Charnia Ecology

Phase 2:

Bat and bird activity survey report



"Apesford Farm"

Bradnop, Staffordshire
ST13 7EX
(NGR: SK018535)

August 2017

Notice to readers

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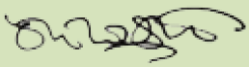
Client details:
Mrs. Rosemary Watson

Application area:
Apesford Farm
Bradnop, Staffordshire

Postcode / OS grid ref:
ST13 7EX (NGR: SK018535)

Issue No:
Final Issue (1)
Date issued:
August 2017

Report written by:
Mark Weston
BSc (Hons), GradCIEEM, AMRSB



Principal Ecologist

Surveyor capability

Ecological assessment and report preparation has been conducted by a Natural England licensed bat Ecologist (CLS00836 – Level 2) and member of the Chartered Institute of Ecology and Environmental Management (MCIEEM), and an associate member of the Royal Society of Biology (AMRSB). The ecologist has a First Class Honours degree in Conservation Biology, and Vice Chancellors award for academic excellence. He has undertaken protected species surveys for over seven years, and is actively involved in scoping, presence/absence surveys and Natural England EPS licence applications with regard to planning and the law. The actions of the surveyor on site and during the production of written reports are undertaken in accordance with the Code of Professional Conduct for the Chartered Institute of Ecology and Environmental Management (CIEEM).

NON-TECHNICAL SUMMARY

- ***Report rationale***

1. Phase 2 bat and bird activity surveys were carried out on behalf of Mrs. Rosemary Watson, in relation to a proposed planning application at "Apesford Farm", Bradnop, Staffordshire ST13 7EX (NGR: SK018535). All surveys were carried out during an optimal period (June/July 2017) by a Natural England licensed bat ecologist [class 2] and member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

- ***Proposed works***

2. It is understood that the proposed planning application considers the Class Q conversion of both curtilage farm buildings for residential purposes.

- ***Site description***

3. Apesford Farm is situated in an open rural setting being ca. 4.5km SE of Leek Town in the Staffordshire Moorlands. The application area is accessed via an aggregated track immediately off Apesford Lane and considers two traditional farm curtilage buildings, which are referred to in this report as Building A and Building B. Both buildings are of a block stone construction with pitched and tiled roof, and currently being used as livestock holdings for pigs on ground-floor elevations.

- ***Survey Results***

4. Both building A and B were found to have a number of external and internal features considered highly suitable for both crevice-dwelling and void dwelling bats species. However, both buildings were found to be subject to frequent disturbance, noise and exposed to abiotic influence from outside, thus depreciating overall viability to moderate.

5. Based on overall building rating, two activity surveys (1 x dusk / 1 x dawn) were assigned to each of the structures A and B. A total of four bat species were transiently recorded in low numbers over site: common pipistrelle; soprano pipistrelle; Myotis spp. (whiskered/ Brandt's bat considered); common noctule and brown long-eared bat. Moderate sustained levels of individual foraging and commuting was recorded along the main linear access track (between farmhouse and buildings A and B). The site was considered as being profitable for foraging bats with an increase of invertebrate abundance due to high levels of farm manure and drainage issues onsite, resulting in water logging of the central 'forecourt' area.

IMPACT ASSESSMENT

- ***Survey constraints***

6. A number of health and safety constraints were encountered during the building assessment, thus preventing a thorough inspection of some the internal compartments in both buildings. Furthermore, sustained noise levels were encountered during activity surveys, due to dogs barking and livestock free-ranging around site, which compromised overall efficiency of audio and visual detection of bats.

- ***Designated sites***

7. Due to the scale of the proposed development NO impact on any designated sites in the surrounding landscape is predicted, with existing footprints for each building to be retained.

- ***Bat roost(s)***

8. Whilst no impact to any bat roost(s) of high conservation concern is currently predicted under the proposed scheme, both buildings are nonetheless considered as having moderate to high potential for roosting bats, based on their structural features and close linear proximity to a well-used foraging and commuting corridor for bats.

9. Precise impact to roosting bats is therefore subject to timing of intended works. It is considered highly probable that that development of both buildings will be phased separately and carried out independently of each other. Should either of these buildings be allowed to stand idle over any given period, there is high potential that both buildings may be exploited by roosting bats over space and time. This is particularly relevant to common pipistrelle, which are known to roost-switch and were seen as being the dominant species onsite.

- ***Birds***

10. Evidence of a small colony of nesting Barn swallow was recorded in both building A and B. No evidence of Barn owl was recorded, although both buildings are considered as having good potential for this species, with breeding pairs recorded in a 1km radius.

11. **PLEASE NOTE:** Phase 2 bat and bird activity reports are generally valid for two years from date of report issue. However, based on overall rating of both buildings; survey constraints; potential phased development and surrounding habitat, the **validity of this report is considered to be robust for one year only from date of issue (August 2017).**

- ***Mitigation licence***

12. Should both buildings be developed within 12 months from the date of report issue, then as no evidence of summer roosting bats was recorded in either building A and B, **it will NOT be necessary to apply for a mitigation licence from Natural England at this juncture.**

- ***Further survey***

13. Should either of the proposed building development(s) extend beyond a 12 month period from the date of report issue, then an additional Bat and Barn owl activity survey should be carried out, in-order to reaffirm absence of protected species onsite prior to any works commencing. This should be undertaken by a suitably qualified Ecologist during an optimal survey period (May to August end).

- ***Mitigation recommendations***

14. Should both buildings be developed within 12 months from the date of report issue, then **non-licensable mitigation and enhancement measures are recommended** to prevent, offset or reduce the degree of impact to protected bats and birds that may occur through development(s).

15. All mitigation recommendations contained within this report should be **made a condition of any planning consent** issued by the Local Planning Authority, and include: **Further survey** (if applicable); **Timing of works** (autumn/winter (late Sept to Oct) to early spring (Jan to March); **Onsite supervision**; **Roost compensation/enhancement for both bats and birds** (Swallow and Barn owl considered); and a regulated **lighting scheme**.

16. **IMPORTANT:** In the unlikely event that bats are discovered during works (or suspicion arise about the possible presence of bats, i.e. between gable-end cavities and intermediate layers obscured by roofing membrane), then **ALL work must cease immediately**. Thereafter, the acting Ecologist should re-assess the structure, and determine whether a mitigation licence from Natural England will need to be obtained before any further work can be carried out.

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1. INTRODUCTION

1. On behalf of Mrs. Rosemary Watson, Phase 2 bat and bird activity surveys were carried out in relation to a proposed planning application at "Apesford Farm", Bradnop, Staffordshire ST13 7EX (NGR: SK018535).

2. The objective of this report is to provide the client with information on the known and potential bat roosts and birds nesting within the building, and to outline recommendations on how to proceed with the works in a legal and ecologically sensitive manner should bats and birds be present.

3. All survey work was undertaken in accordance to current Bat Conservation Trust (BCT) guidelines, and carried out during June and July 2017 by a Natural England class 2 licensed bat ecologist and member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

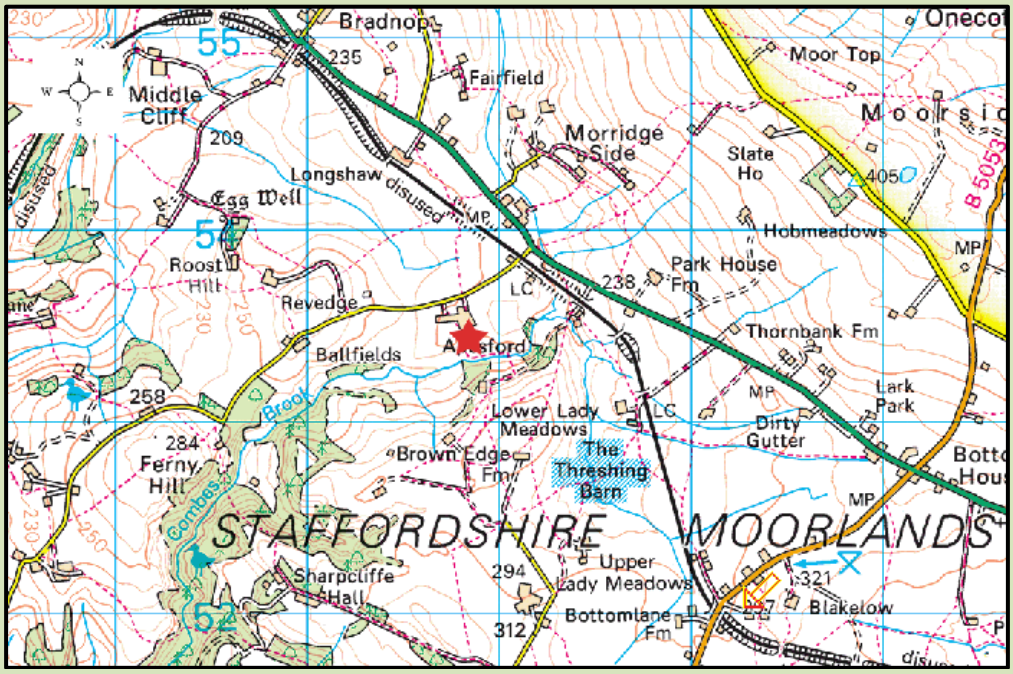

Figure 1. Location of proposed development area (red) in context to the wider landscape (source:0S Maps)

- ***Site description***

4. Apesford Farm is situated in an open rural setting being ca. 4.5km SE of Leek Town in the Staffordshire Moorlands. The application area is accessed via an aggregated track immediately off Apesford Lane and considers two traditional farm curtilage buildings, which are referred to in this report as Building A and Building B. Both buildings are of a block stone construction with pitched and tiled roof, and currently being used as livestock holdings for pigs on ground-floor elevations.

- ***Proposed development***

5. It is understood that the proposed planning application considers the Class Q conversion of both curtilage farm buildings for residential purposes.

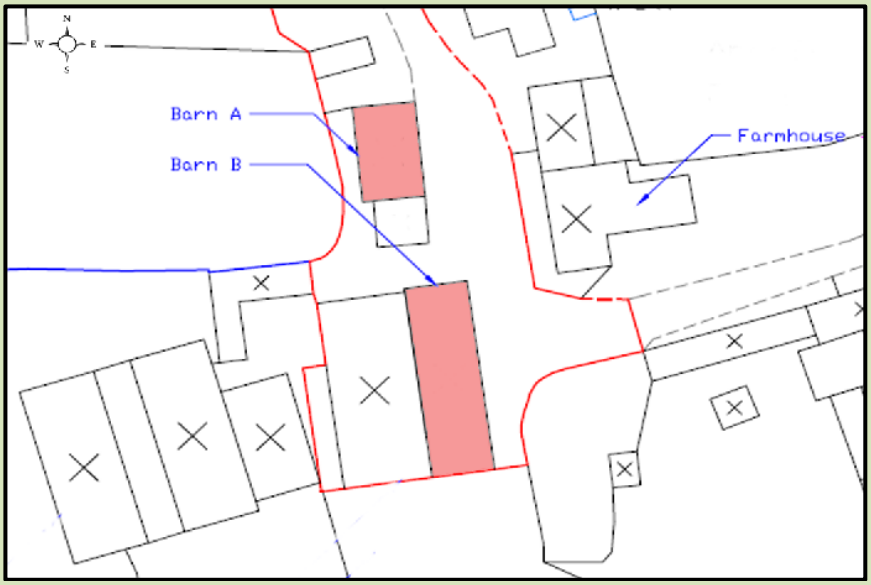

Figure 2. Buildings proposed for development (red) in relation to Main farmhouse.

- ***Aims of survey***

6. Phase two bat and bird activity surveys generally serve to provide initial advice at the pre-acquisition stage, with regards to any potential ecological impacts through development regarding protected bat and bird species under the Wildlife and Countryside Act 1981 (as amended) and/or the Conservation (Natural Habitats, &c.) Regulations 1994 (2); including species listed in the UK and local Biodiversity Action Plans (BAPs).

7. This report has been prepared with due consideration for various best practice guidance and methodologies including those of the Chartered Institute of Ecology and Environmental Management (CIEEM (2012)1, the emerging BS 42020 and BCT Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn) 2016.

Bats
• Probability of bats and their roost sites being present at the proposed redevelopment site i.e. buildings and trees
• To assess the roost status should bats be present.
• To assess commuting and foraging habitat that may be subject to impact from proposed development.
• To provide an overall impact assessment.

Table 1. Aims of survey in relation to bats.

- ***Legislation and policy guidance***

8. All species of bat are listed in Schedule 5 of The Wildlife and Countryside Act (1981) 1981 (as amended) and/or the Conservation (Natural Habitats, &c.) Regulations 1994 (2); including species listed in the UK and local Biodiversity Action Plans (BAPs) (See Appendix 5).

9. In Britain all bat species and their roosts are legally protected, by both domestic and international) .This means a criminal offence will be committed if you:

- Deliberately capture, injure or kill a bat;
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats;
- Damage or destroy a bat roosting place (even if bats are not occupying the roost at the time);
- Possess or advertise/sell/exchange a bat (dead or alive) or any part of a bat;
- Intentionally or recklessly obstruct access to a bat roost.

10. A bat roost is interpreted as 'any structure or place, which any wild bat uses for shelter or protection (i.e. buildings, trees, bridges, tunnels etc.). Bats tend to show a high fidelity to roosts; subsequently, legal opinion regards a roost to be protected whether or not the bats are present at the time. There are many types of roost used by temperate bats during their annual cycle: Any structures found having evidence of bats will be further evaluated to assess which of the following roost categories may be present onsite (if any).

Roost status	Description
Maternity / Nursery Roost	Used by breeding bats, where pups are born and raised to independence (Anecdotal evidence may support this prospect despite sub-optimal survey period).
Hibernation Site	Where bats may be found during the winter. (This is assessed within the context of this report).
Daytime Summer Roost	Used by males and/or non-breeding females (Seasonal limitations prevent robust analysis of this).
Night Roost	Where bats rest between feeding bouts during the night but are rarely present during the day.
Feeding Roost	Where bats temporarily utilize feeding perches and stations to eat an item of prey.
Transitional (or Swarming) Site	Where bats may be present during the spring or autumn (This cannot be assessed within the context of this report).
Maternity / Nursery Roost	Used by breeding bats, where pups are born and raised to independence (Anecdotal evidence may support this prospect despite sub-optimal survey period).

Table 2. Bat roost status definitions

11. The survey protocol also considers all common wild birds that are protected under the Wildlife and Countryside Act 1981 (and as amended). This protection extends to bird nests during the breeding season, which makes it an offence to damage or destroy nests or eggs.

Birds
• Establish if birds are using the site.
• Locate nest sites, if present.
• Assess what types of activities were shown within the redevelopment site.
• Assess suitable food resources and habitat requirements.
• Provide an impact assessment, if nests are found.

Table 3. Aims of survey in relation to birds.

12. Certain rare breeding birds such as Barn Owl *Tyto alba*, are listed on Schedule One of The Wildlife and Countryside Act 1981 (and as amended). Under this legislation they are afforded the same protection as common wild birds and are also protected against disturbance whilst building a nest or on or near a nest containing eggs and unfledged young. Survey protocol considers the following:

Barn Owl (*Tyto alba)*
• Establish presence onsite.
• Establish potential nest sites (PNS).
• Locate any active roost sites (ARS).
• Locate any temporary roost sites (TRS)
• Assess potential feeding and dispersal habitats (PFH)
• Provide an impact assessment, should barn owl(s) be present

Table 4. Aims of survey in relation to Barn Owl.

- ***Valued ecological receptors (VERs)***

13. .Assessment also considers potential effects on Valued Ecological Receptors (VERs) and Zones of Influence (ZoI) during pre and post development, both onsite and off- site. The term Zone of Influence is used to describe the geographic extent of potential impacts of a proposed development.

- ***Mitigation***

14. Should a likely significance of negative impacts to bats and/or birds be identified during the survey period, then further surveys, mitigation and enhancement measures may be necessary to prevent, offset or reduce the degree of impact that may occur should development commence.

15. Should bats be present onsite, then a European Protected Species (EPS) development license issued by Natural England (NE) may be required prior to any works taking place. The purpose of this report will only provide a preliminary outline of a bat mitigation strategy. A detailed method statement will need to be determined through consultation with an appropriately qualified and experienced bat ecologist thereafter, to fully support the aforementioned licence application.

16. Mitigation should be proportionate, justifiable and avoid or minimize any harm to species found during works, whilst ensuring the Favourable Conservation Status of local bat populations is maintained. Mitigation should be proportionate to:

    - Type and scale of works and predicted impacts on bats
    - Size, nature and complexity of the development site
    - Likelihood of bats being present or affected
    - Species and numbers of individuals concerned
    - Type of roost and/or habitat affected.

2. SURVEY METHODOLOGY

17. In accordance with BCT 3rd edition (2016) guidelines, the following survey protocol is considered appropriate to provide a full ecological evaluation of the site in order to determine the following:

- ***Pre-survey data search***

18. Pre-survey data search provided historical records of any protected bat and bird species found within a 2km radius of the application area. Additional ecological data has been sourced to understand any constraints that the proposed planning application may have on species and habitat in the wider landscape. The National (UK) and local (Staffordshire) Biodiversity Action Plans (BAPs) were also scrutinized for protected habitats and species relevant to the application area.

19. A number of electronic sources sites were also consulted including; www.magic.gov.uk; www.naturalengland.org.uk; Google Earth and www.ordinancesurvey.co.uk.

- ***Field surveys***

20. A walkover survey, including visual inspection of building and any trees, was undertaken to determine the availability of required resources for the protected species in the immediate area. The building was inspected both externally and internally for:

    - Presence or absence of bats onsite (i.e. hibernating bats)
    - Evidence and/or potential of bat roosts onsite (i.e. summer roosts)
    - Whether additional surveys are required.

<table>
<tr><th>Jan</th><th>Feb</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>Aug</th><th>Sept</th><th>Oct</th><th>Nov</th><th>Dec</th></tr>
<tr><td colspan="3">Inspection of Hibernation roosts- semi optimal survey</td><td>Limited activity-sub optimal</td><td colspan="5">Summer roost emergence & re-entry surveys -Optimal survey period</td><td>Limited activity -sub optimal</td><td colspan="2">Hibernation roosts - semi optimal survey</td></tr>
<tr><td colspan="12">Internal roost surveys are possible / Trees are best surveyed during Winter</td></tr>
</table>

Table 5. Annual survey optimality for bats.

21. Phase 2 bat and bird activity surveys were conducted during an optimal period of the bat surveying season and with sufficient intervals between surveys to allow for any stochastic events over space and time. Weather conditions were optimal throughout all survey periods (Temp: >8°C / dry conditions). Assessment incorporated the use of binoculars, torch, endoscope and ladders where necessary.

Surveyor information

22. Ecological assessment on-site was overseen by **Mark Weston**, a Natural England licensed bat Ecologist (CLS10722 – Level 2) and member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Assistant ecologist(s): **Louise Cox** BSc (Hons); **Jade Leese** BSc, MSc; **Jack Weston.**

- ***Habitat survey***

23. The survey assessed habitat onsite in context to the wider landscape with regard to any important bat roosts, commuting/foraging areas that may be affected by the proposed development.

- ***Roost survey***

24. All potential roost structures (i.e. buildings) onsite or within the Zone of Influence of the proposed development were assessed, based on standard methodologies set out by Natural England, the Bat Conservation Trust (BCT) and the Joint Nature Conservation Committee (JNCC).

25. External inspection considered suitable ingression points where species such as bats and birds could gain entry into any structures to roost and/or nest.

    - Condition of roof i.e. missing or raised roof tiles;
    - Condition of windows and doors i.e. broken panes;
    - Potential ingression points around ridges and apex of the buildings;
    - Any anecdotal evidence of bats I.e. droppings, grease marks, feeding remains;
    - Any evidence of birds i.e. nest material, droppings.

26. Inspection incorporated visual assessment with the use of torch, endoscope and ladders to ascertain the following:

    - Any potential internal roost features i.e. non-illuminated areas, joints, crevices, beams and cavities.
    - To locate potential roost/nest sites;
    - To listen for any bats and birds;
    - To examine floors, walls and structural elements for anecdotal evidence i.e. droppings, urine stains, corpses and feeding remains

- ***Building rating***

27. In the absence of any evidence, trees and structures were assigned a rating of suitability from negligible to high potential for supporting bats. The rating is based on the number and type of features suitable for use by bats (such as rot holes, cavities and raised bark), location of the structure in the surrounding landscape and surveyor's experience.

Suitability	Description Roosting habitats	Commuting and foraging habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.	Negligible habitat features on site likely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[a] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation[b]). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.[c]	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions[a] and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions[a] and surrounding habitat.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.
Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.*, 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.
This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015).

Table 6. Roost habitat assessment (BCT, 2016)

28. Under revised BCT guidelines (2016), the number of prescribed activity surveys are based on initial overall building rating and suitability to support roosting bats:

Low roost suitability	Moderate roost suitability	High roost suitability
One survey visit. One dusk emergence or dawn re-entry survey[a] (structures). No further surveys required (trees).	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey.[b]	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn.[b]

[a] Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case-by-case basis (see Section 5.2.9). If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category.
[b] Multiple survey visits should be spread out to sample as much of the recommended survey period (see Table 7.1) as possible; it is recommended that surveys are spaced at least two weeks apart, preferably more. A dawn survey immediately after a dusk one is considered only one visit.

Table 7. Survey effort in relation to roost suitability (BCT, 2016).

29. Activity surveys combined an overall assessment of any *in-situ* roost onsite, and any other Valued Ecological Receptors (VERs) considered to be within the Zone of Influence (ZoI) of the development, whilst considering any important commuting and foraging routes used by bats.

30. All activity surveys were undertaken in accordance with the guidelines published by the BCT 3rd edition 2016 to ascertain the following:

- Determine the presence/absence of species, i.e. the species present in a given area
- Determine the intensity of bat activity both spatially and temporally
- Determine the type of activity i.e. foraging (by feeding buzzes);commuting (by high directional pass rates); mating (by mating social calls)
- Find roosts by tracking back bat flight paths or observing commuting range

Dusk emergence survey

31. The object of this survey is to detect active bats leaving possible roost sites identified in the external and internal surveys. This was achieved by:

- Being at the site 1 hour before sunset.
- Listening for social calls at potential roost sites.
- Standing at different transect points around the buildings, to record any emerging bats and egress points.
- Standing at different transect points to assess foraging/commuting areas.
- Carrying out survey up to 1.5 - 2 hours after sunset to holistically consider interspecific differences between different bat species

Dawn re-entry survey

- Being at the site 2 hours before sunrise.
- Listening for social calls at potential roost sites.
- Standing at different transect points around the buildings, to record any swarming behaviour around potential re-entry points.
- Standing at different transect points to assess foraging/commuting areas.

32. Bat ultrasound data was gathered using a number of heterodyne units (Batbox Duet and SSF Bat2) and real-time recording devices (EcoObs Batcorder). Real time recordings were subsequently analyzed using BatSound v4.03 and statistical algorithm analysis was carried out using EcoObs BcAdmi, BatIdent and BcAnalyze software to provide an unbiased discrimination of species onsite.

33. Evidence will be used to determine whether a European Protected Species (EPS) licence will be required to ensure legal compliance during development. This will also include identifying which mitigation measures [if any] would be most appropriate.

3. RESULTS

- ***Designated sites***

34. Pre-survey data search shows the application area falls within Area 64 Potteries and Churnet Special Landscape Area.

Statutory designations within a 1km radius

SK006526	Combes Valley	SSSI

Statutory designations within a 1km radius

05/12/69	SK016529	Barnfield (field north of)	Local Wildlife Site	A field supporting species-rich grassland on a steeply sloped field. The field is currently grazed by a horse.
05/14/01	SK010541	Revedge Farm (north of)	Local Wildlife Site	Two pastures with extensive areas of marshy grassland and acidic flushes. There is a narrow tree-lined stream on their north-eastern edges. The fields are sloping and are bounded by a mix of dry stone walls and fences.
05/23/03	SK020533	Roughstone Hole	Local Wildlife Site	An extensive area with ancient semi-natural broadleaved woodland, acid grassland, marshy grassland and in flatter areas species-poor semi-improved neutral grassland.
05/23/29	SK022539	Cook's Hollow	Retained BAS	A series of narrow streams / drains flow through the site which converge before being culverted beneath the road.
05/23/37	SK023537	Cook's Hollow (south of)	Retained BAS	A stretch of disused single track railway line between Apesford Crossing and the track to Gorsthead Mill Farm. In this location the track is on a steep embankment which has been colonised by a variety of vegetation types.

Ancient woodlands within a 1km radius

SK0107552672	Sixoaks and backhill woods	Ancient & Semi-Natural Woodland

35. Subsequently the application area is within a SSSI Impact Risk Zone [assesses planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England)].

- ***Protected species***

36. Pre-survey data finds seven British bat species are currently given UK BAP (2007) Priority Species Status. National Biodiversity Network and Staffordshire Wildlife Trust (SWT) records show that 11 of the 17 resident UK bat species occur in the county with three UK BAP species being recorded within 2km of the proposed application area (highlighted in orange):

UKBAP	Common name	Species	Recorded within 2km
☑	BROWN LONG-EARED BAT	*Plecotus auritus*	☑
☑	BARBASTELLE BAT	*Barbastella barbastellus*	☒
☑	BECHSTEIN'S BAT	*Myotis bechsteinii*	☒
☑	NOCTULE	*Nyctalus noctula*	☑
☑	GREATER HORSESHOE BAT	*Rhinolophus ferrumequinum*	☒
☑	LESSER HORSESHOE BAT	*Rhinolophus hipposideros*	☒
☑	SOPRANO PIPISTRELLE	*Pipistrellus pygmaeus*	☑

Table 5. UKBAP Bat species recorded within Staffordshire.

37. A further four/five bat species that are not currently given UK BAP consideration are also recorded within the county, whilst SER data and personal observations show two of these species are recorded within a 1km radius of the site (highlighted in orange):

UKBAP	Common name	Species	Recorded within the county
☒	DAUBENTON'S BAT	*Myotis daubentonii*	☑
☒	NATTERER'S BAT	*Myotis Nattereri*	☑
☒	WHISKERED / BRANDT'S BAT	*Myotis mystacinus/brandtii*	☑
☒	COMMON PIPISTRELLE	*Pipistrellus pipistrellus*	☑

Table 6. Non UKBAP Bat species recorded in Staffordshire.

38. Pre-survey data show no records of any bat roosts within the application area itself. SER provide seventeen observations of Barn Owl (*Tyto alba*) within a 2km radius of the application area, with breeding recorded 940m due SW at RSPB Coombes Valley Nature Reserve.

- ***Field surveys***

39. The proposed application falls under the Regional (Joint) Character Area of 64 Potteries and Churnet Valley, comprising of 'Ancient Slope and Valley farmlands' landscape character types. The site sits on a topography of Dissected Sandstone Cloughs and Valleys character area along the edge of the Settled Plateau Farmland Slopes with non-calcareous stagnogley and poorly drained soils creating loamy and clayey pedology supporting rough grassland pasture.

40. In context to the wider landscape, the site is located at the south-west tip of the Pennines on an upland plateau transition between the lowland heathlands of south Staffordshire and the larger expanses of upland moorland to the north. The application area is surrounded by open agricultural farmland, gently undulating hills, hedgerows, and intermittent blocks of ancient woodland. 115sqm

41. The habitat onsite chiefly comprises of bare open ground with hard-standing. There would appear to be some drainage issues onsite resulting in a permanent water-logged area in the central area separating the main farmhouse and buildings A/B.

42. Minor patches of ruderal herbs and scattered semi-mature trees around selected boundaries which abut onto farmland and a neighbouring farmstead on the western boundary. The surrounding agricultural farmland is separated by dry stone walls, hedgerows and intermittent woodland blocks. Coombes valley (SSSI) and brook is located ca. 300m away on the south-west boundary. Albeit the site is at elevation and subsequently exposed to the elements, the surrounding habitats provide a number of valuable resources for both bats and birds including Barn Owl, with excellent connectivity to the wider landscape considered.

- ***Roost survey***

  - ***Building A***

43. Building A is located on the northern elevation of Apesford farm and is a two storey building with an existing footprint of 50m^2. It is constructed of block stone with a pitched and tiled roof. A low elevation, single-storey pre-fabricated structure is located on the southern gable-end, with a flat corrugated metal sheet roof and side windows.

44. A number of ingress points for both bats and birds (including Barn owl) were recorded around the north and east elevations, by-way-of open pitching holes on upper sections and open windows at ground level. A number of raised and lifted roof and ridge tiles were also recorded across the eastern elevation, whilst gaps under roof verges and eaves were also present. Evidence of European Swallow was recorded accessing the building via the pitching hole on the northern gable-end. No evidence of bats was recorded during the external inspection.

45. Access into the building was made via ladders through a first floor pitching hole on eastern elevation. The majority of the interior was found to be open to roof level with a first-floor landing stage area on the southern gable-end. The ground-floor area was found to be used as a livestock area for pigs and subject to frequent disturbance. The entire area was found to somewhat exposed to the external abiotic elements and was find to be partially illuminated by natural daylight ingress from open windows and a hole in the roof section on the south gable-end. It was not possible to inspect the roof section and timber truss work beyond the first floor staging area. Cracks and crevices were recorded on this gable-end area; however, no evidence of roosting bats was recorded internally. ,

46. The roof section was found to be covered in traditional under-felt which was found to be in a relatively good state of repair and tightly fitted. Exposed timber truss work and purlins were present within the roof section, where a number of active nests were occupied by a colony of European Swallow (N<10). No evidence of Barn owl was recorded although the building is considered as having good flight access into the building and internal perching features highly suitable for this species, albeit the structure is subject to frequent disturbance.

Building A: Plates



Figure 3. SE elevation of Building A



Figure 4. North gable-end of Building A.



Figure 5. NE elevations of building A



Figure64. South gable of Building A.



Figure 7. South gable 1st floor staging area



Figure 8. Exposed timber truss work roof section



Figure 9. Ground-floor area



Figure 10. Hole in roof + crevices on south gable.

- ***Building B***

47. Building B is the larger of the two traditional farm buildings proposed for development, being located on the southern elevation of Apesford farm. It comprises of a rectangular two storey traditional fam building with an existing footprint of 115m^2. The building is constructed of block stone with a pitched and tiled roof. Open-ended, lean-to cubicle sheds with flat corrugated metal sheet roofing are tied into the western elevation of the building and used as livestock pens.

48. Once again, numerous ingress points were externally recorded for both bats and birds (including Barn owl) around all elevations, with open pitching holes on upper sections of both north and south facing gable-ends and open windows and doors at ground level. A number of raised and lifted roof and ridge tiles were also recorded across the eastern facing pitch, whilst gaps under roof verges and eaves were also present.

49. Internally, the building is divided into 4/5 ground-floor sub-compartments and used for livestock and storage. The central compartment and most southerly gable-end compartment were found to be open to roof level. A first-floor walk-way gantry is present in the central section which leads into a roof void compartment on the northern elevation. A further roof void compartment was also recorded on the southern elevation of gantry staging but was not accessible due to a partitioning wall and structural stability of the first floor.

50. The majority of the roof section was found to be covered in traditional under-felt which was found to be torn providing suitable recesses for bats to roost behind. The interior 1st floor area was also considered as having sufficient volume highly suitable for void dwelling bats, with exposed timber truss work and purlins present throughout for perching.

51. Similarly to Building A, the internal compartments within Building B were found to be subject to abiotic influence from outside and illuminated by natural daylight ingress through broken doors, windows, roof sections and pitching holes. No evidence of bats was recorded in Building B although all areas of the building were found to be heavily contaminated with detritus and cluttered with debris throughout. The structural stability of some of the first-floor sections were also questionable thus constraining overall assessment somewhat.

52. Nesting Swallow was also recorded utilizing the undersides of timber rafters in ground floor and first floor compartments to a lesser degree than that of Building A.

53. No evidence of Barn owl was recorded.

Building B: Plates



Figure 11. NE elevation of Building B



Figure 12. SE elevation of Building B.



Figure 13. SW elevation of building B



Figure 14. NW elevation of Building B.



Figure 15. Central ground-floor compartment.

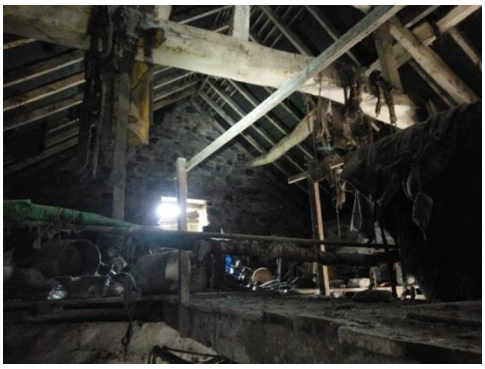

Figure 16. Looking north on gantry



Figure 17. Roof void on Southern elevation.



Figure 18. Roof void on North gable-end.

54. Both building A and B were found to have a number of external and internal features considered highly suitable for both crevice-dwelling and void dwelling bats species. However, both buildings were found to be subject to frequent disturbance, noise and exposed to abiotic influence from outside, thus depreciating potential overall.

55. No evidence of any high conservation status bat roosts was recorded in either building, although inspection was constrained in a number of places. Subsequently both Building A and B were considered as having high moderate potential for roosting bats.

Birds

56. Building A and B are considered as having high ecological value for a summer breeding colony of European Swallow. Although no evidence of Barn owl was found (survey constraints to consider), recorded, both buildings are considered as having a number of features considered highly suitable for this species.

- ***Activity surveys***

57. Based on overall building rating, two activity surveys (1 x dusk / 1 x dawn) were assigned to each of the structures A and B, being carried out under suitable weather conditions during June and July 2017, which is considered as being a highly optimal surveying period.

Survey 1 - Dusk emergence					DATE: 24/06/2017
SUNSET:	20:561hrs	**TEMP START**	11.5°C	**CLOUD COVER START**	80%
START TIME	20:35hrs	**TEMP FINISH**	10 °C	**CLOUD COVER FINISH**	90%
FINISH TIME	23:00hrs	**WIND SPEED**	<1	**PRECIPITATION**	NIL
Survey 2 – Dawn re-entry					DATE: 09/07/2017
SUNRISE:	04:54hrs (Dawn 04:10hrs)	**TEMP START**	10.5°C	**CLOUD COVER START**	60%
START TIME	02:00hrs	**TEMP FINISH**	11.5 °C	**CLOUD COVER FINISH**	40%
FINISH TIME	04:20hrs	**WIND SPEED**	<1	**PRECIPITATION**	NIL

58. No bats were seen emerging or re-entering into either Building A or B during dusk/dawn periods, nor was any evidence of pre-emergent, void dwelling bats found during regular internal inspections.

- ***Foraging and Commuting***

59. Moderate sustained levels of individual foraging and commuting bats were recorded around site, with four species of bat recorded in total. Activity was found to be highest during dusk with a total of 135 bat passes recorded and assigned to common pipistrelle (N118 / 100%); soprano pipistrelle (N9 /100%); *Myotis* spp. (whiskered/ Brandt's bat N3 / 63%) and common noctule (N5 / 100%). A visual sighting of a Brown long-eared was also considered during the dusk period. In contrast, the dawn survey period yielded a total of 40 bat passes in total and assigned to common pipistrelle (N32 / 100%); soprano pipistrelle (N5 /100%); and *Myotis* spp. (whiskered/ Brandt's bat N3 / 68%).

60. The vast majority of bat activity was recorded along the eastern elevation, where bats were seen utilizing the main access track (between farmhouse and buildings A and B) as a linear corridor for commuting and foraging. The site was considered as being profitable for foraging bats with an increase of invertebrate abundance due to high levels of farm manure and drainage issues onsite, resulting in water logging of the central 'forecourt' area

61. No evidence of Barn owl was recorded during the survey periods.

4. IMPACT ASSESSMENT

- ***Survey constraints***

62. A number of health and safety constraints were encountered during the building assessment, thus preventing a thorough inspection of some the internal compartments in both buildings. Furthermore, sustained noise levels were encountered due to dogs barking and livestock free-ranging around site, which compromised audio and visual concentration during survey periods.

- ***Designated sites***

63. As the proposed development retains the existing size and physical form of the existing building (s) footprint, with no additional land up-take considered, NO impact on any designated sites in the surrounding landscape is predicted. However, the development should be sensitive to any post development lighting that may have deleterious effects on adjacent habitats and disrupt connectivity in the immediate landscape.

- ***Bat roosts***

64. No impact to any bat roost(s) of high conservation concern is currently predicted under the proposed scheme. However, despite no physical evidence being found, both buildings are nonetheless considered as having moderate to high potential for roosting bats, based on their structural features and close linear proximity to a well-used foraging and commuting corridor for bats. Subsequently there is high potential that both buildings may transiently be used by individual roosting bats over space and time.

65. Precise impact to roosting bats is therefore subject to timing of intended works. It is considered highly probable that that development of both buildings will be phased separately and carried out independently of each other. Should either of these buildings be allowed to stand idle over any given period, there is increased potential of roost uptake, in-view of numerous ingression points and structural features present in either building for bats.

66. Phase 2 bat and bird activity reports are generally valid for two years from date of report issue. However in this instance, assessment of the proposed development at Apesford Farm found within this report can only be considered valid for one year from date of issue (August 2017), based on overall building rating; survey constraints and surrounding habitat.

67. Both buildings were found to be of high ecological value for a small-medium population of breeding European Swallow. No impact to Barn owl is currently considered although, once again, both buildings are considered as having good roosting potential for this species over space and time. As breeding Barn owl is also recorded within 500m, further assessment of the building(s) should be made prior to any works commencing.

5. RECOMMENDATIONS

- ***Mitigation licenses***

68. As no evidence of roosting bats were recorded in either of the building subject to development, it will NOT be necessary to apply for a mitigation licence from Natural England at this juncture on the proviso that the following non-licensable mitigation measures are adhered to and made a condition of the planning consent.

- ***Further survey***

69. Should either of the proposed building development(s) extend beyond a 12 month period from the date of report issue (August 2017), then an additional Bat and Barn owl activity survey should be carried, in-order to confirm absence prior to any works commencing. This should be undertaken during either dusk or dawn by a suitably qualified Ecologist during an optimal survey period (May to August end).

70. Alternatively, should both buildings be developed within 12 months from the date of report issue, then no further survey effort is considered necessary should the following mitigation recommendations be applied.

- ***Timing of works***

71. Best practice guidelines recommend that any works which encroach into the roof section area of either buildings (including brick-work around roof convergence points) should be carried out during autumn/winter (late Sept to Oct) to early spring (Jan to March), when bats have vacated summer maternity roosts.

- ***Onsite supervision***

72. Any works that encroach into the roof section of either Building A or B should be carried out under supervision of suitably qualified bat Ecologist, who should inspect ahead of any works to ensure that there are no bats are present. All roof tiles should be carefully removed individually and inspected around undersides, before proceeding in a systematic 'top-down' manner starting from ridge level. Inspection of any cavity areas on either building that will be lost through development should also be undertaken using an endoscope where necessary.

- **Receptor box**

73. in the unlikely event that roosting bats are encountered during works on either building, a receptor bat box (Schwegler 2FN) should be suitably installed onsite as a precautionary measure. This receptor box should be sited well outside the zone of influence of the proposed development(s) and prior to any works commencing.

74. **IMPORTANT:** Should any bats be discovered during works (or suspicion arise about the possible presence of bats, i.e. between gable-end cavities and intermediate layers obscured by roofing membrane)**,** then **ALL work must cease immediately** and a licensed bat ecologist should be consulted straight away. Thereafter, the named ecologist should re-assess the structure, and determine whether works can continue without a licence from Natural England.

- ***Roost compensation/ enhancement***

75. In accordance with the Natural Environment and Rural Communities (NERC) Act 2006, development proposals should seek, where possible, to enhance opportunities available to local bat populations. There is currently no evidence found in either of the buildings to justify retention of any internal roof void features for void dwelling bat species (Brown long-eared bat considered) and Barn owl, despite both buildings being considered suitable and within the trajectory of a well-used foraging and commuting corridor.

73. Enhancement therefore considers the potential of crevice dwelling bats with common pipistrelle being seen as the dominant species across site. Subsequently one of the two following proposed designs should be implemented onsite:

- ***Option A:***

74. A minimum of four bat access ridge tiles should be located at equidistant across the new ridge line on each of the buildings subject to development. Such features can be economically created by the use of modified Hog's-back or Half-round ridge ventilator tiles; whereby the removal of internal mesh or plastic mouldings from such tile can create potential voids for utilization.

75. **IMPORTANT:** Should modern breathable roofing membrane (BRM) be used during renewal of roof on either building, it is imperative that bats **do not** come into contact with this substrate. Subsequently, a $1m^2$ section of bitumastic F1 felt should be sandwiched on top of any BRM, where raised bat access tiles have been allocated.

- ***Option B:***

76. Should the proposed scheme prefer to exclude the potential of bats roosting in any intermediary sections of the main building structure(s), then a minimum of three (3no.) Schwegler 1FQ external bat boxes should be fitted at height around east and south elevations on building A and building B.



Figure 19. Schwegler 1FQ (source NHBS.co.uk)



Figure 20. & 21. Proposed locations of Schwegler 1FQ bat boxes on building A and B.

- ***Foraging and commuting habitat***

77. Due to the ecological value of the surrounding habitat, a sensitive lighting design will almost certainly need to be implemented at this prerequisite stage, in-order to minimize potential light-spill that may deleterious effects on foraging and commuting flight-paths for bats onsite.

78. Consideration should be given to the use of low energy LED lighting to minimize light spill around the building(s) should be incorporated. Alternatively, Low-pressure sodium lamps (SOX) are recommended, which should be fitted with hoods to direct the light below the horizontal plane to minimize light-spill. Where necessary any security lighting will be less than 200 lumens (150 watts) and placed on a timer setting and faced down to reduce sky glow. Height of any columns around the development should not exceed eight metres.

❖ **BIRDS**

79. As all birds are protected under the Wildlife and Countryside Act 1981 (as amended), proposed works on either building should be undertaken outside the bird breeding season (March to August inclusive). Where this is not possible, then a check for nesting birds should be undertaken by an ecologist prior to works. Should any active bird nests be found, then these should be left undisturbed until offspring have fully fledged. It may be necessary to enforce an exclusion work zone of 5m to reduce disturbance and minimize potential displacement of nesting birds.

80. Mitigation recommends a minimum of eight pre-formed “cup-shaped nests” for Swallow should be incorporated into the scheme. These pre-formed nests should ideally be placed at least 1m apart, high up on beams in other curtilage buildings onsite where possible. If this is not possible then installation of external eaves/ridge overhang boxes with an open bottom and ledges for swallows to nest on should be implemented as an alternative. Further guidance by a suitably qualified ecologist should be sought in this event.



Figure 22. Schwegler 10 swallow nest (source: www.wildcareshop.com)



Figure 23. Eco Barn Owl nest box

76. Whilst no evidence of Barn owl was recorded onsite during the survey period, breeding Barn owl is recorded in a 1km radius. As both buildings have excellent potential for this species, it is recommended that a Barn owl nesting box is incorporated into the scheme, and further consultation should be sought with regard to precise placement. Additional literature regarding owl nesting boxes has subsequently been included within the Appendix of this report.

    In accordance to Natural Environment and Rural Communities (NERC) Act 2006, it is also recommended that a minimum of five bird nesting boxes, suitable for different passerine bird species are included into the overall scheme. Bird nesting boxes should be positioned at ca. 2-4m above ground level where possible.

77. Further information regarding nest boxes can be found on the RSPB website: http://www.rspb.org.uk/advice/helpingbirds/nestboxes/smallbirds/siting.aspx

78. Should any landscaping be considered at a later date, then it is recommended that only native tree and shrub species are planted. In particular, no plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 should be planted during any landscaping around the conversions. For further details of Schedule 9 plants visit the Defra website: www.defra.gov.uk/wildlife-pets/non- native.

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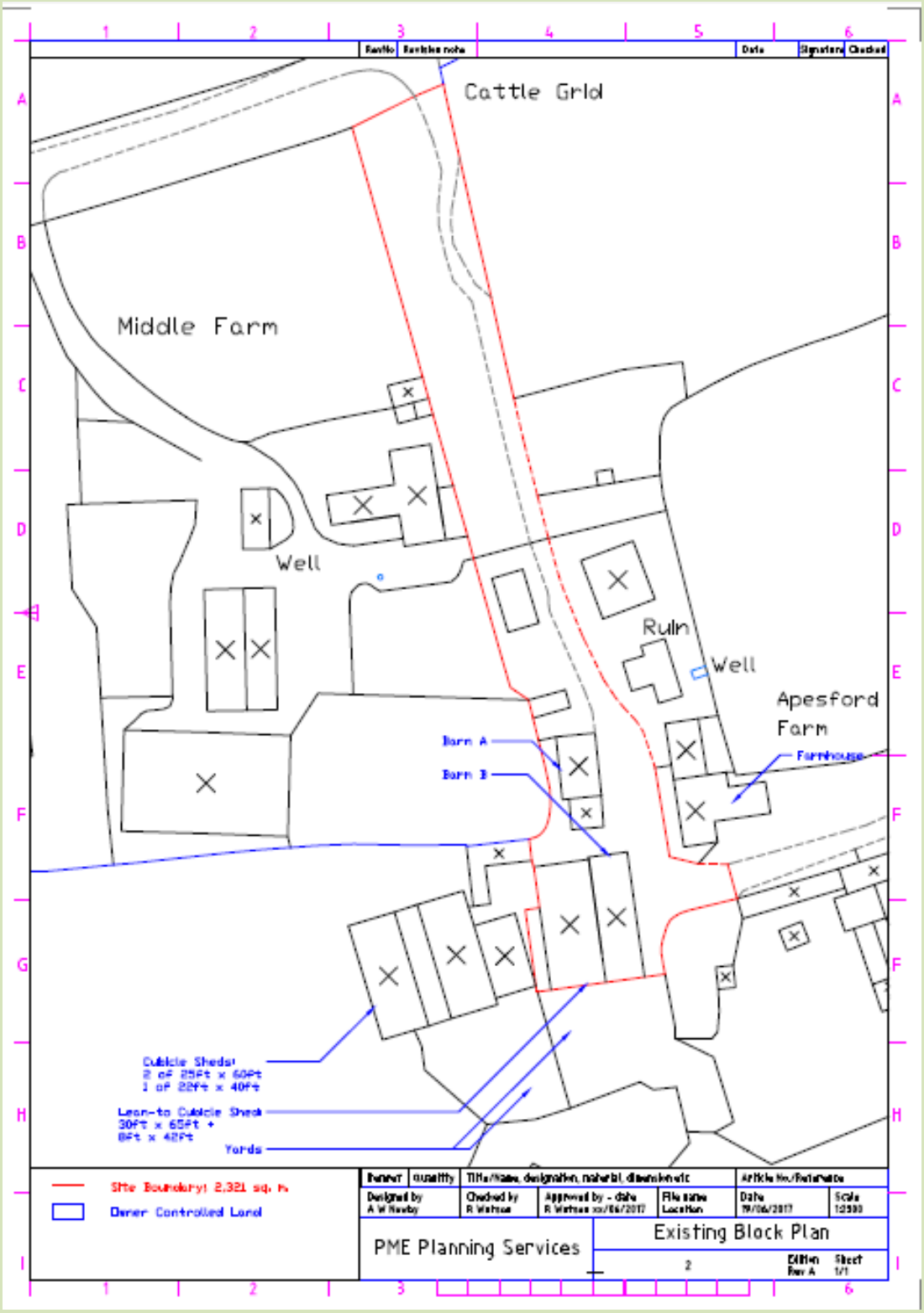
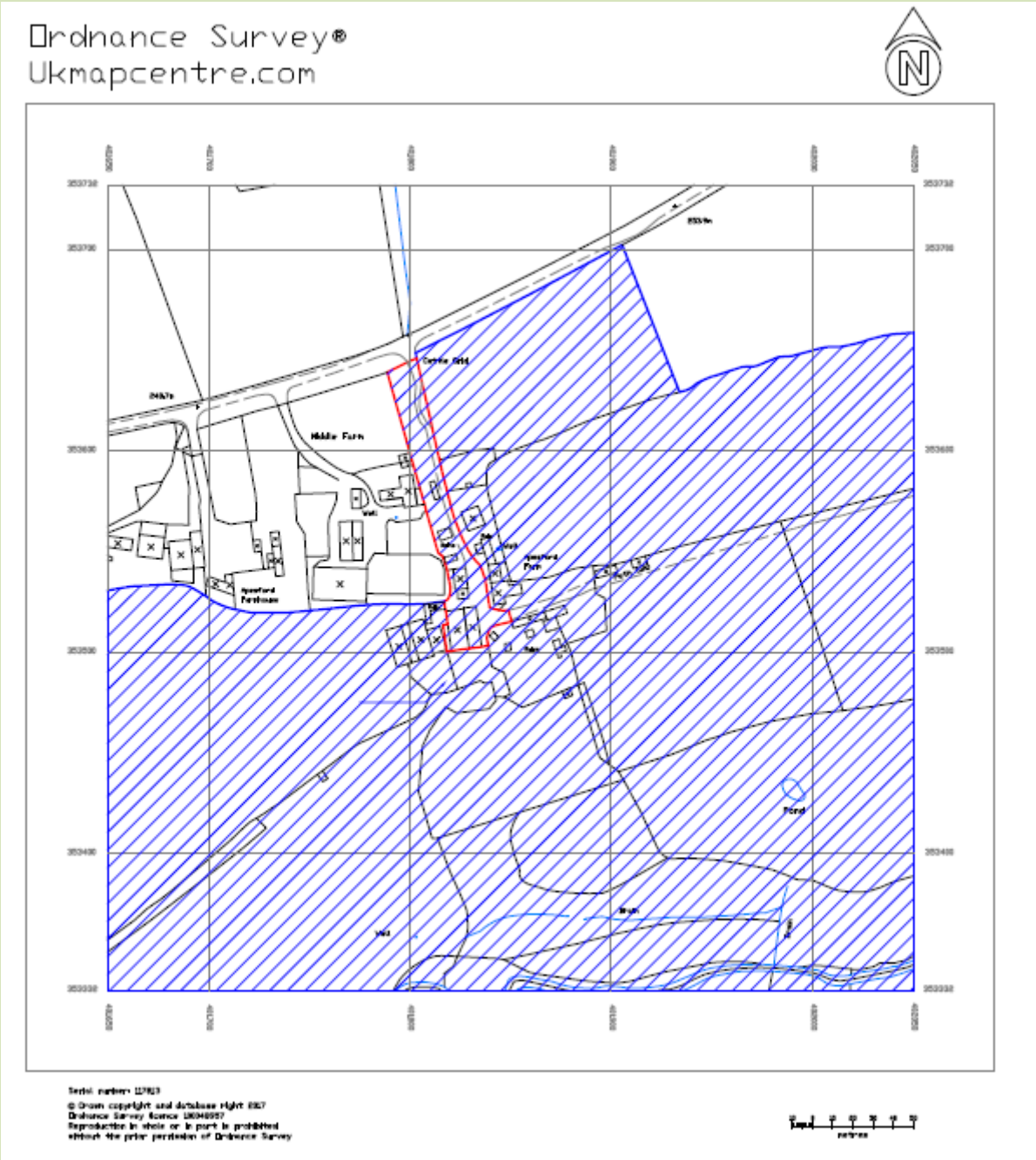
APPENDICES

Appendix 1 – Maps & forms




Ordnance Survey®
Ukmapcentre.com
N
Middle Farm
Apesford Farmhouse
Apesford Farm
Pond
Serial number: 117813
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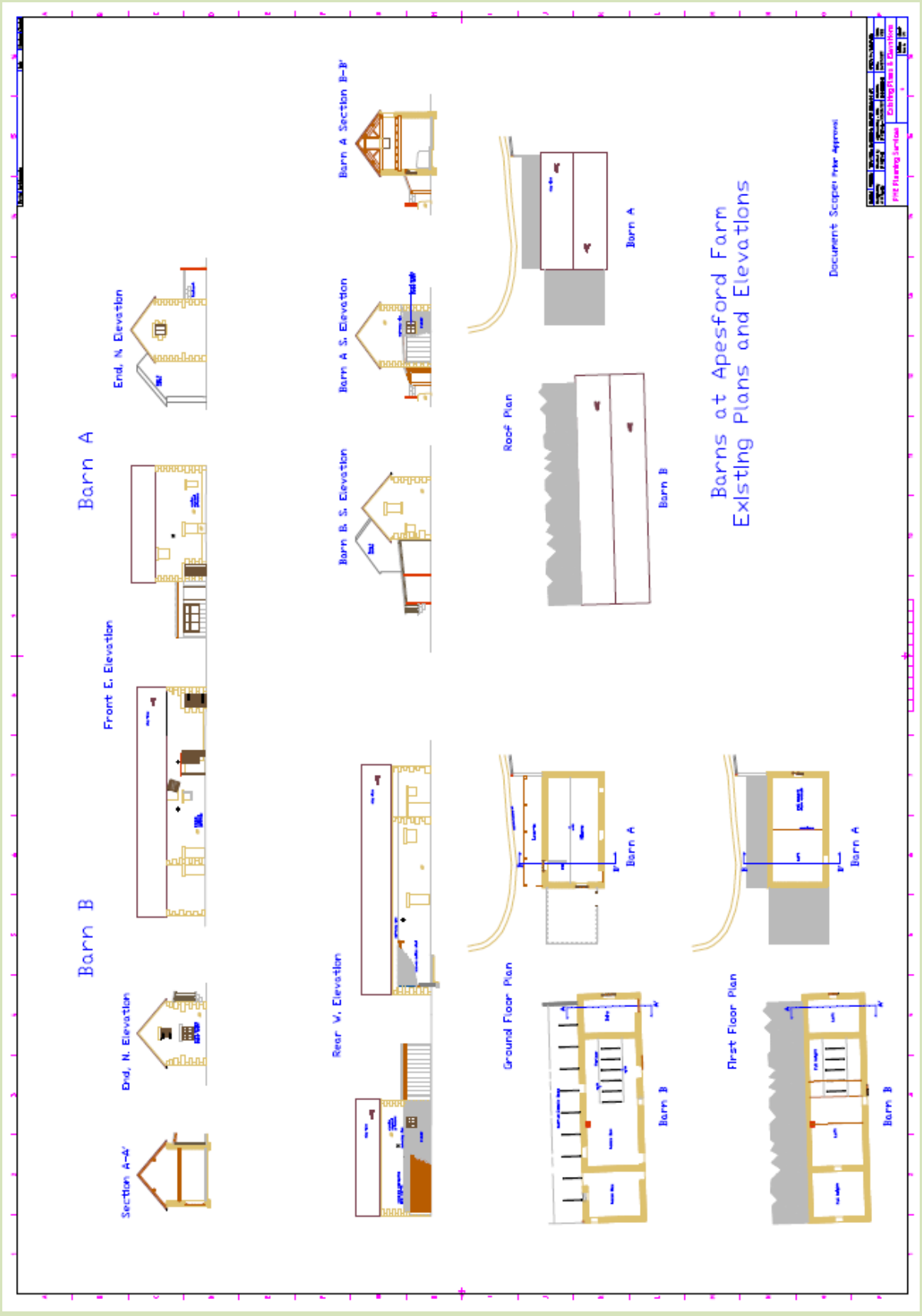
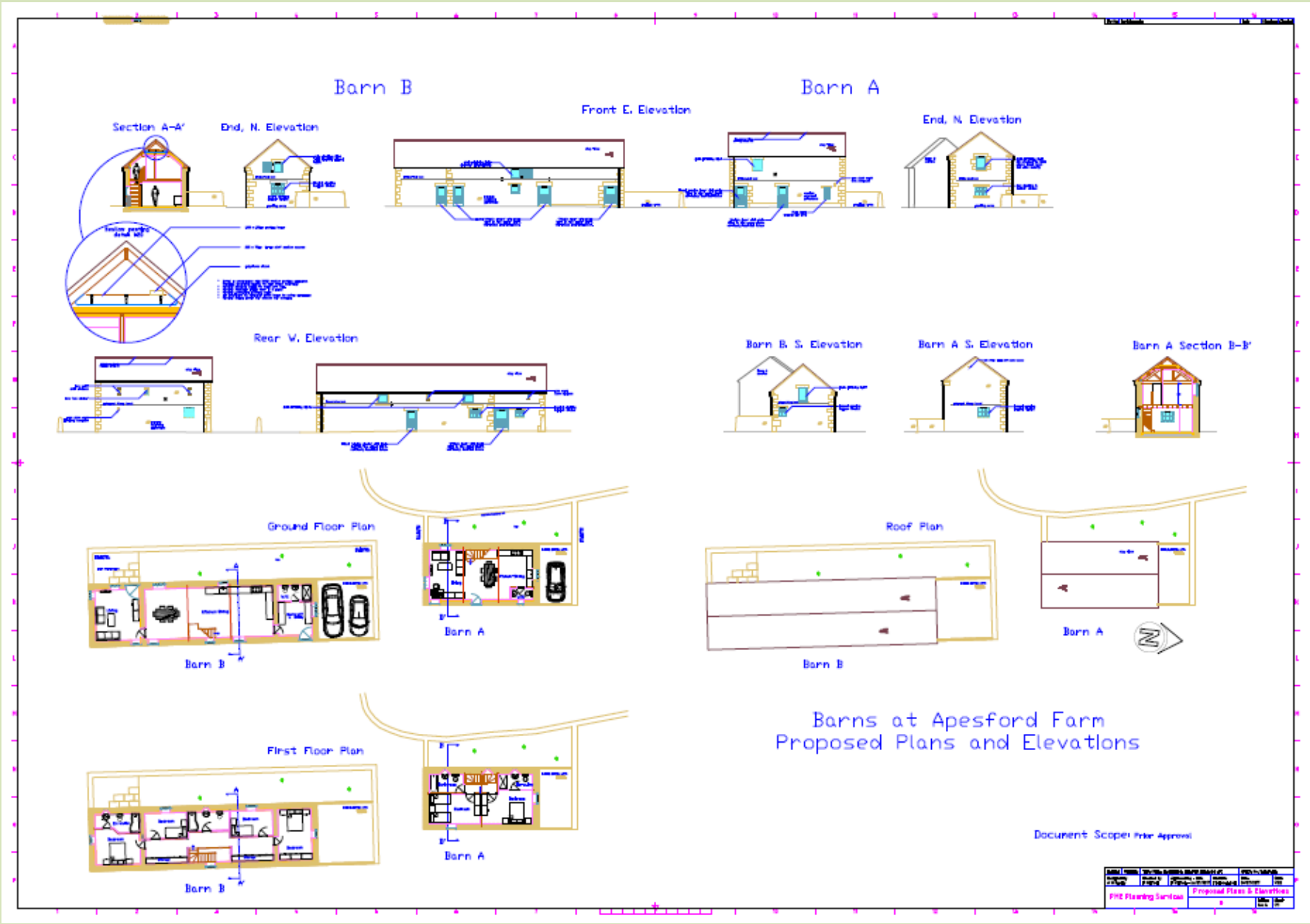
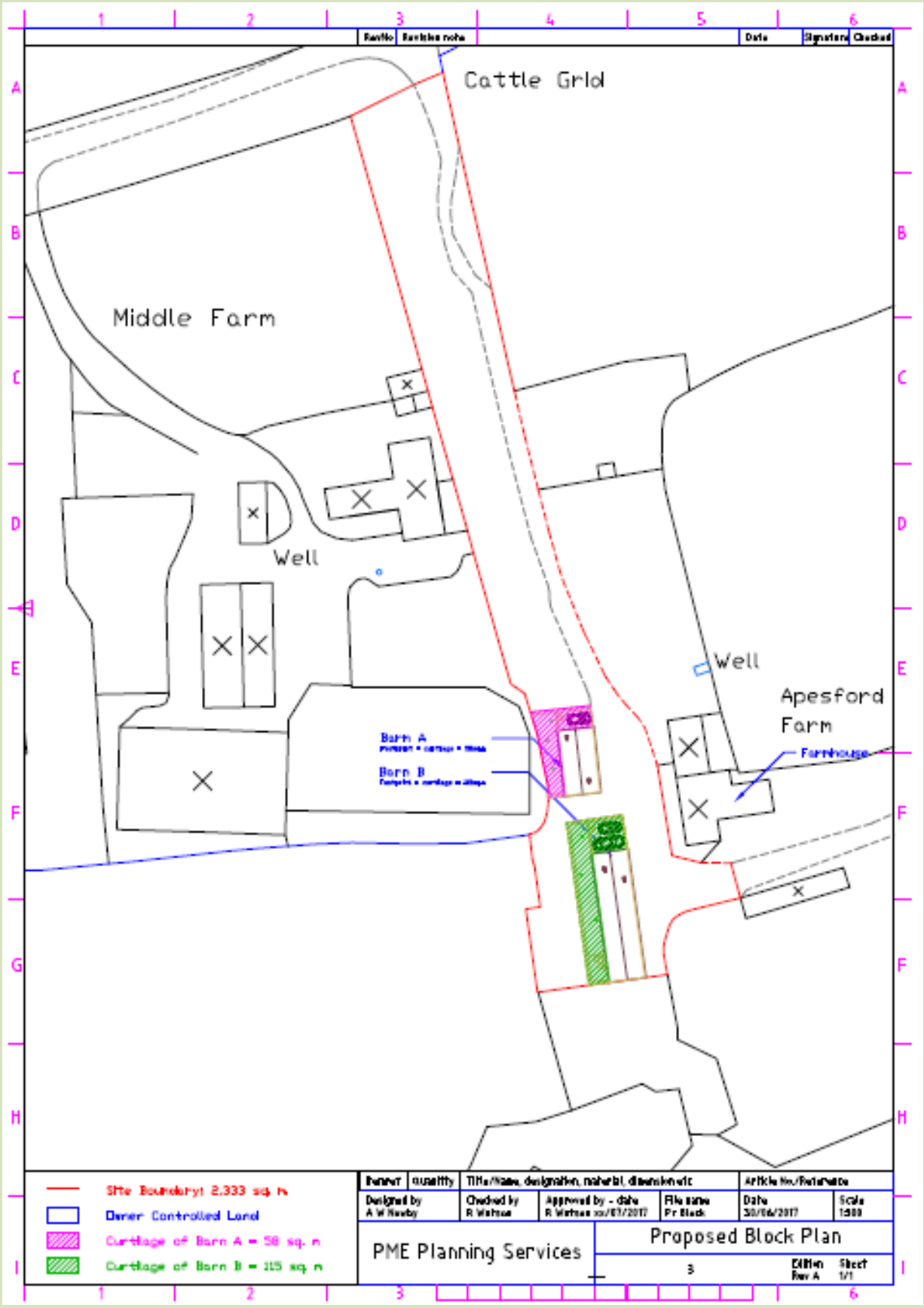
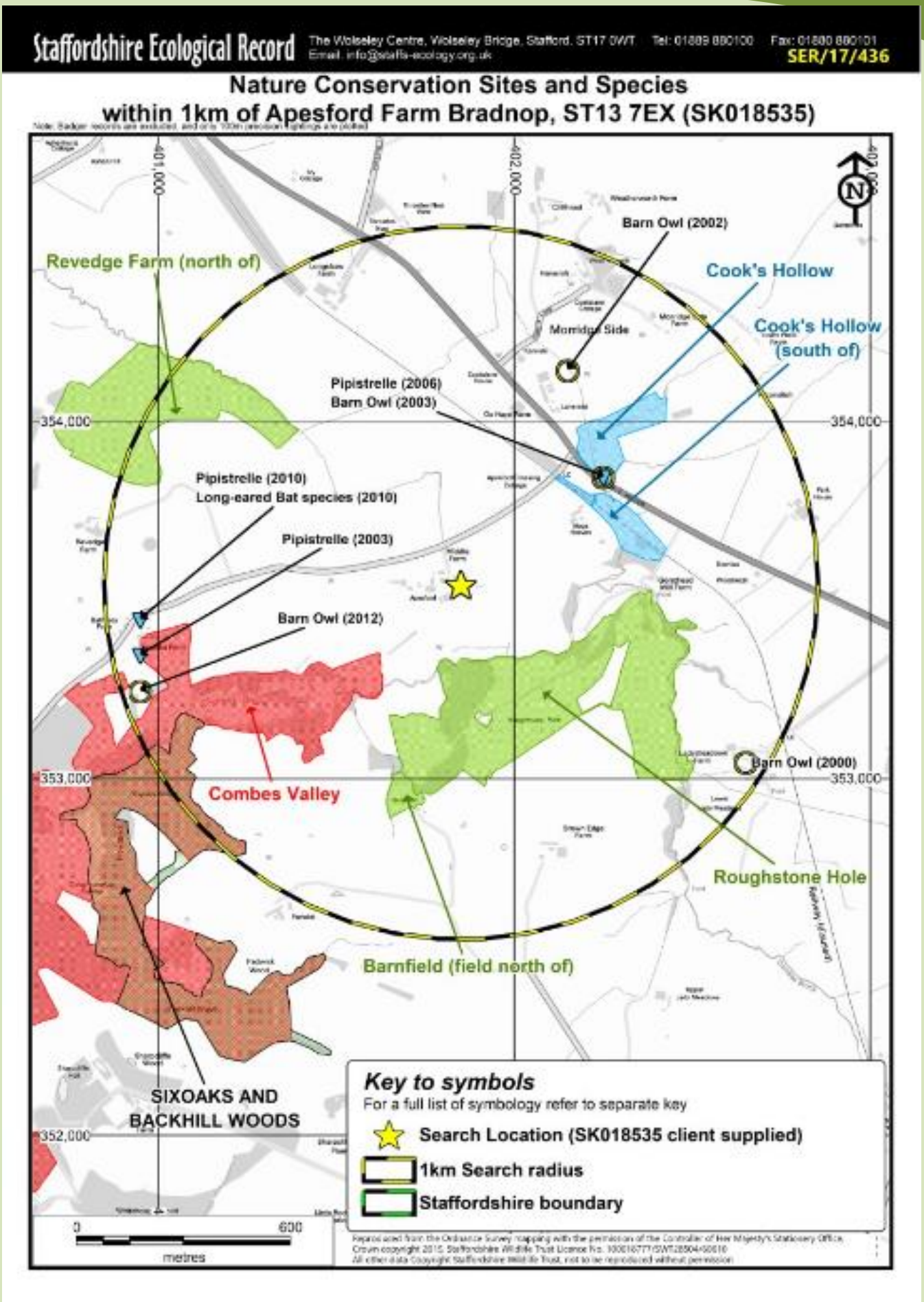
metres


Barns at Apesford Farm
Existing Plans and Elevations
Barn A
Barn B
Front E. Elevation
End. N. Elevation
Section A-A'
End. N. Elevation
Rear W. Elevation
Barn A Section B-B'
Barn A S. Elevation
Barn B S. Elevation
Roof Plan
Barn A
Barn B
Ground Floor Plan
Barn A
Barn B
First Floor Plan
Barn A
Barn B
Document Scoped Prior Approval


Barn B
Barn A
Section A-A'
End, N. Elevation
Front E. Elevation
End, N. Elevation
Rear W. Elevation
Barn B S. Elevation
Barn A S. Elevation
Barn A Section B-B'
Ground Floor Plan
Barn B
Barn A
Roof Plan
Barn B
Barn A
First Floor Plan
Barn B
Barn A
Barns at Apesford Farm
Proposed Plans and Elevations
Document Scope: Prior Approval
FHE Planning Services
Proposed Plans & Elevations


Cattle Grid
Middle Farm
Well
Well
Apesford Farm
Farmhouse
Barn A
Barn B
Site Boundary: 2,333 sq m
Owner Controlled Land
Curtilage of Barn A = 58 sq m
Curtilage of Barn B = 115 sq m
PME Planning Services
Proposed Block Plan
3


Staffordshire Ecological Record
The Wolseley Centre, Wolseley Bridge, Stafford, ST17 0WT Tel: 01889 880100 Fax: 01889 880101
Email: info@staffs-ecology.org.uk
SER/17/436
Nature Conservation Sites and Species
within 1km of Apesford Farm Bradnop, ST13 7EX (SK018535)
Barn Owl (2002)
Revedge Farm (north of)
Cook's Hollow
Cook's Hollow (south of)
Moridge Side
Pipistrelle (2006)
Barn Owl (2003)
Pipistrelle (2010)
Long-eared Bat species (2010)
Pipistrelle (2003)
Barn Owl (2012)
Barn Owl (2000)
Combes Valley
Roughstone Hole
Barnfield (field north of)
SIXOAKS AND BACKHILL WOODS
401,000
402,000
354,000
353,000
352,000
Key to symbols
For a full list of symbology refer to separate key
Search Location (SK018535 client supplied)
1km Search radius
Staffordshire boundary
0
600
metres

Appendix 2 – Policy guidelines

PAS 2010	*The published 'PAS 2010' 'Planning to halt the loss of biodiversity' which is the government's new policy aimed at all authorities and developers involved in the planning process in the UK to halt biodiversity decline by 2010 and deliver net biodiversity gains as part of the green infrastructure provisions.*
National Planning Policy Framework, Section 11:	*The recently published framework in 2012, replaces the previous Planning Policy Statement 9. Section 11: Conserving and enhancing the natural environment, reaffirms the Government's commitment to maintaining green belt protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife, aims to improve the quality of the natural environment, and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.*
Article 10 of the EC Habitats Directive:	*The published Article requires government to develop features such as 'stepping stones' on the landscape, such as clusters of ponds, tracts of rough grassland or scrubland and vegetated railway line embankments.*
Wildlife and Countryside Act 1981:	*All species of bat are fully protected under the Wildlife and Countryside Act 1981, the European Conservation (Natural Habitats etc.) Regulations 1994, and the Countryside and Rights of Way Act 2000. This legislation makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.*
Conservation of Habitats and Species Regulations (2010)	*The Conservation of Habitats and Species Regulations 2010 consolidate all the various amendments made to the Conservation (Natural Habitats, &c.) Regulations 1994, in respect of England and Wales. It is an offence to possess, sell or offer, or transport for sale any European species of bat or any part derived from such a species. These Regulations also remove the 'incidental result defence'. In other words, it is no longer a defence to show that the killing, capture or disturbance of a species covered by the Regulations or the destruction or damage of their breeding sites or resting places was the incidental and unavoidable result of a lawful activity. Natural England can grant European Protected Species (EPS) licences in respect of development to permit activities that would otherwise be unlawful.*
Natural Environment and Rural Communities Act (2006)	*Under Section 40 of the Natural Environment and Rural Communities Act (2006), public bodies, including Local and Regional Planning Authorities, have a duty to 'have regard' to the conservation of biodiversity in England when carrying out their normal functions, which includes consideration of planning applications. In compliance with Section 41 of the Act, the Secretary of State has published a list of species considered to be of principal importance for conserving biodiversity in England. This is known as The England Biodiversity List, all of which make up the UK BAP Priority Species. Regional Planning Bodies and Local Planning Authorities will use it to identify the species that should be afforded priority to maintain, restore and enhance species and habitats.*
Bird legislation	*Most resident nesting birds are protected under the Wildlife and Countryside Act 1981, which protects birds, nests, eggs and nestling's. Some rarer species, such as barn owls, are afforded extra protection.*

SUPPLEMENTARY INFORMATION REGARDING OWL NEST BOXES

(Source: Barnowltrust.org.uk)

Barn Owl nestboxes for inside buildings

Find out why indoor Barn Owl nestboxes are the best option.

Print PDF

Do you have a suitable building?

Ideal buildings for Barn Owl nestboxes are:

- At least 4 metres high.
- With an opening or hole at least 3 metres above ground level which overlooks open countryside.
- Where the nestbox can be positioned 3+ metres above the ground.
- Where the nestbox access hole is visible to an owl from the most likely entrance point.
- Ideally within 1 km of areas or strips of rough grassland.



It's worth bearing in mind that:

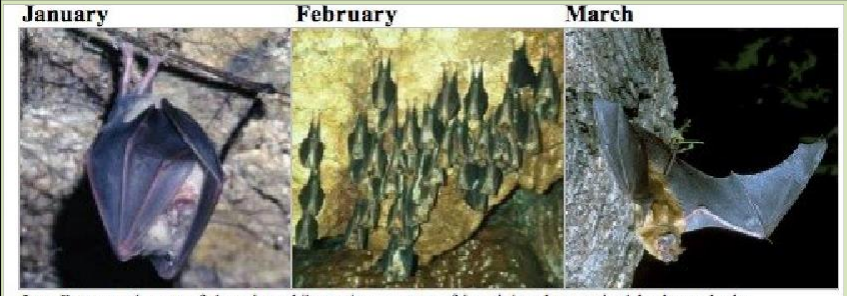
- It doesn't matter what the building is made of, or used for, and its position in relation to your house makes no difference.
- Barn Owls can learn to tolerate noise and activity as long as they have something to hide in – such as a nestbox.
- When choosing the building and the owl box position, remember that Barn Owls are interested in *openings and holes* rather than buildings or boxes. The way in needs to be visible. See our photo gallery suitable positions for Barn Owl nestboxes in buildings.
- See a photo gallery of openings and holes that are attractive to Barn Owls.





Appendix 3 – Annual life cycle of a temperate bat

January **February** **March**



Jan: Bats spend most of the winter hibernating, a state of inactivity characterised by lower body temperature, slower breathing, and lower metabolic rate. **Feb:** Bats are still hibernating. They have little fat left to live off of now. They may leave the roost on warmer nights to find food and a drink of water. **March:** Bats may begin to emerge and signs of limited activity can be seen. There are small numbers feeding as it gets warmer. In bad weather, they may become torpid.

April **May** **June**



April: Bats have mainly come out of hibernation and are hungry and active, feeding on most nights. They may be moving between several roost sites. They may become torpid (cool and inactive) again when cold. **May:** Bats are fully active and feeding. Females start forming maternity colonies and looking for suitable nursery sites, such as buildings or trees. Males will roost on their own or in small groups. **June:** Female bats usually give birth to a single pup, which they feed on their milk. Young bats are very small (less than an inch) with thin, slightly grey fur. Adult bats will catch thousands of insects each in a night.

July **August** **September**



July: Mothers continue to suckle young. Some young are growing fast and almost full-size; others are still very small. At around three weeks old, young bats are sometimes found on the ground as they learn to fly. **Aug:** At six weeks old, the young bats begin to catch insects for themselves and no longer need their mothers' milk. The summer maternity colonies begin to disperse and bats may move to mating roosts. **Sept:** Mating season begins, with males of most species using special mating calls to attract females, which can include purrs, clicks, and buzzing. Bats are also concentrating on building up fat stores for the coming months.

October **November** **December**



Oct: More mating is taking place, and building up fat reserves is becoming crucial to survive the winter season. Bats are seeking suitable hibernation sites, and beginning periods of torpor. **Nov:** Periods of torpor are lasting longer. Some begin hibernation, to save energy over the colder months, when insects are harder to find. They are using stored fat as fuel. **Dec:** Bats are hibernating. They may roost on their own or in small groups, often in cool, quiet places like disused buildings, old trees or eaves, where they hopefully won't be disturbed. **(Source: Bat Conservation Trust).**

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