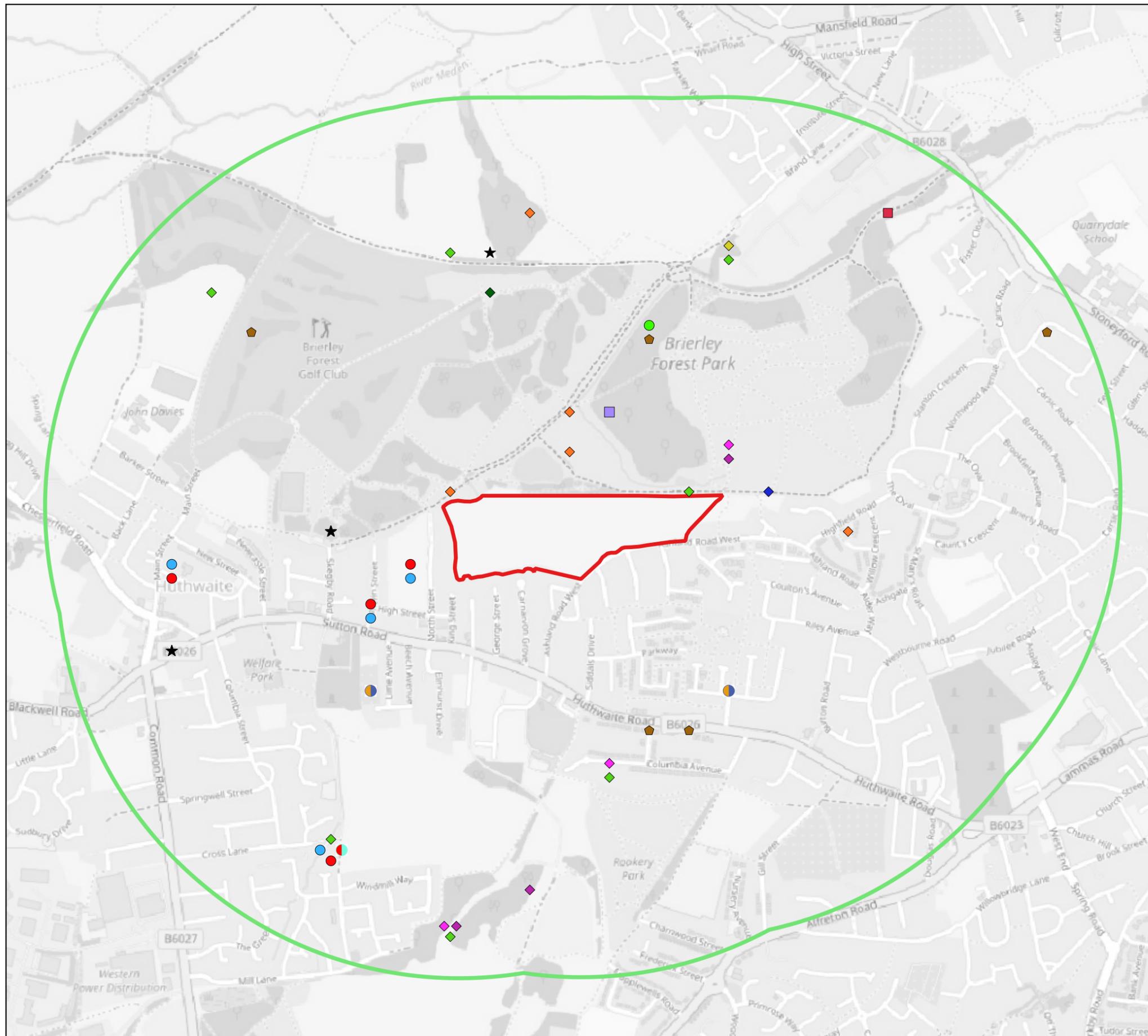
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Figure 1

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Key

- Site Boundary
- 1km buffer
- Badger
- Unidentified bat species
- Common Frog
- Common Lizard
- Common Pipistrelle
- Common Toad
- Grass Snake
- Great Crested Newt
- Hedgehog
- Noctule
- Nyctalus sp.
- Pipistrellus sp.
- Slow-worm
- Smooth Newt
- Water Vole
- Bird Species

client
Bellway Homes (East Midlands) Ltd.

project
Land off Ashland Road, Sutton-in-Ashfield, Nottinghamshire

drawing title
CONSULTATION PLAN - PROTECTED SPECIES

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1:10000

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2/3/2020

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Key

- Site Boundary
- × Scrub - scattered
- Target note
- coniferous trees
- Broadleaved tree
- Standing water
- Running water
- Intact hedge - species-poor
- Fence
- A Cultivated/disturbed land - arable
- Other tall herb and fern - ruderal
- Poor semi-improved grassland
- Scrub - dense/continuous

TARGET NOTES

TN1 - Clump of Japanese knotweed within vegetation on western site boundary.

TN2 - Localised additional herbaceous species present more typical of wetter grassland, likely in association with wet ditches and surrounding damp patches.

client
Bellway Homes (East Midlands) Ltd

project
Land off Asland Road,
Sutton-in-Ashfield, Nottinghamshire

drawing title
PHASE 1 HABITAT PLAN -
WESTERN HALF OF SITE

scale
1:1500

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issue
2/3/2020

drawing / figure number
Figure 3

rev
7919-E-RevA





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Key

- Site Boundary
- × Scrub - scattered
- ⊙ Target note
- Broadleaved tree
- Standing water
- Intact hedge - species-poor
- + + + Hedge with trees - species-poor
- + + + Fence
- Cultivated/disturbed land - arable
- Other tall herb and fern - ruderal
- Poor semi-improved grassland
- Scrub - dense/continuous

TARGET NOTES

TN3 - Localised additional herbaceous species present likely due to natural dispersal via connectivity between this area and the grassland to the north which is managed for species richness.

client
Bellway Homes (East Midlands) Ltd

project
Land off Asland Road,
Sutton-in-Ashfield, Nottinghamshire

drawing title
**PHASE 1 HABITAT PLAN -
EASTERN HALF OF SITE**

scale
1:1500

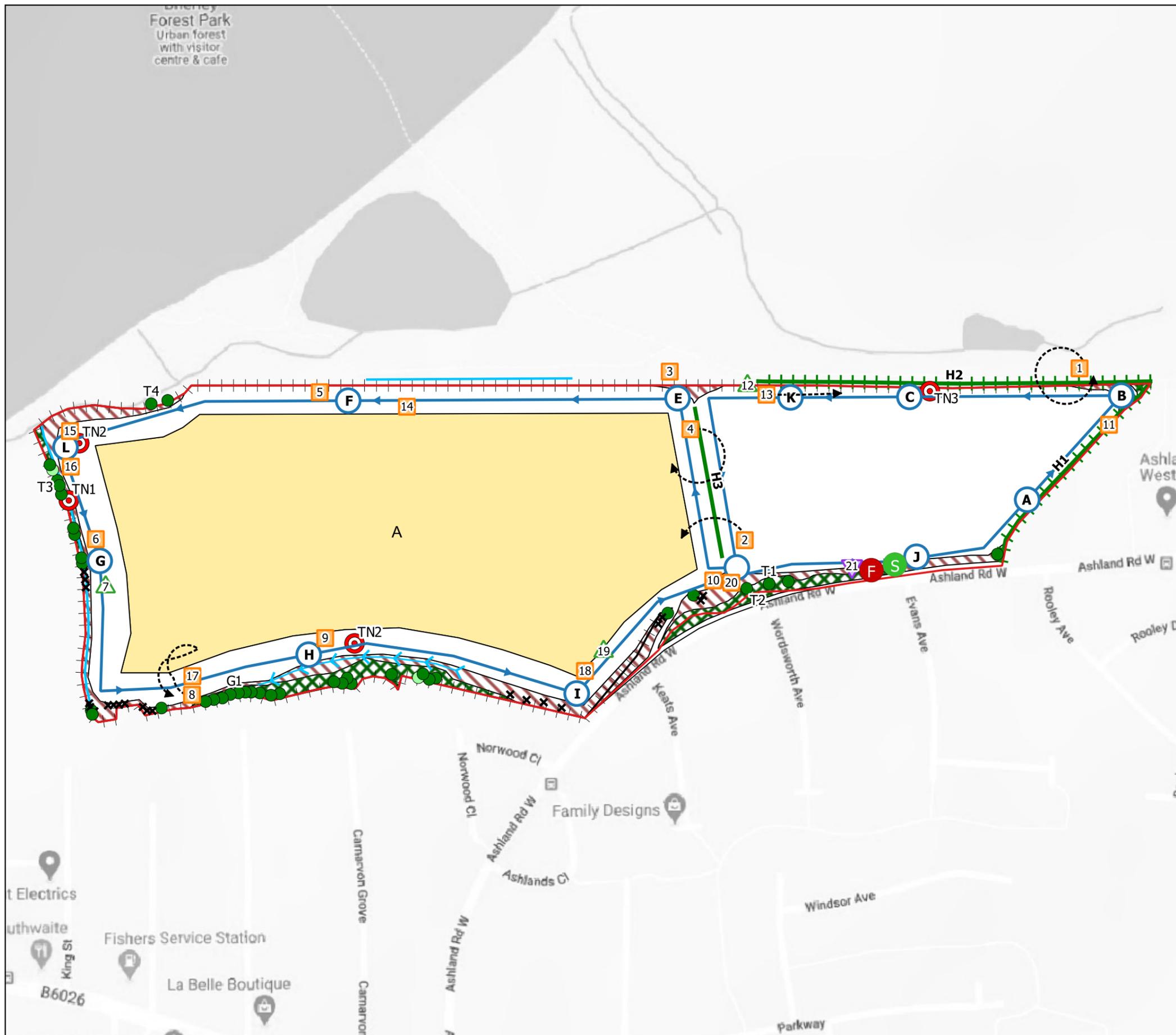
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Key:

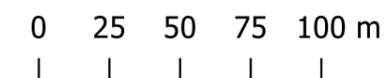
- Common Pipistrelle
- ▲ Myotis Species
- ▼ Noctule
- - - > Flight Arrow
- Start point
- Finish point
- Point Count Locations
- Transect Route
- Site Boundary

Bat Species (contacts)

Ref	Bat sp	Time	Behaviour	Passes
PC A	No Bats	20:07-20:12		
PC B	Ref 1	20:14-20:19		
1	Common pipistrelle	20:15	F	4
PC C		20:21-20:26		
PC D	Ref 2			
2	Common pipistrelle	20:32	F	5
PC E	Ref 3 & 4	20:37-20:42		
3	Common pipistrelle	20:37	C	1
4	Common pipistrelle x2	20:39	F, S	3
PC F	Ref 5	20:45-20:50		
5	Common pipistrelle	20:46	F, S	3
PC G	Ref 6 & 7	20:55-21:00		
6	Common pipistrelle	20:56	F, S	5
7	Myotis sp.	20:56	F	3
8	Common pipistrelle x2	21:01	F	C
PC H	Ref 9	21:06-21:11		
9	Common pipistrelle	21:10	F	3
PC I	No Bats	21:14-21:19		
10	Common pipistrelle	21:21	F	3
PC J	No Bats	21:24-21:29		
11	Common pipistrelle	21:32	P	3
PC K	Ref 12	21:37-21:42		
12	Myotis sp.	21:40	F	1
13	Common pipistrelle	21:41	F	1
14	Common pipistrelle	21:48	F	2
PC L	Ref 15 & 16	21:52-21:27		
15	Common pipistrelle	21:54	F	1
16	Common pipistrelle	21:56	F	1
17	Common pipistrelle x2	21:01	F, S	C
18	Common pipistrelle	22:09	F	1
19	Myotis sp.	22:10	S	1
20	Common pipistrelle	22:12	p	3
21	Noctule	22:14	P	2

Behaviours: P= Pass, F= Foraging, C = Commuting, S= Social, U= Unknown

Passes: C= Continuous



client
Bellway Homes (East Midlands) Ltd.

project
Ashland Road, Sutton in Ashfield, Nottinghamshire

drawing title
BAT TRANSECT PLAN 22.08.2019

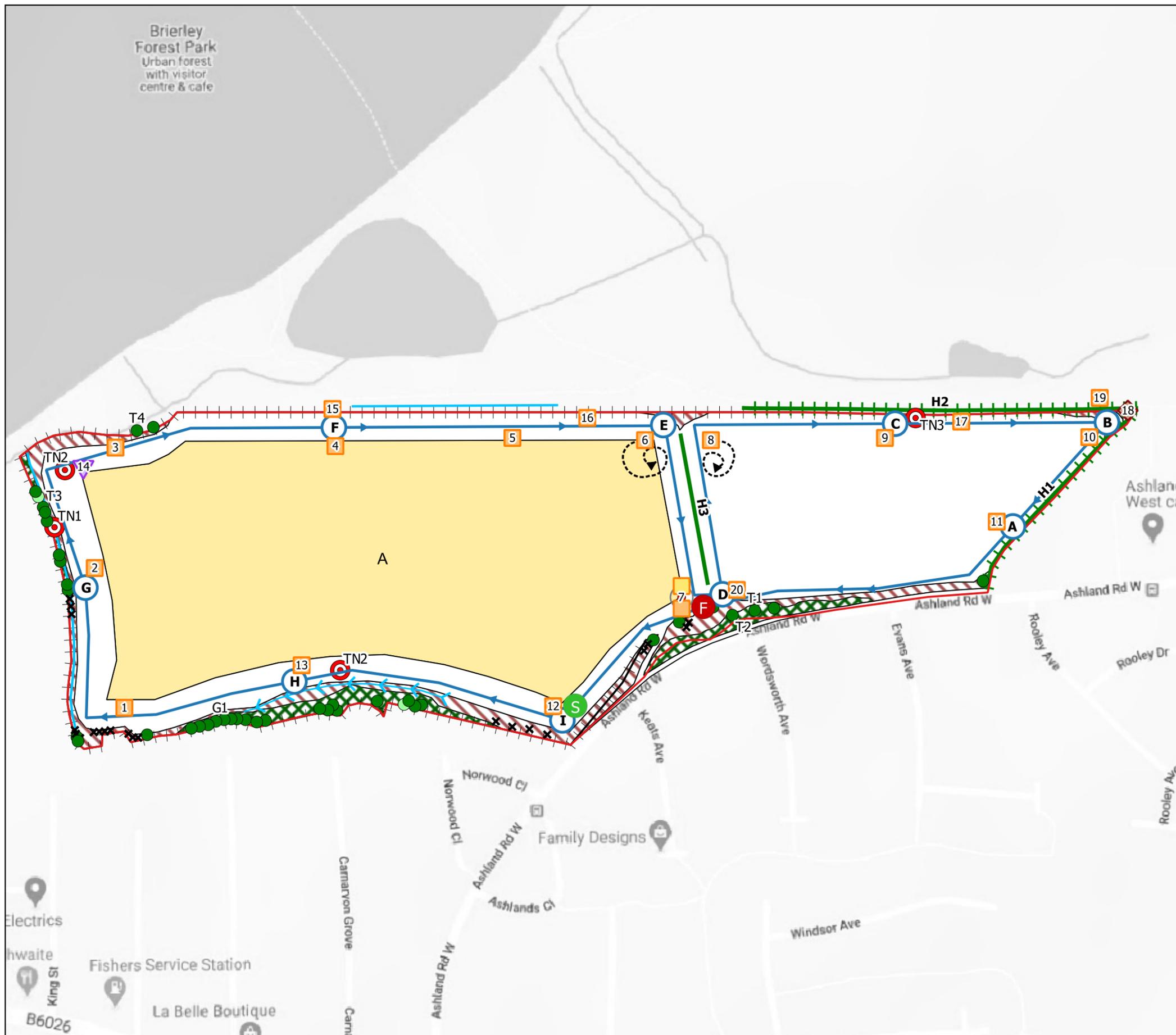
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2/3/2020

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Figure 5

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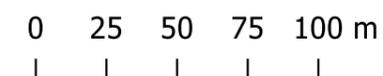
Key:

- Common Pipistrelle
- Soprano Pipistrelle
- Brown Long-eared
- Noctule
- Flight Arrow
- Start point
- Finish point
- Point Count Locations
- Transect Route
- Site Boundary

Bat Species (contacts)

id	Ref	Bat species	Time	Behaviour	Passes
1	PC I	No Bats	19:25-19:30		
2	PC H	No Bats	19:34-19:39		
3	1	Common pipistrelle	19:41	C	1
4	2	Common pipistrelle	19:43	P	2
5	3	Common pipistrelle	19:48	C	1
5	PC F	Ref 4	19:50-19:55		
6	4	Common pipistrelle	19:50	U	2
7	5	Common pipistrelle	19:56	C	4
8	6	Common pipistrelle	19:59	F/C	3
9	PC E	Ref 6	20:01-20:06		
10	7	Common pipistrelle	20:02	U	M
11	7	Soprano pipistrelle	20:02	U	M
12	PC D	Ref 8	20:09-20:14		
13	8	Common pipistrelle	20:10	C/F	M
14	9	Common pipistrelle	20:17	U	1
15	PC B	Ref 10	20:21-20:26		
16	10	Common pipistrelle	20:21	p	2
16	PCA	Ref 11	20:29-20:34		
17	11	Common pipistrelle	20:31	U	1
18	PC I	Ref 12	20:41-21:46		
19	12	Common pipistrelle	20:46	U	1
20	PC H	Ref 13	20:47-20:50		
21	13	Common pipistrelle	20:49	P	1
23	14	Noctule	20:49	P	1
24	PC F	Ref 15	20:55-21:58		
25	15	Common pipistrelle	20:59	F	M
26	16	Common pipistrelle	21:02	F	M
27	17	Common pipistrelle	21:06	P	M
28	PC B	Ref 18 & 19	21:07-21:10		
29	18	Brown long eared	21:07	C	1
30	19	Common pipistrelle	21:08	F	M
31	PC D	Ref 20	21:13-21:16		
32	20	Common pipistrelle	21:15	C	1

Behaviours: C= commuting, P= Passing, U= Unknown, F= Foraging
Passes: M = Multiple



client
Bellway Homes (East Midlands) Ltd.

project
Ashland Road, Sutton in Ashfield, Nottinghamshire

drawing title
BAT TRANSECT PLAN 16.09.2019

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Figure 6

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7919-E-RevA



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Key

- site boundary
- 500m radius around site boundary
- waterbodies

client
Bellway Homes (East Midlands) Ltd

project
Land off Asland Road,
Sutton-in-Ashfield, Nottinghamshire

drawing title
WATERBODY PLAN



scale
1:6000

drawn
WVR/

issue
2/3/2020

drawing / figure number
Figure 7

Rev
7919-E-RevA

Appendix A: Botanical Species list

Common Name	Scientific Name	DAFOR
Tall Ruderal		
bramble	<i>Rubus fruticosus</i> agg.	Locally D / A
broadleaved dock	<i>Rumex obtusifolius</i>	O
buckler fern sp.	<i>Dryopteris</i> sp.	R
cleavers	<i>Galium aparine</i>	A
clustered dock	<i>Rumex conglomeratus</i>	F
cock's foot	<i>Dactylis glomerata</i>	O
coltsfoot	<i>Tussilago farfara</i>	Locally F
common comfrey	<i>Symphytum officinale</i>	R
common mallow	<i>Malva sylvestris</i>	R
common nettle	<i>Urtica dioica</i>	F
common ragwort	<i>Jacobaea vulgaris</i>	R
common vetch	<i>Vicia sativa</i>	Locally F
cow parsley	<i>Anthriscus sylvestris</i>	F
creeping buttercup	<i>Ranunculus repens</i>	
creeping cinquefoil	<i>Potentilla reptans</i>	O
creeping thistle	<i>Cirsium arvense</i>	A
dandelion sp.	<i>Taraxacum officinale</i> agg.	F
false oat-grass	<i>Arrhenatherum elatius</i>	F
fescue sp.	<i>Festuca</i> sp.	R
field horsetail	<i>Equisetum arvense</i>	R
goat's-beard	<i>Tragopogon pratensis</i>	R
great willowherb	<i>Epilobium hirsutum</i>	F
hedge bindweed	<i>Calystegia sepium</i>	O
hedge woundwort	<i>Stachys sylvatica</i>	R
hogweed	<i>Heracleum sphondylium</i>	O
Italian ryegrass	<i>Festuca perennis</i>	R
large bindweed	<i>Calystegia sepium</i>	Locally D
meadowsweet	<i>Filipendula ulmaria</i>	Locally A
prickly sows-thistle	<i>Sonchus asper</i>	R
red clover	<i>Trifolium pratense</i>	R
ribwort plantain	<i>Plantago lanceolata</i>	O
rosebay willowherb	<i>Chamaenerion angustifolium</i>	D
rough meadow-grass	<i>Poa trivialis</i>	F
soft rush	<i>Juncus effusus</i>	R
teasle	<i>Dipsacus fullonum</i>	R
white clover	<i>Trifolium repens</i>	F
white dead nettle	<i>Lamium album</i>	O
wild strawberry	<i>Fragaria vesca</i>	R
willowherb sp.	<i>Epilobium</i> sp.	F
wood avens	<i>Geum urbanum</i>	Locally A
Yorkshire-fog	<i>Holcus lanatus</i>	F

Common Name	Scientific Name	DAFOR
Poor Semi-improved Grassland		
cock's foot	<i>Dactylis glomerata</i>	D
common mouse-ear	<i>Cerastium fontanum</i>	O
common sorrel	<i>Rumex acetosa</i>	O
common vetch	<i>Vicia sativa</i>	Locally F
couch grass	<i>Elymus repens</i>	R
Cut-leaved crane's-bill	<i>Geranium dissectum</i>	O
creeping buttercup	<i>Ranunculus repens</i>	Locally F
creeping cinquefoil	<i>Potentilla reptans</i>	R
creeping thistle	<i>Cirsium arvense</i>	R
dandelion sp.	<i>Taraxacum officinale</i> agg.	F
false oat-grass	<i>Arrhenatherum elatius</i>	D
fescue sp.	<i>Festuca</i> sp.	O
field horsetail	<i>Equisetum arvense</i>	R
goat's-beard	<i>Tragopogon pratensis</i>	R
hedge bindweed	<i>Calystegia sepium</i>	R
Italian ryegrass	<i>Festuca perennis</i>	R
meadow buttercup	<i>Ranunculus acris</i>	F
meadow foxtail	<i>Alopecurus pratensis</i>	F
meadow vetchling	<i>Lathyrus pratensis</i>	O
mosses	<i>Bryophyta</i> sp.	Locally F
perennial ryegrass	<i>Lolium perenne</i>	D
ribwort plantain	<i>Plantago lanceolata</i>	F
rough meadow-grass	<i>Poa trivialis</i>	F
great burnet	<i>Sanguisorba officinalis</i>	Locally F
soft rush	<i>Juncus effusus</i>	Locally F
timothy	<i>Phleum pratense</i>	O
tufted vetch	<i>Vicia cracca</i>	Locally F
white clover	<i>Trifolium repens</i>	F
Yorkshire-fog	<i>Holcus lanatus</i>	D
Dense and Scattered Scrub		
ash	<i>Fraxinus excelsior</i>	R
blackthorn	<i>Prunus spinosa</i>	F
bramble	<i>Rubus fruticosus</i> agg.	A
common elder	<i>Sambucus nigra</i>	F
common hawthorn	<i>Crataegus nonogyna</i>	F
common hazel	<i>Corylus avellana</i>	O
common nettle	<i>Urtica dioica</i>	F
field maple	<i>Acer campestre</i>	O
goat willow	<i>Salix caprea</i>	O
holly	<i>Ilex aquifolium</i>	R
large bindweed	<i>Calystegia sepium</i>	Locally A
plum	<i>Prunus</i> sp.	Locally F

Common Name	Scientific Name	DAFOR
privet	<i>Ligustrum vulgare</i>	R
sycamore	<i>Acer pseudoplatanus</i>	O
Scattered Broadleaved Trees		
ash	<i>Fraxinus excelsior</i>	O
pedunculate oak	<i>Quercus robur</i>	F
common hawthorn	<i>Crataegus nonogyna</i>	O
copper beech	<i>Fagus sylvatica var.</i>	R
horse chestnut	<i>Aesculus hippocastanum</i>	O
Norway spruce	<i>Picea abies</i>	R
sycamore	<i>Acer pseudoplatanus</i>	F
Broadleaved Plantation Woodland – Adjacent to Northern Boundary		
ash	<i>Fraxinus excelsior</i>	F
black bryony	<i>Tamus communis</i>	R
blackthorn	<i>Prunus spinosa</i>	O
bramble	<i>Rubus fruticosus agg.</i>	R
cleavers	<i>Galium aparine</i>	O
clustered dock	<i>Rumex conglomeratus</i>	R
common dogwood	<i>Cornus sanguinea</i>	O
common elder	<i>Sambucus nigra</i>	O
common hawthorn	<i>Crataegus nonogyna</i>	O
common hazel	<i>Corylus avellana</i>	O
common nettle	<i>Urtica dioica</i>	R
crack willow	<i>Salix fragilis</i>	O
creeping thistle	<i>Cirsium arvense</i>	R
false oat grass	<i>Arrhenatherum elatius</i>	O
field maple	<i>Acer campestre</i>	F
goat willow	<i>Salix caprea</i>	O
great willowherb	<i>Epilobium hirsutum</i>	O
guelder rose	<i>Viburnum opulus</i>	R
hogweed	<i>Heracleum sphondylium</i>	R
pedunculate oak	<i>Quercus robur</i>	O
sessile oak	<i>Quercus petraea</i>	R
white poplar	<i>Populus alba</i>	Locally A
white willow	<i>Salix alba</i>	O
wild cherry	<i>Prunus avium</i>	O
Yorkshire-fog	<i>Holcus lanatus</i>	R
Scattered Broadleaved Trees		
ash	<i>Fraxinus excelsior</i>	O
pedunculate oak	<i>Quercus robur</i>	F
common hawthorn	<i>Crataegus nonogyna</i>	O
copper beech	<i>Fagus sylvatica var.</i>	R
horse chestnut	<i>Aesculus hippocastanum</i>	O
Norway spruce	<i>Picea abies</i>	R

Common Name	Scientific Name	DAFOR
sycamore	<i>Acer pseudoplatanus</i>	F
H1: Native Species-poor Hedgerow (total woody species only)		
ash	<i>Fraxinus excelsior</i>	R
blackthorn	<i>Prunus spinosa</i>	D
bramble	<i>Rubus fruticosus agg.</i>	R
common elder	<i>Sambucus nigra</i>	O
common hawthorn	<i>Crataegus nonogyna</i>	D
common hazel	<i>Corylus avellana</i>	O
goat willow	<i>Salix caprea</i>	R
large bindweed	<i>Calystegia sepium</i>	O
rose sp.	<i>Rosa sp.</i>	R
H2: Native Species-poor Hedgerow (total woody species only)		
ash	<i>Fraxinus excelsior</i>	O
blackthorn	<i>Prunus spinosa</i>	A
bramble	<i>Rubus fruticosus agg.</i>	R
common elder	<i>Sambucus nigra</i>	R
common hawthorn	<i>Crataegus nonogyna</i>	A
common hazel	<i>Corylus avellana</i>	R
field maple	<i>Acer campester</i>	O
goat willow	<i>Salix caprea</i>	R
horse chestnut	<i>Aesculus hippocastanum</i>	F
large bindweed	<i>Calystegia sepium</i>	R
pedunculate oak	<i>Quercus robur</i>	O
sycamore	<i>Acer pseudoplatanus</i>	F
H3: Native Species-poor Hedgerow (total woody species only)		
blackthorn	<i>Prunus spinosa</i>	D
bramble	<i>Rubus fruticosus agg.</i>	O
common elder	<i>Sambucus nigra</i>	O
common hawthorn	<i>Crataegus nonogyna</i>	A
common hazel	<i>Corylus avellana</i>	R
field maple	<i>Acer campester</i>	R
hops	<i>Humulus lupulus</i>	O
<p>The DAFOR species scale is as follows: D = Dominant, A = Abundant, F = Frequent, O = Occasional and R = Rare</p> <p>Species in bold: Grass species</p> <p>Species highlighted in blue: Characteristic species for Neutral Grassland as on the Sites of Importance for Nature Conservation (SINC) Selection list in Nottinghamshire (14 or more characteristic species required to be considered neutral grassland of conservation importance).</p>		

Appendix B: Illustrative Master Plan



- KEY**
-  Site Boundary
10.31 Ha
 -  Indicative Development Parcels
8.49Ha = circa 300 dwellings @ 34dph
 -  Site Access
to be detailed by transport consultants
 -  Primary Route Accomodating a Bus Route
 -  Primary Route
 -  Secondary Route
 -  Shared Private Drives
 -  Existing Vegetation
Shown Indicatively
 -  Proposed Vegetation
Shown Indicatively
 -  Public Rights of Way
 -  Indicative Footpath Connections
 -  Attenuation Basin
 -  Fowl Water Pumping Station