Land to the South of Ravensthorpe Road

Ecological Survey Report

Miller Homes

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Quality information

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1. Introduction

Miller Homes is seeking outline planning permission for a proposed new residential development (the scheme) to the south of Ravensthorpe Road, Dewsbury (the site, approximate central grid reference SE 230 196). The boundary of the site is shown on the Figures provided with this report, including Figure 1 which provides a map of the habitats present in association with the site.

AECOM was commissioned by Miller Homes to provide advice on requirements for ecological survey in support of these proposals, and subsequently to deliver the programme of recommended surveys and to provide an assessment of the ecological constraints associated with the site.

This report has been prepared to define the baseline ecological conditions associated with the site as identified through the commissioned programme of ecological surveys completed by appropriately experienced ecologists from AECOM. The ecology surveys covered by this report are:

- Phase 1 habitat survey
- Hedgerow survey
- Wintering bird survey
- Breeding bird survey
- Preliminary bat roost appraisal
- Bat activity survey

Information is also provided to clarify the surveys of other potentially relevant habitats and species that have been scoped out. In all cases this is because there are no suitable conditions associated with the site.

The proposals for the site are still at an early stage, and therefore there was not a detailed scheme design that could be assessed. Accordingly, a precautionary approach is taken to assessment in this report that does not require knowledge or assumptions of final scheme design. Given the small size (8.37 ha) of the site and the defined baseline conditions, it is considered highly unlikely that the conclusions of the current assessment would be materially different if a detailed scheme layout was available.

Given the foregoing, the purpose of this report is to provide a robust but still relatively high level appraisal of the ecological risks and opportunities associated with the site, as would be expected for an outline planning application where the precise details of the scheme are yet to be specified and agreed with Kirklees District Council. Accordingly, the assessment of potential impacts from the scheme is general not specific, and recommendations are made that have potential to contribute to the avoidance or mitigation of potential ecological impacts, such that these impacts are no longer relevant at the time of a full planning application. This includes consideration of potential options for ecological enhancement in accordance with local and national planning policy.

The results of the work undertaken to date do not automatically remove the need for further ecological surveys and technical reports, and further work may be necessary to support a subsequent full planning application. However, sufficient ecological surveys and assessment have been undertaken to understand the ecological constraints and opportunities associated with the site, to allow determination of the outline planning application, and to allow the specification of reserved matters.

2. Legislation and Planning Policy

The following wildlife legislation (Table 2.1) and national and local planning policy (Table 2.2) is potentially relevant to the scheme. This legislation and planning policy has been considered when planning and undertaking the ecology surveys using the methods described in Section 3, when identifying potential ecological constraints to the scheme, and when making recommendations for master planning and mitigation in Section 5 of the report.

Compliance with legislation may also require the attainment of relevant protected species licences prior to the implementation of development plans, and advice is given on potential requirements for development licences.

Table 2.1: Summary of Relevant Legislation

Statute	Relevant legal requirements
The Conservation of Habitats and Species Regulations 2010 (as amended) (the Habitats Regulations)	Affords protection to European Protected Species, e.g. bats and great crested newt (*Triturus cristatus*), listed on Schedule 2. It is an offence (subject to exceptions) to deliberately capture, kill, disturb, or trade in listed animals. In certain circumstances, licences can be granted to permit some actions prohibited under the Act. Regulation 9A of the Conservation of Habitats and Species (Amendment) 2012 Regulations requires that competent authorities must take such steps in the exercise of their functions as they consider appropriate to secure the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds … as appropriate, and having regard to the requirements of Article 2 of the new Wild Birds Directive. This includes the use of planning and development control measures.
Wildlife and Countryside Act 1981 (as amended) (WCA)	Part 1 of the Act affords general protection to all species of wild bird, and specific protection to flora and fauna listed on Schedules 1 (birds protected by special penalties), 5 (other animals), and 8 (flora, fungi and lichens). With regard to the identified relevant ecological features, it is an offence (subject to exceptions) to: • kill, injure, or take any wild bird; • take, damage or destroy the nest of any wild bird while that nest is in use or being built; • take or destroy an egg of any wild bird; • disturb any wild bird listed on Schedule 1of the Act while it disturb the dependent young of such a bird (i.e. quail); and • kill, injure or take any wild animal listed on Schedule 5 (i.e. bats, great crested newt, common lizard); • damage, destroy or obstruct places used for shelter or protection by wild animals listed on Schedule 5 and covered by Part 4a of the Act (i.e. bats and great crested newt); • intentionally disturb wild animals listed in Schedule 5, and covered by Part 4a of the Act, that are occupying places of shelter and protection (i.e. bats and great crested newt). In certain circumstances, licences can be granted to permit some actions prohibited under the Act. Schedule 9 provides lists of non-native flora and fauna that it is an offence to release or cause to spread in the wild. Of primary relevance in the context of proposed developments are flora i.e. controlled weeds
Natural Environment and Rural Communities (NERC) Act 2006	Section 41 (s41) includes a list of habitats and species to be used by decision-makers, including local authorities, to guide the implementation of their duties under section 40 of the Act to have regard to the conservation of biodiversity in England, when carrying out their normal functions. Relevant habitats and species are identified in Section 4 of this report.
Protection of Badgers Act 1992	Not currently applicable to the baseline conditions, as no evidence of

Statute	Relevant legal requirements
	badger was found. Has a bearing on post-consent implementation and mitigation as there remains the risk that badgers may subsequently colonise the application site. Makes it an offence to kill or take a badger, to cruelly ill-treat a badger, or to interfere with a badger sett, including disturbing a badger while it is occupying a sett. In certain circumstances, licences can be granted to permit some actions prohibited under the Act.
The Hedgerow Regulations 1997	Does not apply to acts of hedgerow removal covered by the process for granting planning permission. However, it retains value as part of the process for determining the relative value of specific hedgerows/ hedgerow networks and appropriate mitigation.

Table 2.2: Summary of Relevant National and Local Planning Policy and Associated Guidance

Document	Relevant policies	Purpose
National Planning Policy Framework (NPPF)	Section 11	The NPPF states the commitment of the UK Government to minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. It specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this it to be delivered in the planning system. Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.
Kirklees Unitary Development Plan (UDP) adopted 1st March 1999 (saved policies)	NE4: Sites of Wildlife Significance	Presumption against development affecting local nature conservation designations.
	NE5: Wildlife Corridors	Requires retention of wildlife corridors shown on the Proposals Map or otherwise identified as Green Belt, and the protection of their associated wildlife value.
	NE6: Water Habitats	Protection and enhancement of water habitats.
	NE9: Mature Trees	Requires retention and protection of mature trees.
Kirklees Council General Advice Note	Biodiversity and Geological Conservation: Guidance to Accompany Validation Checklist	Provides supplementary guidance on requirements for the assessment of potential biodiversity impacts within planning applications.

3. Methods

3.1 Species Nomenclature Applied

All flora and fauna named in this report are primarily referred to using their common names. Where certain species are poorly understood by the general public, or common names are not standardised or not well known by specialists and/ or non-specialists, and/ or there is a need to distinguish a specific race of the species concerned (e.g. a rare or non-native subspecies or variety), then the scientific name is given for the relevant species at its first mention in this report.

In practice this means that scientific names are provided for all plants, invertebrates and other less familiar species. Scientific names are not used in this report for most bird, mammal, reptile and amphibian species, as these species are generally referred to by their common names by both non-specialists and ecologists and other specialists. The precise usage of the common names of these species is therefore well understood and is also used within relevant legislation and planning policy, to the extent that the inclusion of scientific names is not necessary.

3.2 Desk Study

A desk study was carried out to identify nature conservation designations, and protected and notable habitats and species potentially relevant to the proposed development. This information was used by AECOM to inform the scoping of requirements for ecological survey and assessment.

A stratified approach was taken when defining the geographic extent of the desk study, based on the likely zone of influence of the proposed development on different ecological receptors and an understanding of the maximum distances typically considered by statutory consultees. Accordingly, the desk study identified any international nature conservation designations within 5 km of the site boundary, other statutory nature conservations designations within 2 km of the site boundary, and local non-statutory nature conservation designations and protected or notable habitats and species within 1 km of the site boundary.

The desk study was carried out using the data sources detailed in Table 3.1. Protected and notable habitats and species include those listed under Schedules 1, 5 and 8 of the WCA; Schedules 2 and 4 of the Habitats Regulations; and species and habitats of principal importance for nature conservation in England listed under Section 41 (S41) of the NERC Act. Records of non-native controlled weed species were also collated; such species are listed under Schedule 9 of the WCA.

Table 3.1: Desk Study Data Sources

Data Source	Accessed / response received	Data obtained
Multi-Agency Geographic Information for the Countryside (MAGIC) website	19th August 2015, results revalidated 1st November 2016	• International statutory designations within 5 km • Other statutory designations within 2 km • Ancient woodlands and notable habitats within 1 km • Higher Level Environmental Stewardship (HLS) agreements applied to the site • Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential protected and notable species constraints
West Yorkshire Ecology	1st September 2015	• Non-statutory designations within 1 km • Protected and notable species records within 1 km (records for the last 10 years only)
West Yorkshire Bat Group	August 2015	• Bat records

Data Source	Accessed / response received	Data obtained
Ordnance Survey (OS) 1:2500 Pathfinder maps and aerial photography	1st September 2015	• Information on habitats and habitat connections (based on aerial photography) relevant to interpretation of planning policy and assessment of potential protected and notable species constraints
Kirklees Biodiversity Action Plan (BAP)	1st September 2015	• General information on Local Biodiversity Action Plan Priority Habitats and Species (aligns with NERC Act Section (S41) List with odd exception)
Kirklees Council Local Plan Map	1st September 2015	• Non-statutory designations within 1 km • Designated green and wildlife corridors

3.3 Survey Scoping

A Preliminary Ecological Appraisal (PEA) was undertaken of the site and adjacent land on 26th August 2015 and an internal report was submitted to Miller Homes. It is this initial work that forms the basis of the current assessment, with the relevant data and rationale carried forward into this report.

The approach applied accorded with the *Guidelines for Preliminary Ecological Appraisal* published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2013) and was consistent with the requirements of *British Standard 42020:2013 Biodiversity. Code of Practice for Planning and Development*. The PEA involved a combination of desk study and extended Phase 1 habitat survey and was undertaken by an appropriately experienced AECOM ecologist.

Based on the work undertaken for the PEA, the following additional surveys were identified as necessary to support a planning application for the scheme:

- Hedgerow survey;
- Wintering bird survey;
- Breeding bird survey;
- Preliminary bat roost appraisal survey;
- Bat activity survey;
- Badger survey; and
- Botanical survey (addressed during the preceding Phase 1 habitat survey).

The following habitat and species surveys were scoped out based on the results of the Phase 1 habitat survey which identified no suitable conditions within the site:

- National Vegetation Classification (NVC) survey – there are no species-rich habitats that required detailed botanical investigation through NVC survey, and no notable plant species were recorded or considered likely to occur;
- Reptile survey – there are no suitable habitats for reptiles, with most land being under arable production;
- Great crested newt and other amphibians – no ponds are known to occur within 500 m of the site, therefore there is no breeding habitat for great crested newt in proximity to the scheme;
- Riparian mammal survey – the are no watercourses associated with the site;
- Invertebrate survey – the site is predominantly under intensive arable production and therefore unsuitable for notable invertebrates. Boundary habitats are limited in extent, of recent origin, species-poor, and generally within the likely zone of spray drift of herbicides and pesticides applied to arable fields. All the conditions mean there is no reasonable likelihood of notable invertebrates occurring.

Requirements for emergence surveys of trees with bat roost potential were also considered, but were scoped out based on the locations of the relevant trees. The single relevant tree is located in a boundary hedgerow where impacts are unlikely and avoidable through sensitive design.

3.4 Phase 1 Habitat Survey

A Phase 1 habitat survey was undertaken of the site and adjacent land on 26th August 2015, with subsequent updates to the baseline data made during the badger survey on 20th May 2016, and the hedgerow survey on 17th June 2016. The survey was undertaken in accordance with the standard Joint Nature Conservation Committee (2010) methodology.

Phase 1 habitat survey is a standard method of environmental audit. It involves categorising different habitat types and habitat features within a survey area. The information gained from the survey can be used to determine the likely ecological value of a site, and to direct any more specific survey work which may need to be carried out prior to the submission of a planning application.

The standard Phase 1 habitat survey method can be “extended” to record target notes on protected, notable and invasive species. Accordingly, evidence (direct sightings or field signs) of protected species were recorded where encountered. Invasive non-native plant species listed in Schedule 9 of the WCA were also recorded if found.

Where relevant ecological receptors were present, target notes were recorded and the position of these shown on the Phase 1 habitat map (Figure 1). Typical and notable plant species were recorded for different habitat types and reflect the conditions at the time of survey. This was not intended to be a detailed inventory of the plant species present in the survey area, as this is not required for the purposes of Phase 1 habitat survey. Further surveys would have been commissioned to collect detailed botanical data, if this was determined as necessary after the Phase 1 habitat survey. Based on the habitats identified in association with the site, the only additional botanical survey considered necessary was a hedgerow survey (see Section 3.5).

3.5 Hedgerow Survey

A hedgerow survey was carried out on 17th June 2016 in accordance with the relevant methods described in the Hedgerow Regulations. The geographic extent of the survey was restricted to within the site boundary, and encompassed all of the hedgerows identified to be present during the preceding Phase 1 habitat survey. Once in the field the hedgerows requiring survey were subject to further review. The hedgerows surveyed have been assigned unique identifier numbers, and their locations are shown on Figure 2.

The identified hedgerows were surveyed and assessed against the “Wildlife and Landscape” criteria detailed in the Regulations. The identified hedgerows were not assessed against the history and archaeology criteria of the Regulations as these criteria are not within the professional remit of an ecologist.

In West Yorkshire a hedgerow is important for Wildlife and Landscape if it is at least 30 years old and:

- has at least 6 qualifying woody species present;
- has at least 5 qualifying woody species and meets at least 3 of the criteria marked with an * in Table A1, Appendix A;
- has at least 5 qualifying woody species that include one of the following – black poplar, large-leaved lime, small-leaved lime, wild service-tree;
- has at least 4 qualifying woody species and meets at least 4 of the criteria marked with an * in the table provided as Table A1, Appendix A; or
- runs parallel with a bridleway, footpath or Byway Open to all Traffic (BOAT), has 4 or more qualifying woody species present and meets 2 or more of the criteria marked with an * in Table A1, Appendix A.

Whilst the primary aim of the survey work undertaken was to determine the presence and distribution of important hedgerows, the survey data collected can also be used to determine whether hedgerows

are species-rich or species-poor. All hedgerows that can be determined as important are by definition species-rich (see below), but conversely this does not mean that all species-rich hedgerows are also important. As such, the identification of species-rich hedgerows is a way of further assessing the value of the hedgerow resource.

Based on the criteria used in West Yorkshire (West Yorkshire Local Sites Partnership, 2011), species-rich hedgerows are those that have an average of four or more woody species per 30 m survey section. Species-poor hedgerows are those with an average of three or less woody species per 30 m survey section. The current assessment rounds up the average number of woody species recorded to derive a whole number (e.g. if the mean calculated is 5.4 woody species this is rounded up to 6 woody species). This is on the basis that it is not possible to have part of a species, a species is either present or it is not.

3.6 Great Crested Newt Habitat Appraisal

Prior to undertaking the extended Phase 1 habitat survey, aerial photography and 1:2,500 OS mapping were examined to attempt to identify the presence of ponds within 500 m of the site. This process could not guarantee to definitively identify all ponds present, but it is the best that can be achieved within the limits of available data.

Specific searches were made for ponds within and adjacent to the site when undertaking the extended Phase 1 habitat survey as described in Section 3.1, to supplement the data gathered through desk based review of available imagery.

3.7 Wintering Bird Survey

The site was assessed to be low risk for wintering birds based on the following considerations:

- The site is predominantly intensively managed arable farmland, and is located on the urban fringe where it backs onto existing residential properties. It is also crossed by designated and desire line footpaths, resulting in recreational disturbances. This combination of characteristics makes it unlikely that the site would be of high importance for wintering birds. This is supported by the available desk study data, which identified no records of large aggregations of wintering birds, or the regular occurrence of notable bird species.
- There is poor connectivity to wetland habitats in the wider landscape, making it unlikely that the site would have a specific attractant value as foraging habitat for species of water birds. This is supported by the available desk study data, which identified no records of aggregations of water birds.
- The site is of poor value for woodland bird species, as it is not immediately adjacent to established woodland and has only a fragmented network of associated hedgerows and tree lines.

Given the above, the primary purpose of the wintering bird survey was to obtain sufficient data to validate the above assessment i.e. confirm the assessment that the site is of low value for wintering birds.

A five visit wintering bird survey was commissioned, with monthly surveys undertaken over the period November 2015 to March 2016 (Table 3.2). The survey was therefore timed to coincide with those months when wintering birds would reasonably be expected to be making greatest use of the application site. The survey was commissioned too late to allow a survey visit in October 2015, but given the rationale presented above a survey in October was not considered necessary, with data for a five month period being more than sufficient to determine the relative importance of the site for wintering birds.

The survey area comprised the site and adjacent land, but at the time of survey full land access was not available so the survey was undertaken from areas of public access (NB full access was possible at the time of the breeding bird survey, so the same limitations do not apply). This is not a significant limitation given the stated purpose of the survey and the uniformity of the habitat conditions present.

The only area of land not visible from byways was part of the main arable field where hedgerows obscured sight lines. Otherwise clear views were possible across the site.

Each survey visit was undertaken between dawn and late morning when birds where likely to be most active and apparent. The survey involved walking all of the field and habitat boundaries within the survey area. The route was walked slowly with the surveyor stopping periodically to scan the survey area with binoculars. Where practicable, any birds flushed to other parts of the survey area were noted and ignored on subsequent encounters, in order to minimise double-counting.

The location, movements and activities of birds present were recorded onto base-maps using standard British Trust for Ornithology (BTO) species and activity codes.

Table 3.2: Wintering Bird Survey Dates and Associated Conditions

Visit	Date	Start time	Conditions
1	26th November 2015	08.00	8°C, dry, no wind, 10% cloud
2	18th December 2015	09.00	12°C, dry, no wind rising to force 2 southerly wind, 100% cloud cover
3	28th January 2016	08.00	6°C, dry, bright, no wind rising to force 2 southeasterly wind, no cloud
4	24th February 2016	7.30	-2°C, dry, bright, no wind, no cloud
5	23rd March 2016	06.45	7°C, dry, 100% cloud cover

3.8 Breeding Bird Survey

The survey involved a standardised timed method (Brown and Shepherd, 1993) but adapted to follow the Common Birds Census (Marchant, 1983) mapping technique. Three survey visits were made to the application site during the main bird breeding season of April to mid-June. The survey dates and associated weather conditions are detailed in Table 3.3.

The survey area comprised the site and adjacent land within the same ownership or where otherwise accessible using existing byways or otherwise visible from within the site.

Each survey visit was undertaken in the period dawn to no later than mid-morning, at the time of day when birds are most vocal and territories are most easily defined. Cold, windy or wet days were avoided were possible because the activity, and thus detectability, of birds would be much reduced.

The survey involved walking all of the field and habitat boundaries within the survey area. Birds were located by walking, listening and scanning by eye and with binoculars. Breeding was confirmed if nests or young were observed, and otherwise considered likely if birds were engaged in territorial and breeding activities such as singing, displaying, carrying nest material, repetitively alarm calling, disturbance displaying, carrying food, or in territorial dispute.

The location, movements and activities of birds present were recorded onto base-maps using standard British Trust for Ornithology (BTO) species and activity codes. Maps were produced of the breeding behaviour recorded during each visit, and these were combined to produce an estimate of the overall number of breeding territories for each species. This analysis followed the standard approach detailed in Marchant (1983). No attempt was made to assign territories to woodpigeon and non-native game birds. The timing of the surveys (spring) meant that the survey was undertaken well outside of the peak breeding season of woodpigeon which is predominately late summer/early autumn. Therefore it was considered that assigning territories would not have been representative for this species. In addition, because woodpigeon is an extremely common and widespread species, it would not reasonably be considered a target species for survey. Assigning territories to non-native game birds was also not considered necessary or appropriate, particularly as the application site is closely associated with land managed as a game bird shoot involving annual or periodic captures and

releases of captive birds. Such annual captures and releases make it impractical to determine or explain trends in the numbers of game birds using the application site.

Table 3.3: Breeding Bird Survey Dates and Associated Conditions

Visit	Date	Start time	Conditions
1	13th May 2016	05.30	10°C, light wind, dry, 100% cloud cover
2	8th June 2016	05:30	16°C, light wind, dry, 100% cloud cover
3	17th June 2016	04:40	12°C, no wind, dry, 100% cloud cover

3.9 Preliminary Bat Roost Appraisal Survey

All trees within and on the boundary of the site were appraised on 20th May 2016 for their potential to support bat roosts. The purpose of the survey was to identify any potential roost features for bats (rot holes, damaged limbs, woodpecker holes, peeled bark) or evidence indicating the presence of bats (droppings, live or dead specimens). All trees were assessed, but only those with potential roost features are described in this report. If a tree is not specifically identified in this report as having a potential value for roosting bats it should be assumed to be unsuitable.

The inspection was carried out with the aid of close-focussing binoculars and a high powered torch, in accordance with standard survey guidance (Collins, 2016). Further details of the BRP survey approach and classification applied is provided as Appendix C.

Adjacent off-site residential areas were not subject to survey, and instead the assessment provided in this report assumes that these residential areas may contain bat roosts. The relevance of potential off-site bat roosts to the scheme is assessed with reference to the results of the bat activity survey (see Section 3.10) which provides data on the relative importance of the site for foraging and roosting bats. In other words, if significant numbers of bats or notable species of bat are recorded shortly after sunset within the site it is considered likely that these bats will have arrived from roosts in adjacent residential properties and this may merit further consideration during detailed design of the scheme.

3.10 Bat Activity Survey

3.10.1 Survey Scoping

Before commencement of bat surveys, the site was appraised to determine whether it was a low, medium or high risk site for bats in accordance with published guidance (Collins (2016). The site was appraised to be low risk for bats based on the following:

- the desk study data did not identify the presence of any high risk species roosting near the application site;
- the site is predominantly intensively managed arable farmland of relatively low habitat quality for bats; and
- habitat connectivity across the site is relatively poor and limited to small network of hedgerows that provides only fragmented habitat linkages to the wider landscape.

Given the above, the objective of the bat activity surveys undertaken in 2016 was to collect data to verify the assessed value of the application site for bats, determine which if any bat species use the application site, estimate the relative sizes of the populations of each species present, and identify any patterns in the bat usage of the application site i.e. which parts are more important to bats and which parts are less important.

Based on the published guidance (Collins, 2016) for low risk situations, the following survey effort was applied to assess the application site and is described in greater detail below:

- walked transect survey – three dusk and one dusk/pre-dawn surveys were undertaken in the active season for bats (May to September);
- static monitoring survey – three survey periods (a minimum of 5 days per survey period) in the active season for bats (May to September).

3.10.2 Walked Transect Survey

Bat detector surveys were undertaken on one occasion per month over the period June to September 2016 (three dusk surveys and one dusk/ pre-dawn survey). Survey work was paired with survey work on an adjacent land parcel that is to be subject to a separate planning application and that is not assessed in this report. It was technically appropriate to combine the surveys of both sites as both are small, and this does not conflict with current survey guidance (Collins, 2016). Accordingly, to avoid possible ambiguity in survey approach that might arise from attempting to split out the data for the two different land parcels, all survey data are included in Appendix B, where the data relating to the site is highlighted for clarity. Only data relevant to the site has been used in the assessment.

Three of the surveys were dusk surveys and one was a dusk/ dawn survey. Survey visits were scheduled for dates when appropriate weather conditions were expected (survey dates are given with the survey results in Appendix B). Appropriate conditions were those with an absence of rain and/ or strong winds and with evening temperatures above 7°C.

The survey involved walking a transect route (as shown on Figure 5) that provided representative coverage of the site and habitats of potential value to bats. The transect route was walked at a steady speed and bat activity was detected/ recorded using a handheld frequency division bat detector (e.g. Bat box Duet) and a recording device (e.g. SM2 or Edirol). All bat activity detected during the survey was recorded and mapped on a suitably scaled plan.

Each dusk survey commenced around sunset and was completed approximately two hours after sunset to coincide with peak activity periods as bats emerge and disperse from their roosts. Pre-dawn surveys commenced two hours before sunrise and finished at sunrise to coincide with peak activity as bats return to their roosts. The direction taken when walking each transect was reversed between survey visits so that they were not always walked in the same direction, to maximise the coverage of the site at different times of the night.

3.10.3 Static Monitoring Survey

Static monitoring was undertaken to supplement the results of the activity survey, by providing data for a long time period and by so doing provide greater confidence of the relative value of the site for bats. Given the small size and uniform habitat conditions of the site, static monitoring was undertaken at one discrete location as shown on Figure 5. The location was selected to collect data on bat activity associated with suitable bat foraging and commuting habitats.

Data were collected using SM2Bat and SM2Bat+ static bat detectors. The survey approach was consistent with current survey guidance (Collins, 2016) and static detectors were set to start recording half an hour before the published sunset time and to stop recording half an hour after the published sunrise time.

As there is potential for bat activity levels and habitat use to vary across the survey season of May to September it is good practice to spread survey effort out over the active season. As such, data were collected over periods of at least five full nights to coincide with spring, summer and late summer/early autumn. Typically the static detectors were left to run longer than required to compensate for any nights when conditions were unsuitable for bats e.g. too cold or wet. The survey dates and associated conditions are summarized in Table 3.4.

The bat sound recordings made during the surveys were later analysed using BatSound v4.2 and Analook W software to identify the bat species present and the number of passes made by each species. The number of passes is not directly correlated with the number of individual bats involved and many of the passes recorded are likely to be a result of repeat activity by relatively few bats. However, the data can be used as an indicator of the relative significance of a site or monitoring location for bats.

There is no published guidance on bat activity levels; therefore, for the purpose of this report bat activity levels, during static monitoring surveys, were defined using the following categories:

- Very low activity was set at a mean of <2 passes per hour (per static location);
- Low activity was set at a mean of 2 to 25 passes per hour;
- Moderate Activity was set at a mean of 26 to 99 passes per hour; and
- High Activity was set at a mean of over 100 passes per hour.

Table 3.4: Dates of the 2016 Static Monitoring Surveys for Bats and the Associated Conditions

Visit	Season	Dates	Air temperature
1	Spring	2nd to 6th June	6 to 22°C
2	Early-summer	26th to 30th July	15 to 22°C
3	Late summer	12th to 16th August	8 to 18°C

3.11 Badger Survey

A badger survey was undertaken on 20th May 2016 and encompassed all suitable habitats within the site and a 50 m radius out from this, where accessible. The purpose of the badger survey was to identify and classify the status of any setts (main, outlier, annexe, satellite) that could be potentially affected by the scheme. Definitions of the different types of badger sett considered by the survey are provided below as Table 3.5.

Table 3.5: Definitions of the Types of Badger Sett

Sett Type	Definition
Main	Normally in continuous use and usually used for breeding. They generally include a large number of entrance holes with significant amounts of earth spoil piled around the surrounding ground. The holes and surrounding area generally show strong signs of current active use, including well used paths and sett entrances.
Annex	Usually quite close to a main sett - normally only tens of metres. They are usually clearly linked to the nearby main sett by well-worn paths. They usually have multiple holes, not all of which may appear active but some holes usually show signs of recent activity at most times of year. At larger annex setts there is likely to be a considerable accumulation of spoil around the sett area.
Subsidiary	Setts with only a small number of holes (generally less than 5) at some distance from a main sett and often without obvious linking paths. The holes can be very variable in signs of usage and are often much less consistently in use than those of main or annex setts. Generally, however, they show signs of recent use. They tend to be repeatedly used and accumulations of spoil – often including digging from the current year – are usually present.
Outlier	Usually consist of a single or double hole but may occasionally have more. Generally, they have only a small accumulation of spoil at the hole entrance and are not clearly linked to other setts by worn trails. They are usually only used sporadically and may show little evidence of very recent use. Outliers may be occupied by foxes or rabbits when not in use.

3.12 Desk Study and Field Survey Limitations

The aim of a desk study is to help characterise the baseline context of a proposed development and provide valuable background information that would not be captured by a single site survey alone. Information obtained during the course of a desk study is dependent upon people and organisations having made and submitted records for the area of interest. As such, a lack of records for a particular habitats or species does not necessarily mean that the habitats or species do not occur. Likewise, the presence of records for particular habitats and species does not automatically mean that these still occur within the area of interest or are relevant in the context of the proposed development.

Full access was permitted to all land within the site boundary, and all surveys were undertaken in appropriate weather conditions and appropriate times of year. Where the site only encompassed part of a field or similar land management unit, the survey coverage also considered this adjacent land to maximise the opportunity to identify relevant constraints and opportunities. As such, there are no technical limitations to the site surveys undertaken.

Where adjacent land was not within the extent of the agreed land access, this was generally open farmland with associated footpaths and other publically accessible byways. This afforded clear views and good access to adjacent land and accordingly there were no constraints to the appraisal of potential ecological constraints associated with adjacent land, or the recording of bird activity on third party land.

Where habitat boundaries coincide with physical boundaries recorded on OS maps the resolution is as determined by the scale of mapping. Elsewhere, habitat mapping is as estimated in the field and/or recorded by hand-held GPS. Where areas of habitat are given they are approximate and should be verified by measurement on site where required for design or construction. While indicative locations of trees are recorded this does replace requirements for detailed specialist arboricultural survey to *British Standard 5837:2012 Trees in Relation to Design, Demolition and Construction.*

4. Results

4.1 Nature Conservation Designations

4.1.1 Statutory Designations

Table 4.1 details the statutory nature conservation designations identified by the desk study, based on the method given in Section 3.1 of this report. The designations are listed in descending order, with those closest to the site listed first.

Table 4.1: Statutory Nature Conservation Designations

Designation	Reason(s) for designation	Relationship to the site
Lower Spen Wildlife Area Local Nature Reserve (LNR)	Woodland habitat	0.9 km to the north and separated from the site by the River Calder and extensive urban development.
Sparrow Wood LNR	Woodland, scrub, grassland and wetland habitats	1 km to the northeast and separated from the site by extensive urban development.

4.1.2 Non-Statutory Designations

Table 4.2 details the non-statutory nature conservation designations identified by the desk study based on the method given in Section 3.1 of this report. The designations are listed in descending order, with those closest to the site listed first.

Table 4.2: Non-Statutory Nature Conservation Designations

Designation	Reason(s) for designation	Relationship to the site
Jordan Wood and Oliver Wood Local Wildlife Site (LWS)	High bluebell (*Hyacinthoides non-scripta*) cover	0.75 km to the southwest
Lower Spen Wildlife Area LWS	Designated LNR	0.9 km to the north and separated from the site by the River Calder and extensive urban development.
Sparrow Wood LWS	Designated LNR	1 km to the north and separated from the site by extensive urban development.

4.2 Habitats

4.2.1 Phase 1 Habitat Types

The habitats recorded, their extent and distribution are shown in Table 4.3 and Figure 1. The areas calculated and given in Table 4.3 are approximate only. The associated target notes, where made, are incorporated into the main text of the habitat descriptions. Illustrative photographs are provided as appropriate in Appendix D.

None of the habitats recorded are being managed as part of a HLS agreement. All of the habitats present are located in designated green belt and therefore all semi-natural habitats are likely to contribute to wildlife corridors as defined in planning policy NE5. However, the relative contribution made to the wildlife corridor network is likely to be limited given the prevailing habitat conditions of intensively managed arable farmland. The agricultural management regimes applied to these habitats currently limits their potential biodiversity value.

There are no watercourses within or adjacent to the site.

The desk study and Phase 1 habitat survey identified no ponds within the site or within 500 m of the site were identified by the desk study. Therefore the potential presence of protected species associated with pond habitats, for example great crested newt, can be scoped out and do not need to be considered further in this report.

Table 4.3: Habitats present within the site, in descending order based on spatial area occupied

Habitat	Brief description	Area (ha/ m)	% of site area
Arable	Land cultivated for agriculture, crops include cereals and field bean (*Vicia faba*).	8.17 ha	98%
Improved/ poor semi-improved neutral grassland	Species-poor field headlands and track verges.	0.2 ha	2%
Hedgerows	A fragmented network of intact hedgerows occurs towards the centre of the site, but connectivity with the wider landscape is relatively limited.	300 m	-
Scattered trees and shrubs	Mature free-standing trees and shrubs on field boundaries.	Not applicable	Not applicable

The habitats recorded are described in greater detail below.

Arable

Arable farmland comprises most of the land within the site (Photographs 1 to 3, Appendix D), and is distributed between two large arable fields. At the time of survey the arable fields were being used for the cultivation of cereals and field beans (*Vicia faba*) but the field margins support a limited sparse flora of common annual plant species such as common field-speedwell (*Veronica persica*), black-grass (*Alopecurus myosuroides*), redshank (*Persicaria maculosa*), pale persicaria (*Persicaria lapathifolium*), wild raddish (*Raphanus raphanistrum*), annual meadow-grass (*Poa annua*), fat hen (*Chenopodium album*), common orache (*Atriplex patula*), charlock (*Sinapis arvensis*) and groundsel (*Senecio vulgaris*).

Improved / Poor Semi-improved Neutral Grassland

There are narrow linear strips of enriched, unmanaged poor semi-improved grassland along the edges of fields, tracks and roads. Such areas are transitional towards agriculturally improved grassland and are dominated by robust grasses and herbs, including Yorkshire-fog (*Holcus lanatus*), timothy (*Phleum pratense*), false oat-grass (*Arrhenatherum elatius*), white clover (*Trifolium repens*), cow parsley (*Anthriscus sylvestris*), creeping thistle (*Cirsium arvense*), common nettle (*Urtica dioica*), hogweed (*Heracleum sphondylium*), great willowherb (*Epilobium hirsutum*) and other species typical of nutrient-enriched grassland.

Hedgerows

There are three hedgerows associated with the site as summarised below in Table 4.4, and mapped on Figure 2. The full data derived from the Hedgerow Regulations (Wildlife and Landscape) survey is provided as Tables A1 to A3 of Appendix A.

Two of the hedgerows are intact and contain mature standard trees (e.g. Photograph 4, Appendix D), the exception is Hedgerow 2 which is defunct and has gaps comprising greater than 10% of the total hedgerow length. All of the hedgerows are dominated by hawthorn, with other species present including wild cherry (*Prunus avium*), elder (*Sambucus nigra*), goat willow (*Salix caprea*) and wych elm (*Ulmus glabra*). Hedgerow 3 can be considered species-rich, but it is not believed to be of ancient origin and does not support assemblages of woodland ground flora.

None of the three hedgerows meet Wildlife and Landscape criteria for importance.

Table 4.4: Summary Details on the Hedgerows Associated with the Site

Hedgerow No.	Approx. length (m)	Intact/ defunct	Mean No. of woody species	No. standard trees	Species-rich/ poor	Important?
1	100	Intact	3	1	Poor	No
2	100	Defunct	2	0	Poor	No
3	100	Intact	4	2	Rich	No

Scattered Trees and Shrubs

The only mature trees present are associated with the hedgerows described above, where mature trees of pedunculate oak, ash (*Fraxinus excelsior*) and goat willow occur.

A line of young semi-mature planted silver birch (*Betula pendula*) trees (approximate dbh of 15 cm) is present on the northern edge of the site where it meets the western end of Ravensthorpe Road. Scattered native scrub occurs locally on field boundaries and is typified by brambles, hawthorn and elder.

Ornamental shrubs have been planted on an arable margin to the south of the western end of line of housing along Ravensthorpe Road (Target Note 1, Figure 1). These shrubs include butterfly-bush (*Buddleja davidii*), silk tassel-bush (*Garrya elliptica*) and Chilean potato-tree (*Solanum crispum*). Native species occur with them, including goat willow and elder.

4.2.2 Notable Habitats

Table 4.5 provides a summary of notable habitats associated with the site, based on the results of the Phase 1 habitat survey and with reference to guidance for the recognition of NERC Act S41 (Maddock, 2008), Kirklees BAP (Kirklees Council, undated) and LWS (West Yorkshire Local Sites Partnership, 2011) quality habitats. Habitats that are potentially covered by the NERC Act and that require screening as potential notable habitats are included in the table, if only to demonstrate they have been considered and screened out.

Based on the analysis presented in Table 4.5, only the site's hedgerows are considered to be sufficiently notable to be a design consideration. It is emphasised that hedgerows remain a widespread habitat both nationally and in suitable areas of wider West Yorkshire, such that the relative nature conservation value of the limited extent of hedgerows present would be considered relatively low, i.e. of value at the local (site) level but not district or higher value.

None of the other habitats recorded by the Phase 1 habitat survey are considered notable in their own right (local value in context of site) but some are assessed further in this report, where relevant, for their potential value to protected and notable species.

Table 4.5: Review of Potential Notable Habitats Associated with the Site

Habitat	NERC Act?	LBAP?	LWS Quality?	Supporting Comments / Other Biodiversity Value
Arable field margins	x	x	x	The arable field margins within the site are not considered notable as they are not being managed for biodiversity through HLS agreements and they are not expected, as a result of the site walkover and desk study, to support notable flora or fauna
Hedgerows	✓	✓	x	All of the hedgerows, both defunct and intact, qualify as the NERC and LBAP habitat. However, the hedgerow resource is of limited extent, relatively isolated and generally species-poor. Accordingly, while not without

				ecological value, enhancement potential, or value to local wildlife populations, the existing resource is unlikely to contribute to landscape scale wildlife corridors.
Mature trees	x	x	x	While mature trees are not well served by habitat classifications, these trees are potentially of biodiversity value and are covered by planning policy (Policy NE9).

Key to symbols: ✓ = yes, x = no

4.3 Species

4.3.1 Native and Controlled Flora

No protected or notable plant species were recorded during the Phase 1 habitat survey or hedgerow survey. None of the habitats recorded were considered of high suitability for, or likely to support protected or notable flora. Given this, native flora is not a constraint to the scheme and accordingly no further consideration is given to native flora in this report.

No non-native invasive weed species were recorded that are listed as controlled weeds on Schedule 9 of the WCA. Given the habitat conditions recorded, it is considered unlikely that any such species would occur and therefore there can be confidence that no invasive species were overlooked. Accordingly, no further consideration is given to native flora in this report.

4.3.2 Wintering Birds

The desk study returned no records of notable bird species in proximity to the site. This supports the findings of the field survey undertaken for the scheme.

The results of the wintering bird survey, as summarised in Table 4.6 and mapped as Figures 3a to 3e, demonstrates that site is of relatively low value for wintering birds. Thirty-three species of bird were recorded over the course of the survey period, and the assemblage recorded is considered typical for the geographic location of the site, and the limited suite of habitats present within the site and on adjacent land.

All bird species were recorded from the site in small numbers (typically less than 10 birds of each species per month), and no large aggregations were recorded.

Much of the bird activity recorded related to small passerine species associated with woody habitats along the field margins in the western-most field of the site, with this area being optimal because it connects to more extensive areas of woodland and grassland to west of the site and is not far from the habitat corridor associated with the River Calder and adjacent railway. While some of the bird species recorded have been assessed to be of conservation concern (Red and Amber List (Eaton *et al,* 2015) or NERC Act), the small numbers of birds recorded indicates that the site should not be considered to be of specific importance for these species. Inclusion on these lists of notable birds does not necessarily mean these species are rare, and none of the species recorded are nationally or locally rare, but it does mean than the populations of these species have declined nationally.

The habitats present are dominated by intensively managed arable farmland and this, combined with proximity to the existing urban fringe, result in conditions that are not optimal for the maintenance of a large or notable wintering bird population.

Table 4.6: Bird Species Recorded from the Site over Winter 2015/16, with an Indication of the Numbers Observed by Month

Species	Status	November	December	January	February	March
Blackbird	Green	1-10	1-10	1-10	1-10	11-20
Black-headed gull	Amber	-	-	1-10	-	-
Blue tit	Green	1-10	1-10	1-10	1-10	1-10
Bullfinch	Amber, NERC	-	1-10	1-10	1-10	
Carrion crow	Green	1-10	1-10	1-10	1-10	11-20
Chaffinch	Green	-	1-10	1-10	1-10	1-10
Coal tit	Green	1-10	-	-	-	-
Collared dove	Green	1-10	1-10	-	1-10	-
Dunnock	Amber, NERC	1-10	1-10	1-10	1-10	1-10
Goldfinch	Green	1-10	1-10	1-10	1-10	1-10
Great spotted-woodpecker	Green	1-10	1-10	1-10	-	-
Great tit	Green	1-10	1-10	1-10	1-10	1-10
Green woodpecker	Green	-	-	1-10	-	-
House sparrow	Red, NERC	1-10	-	1-10	11-20	1-10
Jackdaw	Green	1-10	-	1-10	1-10	-
Jay	Green	-	-	-	1-10	1-10
Kestrel	Amber	-	-	-	1-10	-
Lesser black-backed gull	Amber	-	-	-	1-10	-
Linnet	Red, NERC	1-10	-	-	-	-
Long-tailed tit	Green	1-10	1-10	1-10	-	-
Magpie	Green	1-10	1-10	1-10	1-10	1-10
Meadow pipit	Amber	-	-	-	11-20	-
Mistle thrush	Red	-	-	-	1-10	1-10
Pheasant	Green	1-10	1-10	-	1-10	1-10
Reed bunting	Amber, NERC	1-10	-	1-10	-	-
Robin	Green	1-10	1-10	1-10	1-10	1-10
Song thrush	Red, NERC	1-10	-	1-10	1-10	-
Sparrowhawk	Green	-	-	1-10	-	-
Starling	Red, NERC	1-10	-	-	-	-
Stock dove	Amber	-	1-10	-	-	-
Wren	Green	1-10	1-10	1-10	1-10	-
Wood Pigeon	Green	-	1-10	1-10	1-10	11-20
Yellowhammer	Red, NERC	1-10	-	1-10	-	1-10

4.3.3 Breeding Birds

The desk study returned no records of notable bird species in proximity to the site. This supports the findings of the field survey undertaken for the scheme.

The results of the breeding bird survey, as summarised in Table 4.7 and mapped as Figure 4, demonstrates that site is of relatively low value for breeding birds. Seventeen species of bird were recorded over the course of the survey period, and the assemblage recorded is considered typical for the geographic location of the site, and the limited suite of habitats present. Few birds were recorded displaying territorial behaviour in the arable fields, and instead most activity was associated with wooded habitats on or near the boundaries of the site.

All bird species were recorded from the site in small numbers, with no greater than 5 territories recorded for any one species.

All of the breeding bird activity recorded related to small passerine species associated with hedgerows and other areas of woody vegetation along the field margins. Only one territory was recorded from an arable field, with a single record of skylark from the site. While some of the bird species recorded have been assessed to be of conservation concern (BOC Red and Amber List (Eaton *et al,* 2015) or NERC Act), the small numbers of birds recorded does not indicate that the site should be considered to be of specific importance for these species. The habitats present are dominated by intensively managed arable farmland and this, combined with proximity to the existing urban fringe, result in conditions that are only suitable for a limited suite of breeding birds.

Table 4.7: Bird species recorded from the site during the breeding, with an estimate of the number of territories present

Species	Status	Estimated number of territories
Blackbird	Green	5
Blackcap	Green	1
Blue tit	Green	2
Chaffinch	Green	3
Chiffchaff	Green	2
Dunnock	Amber, NERC	2
Goldfinch	Green	1
Great tit	Green	1
House sparrow	Red, NERC	A maximum of 10 counted based on peak count data for each discrete location, associated with adjacent residences
Linnet	Red, NERC	1
Robin	Green	1
Skylark	Red, NERC	1
Song thrush	Red, NERC	2
Whitethroat	Green	3
Willow warbler	Amber	1
Wren	Green	2
Yellowhammer	Red, NERC	1

4.3.4 Bat Roost Appraisal

There are no buildings on site, but there are a several hedgerow trees all of which were assessed for their potential value for roosting bats.

One tree with features of potential value to roosting bats was found and is located on the southern boundary of the site (Figure 1). This tree is:

- Tree 1 – Mature goat willow (Target Note 2, Figure 1) located just outside the site boundary and adjacent to a well-used desire line path. It has extensive decay to main trunk and some dead and/ or decaying branches. There is a rot hole leading up into the main trunk (low potential) and a rot hole leading up into a major limb (moderate potential). This tree has moderate suitability for roosting bats.

The position of the tree is such that follow-up emergence surveys were not required to support the planning application. Tree 1 is located on the southern site boundary where habitats would be retained, so direct impacts from the scheme would be unlikely. Indirect impacts are also unlikely and can be avoided through application of sensitive design principles e.g. avoidance of light spill and glare through requirements for appropriate lighting design.

4.3.5 Bat Activity

Desk study

The desk study identified the following bat roosts in the search area:

- A Leisler's bat roost in a house on Lees Hall Road 0.9 km to the east of the site; and
- An unidentified bat roost in Fox Royd 1 km to the south of the site.

Walked Transect Surveys

Maps outlining the transect route (including locations of recorded bat activity) for each transect survey are shown on Figures 6a to 6e. The raw survey data are provided in Appendix B.

The surveys recorded low levels of bat foraging activity across the site. Patterns of bat activity were comparable across the survey period with bats recorded from consistent locations in June, July, August and September. All but one of the bat passes recorded over the course of the four survey visits related to foraging common pipistrelle, but a single pass by a noctule bat was recorded during the June dusk survey. No other species were recorded. Low numbers of bats were recorded throughout the survey period; the majority of passes were by single bats, with a maximum of two bats recorded at any one time.

Across the four dusk surveys, two of the surveys started within the land south of Ravensthorpe Road, with the first bats recorded within 32 and 34 minutes after sunset. These were common pipistrelle. This is close to the typical emergence time for this species, suggesting that the bats originated from roosts relatively near the site, possibly within the adjacent residential houses. No activity consistent with bats commuting away from roosts was recorded, and indeed this behaviour would be very difficult to detect given the very small number of bats encountered.

The distribution of bat foraging activity over the four surveys shows a clear correlation with the locations of mature hedgerows and plantation woodland as shown on Figure 1. This is not unexpected given these habitats are optimal for common pipistrelle bats, the main bat species using the site. Other field boundaries are also used to access or when moving between these optimal wooded habitats, but these intermediate areas are likely to be of relatively low foraging value for bats.

Static Detector Surveys

A summary of the static survey results (number of bat passes), along with an assessment of the relative level of bat activity recorded at the SM2 location is provided in Table 4.8. A pie chart is also provided as Table 4.9 to provide further visual illustration of the relative levels of foraging activity contributed by each bat species recorded. The raw survey data are provided in Appendix E.

In common with the walked transects, the vast majority of passes recorded were contributed by common pipistrelle, equating to 93% of the total bat activity (96% if the pipistrelle records that could not be determined to species are taken to be common pipistrelle, as seems likely).

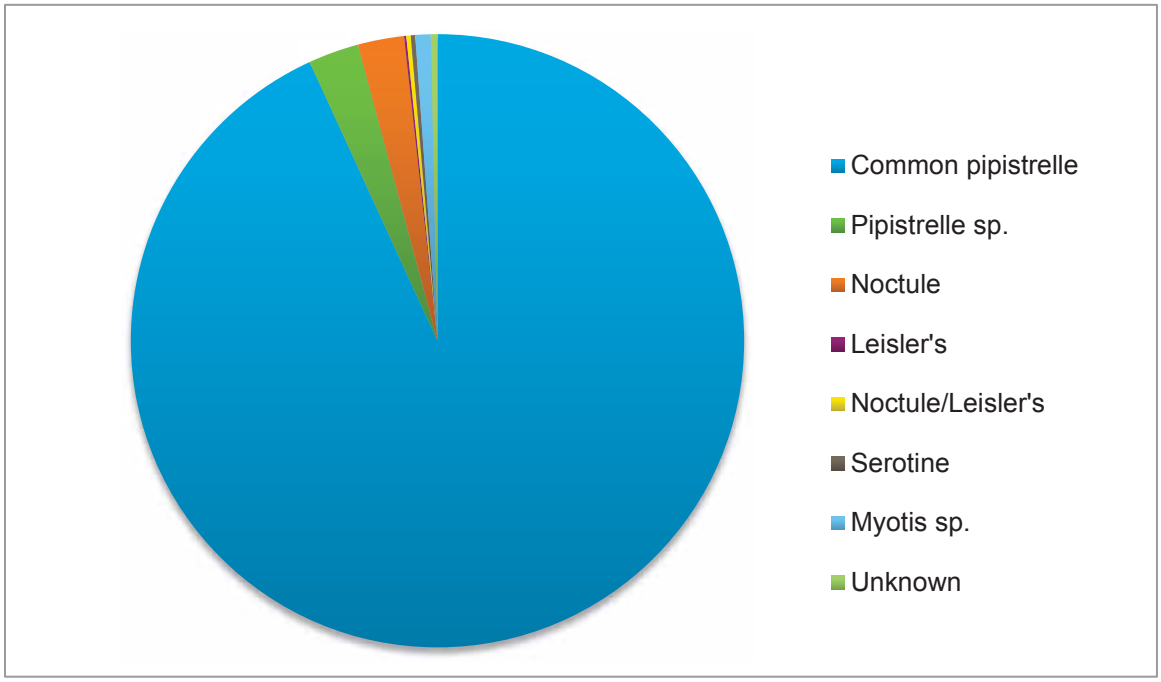
Small numbers of noctule bat passes were recorded, contributing up to 3% of the total bat activity recorded. In addition, very small numbers of passes by Leisler's (1 pass), noctule/ Leisler's (where recordings could not be split between species; 2 passes), serotine (2 passes) and bats in the *Myotis* genus (7 passes) were recorded over the season, consistent with the brief presence of only a single bat or a low number of individuals of each species (Table 4.8). Bats in the *Myotis* genus can be difficult to separate based on their calls and are commonly grouped together when identification to species level cannot be achieved with certainty from recordings. A very small number of bat passes (3 passes in total) could not be determined to either genus or species because the recordings were too faint or indistinct to allow them to be identified using analytical software.

The levels of bat foraging activity recorded for all species are relatively low, and this is consistent with the findings of the activity surveys. Accordingly, the site has a local value to bats, but there is no evidence that the site supports notable levels of bat activity. The species recorded are all relatively widespread and typical of the habitats associated with the site and adjacent land, and therefore there are no grounds to expect that the site has a specific functional importance for the species recorded. Noctule and Leisler's bat are both capable of, and typically, make use of habitats at the landscape scale i.e. they forage over large distances and the land within the site boundary is likely to make up a small proportion of their home range.

Table 4.8: Summary Results of the Bat Static Monitoring Survey

	Cumulative number of passes per bat species over 5 full nights of monitoring									**Mean nightly bat activity (bat passes per hour)**	**Bat activity category**
Survey month	Common pipistrelle	Pipistrelle sp.	Noctule	Leisler's	Noctule/ Leisler's	Serotine	Myotis sp.	Unknown	All bats		
June	552	2	5	0	0	0	1	2	562	15.77	Low Activity
July	89	0	15	0	1	1	1	1	108	2.69	Low Activity
August	162	21	1	1	1	1	5	0	192	4.17	Low Activity

Table 4.9: Contribution of Each Recorded Bat Species to the Total Bat Activity on Site



4.3.6 Badger

No evidence of badger was found with the site or in adjacent habitats, and there are no desk study records for the local area. Given the habitat conditions present and the proximity to an extensive urban area, the site is considered to be of low suitability for badger. Given the absence of any field signs that would indicate that badger is a constraint, no further assessment is required.

4.3.7 Other Species

Brown hare was observed from farmland near Priest Royd Wood, approximately 500 m to the south of the site. The habitat in this area is optimal for brown hare as there is a matrix of arable, pasture and woodland habitats. While there is potential for brown hare to be use arable fields within the site, the habitat conditions are less optimal due to proximity to extensive residential areas, and because the habitats present are less diverse. When the arable crops in the fields are mature or absent (i.e. much of the period between late June and re-sowing of winter crops over September to October), the site offers very little alternative foraging habitat or cover for brown hare. Consequently the habitat conditions present are not considered optimal for this species.

A single hedgehog was observed in a pasture field to the east of the site during one of the bird surveys, but was not observed within the site. There is potential for hedgehog to use habitats within the site, but this species is unlikely to make regular or substantive use of the arable fields as these provide poor foraging habitat. As such, habitat use would be restricted primarily to the relatively small areas of non-arable habitat within the site, such as the hedgerows, adjacent verges and broad-leaved plantation woodland.

No other relevant species were identified through desk study or field surveys for the scheme.

4.3.8 Relevant Species and their Relative Geographic Value

In order to facilitate the assessment of potential impacts, each of the relevant species identified above are assigned a geographic value (Table 4.10) based on considerations of relative distribution, abundance, and whether or not their populations are stable, increasing or in decline.

Table 4.10: The Relative Geographic Values of Relevant Species Recorded from the Site

Species	Geographic value	Supporting comments
Wintering bird assemblage	Local	No species were identified that merit individual assessment. All species present in small numbers and typical of the habitats present and geographic location of the site.
Breeding bird assemblage	Local	As wintering birds.
Common pipistrelle bat	Local	This species has a relatively favourable population status nationally (stable to increasing) and is one of the most widespread species nationally. The data indicate a regular but low level of activity by this species.
Noctule bat	Local	Over 15 days of survey effort, only 16 passes were recorded. This low activity is likely to be attributed to a single bat occasionally flying over the site during the warmer summer months. Noctule is a widely ranging species (up to 5 km in a night) and therefore the site represents only a small proportion of the habitat potentially available to this species in the wider landscape. The habitats present are typical of the lowland farmed landscape, so the site is unlikely to be functionally important for noctule as similar habitats are widespread.
Leisler's bat	Local	Over 15 days of survey effort, a maximum of three passes were recorded. This is consistent with the brief presence of a single bat and does not suggest the presence of a notable population. Given there is a historical record of a roost to the east of the site, and Leisler's bat will cross open ground to access foraging habitat, an occasional transistor pass by this species is not unexpected. Like noctule it is also a highly mobile species and therefore the site represents only a small proportion of the habitat potentially available in the wider landscape.
Serotine bat	Local	Over 15 days of survey effort, only two passes were recorded. This is consistent with the brief presence of a single bat and does not suggest the presence of a notable population. Serotine is typically a species of southern England, and as such this record may indicate the chance presence of a vagrant bat rather than the presence of a population somewhere nearby.
Myotis bat	Local	All species of *Myotis* bat are of comparable status nationally. The data indicate only incidental use of the site by individual bats.
Brown hare	Local	Brown hare is present in the wider landscape but was not observed during any of the surveys on site, including twelve optimally timed bird and bat surveys. Habitat conditions are considered sub-optimal and peripheral to areas of more suitable habitat, especially given the proximity to residential areas.
Hedgehog	Local	There is no evidence to indicate that hedgehog is present on site, but it is likely that it occurs as it is present nearby. However, habitat conditions are not currently optimal for this species do the prevalence of arable farmland. The main habitats of value are on the periphery of the site and would primarily be retained due to needs for stand-offs from trees and residential properties.

5. Discussion

5.1 Nature Conservation Designation Constraints & Opportunities

There are no nature conservation designations relevant to the scheme, therefore there are no constraints or opportunities associated with nature conservation designations. All of the designations listed in Table 4.1 and 4.2 are too distant from the site to be constraints to the development of the site for housing.

The scheme complies with relevant planning policy covering nature conservation designations, as it would not impact any such designations.

5.2 Habitat Constraints & Opportunities

5.2.1 Habitat Constraints

Hedgerows and Free Standing Mature Trees

The only habitats associated with the site that are considered a specific design consideration are the network of hedgerows and other mature trees. Most of the hedgerows associated with the site are located on the southern boundary and therefore would be retained. However, there is one species-poor hedgerow with mature trees (Hedgerows 1) in the site. Hedgerow 1 is not important in the context of the Hedgerow Regulations.

All of the hedgerows present are examples of the NERC Act priority habitat, and while they are limited in extent and connectivity to the wider landscape, they are all likely to provide locally valuable foraging habitats for bats from roosts located in residential areas, and hedgehog.

Given the above, the master plan should aim to maintain the cohesiveness of the hedgerow corridors associated with the site, and retain mature trees, where practicable. This is consistent with national planning policy requiring 'no net loss' and also local planning policy affording protection to mature trees (policy NE9). It is also within the spirit of planning policy NE5 which aims to retain and safeguard wildlife corridors, although as stated earlier in this report the potential contribution of these hedgerows to habitat connectivity is relatively small.

Where localised impacts on Hedgerow 1 and associated mature trees cannot be avoided then appropriate mitigation would need to specified, and Kirklees District Council can be expected to specify a requirement for habitat compensation. All hedgerow loss should be compensated as a minimum on a one for one basis, and to demonstrate net gain ideally more habitat would be put back than that removed. This is consistent with the habitat opportunities described below. There is considerable scope to reinforce habitat connectivity along the southern site boundary through new woody plantings, and this would likely compensate for any hedgerow loss within the site. New hedgerow plantings or alternative woodland or scrub plantings should be species-rich and comprised of native species obtained from a reputable local grower who can source identify their planting stock. This is consistent with current guidance issued by The Arboricultural Association[1] and endorsed by Defra.

Other Habitats

None of the other habitats associated with the site are considered to be mandatory design considerations or require retention. However, where practicable, the master plan should aim to maintain the cohesiveness of the north/ south habitat corridor of scrub and rough grassland in the far west of the site. This merits retention as a potential habitat corridor for bats linking roosts in residential areas to woodland to the west of the site, and as an amenity resource (it already appears to have value as a desire line footpath). This would be supportive of the objectives of policy NE5 also.

[1] Biosecurity in Arboriculture and Urban Forestry Position Statement

Consideration of Requirements for Retention of Wild Bird Habitats

Current national planning policy requires consideration of the potential impacts of development on the quality of wild bird habitats. This does not mean that all bird habitats must be retained, as to require this would effectively prevent all development, but planning authorities are required to screen developments for potential impacts and take a strategic view on this when determining planning applications.

The proposed scheme does not represent a specific conflict with requirements for the retention of wild bird habitats, particularly if the above constraints and the subsequent opportunities are taken into account when developing the scheme master plan. Bird surveys have been undertaken to determine the relative value of the site for both wintering and breeding birds, and these have determined that the site is currently of relatively low value due to the baseline habitat conditions and land management regimes i.e. most land is intensively managed arable farmland.

5.2.2 Habitat Opportunities

Potential opportunities for habitat improvement or creation are described below. These are in addition to any requirements for habitat mitigation identified in Section 5.2.1, but in some cases there may be synergies between proposals for ecological enhancement and mitigation.

Improvement of Habitat Connections through Enhancement of Existing Features

The positions and alignment of the southern boundary hedgerows provide targets for bolstering and extension as part of the soft landscaping proposals for the scheme, to secure both screening and amenity value for local people, and screening and enhancement for biodiversity. Such an approach would be consistent with the objectives of national planning policy (net gain) and also aligns with local planning policy (synergies with objectives of policies NE5 and NE9) and the objectives of the LBAP.

All new woody plantings should be species-rich and comprised of native species obtained from a reputable local grower who can source identify their planting stock. This is consistent with current guidance issued by The Arboricultural Association[2] and endorsed by Defra.

Opportunities to create additional complimentary habitats should also be considered during landscape design e.g. wetlands or species-rich grassland (see also Site Drainage, below).

Site Drainage

Where site drainage is a relevant consideration, then the design of surface water drainage affords opportunity for the creation of features that would provide beneficial new habitat. In particular, Sustainable Urban Drainage Systems (SUDS) should ideally be designed in such a way that wetland habitats can be created or be allowed to establish naturally. Supporting guidance and case studies that can be used to inform SUDS design are detailed in Graham *et al*. (2012) and Woods Ballard *et al*. (2015).

5.3 Species Constraints & Opportunities

5.3.1 Species Constraints

Relevant species constraints associated with the site are limited to bats and breeding birds, although it would also be prudent to re-assess the badger risk associated with the site periodically (as advised in more detail below) as there is low potential for this species to establish a sett(s) in the future. Based on the defined baseline conditions, the site is of relatively low value for wildlife and therefore the scheme complies with requirements of relevant legislation and planning policy.

Bats merit consideration as a specific design constraint to be considered during development of the scheme master plan, as well as being relevant to considerations of potential mitigation requirements and opportunities to provide ecological gain in accordance with planning policy. This is on the basis

[2] Biosecurity in Arboriculture and Urban Forestry Position Statement

that national planning policy identifies that bats are of principal importance for nature conservation in England, and as such planning authorities have a duty to consider opportunities to secure improvements in nature conservation status when reaching planning decisions.

Birds are primarily a constraint with regard to compliance with relevant legislation, and mitigation will be required to manage risk. Opportunities to provide ecological gain in accordance with planning policy should also be considered.

These species are considered further below.

Bats

The site supports a bat population of local value, and is predominantly used by common pipistrelle bats. Potential impacts on bats from the scheme might arise from:

- Loss of Hedgerow 1 has a foraging value for small numbers of bats; and
- Reduced suitability of bat foraging habitats as a result of light spill from lighting that would accompany the scheme.

Habitat loss can be avoided if the recommendations to retain or replace hedgerow and other linear habitats are taken account when developing the site master plan (see Section 5.2).

With the inclusion of additional habitat connections as part of the soft landscaping scheme, there would be potential to achieve net gains in habitat connectivity and quality for bats and/ or buffer existing bat habitats from potential indirect effects from lighting.

Lighting impacts can be avoided by including bats as a specific consideration during lighting design. LED systems in particular, have great potential to improve the specificity of lighting direction such that unnecessary spill and glare can be avoided. Lighting design should aim to remove, or if this is not possible, minimise light spill and glare onto existing and new habitats of potential value to bats. The aim should be to achieve 0 lux in association with bat habitats, but otherwise this should be as low as possible and no greater than 3 lux. The lower the lux achieved, the greater the confidence that bats will not be impacted.

There should be no light spill or glare onto the tree of bat roost potential, and with such a commitment there would be no grounds to require bat emergence surveys or for the presence of this tree to be a consideration during determination of the planning application.

Birds

Birds are not a specific design consideration, as the site is of relatively low value for birds. If the habitat recommendations made in Section 5.2 are addressed in part or in full, then much of the habitat resource of greatest value to birds would be retained. Where the new dwellings have gardens, then these would have potential to develop a similar value for birds as the existing site conditions, although the precise incidence and abundance of individual bird species would likely vary from the established baseline conditions. The loss of arable farmland to the scheme cannot be avoided, but given the limited value of this habitat for birds at this site, the loss of this habitat is not is unlikely to be adverse and does not conflict with planning policy.

Should the scheme be consented and get built, then there would be a need to consider the possible presence of breeding birds at site clearance and during construction. The WCA affords legal protection to all wild birds, and their eggs, active nests and dependent young. Standard mitigation would need to be implemented as follows.

- No vegetation clearance or other ground disturbance with potential to impact nesting birds would take place between 1st March and 31st August inclusive, unless an ecologist has checked the area immediately before the commencement of such works and confirmed the absence of nesting birds.

Where the defined breeding season cannot be avoided, the following approach would need to be applied as relevant and appropriate:

- Prior to the commencement of each discrete phase of site clearance an ecologist should walk the relevant works area to determine the presence/ absence of bird nests.
- In the absence of nests, works can progress as planned. Should any active bird nests be found then the ecologist will advise on appropriate stand-off distances and working requirements. Stand-offs would need to be maintained until the cessation of nesting activity, as determined through monitoring by the supervising ecologist

Badger

Currently there is no evidence of badger in association with the site, but given the extensive woodland to the west of the site there remains the risk of this species moving into the site in the future. A check should be made for badger before submitting the full planning application for the site, to re-confirm that badgers are still absent. This will allow the application to be determined with confidence that badger is not a constraint. A similar survey would also be appropriate prior to site clearance, given the legal protection afforded to badger.

Should any badger setts establish in the future, this would be unlikely to be a barrier to the granting of planning permission, subject to the specification of appropriate mitigation and (if necessary) demonstration that the scheme would be likely to be granted a Badger Licence by Natural England.

Hedgehog

While the scheme should retain most habitat of potential value for hedgehog, as this is associated with site boundaries, there is potential for a minor reduction in habitat for this species if Hedgerow 1 cannot be retained, and potential for other impacts on wider habitat connectivity for this species. As such, it is a consideration in the specification of the landscaping that would accompany the scheme, and also in the specification of the boundaries to individual residential plots.

5.3.2 Species Opportunities

Implementation of the preceding habitat recommendations would secure related benefits for wildlife, including those protected and notable species already associated with the site i.e. bats and birds. In addition, there is potential to secure opportunities for bird nesting and bat roosting provision within the structures of new dwellings. Such measures are encouraged in Kirklees.

Where provided, bat roost provision should be sited to avoid areas with light spill and glare, and should ideally be in proximity to habitat corridors identified on the master plan. They should be position at least 4 m above ground level and should avoid north-facing aspects. Off the shelf options are available that can be readily and inconspicuously incorporated into new builds, and that require no ongoing maintenance.

Options for birds are as flexible as those for bats, but with different models available depending on the target bird species selected. In the case of the current scheme a selection of models should be chosen including those suitable for swift and house sparrow. The last two species are NERC Act species and habitat enhancement for these species would contribute to targets in the LBAP. Bird provision should again ideally be positioned with reference to the orientation of habitat corridors, and should be north-facing to avoid potential for over-heating.

Garden boundaries should be designed in such a way that permeability is retained for species such as hedgehog. Soft boundaries would provide optimal conditions for hedgerow, but hard boundaries would be acceptable with the incorporation of gaps[3] that afford access to neighbouring gardens or the wider landscape. By so doing, there would be likely be a net increase in access for hedgehog to suitable areas of habitat, relative to the baseline conditions of intensive arable farmland.

[3] http://www.hedgehogstreet.org/pages/link-your-garden.html

6. Summary Constraints and Recommendations

6.1.1 Ecological Constraints

The main ecological constraints associated with the site and to be taken into account when developing the master plan are:

- Hedgerows and mature trees; and
- Bats.

In addition, options to incorporate other pre-existing habitats into the master plan should be considered e.g. scattered scrub.

Additional potential species constraints requiring ongoing consideration relate to breeding birds and badger.

6.1.2 Ecological Design, Mitigation and Enhancement Recommendations

The following summary is provided based on the recommendations made in Section 5 of this report. They should be considered and addressed as appropriate in the future development proposal, including the associated master plan.

Scheme Design Recommendations – Risk Avoidance and Potential Enhancement

- Site master plan to include proposals to maintain and where feasible enhance habitat connectivity across the site with reference to the retained habitat network along the southern site boundary.
- All new habitats to be of native composition. All new tree and shrub plantings be source identifiable and in accordance with Arboricultural Association Biosecurity Guidance;
- Biodiversity to be a design consideration when specifying any necessary SUDS;
- Ensure that the tree of bat roost potential on the southern boundary is taken into account by the master plan to demonstrate no risk of impact, including from lighting;
- Lighting scheme to be designed with reference to avoiding impacts on bats, and remove or minimise potential for light spill or glare onto retained habitats, and where feasible new soft landscaping; and
- Include provision for bird nesting and bat roosting habitat in the structure of new dwellings, and provision for hedgehog access in garden boundaries.

Mitigation Requirements

The following requirements are identified based on the assumption that all relevant design considerations are addressed to minimise the potential for adverse ecological effects. This seems reasonable given the limited ecological constraints association with the site and their association with boundary habitats of limited extent.

- Compensate for any local hedgerow loss (where unavoidable) through new plantings of native tree and shrub species, and deliver species-rich new habitat;
- If development is approved and taken forward to construction, mitigation for breeding birds will need to be implemented at site clearance and construction (either sensitive timing to avoid risk, or ecological watching brief); and
- Re-check for badger periodically e.g. prior to submission of full application and prior to site clearance to confirm continued absence.

7. References

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Appendix A Results of the Hedgerow Regulations Survey

Table A1: Summary of qualifying ecological features, under paragraphs 6 & 7 of the Hedgerow Regulations 1997, associated with the hedgerows surveyed

Hedge No.	Hedge Length (m)	>30 years old?	Mean number of qualifying woody species	*Significant number of standard trees (no. of trees in hedgerow)?	*3 woodland herbs within 1m of hedge margins?	*Gaps <10% of hedge?	*Bank or wall along at least half of the hedge?	*Ditch along at least half of the hedge?	*Connections scoring 4 points or more (points scored)?	*Parallel hedge within 15m?	Protected species (as defined by the Regs)?	Important Hedgerow?	Species-rich?
1	100	✓	3	No (1)	No	Yes	No	Yes	No (1)	No	No	No	No
2	100	✓	2	No (0)	No	No	No	No	No (0)	No	No	No	No
3	100	✓	4	Yes (2)	No	Yes	No	Yes	No (3)	No	No	No	Yes

Table A2: Summary of other qualifying wildlife and landscape features, under paragraph 8 of the Hedgerow Regulations 1997

Hedgerow No.	Adjacent bridleway, footpath or byway open to all traffic (BOAT)	4+ woody species (see Table A1)	2+ of * criteria (see Table A1)	Important Hedgerow?
1	x	x	✓	No
2	x	x	x	No
3	x	✓	✓	No

Table A3: Scoring woody species and woodland ground flora recorded from each hedgerow

Hedgerow No.	Woody species	Ground flora
1	Hawthorn (*Crataegus monogyna*) Elder (*Sambucus nigra*) Elm species (wych elm, *Ulmus glabra*)	None
2	Hawthorn Elder	None
3	Hawthorn Willow species (goat willow) Wild cherry (*Prunus avium*) Elder	Wood avens (*Geum urbanum*)

Appendix B Bat Transect Survey Results

Table B1: June Dusk Transect

Date: 21/06/16		**Temperature (°C):** 17	**Rain (0-5)[2]:** 0	**Surveyors:** SW & HM
Sunset/Sunrise time: 21:40		**Wind (0-7)[3]:** 1	**Cloud Cover (0-5)[4]:** 3	
Start Time: 21:50	**Finish Time:** 00:10	**Equipment used**: Batbox Duet and Batlogger	**Weather description (incl. previous evening):** Dry, light wind	

Reference Number/Stop	Time	Species[1]	No. of bats	Activity/Description
1	22:12	PIPI	1	Heard not seen (HNS) two passes
2	22:15	PIPI	1	HNS
3	22:24	PIPI	1	Foraging along hedge, two passes
4	22:32	PIPI	1	HNS
5	22:33	PIPI	1	Flying across field
6	22:37	PIPI	1	Flying down hedgerow
7	22:39	PIPI	1	Flying across field
8	22:41	PIPI	1	
9	22:48	PIPI	1	Foraging along hedgerow, three passes
N/A	22:50	NYNO	1	Not recorded during survey but detected on Batlogger
10	23:00	PIPI	1	Foraging, HNS, 11 passes
11	23:02	PIPI	1	HNS
12	23:06	PIPI	1	HNS
13	23:07	PIPI	1	Foraging, four passes
14	23:20	PIPI	1	HNS, six passes
15	23:29	PIPI	1	Faint pass, HNS
16	23:57	PIPI	1	HNS

[1]**Species codes:** PIPI: Common pipistrelle (Pipistrellus pipistrellus), NYNO: Noctule (Nyctalus noctula)

[2]**Rain scale:** 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood

[3]**Beaufort wind force scale:** 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion

[4]**Percentage scale based on:** 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%

Rows shaded in light blue are bat records from land to the south of Ravensthorpe Road

Table B2: July Dusk Transect

Date: 26/07/16	**Temperature (°C):** 17	**Rain (0-5)[2]:** 0	**Surveyors:** SW & CW
Sunset/Sunrise time: 21:17	**Wind (0-7)[3]:** 0-1	**Cloud Cover (0-5)[4]:** 5	
Start Time: 21:20	**Finish Time:** 23:38	**Equipment used**: Batbox Duet & Edirol	**Weather description (incl. previous evening):** Dry and warm

Reference Number/Stop	Time	Species[1]	No. of bats	Activity/Description
1	21:38	PIPI	1	Heard not seen
2	21:52	PIPI	1	Four passes
3	21:59	PIPI	1	Heard not seen
4	22:07	PIPI	1	Heard not seen, two faint passes
5	22:14	PIPI	1	Four passes
6	22:50	PIPI	1	Four passes
7	23:00	PIPI	1	Heard not seen three passes
8	23:07	PIPI	1	Seven passes
9	23:10	PIPI	1	Five passes
10	23:14	PIPI	1	Seven passes
11	23:25	PIPI	1	One pass

[1]**Species codes:** PIPI: Common pipistrelle (*Pipistrellus pipistrellus*),

[2]**Rain scale:** 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood

[3]**Beaufort wind force scale**: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion

[4]**Percentage scale based on:** 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%

Rows shaded in light blue are bat records from land to the south of Ravensthorpe Road

Table B3: August Dusk Transect

Date: 18/08/16		**Temperature (°C):** 18-20	**Rain (0-5)[2]:** 0	**Surveyors:** JA & SW
Sunset/Sunrise time: 20:52		**Wind (0-7)[3]:** 2	**Cloud Cover (0-5)[4]:** 0-3	
Start Time: 20:30	**Finish Time:** 22:35	**Equipment used**: Batbox Duet & SM2	**Weather description (incl. previous evening):** Dry, mild and still with clear skies at start	

Reference Number/Stop	Time	Species[1]	No. of bats	Activity/Description
1	21:26	PIPI	1-2	Foraging along hedgerow, five passes
2	21:26	PIPI	1-2	Foraging along hedgerow, eight passes
3	21:33	PIPI	1-2	Foraging along hedgerow, three passes
4	21:38	PIPI	1	Foraging along hedgerow, three passes
5	21:44	PIPI	1-2	Foraging along hedgerow, seven passes
6	21:47	PIPI	1	Foraging along lane, two passes
7	21:55	PIPI	1	Foraging along track, two passes
8	22:00	PIPI	2	Foraging along hedgerow, seven passes
9	22:03	PIPI	1	Foraging, one pass
10	22:13	PIPI	1	Foraging, eight passes
11	22:22	PIPI	1	Foraging, two passes

Species codes: PIPI: Common pipistrelle (*Pipistrellus pipistrellus*), NYNO: Noctule (*Nyctalus noctula*)

[2]**Rain scale:** 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood

[3]**Beaufort wind force scale**: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion

[4]**Percentage scale based on:** 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%

Rows shaded in light blue are bat records from land to the south of Ravensthorpe Road

Table B4: August Dawn Transect

Date: 19/08/16		**Temperature (°C):** 16-17	**Rain (0-5)[2]: 0**	**Surveyors:** JA & SW
Sunset/Sunrise time: 05:53		**Wind (0-7)[3]:** 2	**Cloud Cover (0-5)[4]:** 5	
Start Time: 03:50	**Finish Time:** 05:50	**Equipment used**: Batbox Duet & SM2	**Weather description (incl. previous evening):** Mild, dry, overcast, light breeze	

Reference Number/Stop	Time	Species[1]	No. of bats	Activity/Description
1	04:00	PIPI	1	Foraging along hedge, five passes
2	04:05	PIPI	1	Three passes
3	04:15	PIPI	1	One pass
4	04:20	PIPI	1	One pass
5	04:21	PIPI	1	Nine passes
6	04:30	PIPI	2	Nine passes
7	04:35	PIPI	2	One pass
8	04:39	PIPI	1	One pass
9	04:55	PIPI	1	Four passes
10	04:58	PIPI	1	Four passes
11	05:13-05:40	PIPI	1	Foraging along hedgerow, seven passes
12	05:23	PIPI	1	Constant foraging/feeding buzzes
13	05:42	NYNO	1	Not recorded during survey but detected on SM2+

Species codes: PIPI: Common pipistrelle (*Pipistrellus pipistrellus*), NYNO: Noctule (*Nyctalus noctula*)

[2]**Rain scale**: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood

[3]**Beaufort wind force scale:** 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion

[4]**Percentage scale based on:** 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%

Rows shaded in light blue are bat records from land to the south of Ravensthorpe Road

Table B5: September Dusk Transect

Date: 08/09/16		**Temperature (°C):** 18	**Rain (0-5)[2]:** 0	**Surveyors:** SW & RW
Sunset/Sunrise time: 19:38		**Wind (0-7)[3]:** 1-3	**Cloud Cover (0-5)[4]:**	
Start Time: 19:38	**Finish Time:** 21:40	**Equipment used**: Batbox Duet & SM2+	**Weather description (incl. previous evening):**	

Reference Number/Stop	Time	Species[1]	No. of bats	Activity/Description
Part 2b	19:38 - 20:08			
N/A	19:56	NYNO	1	Not recorded during survey but detected on SM2+
Part 2a	20:18-20:33			
1	20:18	PIPI	1-3	10-20 passes, lots of activity around houses
2	20:23	PIPI	1	Five passes
3	20:28	PIPI	1	Six passes
Part 1	20:38-21:40			
4	20:42	PIPI	1	Four passes
5	20:55	PIPI	1	Two passes
6	20:59	PIPI	1	Three passes
7	21:03	PIPI	1	One pass
8	21:37	PIPI	1	One pass

Species codes: PIPI: Common pipistrelle (*Pipistrellus pipistrellus*), NYNO: Noctule (*Nyctalus noctula*)

[2]**Rain scale**: 0 = none, 1 = drizzle, 2 = shower, 3 = rain, 4 = downpour, 5 = flood

[3]**Beaufort wind force scale**: 0 No wind, 1 Light air smoke drifts, 2 Light Breeze leaves rustle, 3 Gentle Breeze small twigs move, 4 Mod Breeze small branches move, 5 Fresh Breeze small trees sway, 6 Strong Breeze large branches move, 7 Mod Gale whole trees in motion

[4]**Percentage scale based on**: 1 = 0-20%, 2 = 21--40%, 3 = 41-60%, 4 = 61-80%, 5 = 81-100%

Rows shaded in light blue are bat records from land to the south of Ravensthorpe Road

Appendix C Method Used for Preliminary Bat Roost Appraisal

Table C1: Survey Methodology for Undertaking an Assessment of Bat Roosting Potential of Buildings and Trees

Buildings

Bats utilise many different features in buildings for places of shelter and roosting. Features that were observed, noted and graded (in accordance with criteria in Table A2) during the external and internal survey of buildings included:

External

- External features associated with each building were visually inspected for their suitability for use by roosting bats. Equipment including close focusing binoculars and powerful spot-lamps were used to study the walls, eaves and roofs of the buildings. Inspection mirrors and endoscopes were used as required.
- Any of the bat species present in the area would be able to enter a roosting cavity through a gap no larger than 20mm wide. However, bats usually also require an area to land that is adjacent to the entrance hole and has a rough surface. Such features were sought during the inspection.
- Features include; gaps in ridge tiles (where mortar is missing) gaps under roof tiles or slates, lead flashing around chimney stacks and around dormer windows, gaps under the fascias and soffits, weatherboarding, missing mortar from joints in stone/ brickwork, roof valleys and hips.
- Special attention was paid to the areas directly below any potential access/ egress point in an attempt to identify any accumulation of bat droppings.
- No work involving scaffolding, multi-sectional ladders over 3 metres in height or rope access work was undertaken as part of the external survey.

Internal

- The most effective method of determining the presence of bat activity within a building is by the presence of their droppings. Bats deposit droppings in both roost and social areas, but the use of such sites by bats can change due to prevailing weather conditions or the time of year.
- The internal inspection comprised surveying all surfaces window ledges, rough wall surfaces, floors, cobwebs, cupboard tops and any relatively undisturbed surface.
- Areas of particular interest (but not restricted to) are the tops of gable end walls, top of the ridge beam, hip and other roof beams, mortise joints, junction of roof beams, areas around chimney breasts, between roof tiles and felting.
- Other features, such as accumulations of discarded wings of moths or butterflies were also recorded where present. Certain bat species are more likely than others to deal with prey items and leave evidence such as this, and so such features can help identify the species present. Similarly, the location of the droppings were recorded as this can provide an indication of both the species and the type of roost that is present.

Trees

Bats will utilise a wide variety of tree features including the following:

- Frost cracks, trunk and branch splits, woodpecker holes,
- Rot holes where branches have been removed
- Hollow sections of trunk, branches and roots
- Areas beneath loose bark, cavities beneath old root buttresses and coppice stools
- Gaps within dense epicormic growth, areas behind dense ivy

These features on each tree were assessed by an ecologist from ground level using binoculars and a high powered torch in order to determine features with the potential to support bats in accordance with criteria in Table A2.

Table C2: Criteria used to Define the Bat Roost Potential of Features

Where possible, the level of Bat Roost Potential (BRP) should be defined with reference to the likely type of roost(s) associated with the relevant feature. Where this is not known then an overall (worst case) level of BRP for the feature is assigned.

Level of Bat Roost Potential	Type of roost		
	Summer or transitional roost used by non-breeding bats	Maternity Roost	Hibernation Roost
Confirmed roost	Presence of bats or evidence of bats. Confirmation of roost status may require further survey.		
High	Feature with multiple roosting opportunities for one or more species of bat. With good connectivity to high quality foraging habitat.	Feature with multiple roosting opportunities for breeding bats (size, temperature). With proximity and connectivity to high quality foraging habitat.	Large site that offers cool stable conditions with multiple roosting opportunities. With proximity and connectivity to high quality foraging habitat.
Moderate	Feature with some roosting opportunities. With connectivity to moderate or high quality foraging habitat.	Feature providing some roosting opportunities. With some connectivity and proximity to moderate or high quality foraging habitat.	Medium sized feature with some roosting opportunities. With some connectivity and proximity to moderate or high quality foraging habitat.
Low	Feature with a limited number of roosting opportunities. With poor connectivity to foraging habitat.	Feature with a limited number of roosting opportunities for breeding bats. With low proximity and connectivity to low or moderate quality foraging habitat.	Small sized feature or feature which may be subject to disturbance or environmental variations, with a limited number of roosting opportunities. With poor connectivity to foraging habitat.
Negligible	Feature with no or very limited roosting opportunities for bats or where the feature is isolated from foraging habitat.	Feature with no suitable roosting opportunities for breeding bats.	Feature with no suitable roosting opportunities for hibernating bats.

Appendix D Photos

Photograph 1: View over the central part of the site towards the housing along Ravensthorpe Road

Photograph 2: Boundary with the broad-leaved plantation on the western boundary of the school

Photograph 3: Boundary with the broad-leaved plantation on the southern boundary of the school

Photograph 4: Mature hedgerow with standard trees

Appendix E SM2 Static Detector Survey Data

Table E1: June 2016 SM2 Data

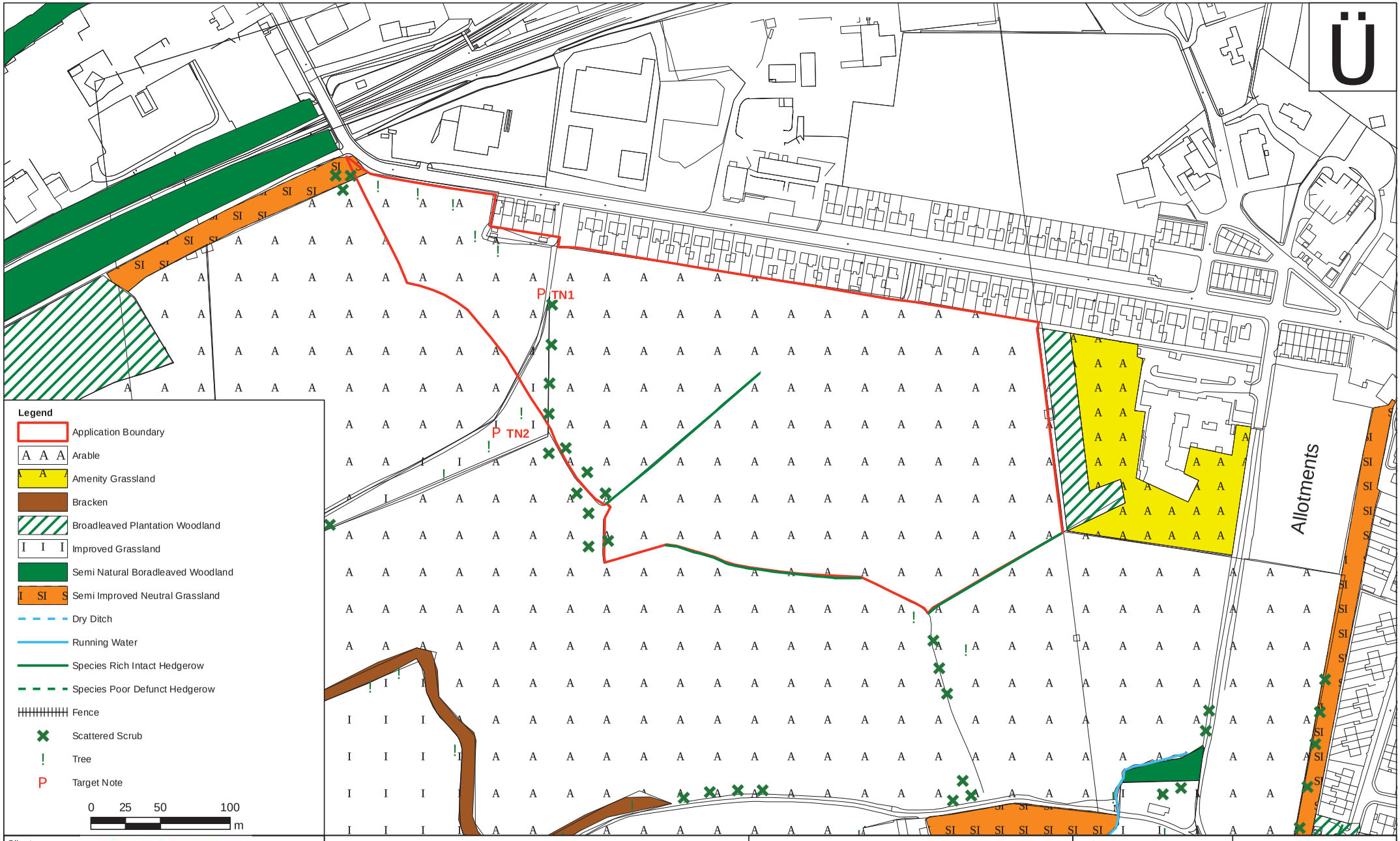
Night	Date	sunset	sunrise	hours of darkness	Total no. bats	Species and number of bats								Bat Activity (passes per hour, all species)
						Common Pipistrelle	Pipistrelle species	Noctule	Leisler's	Noctule/ Leisler's	Serotine	Myotis sp.	Unknown	
1	02/06/2016	21:27:00	04:41:00	7.23	9	9	0	0	0	0	0	0	0	1.24
2	03/06/2016	21:28:00	04:40:00	7.20	31	31	0	0	0	0	0	0	0	4.31
3	04/06/2016	21:29:00	04:39:00	7.17	40	35	1	3	0	0	0	0	1	5.58
4	05/06/2016	21:31:00	04:39:00	7.13	282	279	1	0	0	0	0	1	1	39.53
5	06/06/2016	21:32:00	04:38:00	7.10	200	198	0	2	0	0	0	0	0	28.17
					Total	552	2	5	0	0	0	1	2	**Average activity per hour** 15.77
					Average passes per night	110	0	1	0	0	0	0	0	

Table E2: July 2016 SM2 Data

Night	Date	sunset	sunrise	hours of darkness	Total no. bats	Species and number of bats								Bat Activity (passes per hour, all species)
						Common Pipistrelle	Pipistrelle species	Noctule	Leisler's	Noctule/ Leisler's	Serotine	Myotis sp.	Unknown	
1	26/07/2016	21:13:00	05:11:00	7.97	41	33	0	6	0	0	1	0	1	5.15
2	27/07/2016	21:11:00	05:13:00	8.03	9	3	0	5	0	0	0	1	0	1.12
3	28/07/2016	21:10:00	05:14:00	8.07	36	33	0	3	0	0	0	0	0	4.46
4	29/07/2016	21:08:00	05:16:00	8.13	18	17	0	1	0	0	0	0	0	2.21
5	30/07/2016	21:06:00	05:18:00	8.20	4	3	0	0	0	1	0	0	0	0.49
					Total	89	0	15	0	1	1	1	1	**Average activity per hour** 2.69
					Average passes per night	18	0	3	0	0	0	0	0	

Table E3: August 2016 SM2 Data

Night	Date	sunset	sunrise	hours of darkness	Total no. bats	Species and number of bats								Bat Activity (passes per hour, all species)	
						Common Pipistrelle	Pipistrelle species	Noctule	Leisler's	Noctule/ Leisler's	Serotine	Myotis sp.	Unknown		
1	12/08/2016	20:41:00	05:42:00	9.02	4	3	0	0	0	0	1	0	0	0.44	
2	13/08/2016	20:39:00	05:44:00	9.08	30	29	0	0	0	1	0	0	0	3.30	
3	14/08/2016	20:37:00	05:45:00	9.13	16	15	0	0	0	0	0	1	0	1.75	
4	15/08/2016	20:35:00	05:47:00	9.20	77	57	17	1	0	0	0	2	0	8.37	
5	16/08/2016	20:32:00	05:49:00	9.28	65	58	4	0	1	0	0	2	0	7.00	
					Total	162	21	1	1	1	1	5	0	**Average activity per hour**	4.17
					Average passes per night	32	4	0	0	0	0	1	0		



Client: millerhomes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title: FIGURE 1
PHASE 1 HABITAT MAP

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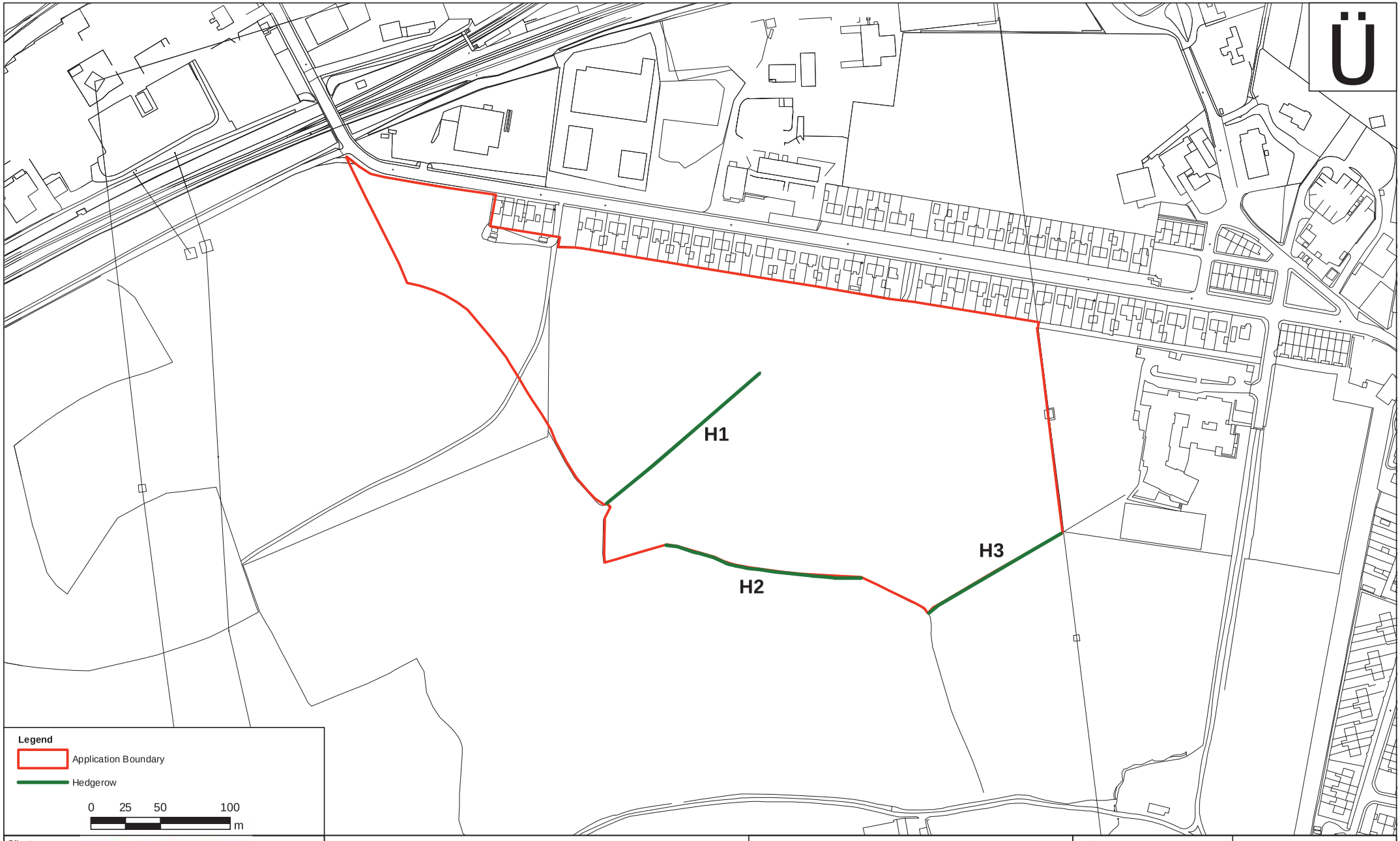
Drawing Number:	60473775 / FIG 1		A3



Client: millerhomes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title: FIGURE 2
HEDGEROW REGULATIONS SURVEY

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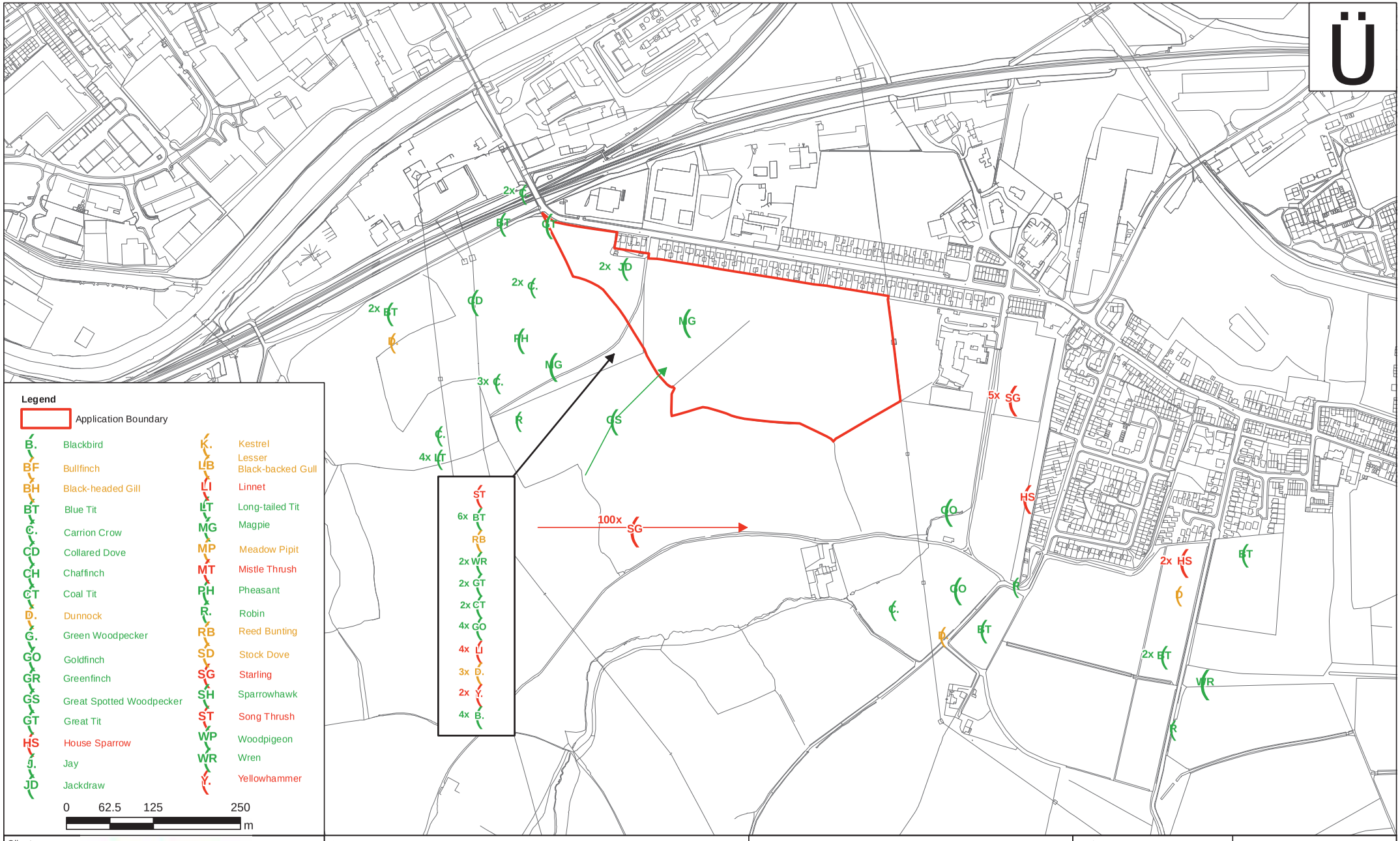

Client: miller homes	Title: FIGURE 3A WINTERING BIRD SURVEY NOVEMBER 2016	AECOM	Design: DB / Drawn: PB
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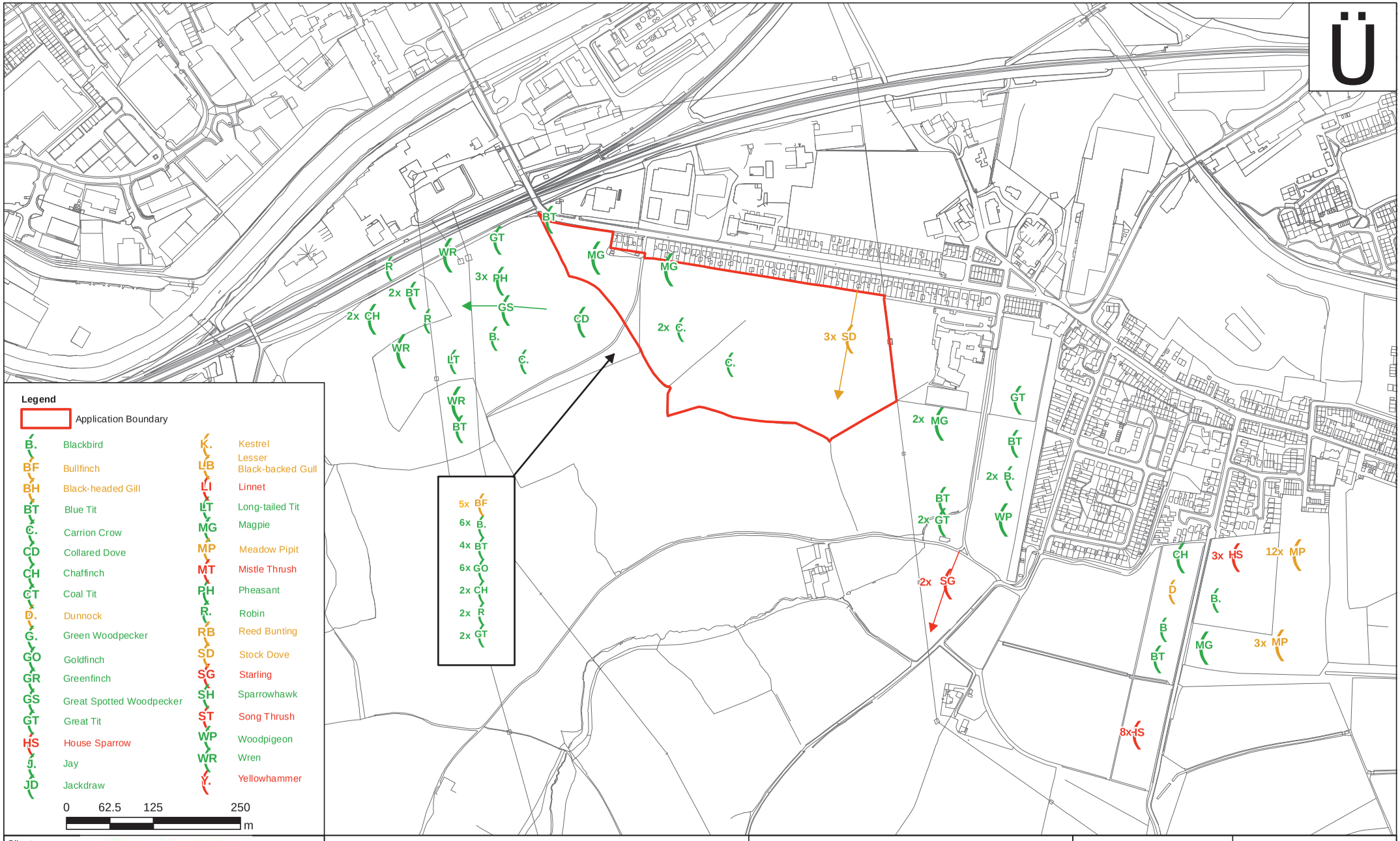

Client: miller homes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title: FIGURE 3B
WINTERING BIRD SURVEY
DECEMBER 2015

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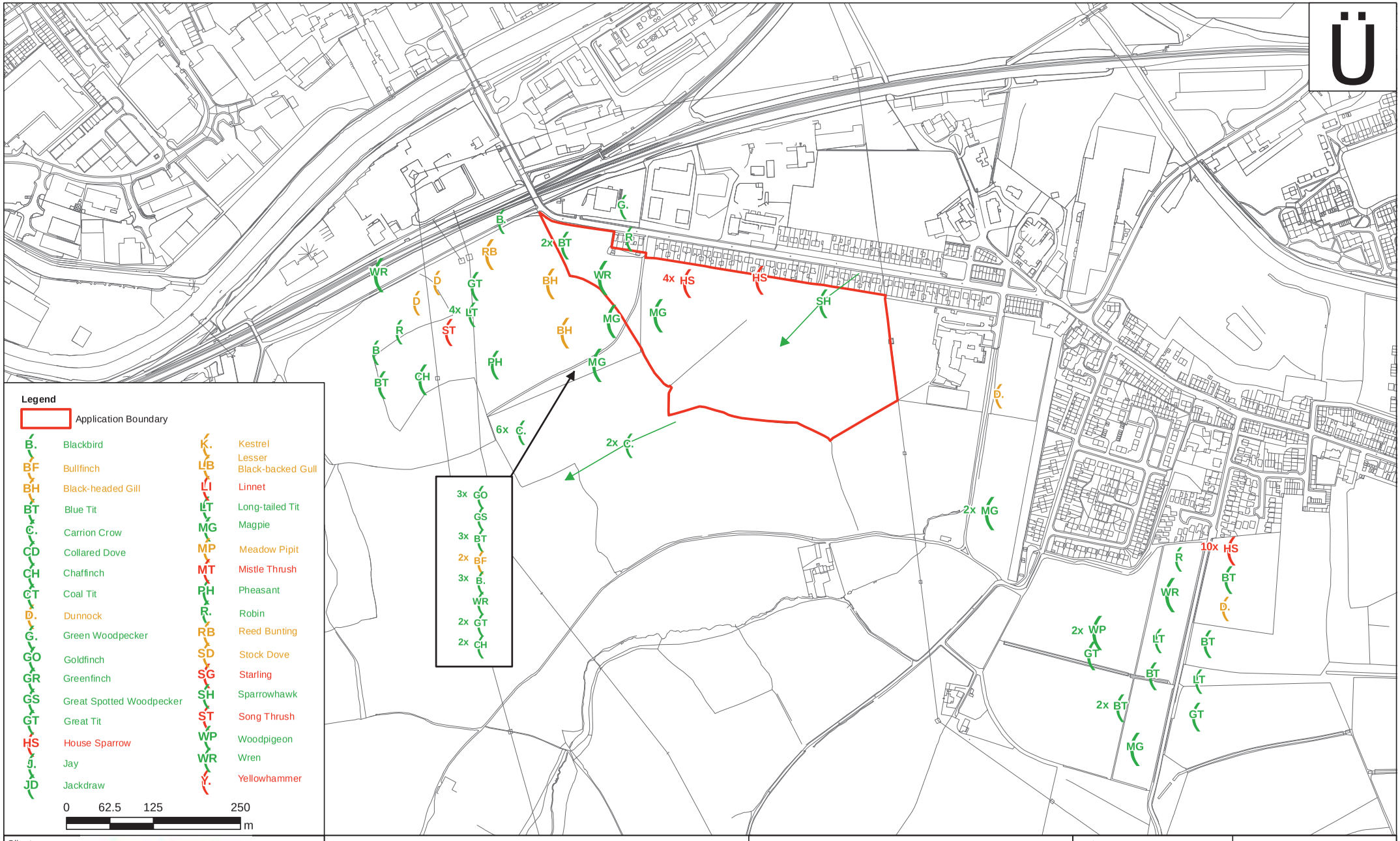
Drawing Number:	60473775 / FIG 3b		A3



Client: miller homes	Title: FIGURE 3C WINTERING BIRD SURVEY JANUARY 2016	AECOM	Design: DB / Drawn: PB
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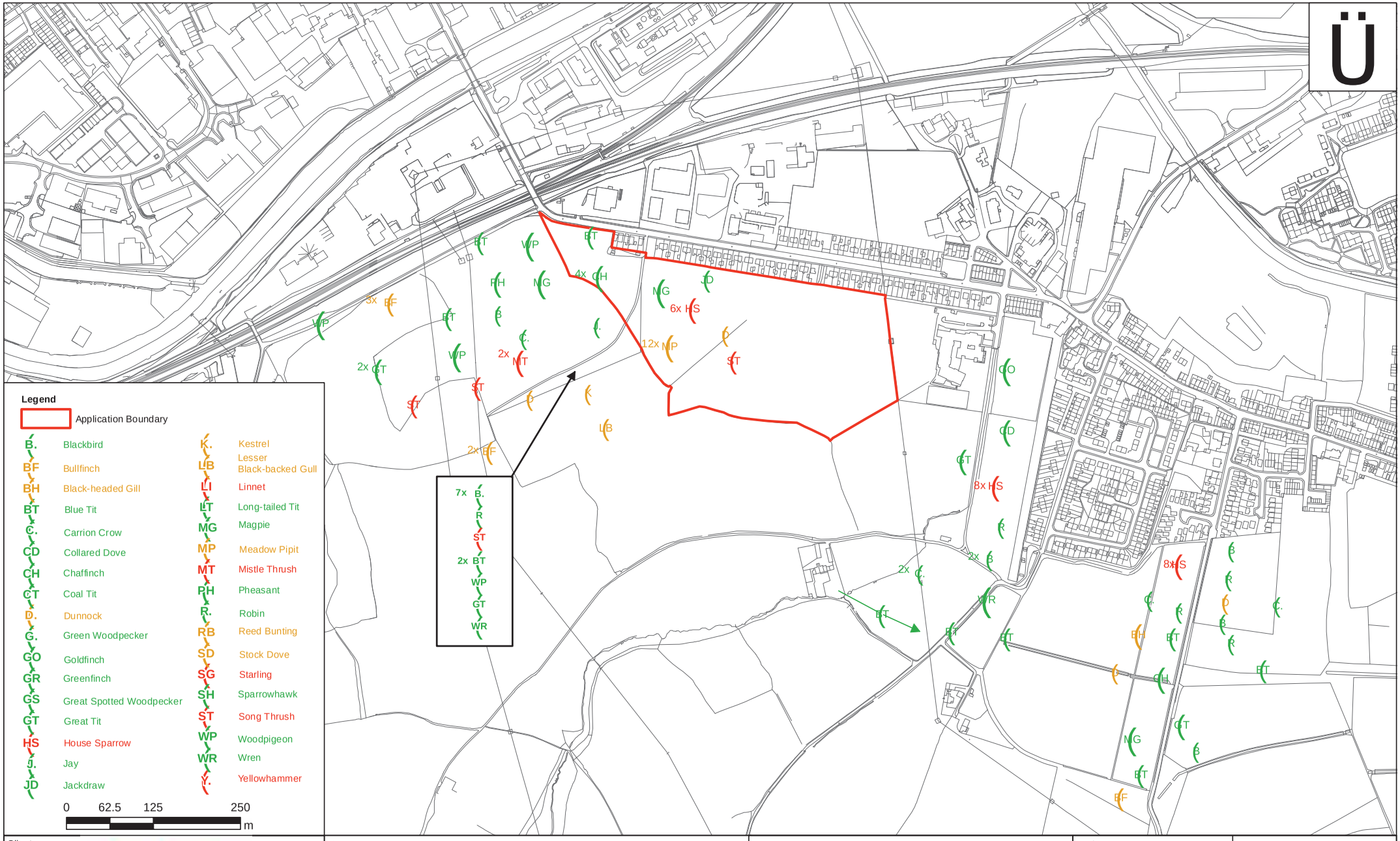

Client: miller homes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title: FIGURE 3D
WINTERING BIRD SURVEY
FEBRUARY 2016

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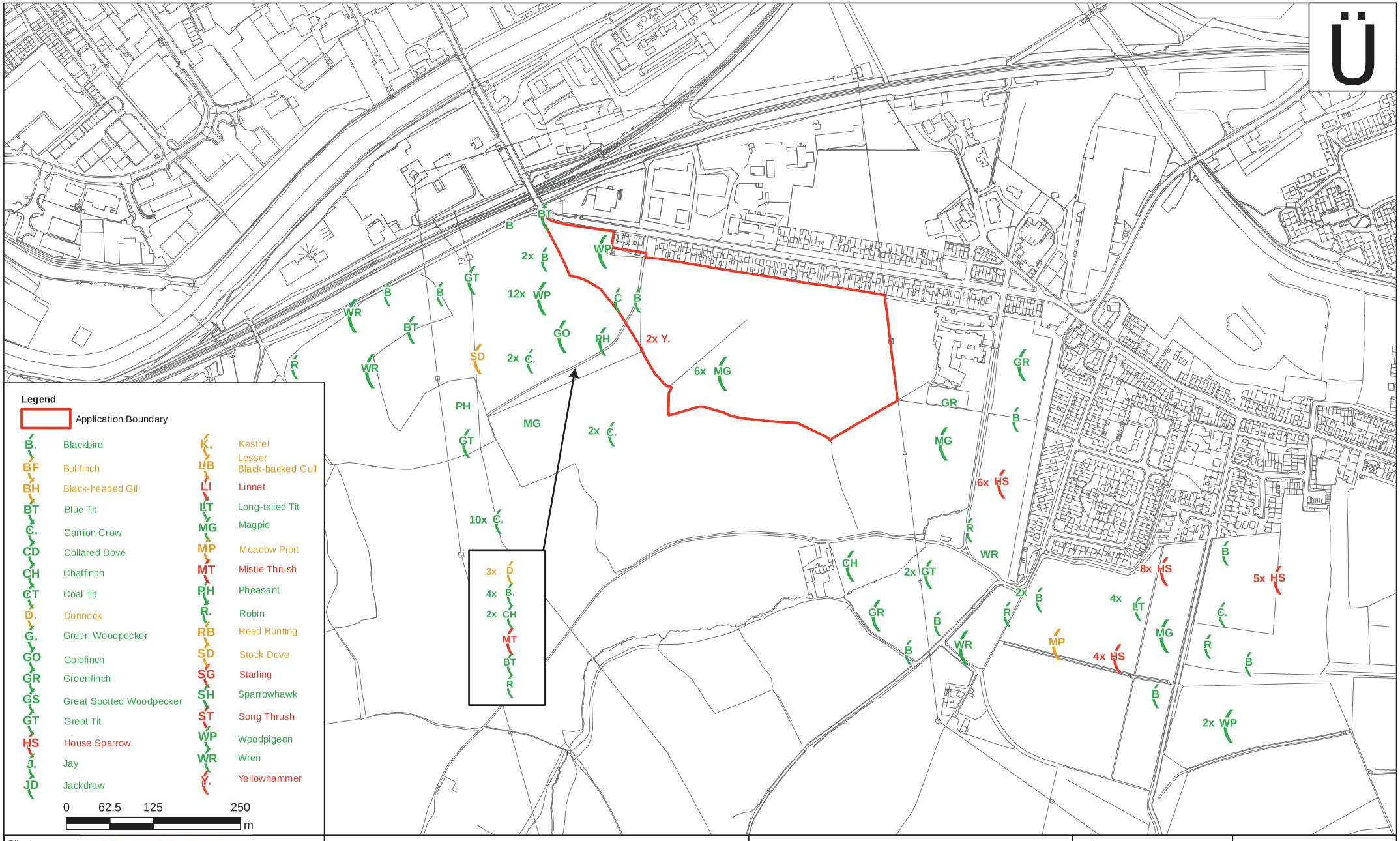
Drawing Number:	60473775 / FIG 3d		A3



Client: miller homes	Title: FIGURE 3E WINTERING BIRD SURVEY MARCH 2016	AECOM	Design: DB / Drawn: PB
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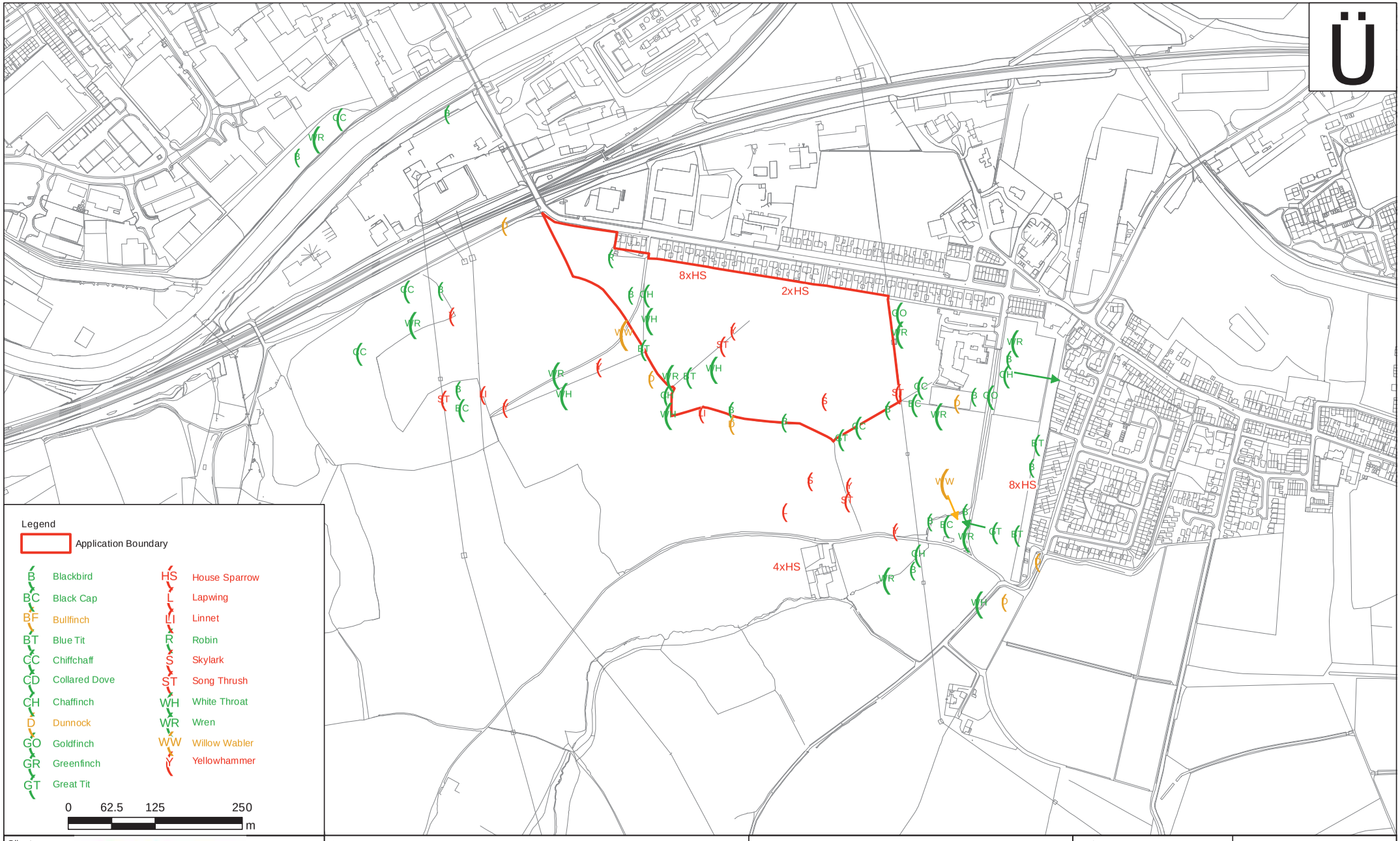

Client: miller homes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title: FIGURE 4
BREEDING BIRD SURVEY

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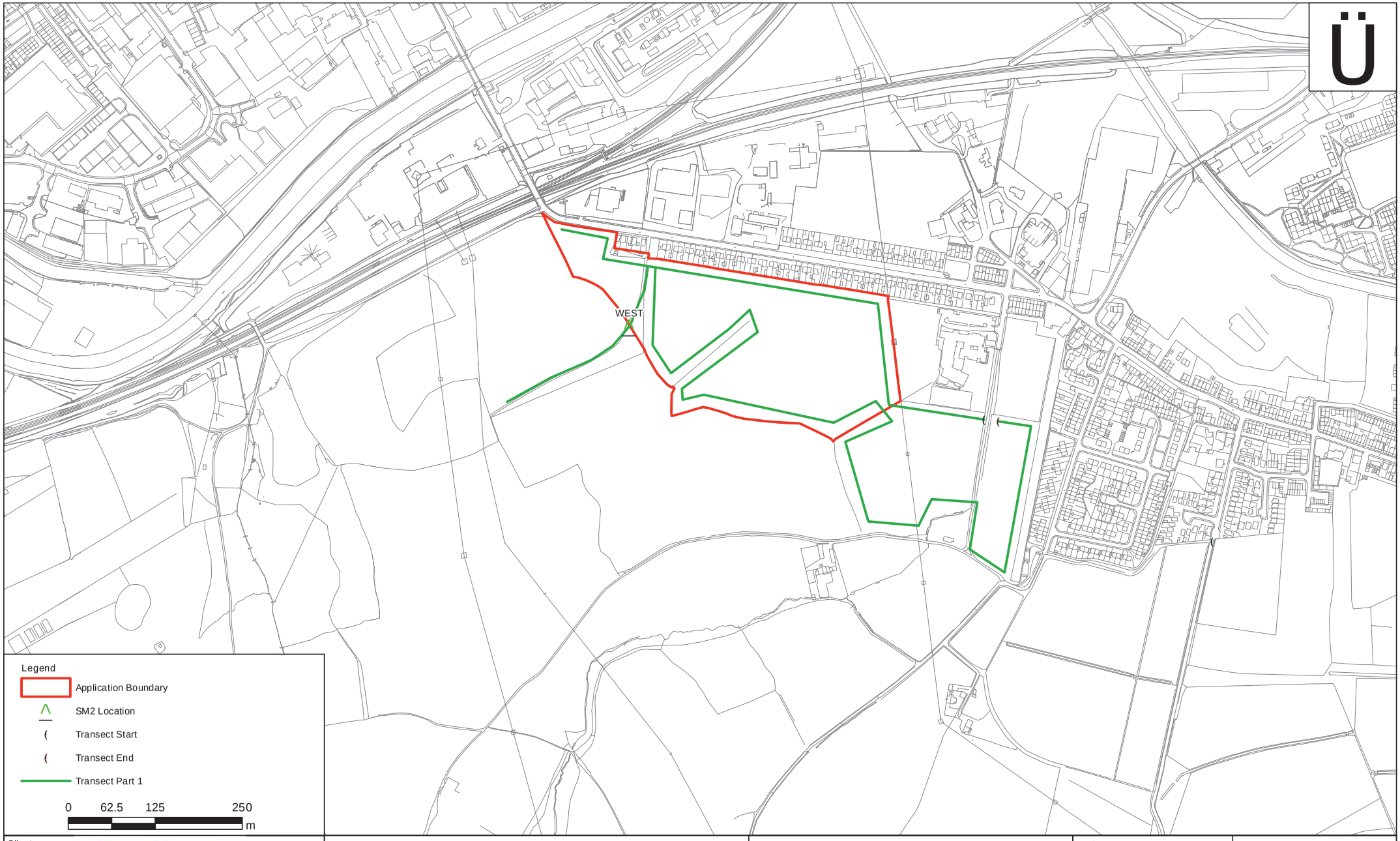

Client: millerhomes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title: FIGURE 5
BAT TRANSECT SURVEY RESULTS
SM2 TRANSECTS

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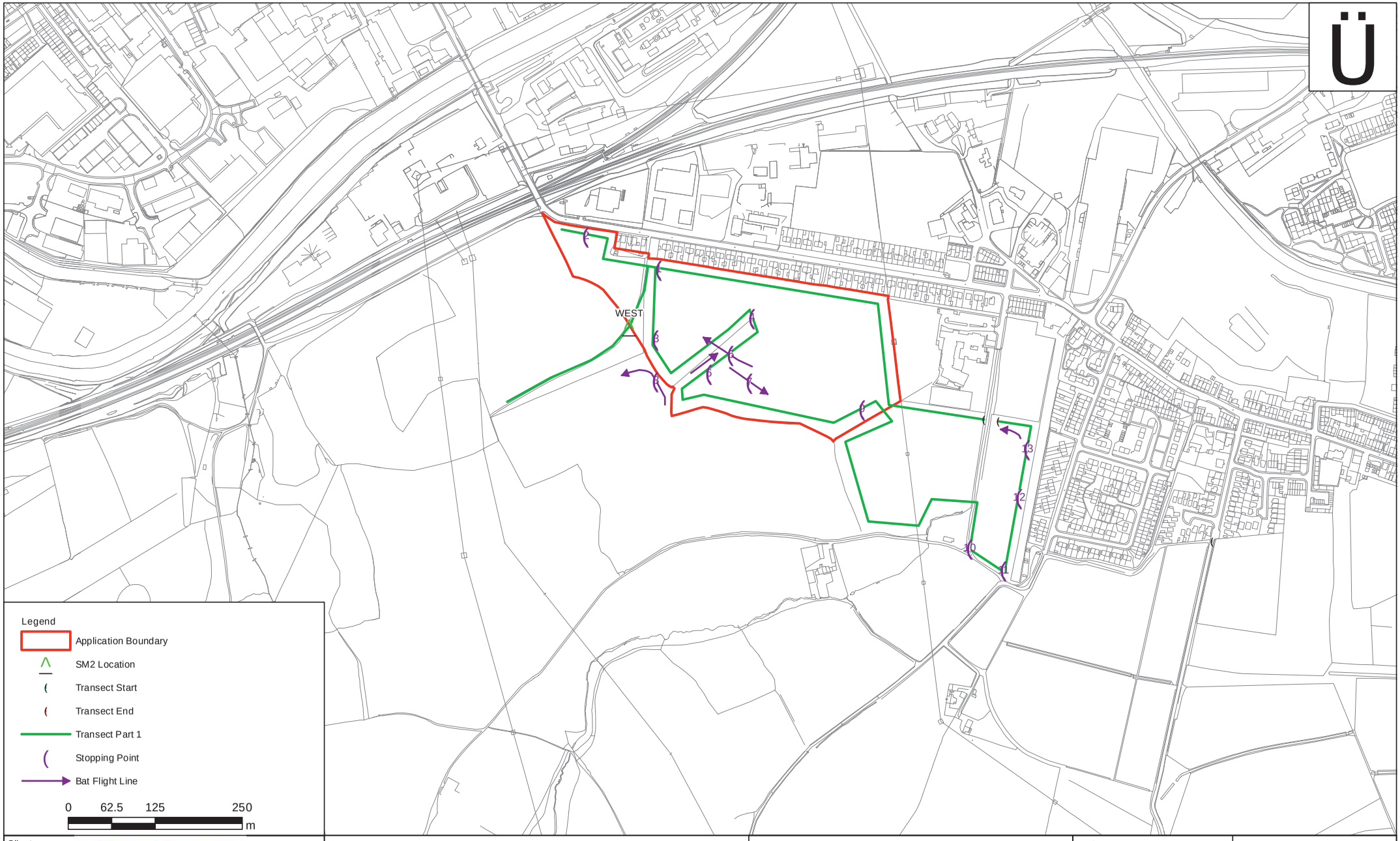
Drawing Number:	60473775 / FIG 5b		A3



Client: millerhomes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title:

FIGURE 6A
BAT TRANSECT SURVEY RESULTS
DATE: 21/06/16

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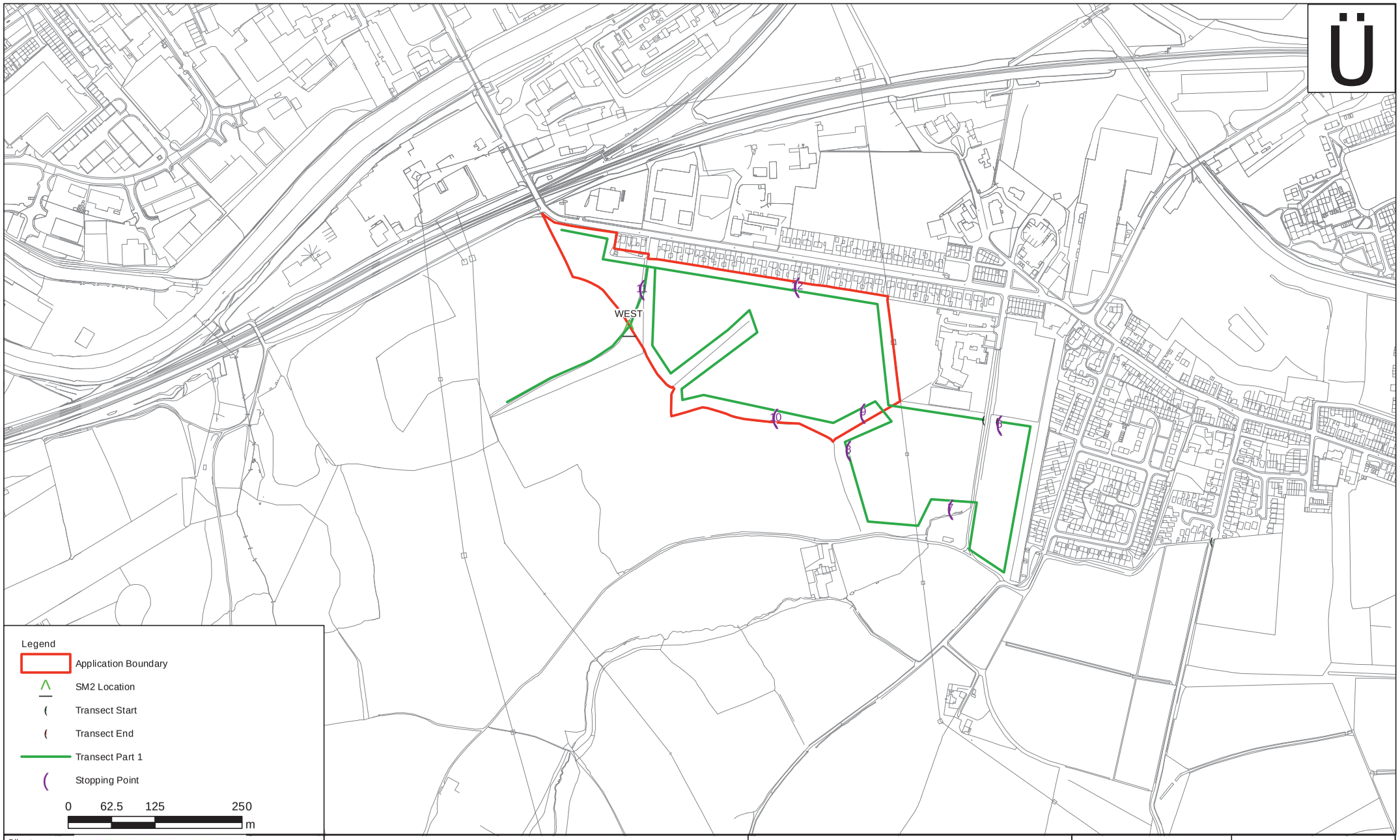

Client: miller homes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title:

FIGURE 6B
BAT TRANSECT SURVEY RESULTS
DATE: 26/07/16

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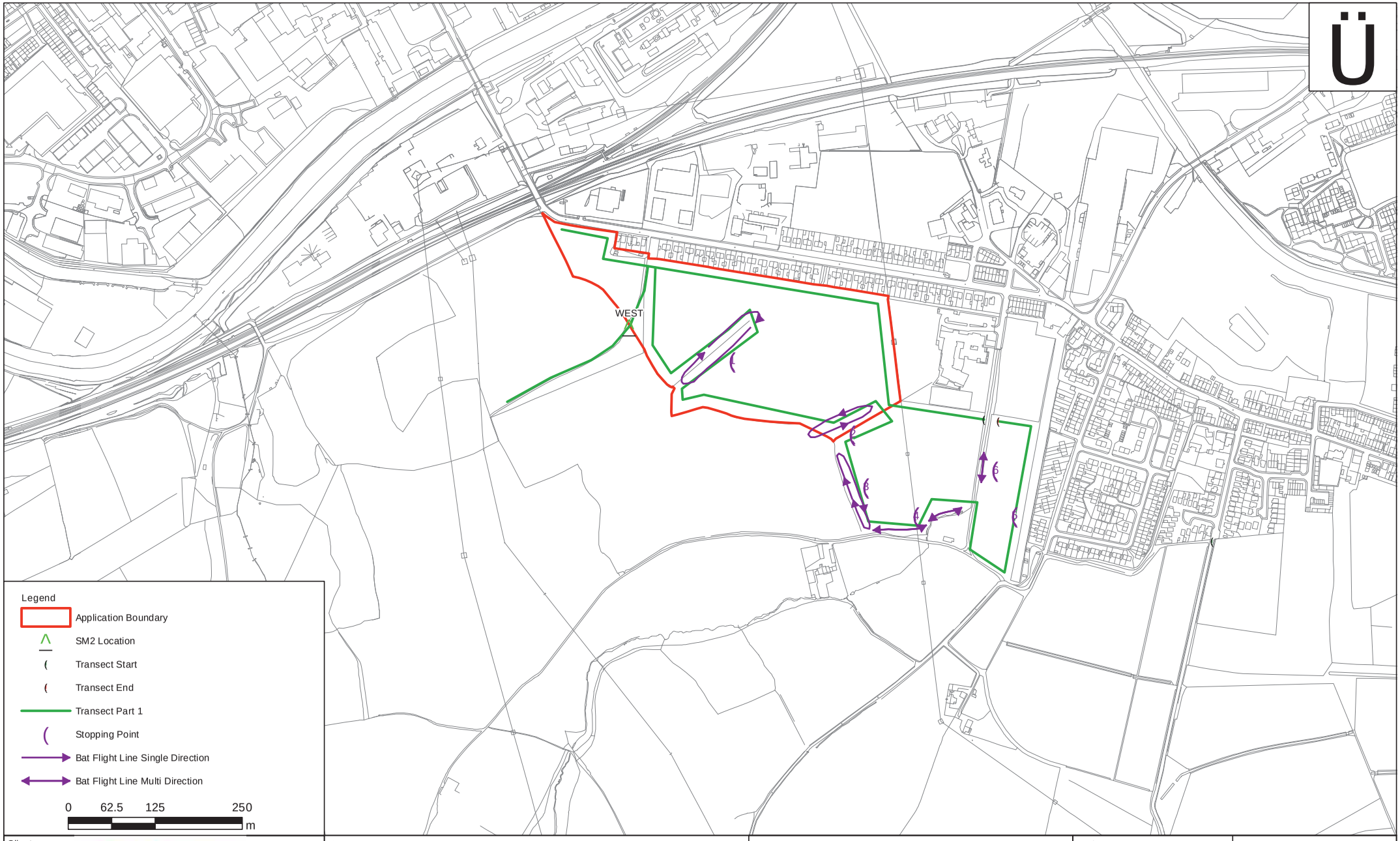
Date:	NOV' 2016	Scale at A3:	1:5,000
Drawing Number:	60473775 / FIG 7b		A3



Client: millerhomes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title:

FIGURE 6C
BAT TRANSECT SURVEY RESULTS
DATE: 18/08/16

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Date:	NOV' 2016	Scale at A3:	1:5,000
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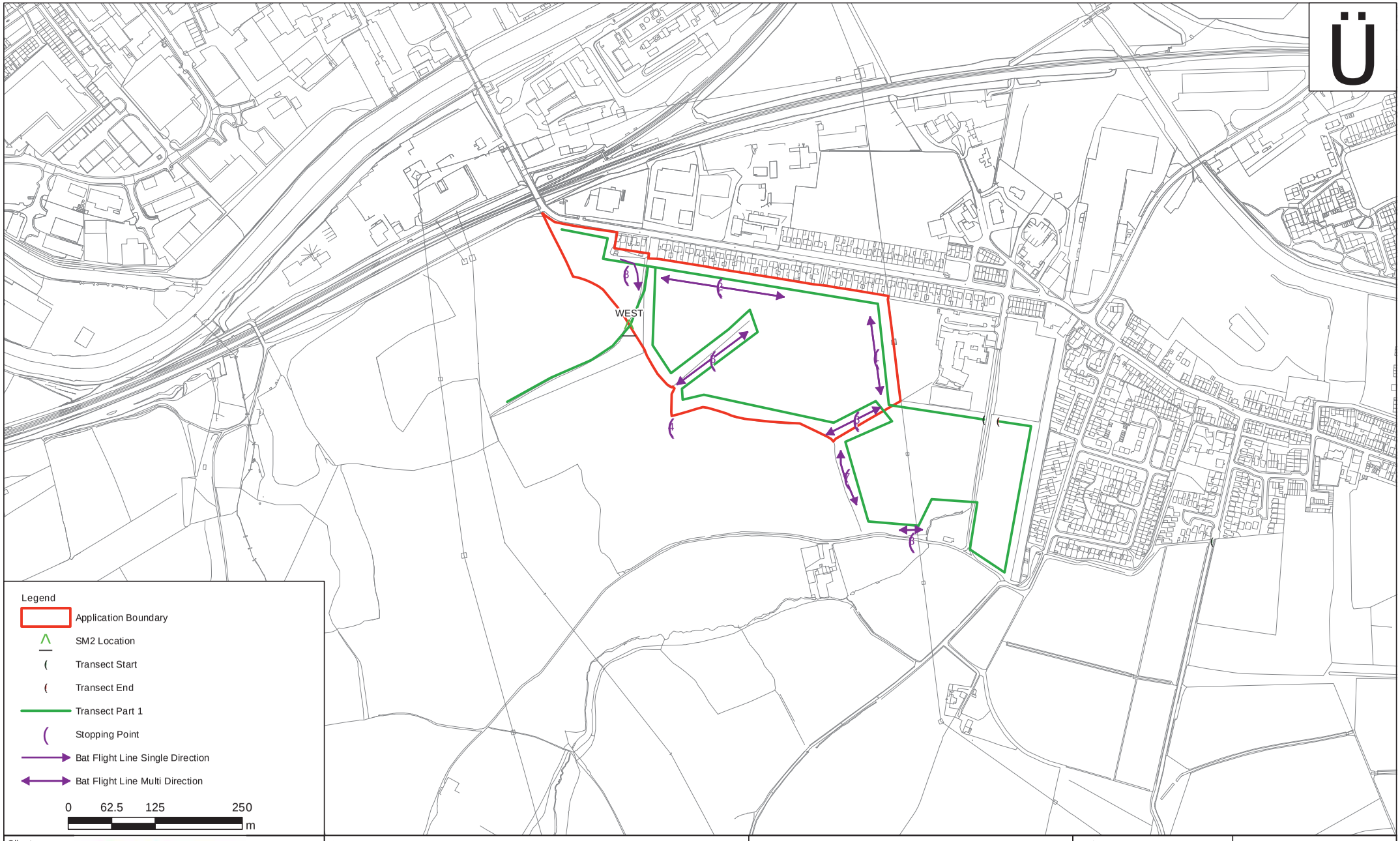

Client: millerhomes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title:

FIGURE 6D
BAT TRANSECT SURVEY RESULTS
DATE: 19/08/16

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Date:	NOV' 2016	Scale at A3:	1:5,000
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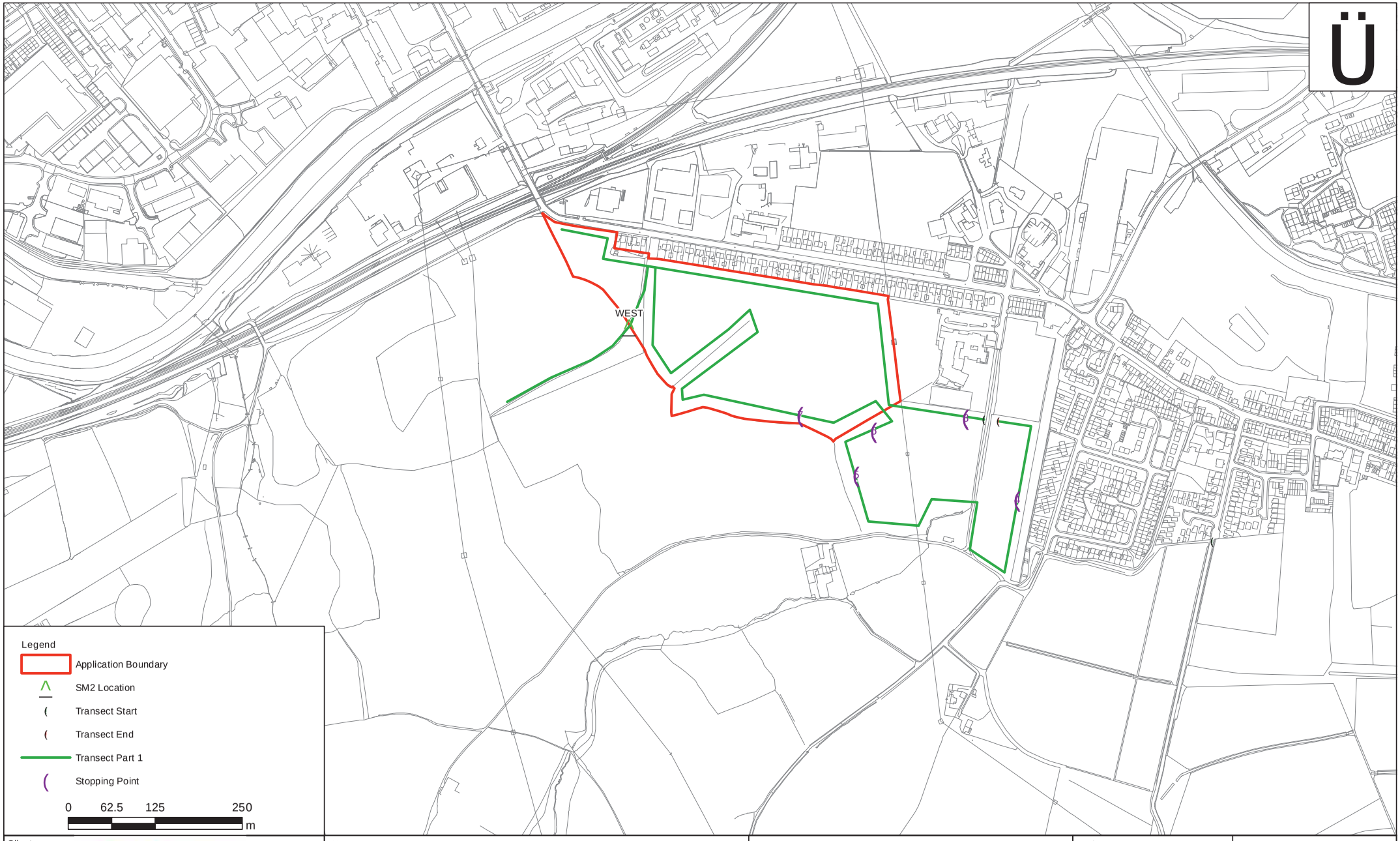

Client: millerhomes

Project: LAND TO SOUTH OF RAVENSTHORPE ROAD

Title: FIGURE 6E
BAT TRANSECT SURVEY RESULTS
DATE: 08/09/16

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Drawing Number:	60473775 / FIG 10b		A3

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