Bat Survey Report

Client: Mrs. Anne Wagstaff

Location: Cresswell Ford Farm, Dilhorne Lane, Caverswall, Stoke-on-Trent, ST10 2PH

Prepared by Mark Weston BSc (Hons) GradCIEEM, AMRSB, Licensed bat surveyor, on behalf of

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October 2015

1. OBJECTIVES OF THE SURVEY

1.1 To assess whether bats and other protected species use or roost in a barn-building at Cresswell Ford Farm, Dilhorne Lane, Caverswall, Stoke-on-Trent, ST10 2PH [Grid ref: SJ 961429]. The proposed planning application considers conversion of the barn into a residential dwelling. No additional land-uptake is proposed.

1.2 To recommend any further actions/mitigation measures required as a result of the survey findings.

2 INTRODUCTION

2.1 Bats are a protected species under the Wildlife and Countryside Act 1981 (as amended); the Countryside and Rights of Way Act, 2000; the Natural Environment and Rural Communities Act (NERC, 2006); and the Conservation of Habitats and Species Regulations (2010). Under this legislation it is an offence to intentionally or recklessly kill, injure or capture bats, disturb or damage, destroy or prevent access to bat roosts.

2.2 All bat roosts are protected whether or not bats are present at the time of survey. A “bat roost” is generally described as any structure or place which a wild bat uses for protection or shelter. This can include buildings, other structures and trees. If bats are present or use the building at any time protection/mitigation measures would need to be provided as an integral part of any development and if planning permission is granted a European Protected Species Licence from Natural England may be need to be obtained before works can begin.

2.3 The survey was carried out and written jointly by Mark Weston (CLS00836 – Level 2) and Ken Wainman (Class Licence No. CLSO2840).

3 BACKGROUND

3.1 The proposed application area is located in Green Belt, and can be accessed immediately off Dilhorne Lane. It comprises of a former two storey and single storey barn-building with a pre-fabricated lean-to section.

3.2 The barn-building is centrally located within the proposed application area, with a footprint of ca. 153m^2. The building comprises of a series of two-storey and single storey brick-buildings, with pitched and tiled roofs. A pre-fabricated lean-to is attached onto the south elevation. The building surveyed is shown in Fig 1.

Figure 1. Building surveyed (yellow) in relation to existing boundaries (red).

3.3 The structure would appear to be in a poor state of disrepair, with numerous broken doors, windows and roof sections, Subsequently, the building provides numerous ingress potential for both bats and birds.

Surrounding Habitat

3.4 In context to the wider landscape, the application area is situated in Green Belt, and surrounded predominantly by open agricultural farmland, gently undulating hills, hedgerows, numerous water-bodies immediately adjacet, and intermittent blocks of ancient woodland. Habitat onsite chiefly comprises of bare open ground with hardstanding, minor patches of ruderal herbs and scattered semi-mature trees around selected boundaries. These habitats provide ample opportunities for foraging and roosting bats and birds, with excellent connectivity considered overall.

Figure 2. Location of proposed development area (Red) in context to the wider landscape.

Pre-survey data

Designated sites

3.5 Staffordshire Ecological Records show the site is contained by **Area Green Belt 64 Potteries and Churnet Valley & Special Landscape Area**. Whilst there are No Statutory Nature Reserves, RIGS, SSSIs, SPAs recorded located in the application area itself, there are a number of designations within a 2km radius of the site (See Appendix). Most relevant is Creswellford Crossing Biodiversity Alert site which resides immediately to the eastern boundary. However, as the the proposal considers a small-scale development, NO IMPACT to designated sites in the surrounding landscape is predicted.

Protected species

3.6 Staffordshire Wildlife Trust (SWT) show 11 of the 17 resident UK bat species occur in the county, with seven species currently given UK BAP (2007) Priority Status. Staffordshire Ecological data show 46 records of three species of bats recorded within a 2km radius of the site, two of which are considered UK BAP species (highlighted in orange):

UKBAP	Common name	Species	
☑	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 1. UKBAP Bat species recorded in Staffordshire.

3.7 A further four/five bat species that are not currently given UK BAP consideration are also recorded within the county with one recorded within a 2km radius of the site (highlighted in orange):

UKBAP	Common name	Species	Recorded within the county
☒	Natterer's bat	*Myotis Nattereri*	☑
☒	Daubenton's bat	*Myotis daubentonii*	☑
☒	Whiskered/ brandt bat	*Myotis mystacinus/brandtii*	☑
☒	Common pipistrelle	*Pipistrellus pipistrellus*	☑

Table 2. Non UKBAP Bat species recorded in Staffordshire.

3.8 SER show no evidence of any notable bat roost(s) within the proposed application area itself.

Birds

3.9 Staffordshire Ecological data provide 62 records of protected birds within a 2km radius of the application area. Common Kingfisher is recorded onsite. A number of raptorial birds of prey are noted including Red Kite and Peregrine Falcon. Twelve records of Barn Owl *Tyto alba* are recorded and considered present in the immediate area. Other species are classified according to their status on Red and Amber lists of Birds of Conservation Concern (BoCC) in the UK (see Appendix).

4 BUILDING INSPECTION (10th July 2015)

4.1 In accordance to standard methodologies set out by Natural England, the Bat Conservation Trust (BCT) and the Joint Nature Conservation Committee (JNCC). BCT survey guidelines, an external and internal assessment of the building was undertaken to assess the following in relation to bats and birds::

- Type and age of building
- Potential roost features (e.g. missing roof tiles, raised tiles, roof voids)
- Potential ingression points in-and-around the building(s) (e.g. broken windows, missing windows and doors / ridges and apex of the buildings)
- Evidence of bats (e.g presence of live or dead bats, droppings, grease marks, urine stains, feeding remains, characteristic odour
- Evidence of nesting birds (including Barn Owl).

4.2 In the absence of any evidence, structures were assigned a rating of suitability from negligible to high potential for supporting bats and birds.

External inspection

4.3 The building proposed for conversion, comprises of two-storey and single storey brick-built sections, with pitched and tiled roofs. A pre-fabricated lean-to is attached onto the south elevation which provides little to no potential for the thermoregulation requirements of roosting bats. The building is in a state of disrepair, with numerous broken doors, open windows and missing roof sections. Whilst NO evidence of bats and birds were recorded during the external inspection, external features provide numerous ingress potential for both bats and birds.

- Total footprint both barns = 196.5sqm
- Internals large single storey barn = 98.1sqm
- Internals 2 storey barn = 60.6sqm
- Curtilage to rear = 81.0sqm
- Curtilage to rear = 60.6sqm

Cresswell Ford Farm: External elevations of the building(s) surveyed:

Fig.3. *North-east gable end elevation of single storey section.*

Fig.4. *South east gable end elevation of two storey barn, with prefabricated lean-to attached on south elevation*

Fig.5. *East gable end elevation of two-storey building*

Fig.6. *Western elevation of single-storey section*

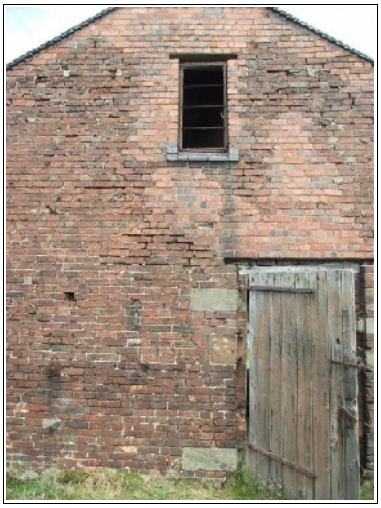

Fig.7. *East gable-end of two-storey section*

Internal inspection

4.4 The roof sections throughout all areas of the building were found to lack any roofing under-felt, with exposed purlins and roof tiles evident. Much of the internal single storey compartments were seen to be well illuminated and influenced by the external environment.

4.5 Internal inspection of ground floor compartment areas recorded evidence of nesting birds, including Barn Swallow *Hirundo rustica.* Most notably a large population (>30) of pigeons/doves were recorded roosting in both single storey compartments, inside the north-south facing interconnecting block, and also in the first floor roof void of the east-west facing two storey building. The timbering of the upper floor was considered to be in a state of decay and heavily infested with bird faeces. Subsequently, only partial inspection was possible via ladder through the loft hatch opening, due to health and safety issues.

4.6 The roof void area was seen to partially illuminated by opposing gable end window areas, and was voluminous in size with timber frame-work exposed to roof level. Gable-end walls showed some evidence of cracks and crevices in the brick-work. The dimensions of the upper floor void area were considered highly suitable for pre-emergent flight species such as Brown Long-eared bat, with cracks and gaps evident around brick work also considered suitable for crevice-dwelling species such as Common pipistrelle. A small internal roof void (containing a water tank) was also inspected in the single-storey section along the north-east elevation which has potential for bats. Conversely, No physical or anecdotal evidence of bats was recorded during the internal inspection, although overall rating considers the barn to have HIGH potential for roosting bats.

Cresswell Ford Farm: Internal features of the building(s) surveyed

Fig.8. Roosting pigeons + broken roof section in the single-storey, central connecting section.

Fig.9. NW section showing high levels of influence from the external environment

Fig.10. Semi-lluminated central connecting compartment

Fig.11. NE gable-end roof void

Fig.12. Semi-illuminated SE facing two-storey section roof void showing high infestation of pigeon

Fig.13. Defunct swallow nest in ground floor section of two-storey barn section

OVERALL BUILDING RATING

4.7 **NO evidence of bats was recorded** both externally and internally, although survey constraints prevented a more thorough inspection of the first-floor section in the main two-storey barn-building section. Other than the prefabricated lean-to on the south elevation, the building as a complete unit is rated as having MODERATE TO HIGH POTENTIAL overall for roosting bats, due to the multitude of egress points, and internal roosting features suitable for both pre-emergence void dwelling species and crevice dwelling bats.

Bat activity survey results

4.8 Two dusk surveys and one dawn survey were carried out on 16th July, 24thJuly (Dawn), and 30thJuly 2015. Due to findings, an additional survey was also conducted on 13th August 2015. Three surveyor were considered sufficient to monitor all elevations of the building (positions of surveyors are contained in Appendices). Surveyor's were:

- **Ken Wainman** Class (Survey) Licence Level 2 (no. CLSO 2840).
- **Mark Weston** BSc (Hons), MCIEEM, Class (Survey) Licence Level 2 (CLSO 0836).
- **Alison Wainman -** who has several years surveying experience.

4.9 During each survey, regular checks were made internally in an attempt to record any pre-emergent flight bats. The first-floor roof void was monitored via a ladder on the east gable-end window. Surveyor effort was considered sufficient, with all elevations and roof sections covered. However, prior consideration was given to the number of ingress points into the building for both bats and birds, and how this might hinder accurate discrimination between emerging bats in roost, and/or transient fly-throughs by bats, as visibility depreciated during the course of the survey period.

1st Dusk Survey 15th July 2015

4.10 **Main highlights:**

- Common pipistrelle was found to be dominant onsite in small aggregated numbers (<10 /σ = 100%). Noctule was characteristically recorded commuting at height (<3 /σ = 100%) over site.
- Between 3-4 **Common pipistrelle** were visually recorded emerging from the pitching hole on the two-storey gable-end section of the building shortly after sunset. Initial evidence would **indicate** a **low status roost** is present in this section.
- Low levels of foraging and commuting activity was recorded during the survey period with a number of Common pipistrelle bats seen utilizing the internal roof void of the main barn-building as a thoroughfare (access via via the pitching holes on east and west gable-ends).

- High levels of transient activity made it difficult to fully determine whether additional bats were emerging from the building or were simply speculating and passing through.

- Brown long-eared bat was seen to be occasional onsite, whereby a single BLE(σ = 100%) was visually recorded flying back and forth in the small roof void in the single-storey section on the NE gable-end between 21:08-22:48hrs. Early sighting of this individual BLE would suggest a potential roost, although NO other bats were recorded in this section.

- Evidence of pre-emergent flight was observed in the roof void of the two storey building, with 2-3 bats visually recorded. Behaviour was highly indicative of BLE with no echolocation detected. Whilst emergence times are in-line with this species, depreciating light and numerous ingression points, cannot fully rule out possible fly-through, although a potential roost for BLE was tentatively considered overall.

- All bats vacated the building around 22:42hrs.
- **NO** evidence of Barn owl was recorded.

1st Dawn Survey 24th July 2015

4.11 **Main highlights:**

- Common pipistrelle was once again found to be dominant onsite albeit intermittent over the survey period.

- Low number passes (<3) *Myotis* bat was recorded commuting around the western elevation. Possible Natterer's bat considered.

- Low to moderate levels of foraging and commuting. Pipistrelle bats showed an affinity to the linearity around building elevation's and fence/tree line borders,

- Peak bat activity declined ca.20mins before dawn.

- Regular inspection of internal roof voids found **NO** evidence of BLE bats swarming and congregating in roost.

- In contrast to the first dusk emergence survey, **NO** bats were seen re-entering the building during the survey period.

- **NO** evidence of Barn owl was recorded.

4.12 ***2nd Dusk Survey*** 30th July 2015

Main highlights:

- This survey returned the lowest activity overall onsite with Common pipistrelle seen as being dominant albeit in small aggregated numbers (<5 /σ = 100%).

- Foraging and commuting activity was once again seen to be seen to be persistent around the building during intervals, with the majority of bat passes assigned to Common pipistrelle.

- Occasional Common pipistrelle seen utilizing the internal roof void of the main barn-building as a thoroughfare throughout the survey period.

- **NO** evidence of pre-emergent flight BLE bats observed.
- **NO** evidence of bats were observed emerging from the building during the survey period.
- **NO** evidence of Barn owl was recorded.

4.13 Based on the polarity between survey findings, an additional dusk survey was deemed necessary to determine the presence /absence of roosting bats in the building

3rd Dusk Survey 13th August 2015

Main highlights:

- Common pipistrelle was dominant onsite in small aggregated numbers (<8 /σ = 100%). Low levels of Noctule (<3 /σ = 100%) were characteristically recorded commuting at height over site during early evening.

- Foraging and commuting activity was once again seen to be seen to be intermittent around the building during intervals, with the internal roof void of the main barn-building being used as a thoroughfare by individual Common pipistrelle.

- **NO** evidence of pre-emergent flight BLE bats observed.
- **NO** evidence of bats were observed emerging from the building during the survey period.
- **NO** evidence of Barn owl was recorded.

5 ANALYSIS AND CONCLUSIONS

5.1 The initial dusk activity surveys would indicate a low status impact roost is present onsite. However, NO further evidence of roosting Common pipistrelle were recorded thereafter, despite extended survey effort. Based on the findings, assessment considers the building serves as a temporal satellite roost for a small population (N<10) of Common pipistrelle. Due to the open ends on gable-ends, the building was seen to be used as a thorough-fare by individual Common pipistrelle, with moderate levels of intermittent commuting and foraging recorded in-and-around the proposed application area during the majority of survey periods.

5.2 Similarly, the initial survey also indicated the building has some potential for individual Brown long-eared bat, with both roof void sections showing some evidence of utilization by this species. Once again, extended survey effort could not corroborate any firm evidence that a permanent roost is present, and a low impact status temporal Satellite roost is thus predicted.

ROOST STATUS	IMPACT STATUS
• Temporal summer satellite roost for a small population of Common pipistrelle (N<8)	LOW IMPACT ROOST
• Temporal summer satellite roost for individual Brown long-eared (N<5)	LOW IMPACT ROOST
SHORT-TERM: DISTURBANCE	**LONG-TERM: ROOST MODIFICATION & LOSS**
HIGH	**LOW TO MODERATE**

Table 3. Impact assessment based on modification of building:

5.3 Overall assessment considers NO HIGH IMPACT ROOSTS (i.e. maternity roost) are currently present in the building proposed for redevelopment. It is speculated that whilst the building is rated as having moderate to high ecological value for roosting bats, all internal sections would appear to be highly influenced by abiotic factors (temperature, air circulation and humidity), thus creating less than stable micro-climates suitable for long-term roost up-take. In addition, high levels of infestation by pigeon/doves in the building may also result in a degree of roost degradation, interspecific competition, and inevitable exclusion.

BATS: Impact assessment on foraging and commuting habitat		
Short-term: Disturbance	**Long-term modification**	**Long-term loss**
MODERATE	MODERATE	NO LONG TERM LOSS PREDICTED

Table 4. Foraging and commuting habitat impact.

Further survey

5.4 Assessment onsite was undertaken during an optimal survey period, and the report findings are considered to be robust overall and representative of protected species currently onsite. Due to the synanthropic nature of species onsite, there is potential for individual bats to over-winter onsite. However, due to health and safety constraints encountered, **NO** further survey recommendations for bats are considered subject to mitigation recommendations.

Mitigation Licences

5.5 Without appropriate mitigation, it is highly likely that the proposed application will result in an offence under Regulation 41 or 4, whereby destruction of a Summer Satellite roost for two species of bat is predicted. Under current legislation, a European Protected Species Licence would need to be obtained from Natural England before any development works can take place.

5.6 Mitigation should fundamentally consider the roosting ecology of crevice-dwelling and void dwelling bat species, with regard to a small, transient population of Common pipistrelle and (to a lesser degree) Brown Long-eared bat.

6 RECOMMENDATIONS

6.1 Based upon the findings in relation to the proposed planning drawings (see Appendix), the following mitigation recommendations are made in order to achieve the following factors:

- **Provision of roosting opportunities;**
- **Availability of foraging and commuting habitat**
- **Appropriate management / protection of existing roosts and areas.**

Roost Compensation for male Common pipistrelle summer roost

6.2 Bat tiles should be incorporated into any new and/or repaired roof sections, to enable access into the intermediate layer underneath the roofing tiles for crevice-dwelling bats. These 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.

6.3 Alternatively, this can be achieved by raising several ordinary ridge tiles along the length of a roof with a deeper bed of mortar, or by narrowing the gap tiles and resting the middle tiles on their neighbours. Gaps between 30 and 150mm should be left without mortar and provide access points for crevice-dwelling species such as Pipistrelle bats. Alternatively, access slits in newly created soffits can also be considered for Common pipistrelle. Where possible access tiles should be incorporated into north and south facing sections, in-order to provide a range of alternative microclimates for bats to select from.

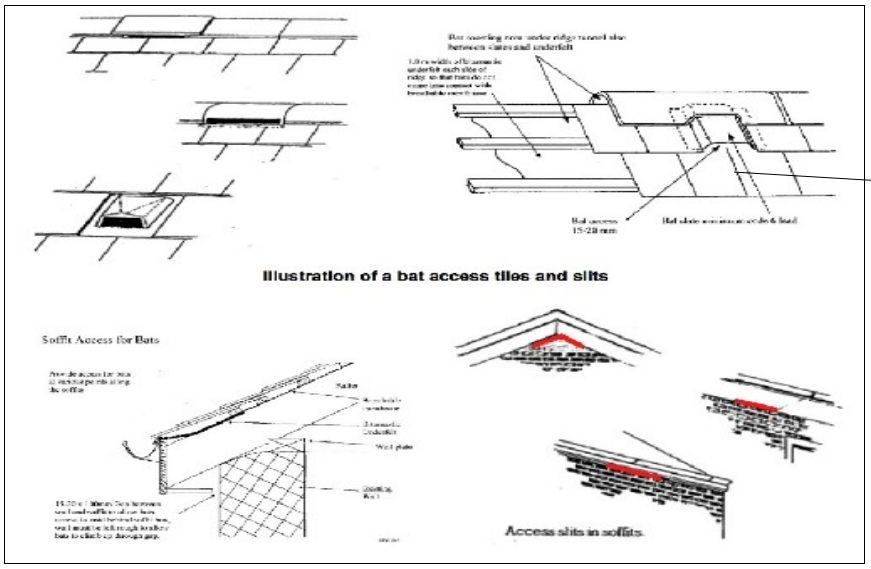

Fig.14. Examples of bat access tiles and soffit slits

Roost Compensation for Brown long-eared bat satellite roost

6.4 It is recommended that provision in the form of a bat-loft for Brown Long-eared bat is incorporated into the design. Typically for a High impact roost, Natural England has minimum requirements with regards to the suitable flight space for BLE (5m x 4.8m x 2.8m high, non-cluttered, roof void with a volume as close to 75cm^3).

6.5 In the case of a low impact Satellite roost for less than five bats, it is believed that a reduced roof void ca 1.2m high with extended width and length (if possible) would be sufficient compensation for such a transient roost, and should be incorporated into the design of the development. In addition, purpose built egress points (in the form of either dormer or ridge vents) will improve accessibility into the loft area, and should be located as near to existing flight-paths and egress points currently used by bats.

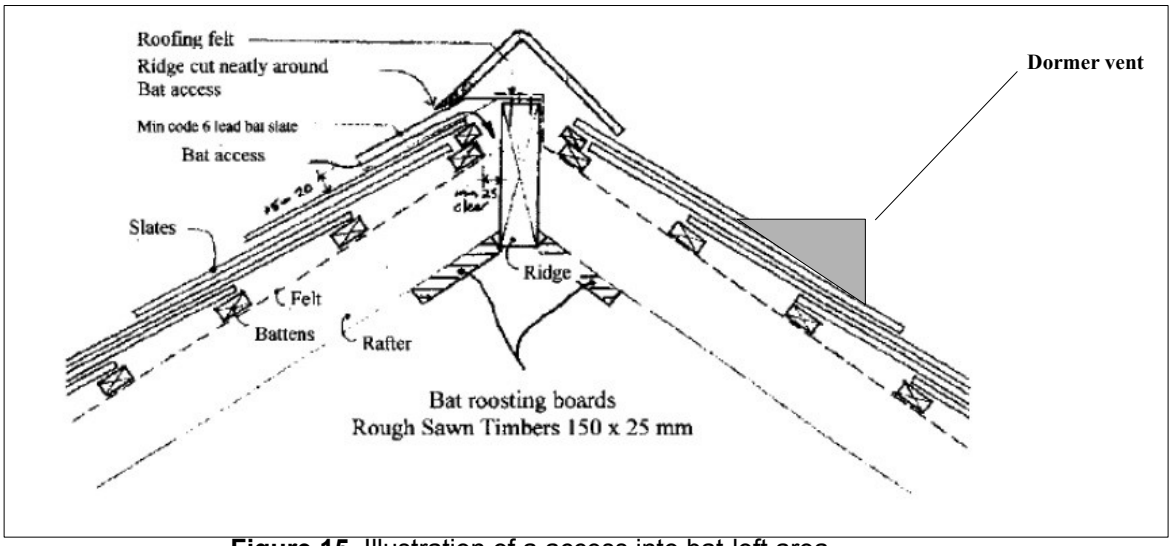

Figure 15. Illustration of a access into bat-loft area.

Modern Breathable Roofing membrane

6.6 Where roosting features are created, the roof section should ideally be lined with traditional dark, black “Bitumen F1” roofing under-felt. The most recent research on breathable roofing membranes (BRMs) show that all BRMs are unsuitable, due to fraying and subsequent entanglement of bats (Waring,2014), and should not be used. Where possible traditional *Bitumastic F1* type felt should be incorporated into the bat-loft and also used to line any rood sections where bats may come in to contact with BRM (i.e. crevice-dwelling bat access tile areas).

6.7 Recently Natural England, with relation to mitigation licences, have publically indicated that they will not prove the use of BRM's in roosts, and will only approve roosts where traditional bitumen felt or timber sarking is used.

6.8 The number of roosting positions within the bat-loft can be further enhanced economically by additional ridge boards and/or installation of traditional *bitumastic F1* type felt drapes between the roof rafters. Such drapes can be loosely tacked onto the underside of roof, with slit cuts into the felt to allow access between all intermediate areas between the bat-loft and roofing tiles..

Timber treatments

6.9 In the event that some timber works may require replacement or remedial care and maintenance, it is important to note that some wood treatments use pesticides that are harmful to bats. Even vapours from treatments used on lower floors and joists, may also affect bats roosting at roof level. Treatments, which use petroleum products to spread the pesticide and aid its penetration, are especially likely to release vapours that could harm or disturb bats.

6.10 Thus any treatment should be undertaken using chemicals approved by Natural England for use in bat roosts. Natural England will provide advice upon which chemical is most suitable and the time of year in which it can be applied. Pesticides containing the synthetic pyrethroids (permethrin, cypermethrin etc.) and boron compounds (Borester 7, disodium octoborate etc.) are considered as being relatively harmless to bats.

6.11 In general should be pre-treated timber be used (for replacement), only wood treated by a copper-chrome-arsenic process such as Tanalith or Celcure should be used as this is harmless to bats when dry. Wood pre-treated by an organic solvent process can contain chemicals which are extremely toxic to bats and should not be used.

6.12 Should remedial timber treatment be necessary (i.e. to treat wood-boring insects), then only a fluid containing permethrin or cypermethrin, flufenoxuron or boron based fluid should be used. In order to prevent rot, then a copper, zinc or boron compound preferably in emulsion or aqueous solution, should be used. These fluids are much less toxic to bats than other commercially available alternatives. Treatment should be carried out at the same time as roofing work.

Receptor sites and enhancement

6.13 Preliminary recommendations should consider suitable receptor sites, in the event that bats are discovered during works. Use of standard capture and exclusion methods may be necessary, to prevent any harm to bats found during the development. It is recommended that two Schwegler 2F bat boxes or similar, are located in suitably mature trees around adjacent boundaries where possible. The boxes should be positioned a minimum of three metres above the ground and where there is a clear flight path for bats entering and leaving.

Figure 16. *Schwegler 2F*

Onsite supervision

6.14 Before ANY work commences, ALL building contractors should be made aware of the possible presence of bats within the building subject to redevelopment, their legal protection and of working practices to avoid harming bats. A soft demolition approach should be carried out around all roof sections under the supervision of suitably qualified bat ecologist.

Timing of works

6.15 Roofing works should only be carried out between 1st October to the 1st April inclusive, to avoid disturbing any bats that might be utilizing the building as a transient summer roost. Starting such works in October would allow any juvenile or adult bats to leave the roost in reasonable weather conditions before they move to their hibernation roost., when bats have vacated to hibernation roosts.

6.16 In the event that individual bats are encountered during works, any such individuals would be enabled to naturally disperse under their own volition, whilst there is still sufficient resources in the surrounding landscape for bats to utilize, prior to the onset of winter.

6.17 **Should any bats be discovered prior to, or during works (or suspicion arise about the possible presence of bats), then all works must cease immediately, and a licensed ecologist should be consulted, if not already present at that time.**

Foraging and commuting habitat.

6.18 The proposed development should be sensitive to impact on foraging and commuting habitat, and nd careful consideration should be given to lighting and excessive disturbance onto adjacent habitats during pre and post development.

Lighting

6.19 Any lighting design should consider potential of light-spill, which can affect the foraging and commuting strategy of local bat species, and should be avoided onto nearby trees and hedges/shrubs. Lighting should be faced down to prevent such spillage, and height of any lighting columns should not exceed eight metres. Low-pressure sodium lamps (SOX) fitted with hoods are recommended to direct light below the horizontal plane to minimize upward light spill.

6.20 Any security lighting should be on a timer setting, and all lighting should not exceed 200 lumens (150 watts).

Scaffolding

6.21 As the building was seen to used a thoroughfare by commuting bats, preliminary consideration should be given to any scaffolding erected onsite. it would be recommended that no plastic sheeting or mesh be used on any such structures during the development, in order to prevent potential snaring and entanglement of volant bats.

Birds

6.22 **NO** further survey recommendations are considered with regard to protected bird species (including Barn Owl), on the proviso that care and vigilance is carried out during works. Ideally works should be programmed outside of the bird breeding season, which runs from March to October inclusive. If this is not possible, a check for active nests should be incorporated into site supervision when regarding bat mitigation, and be undertaken by an experienced ecologist. Mitigation will predominantly need to consider the ecology of European Swallow, which may require installation of additional pre-formed “cup-shaped nests”. These should be placed high up, preferably on beams, at least 1m apart.

Further information can be found on the RSPB website:www..rspb.org.uk/swallow-nest.html

Biodiversity enhancement

6.23 Any landscaping relating to the proposed development should also provide sustainability for local wildlife, and 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.

7 REFERENCES

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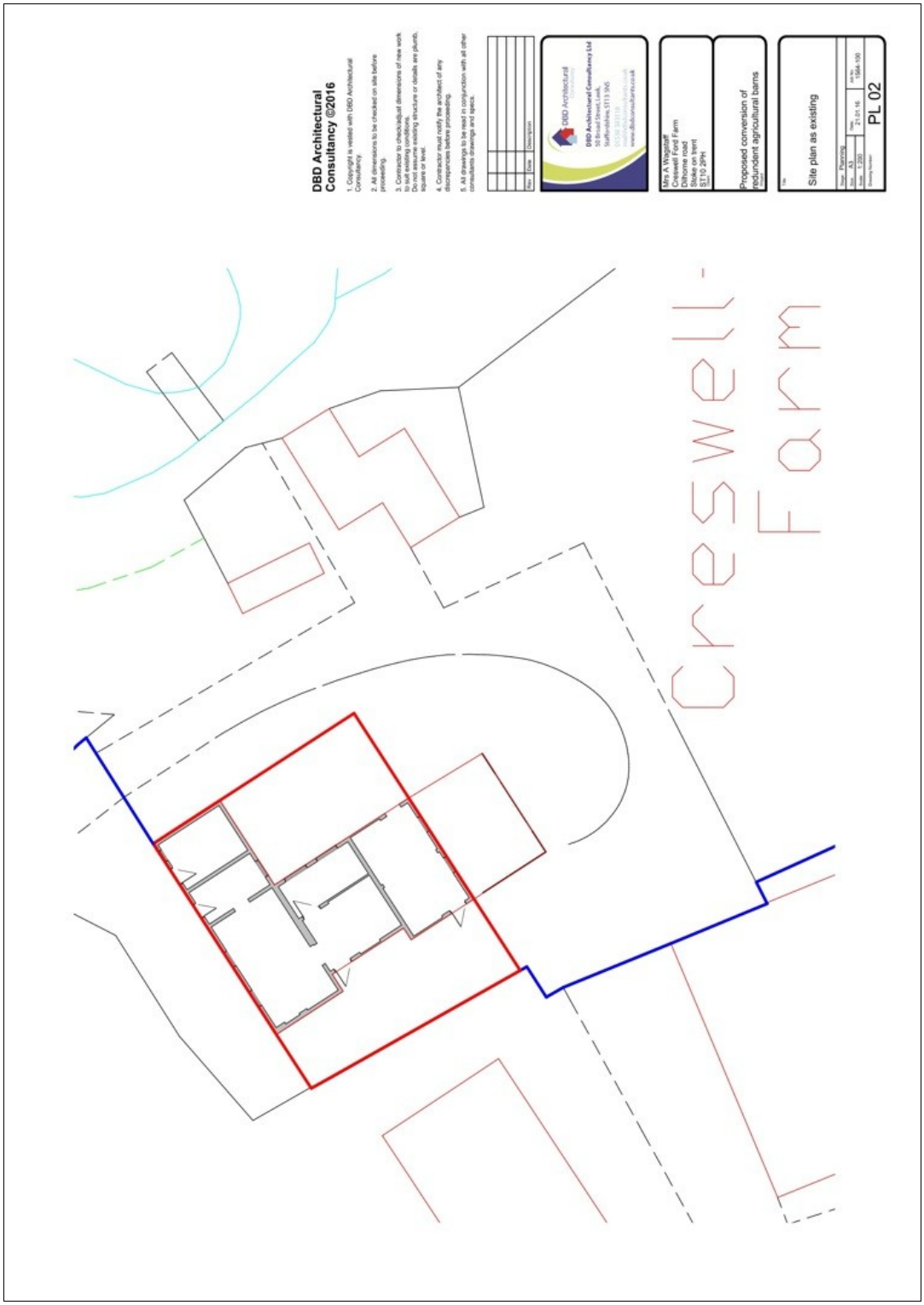
Appendix 1: Maps & Plans



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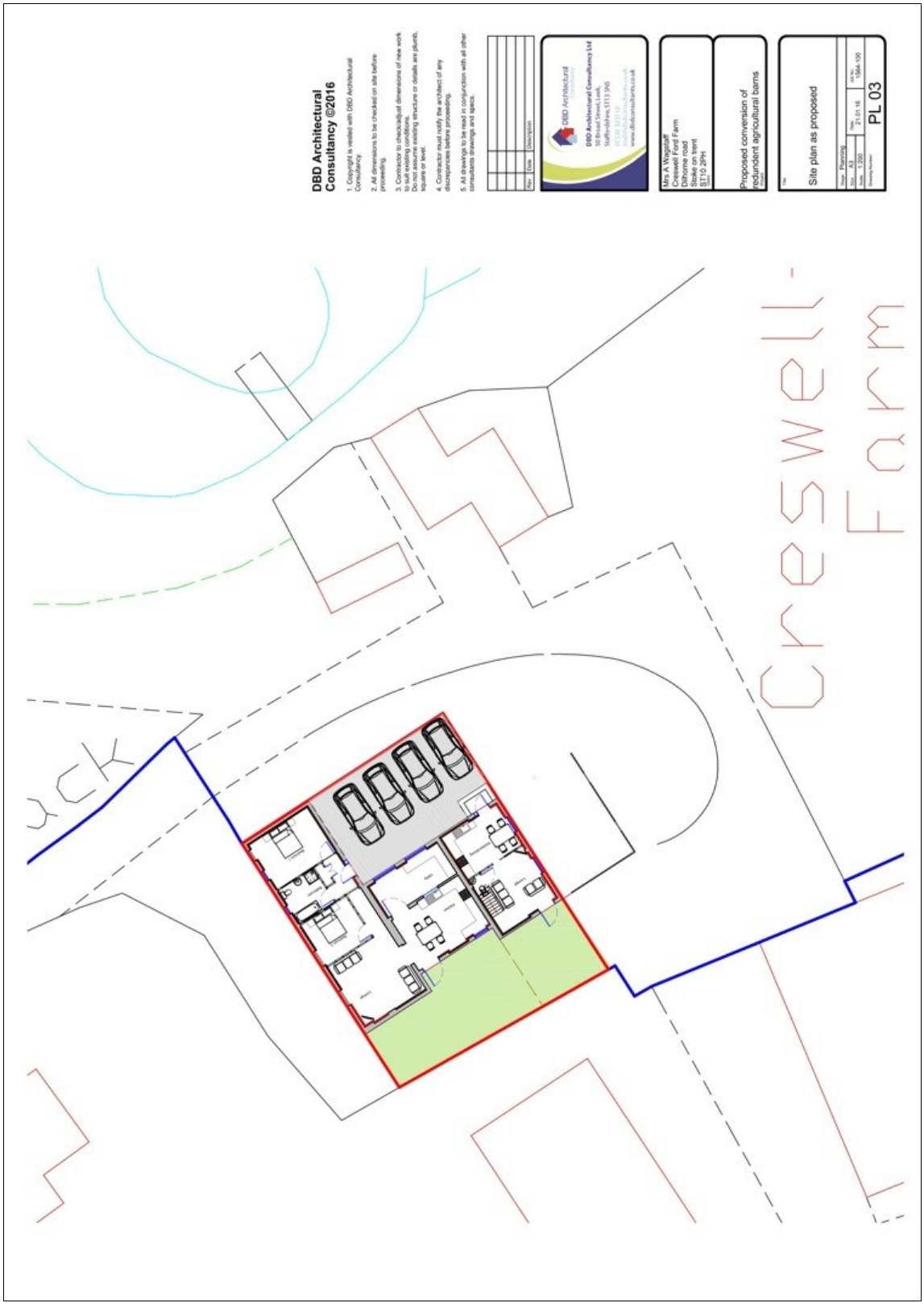

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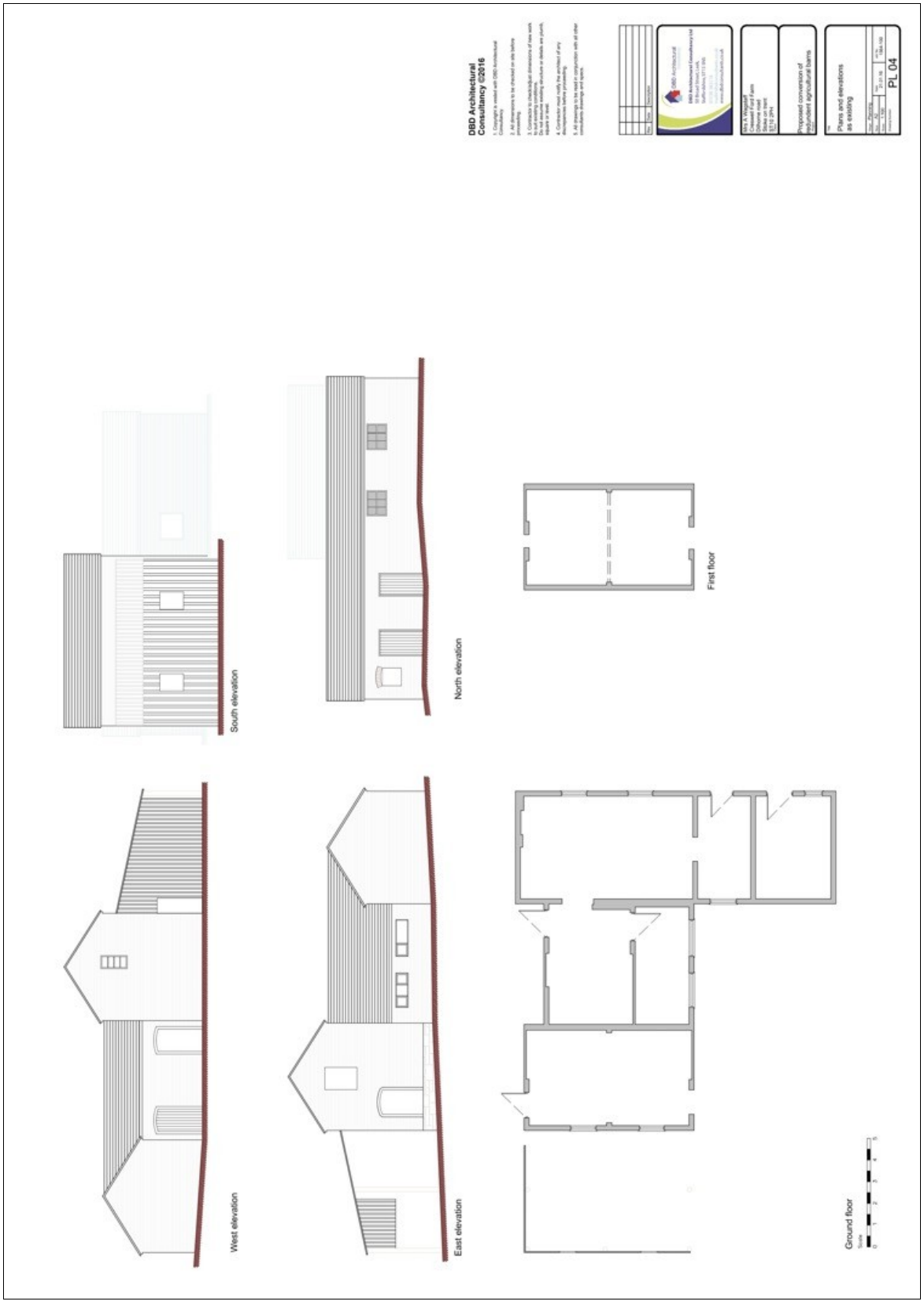

Prepared by Mark Weston BSc (Hons) GradCIEEM, AMRSB, Licensed bat surveyor, on behalf of

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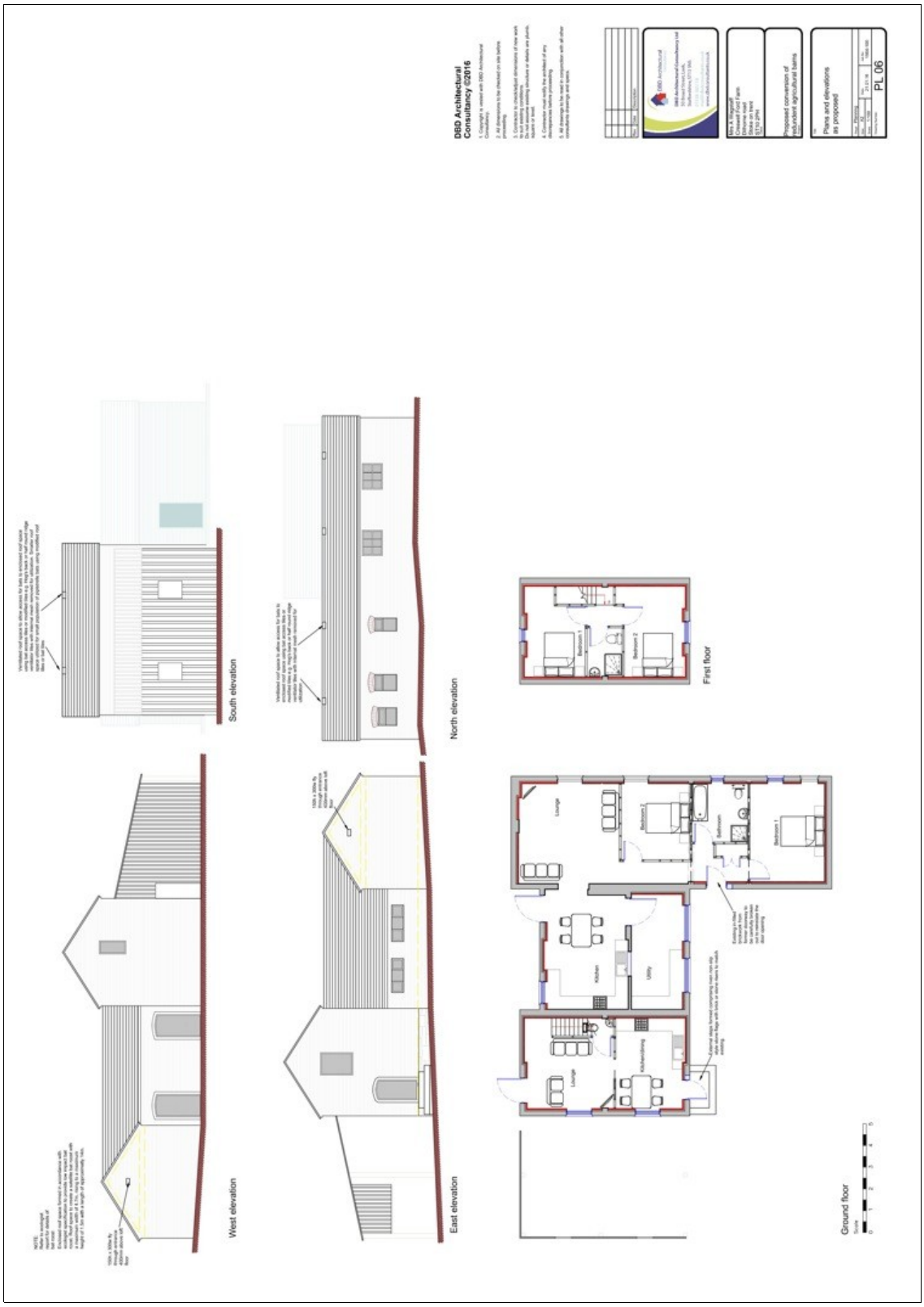

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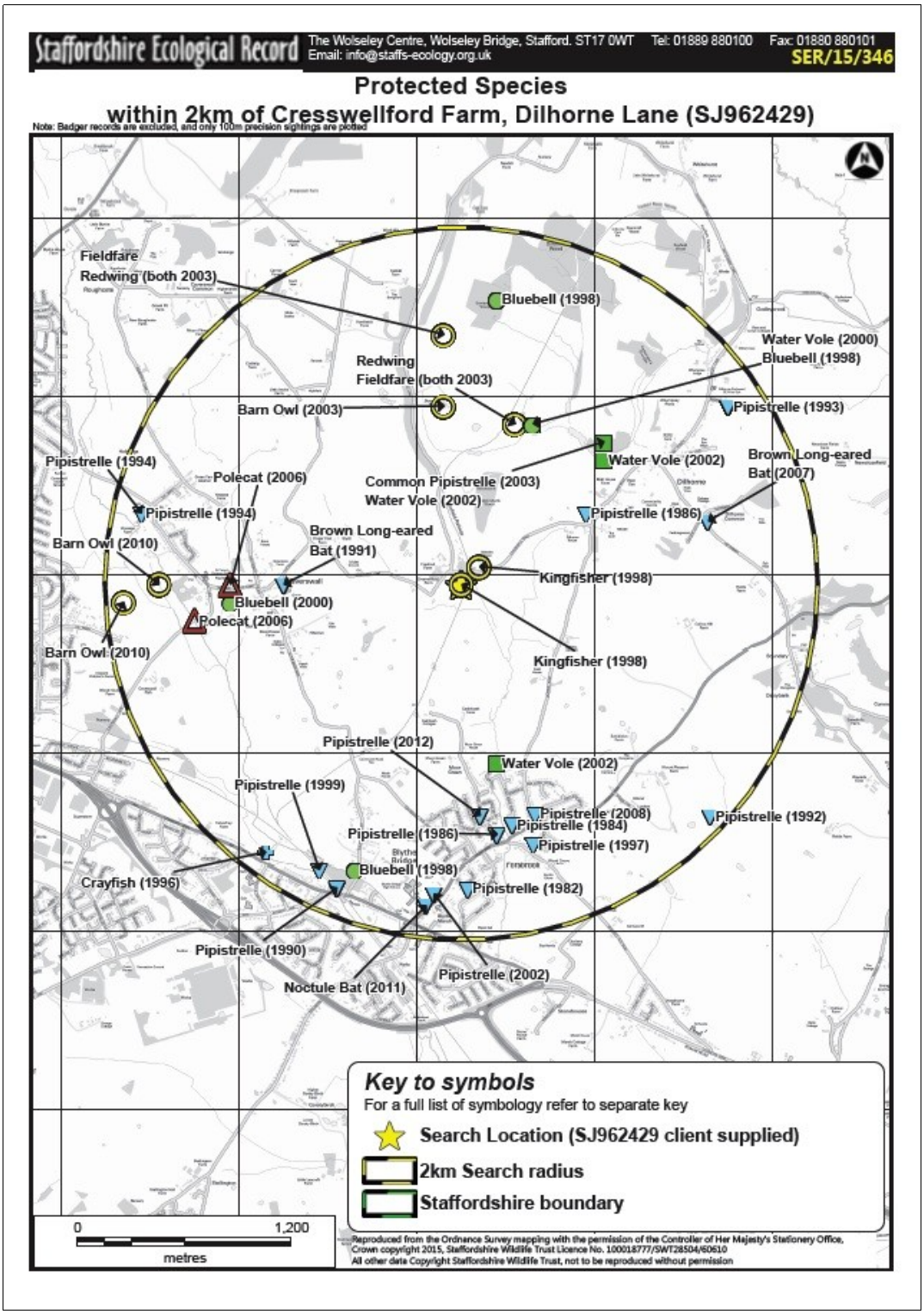
Protected species 2km map



Appendix 2: Pre-survey data

Statutory Sites (SSSIs/LNRs)

None known within the search area

Non-statutory Ecological Sites (SBIs/BASs)

94/63/30	SJ963430	Creswellford Crossing	BAS (1998)
94/63/68	SJ966438	Stansmore Grassland	SBI (2005)
94/64/45	SJ964445	Stansmore Wood and Grassland	SBI (2005)
94/64/98	SJ969448	Dilhorne Wood	BAS (1998)
94/65/45	SJ964455	Heywood Grange Wood	BAS (2000)
94/73/42	SJ974432	St.Thomas's Trees	BAS (2000)
94/74/39	SJ973449	Foxfield & Pearcroft Woods	SBI (1998)
94/82/91	SJ989421	Commonside Quarry	BAS (2000)
94/83/12	SJ981432	Fair View (north of)	BAS (2000)

Site on the Natural England Ancient Woodland Inventory (AWI)

SJ968448	Dilhorne Wood	Ancient & Semi-Natural Woodland
SJ974448	Foxfield Wood	Ancient & Semi-Natural Woodland
SJ964455	Grangewood	Ancient & Semi-Natural Woodland
SJ963445	Stansmore Wood	Ancient & Semi-Natural Woodland

Regionally Important Geological/geomorphological Sites (RIGS)

None known within the search area

3) Protected Species within search area

An annotated list of all Internationally and UK protected species together with species from the UK and Staffordshire Biodiversity Action Plans is attached.

Designated Areas of Ecological Significance		
• **Green Belt area / Conservation area**	• **Special Landscape Area** - Land to east of Caverswall, east of Handley Banks and Finger Post Farm	
Biodiversity Alert Sites:		
• **Caverswall Castle, The Dams**, centre of Caverswall	• **Creswellford Crossing**. nr. Cresswellford Farm, approx. 900m E. of Caverswall * Adjacent to proposed application area	• **Blythe Bridge Woods**, adjacent to River Blithe, approx. 1.5 km south of Caverswall along Caverswall Rd.
SBIs:		
Stansmore Grassland, approx. 1.3 km ENE of Sycamore Farm	Stansmore Wood & Grassland, approx. 1.6 km NE of Sycamore Farm	
Ancient Woodland		
• **Sycamore Wood**, approx. 1.7 km NE of Caverswall	**• Other Significant Woodland/Tree belts:**	
	Trees lining track which runs east of Caverswall • Woodland N of Caverswall Common, approx. 1.1km N of Cookshill • Nursery, Carmel Farm, 1.1km NNE of Cookshill • Blakeleybank Wood, 1.1km E of Caverswall, to the E of Foxfield Railway	

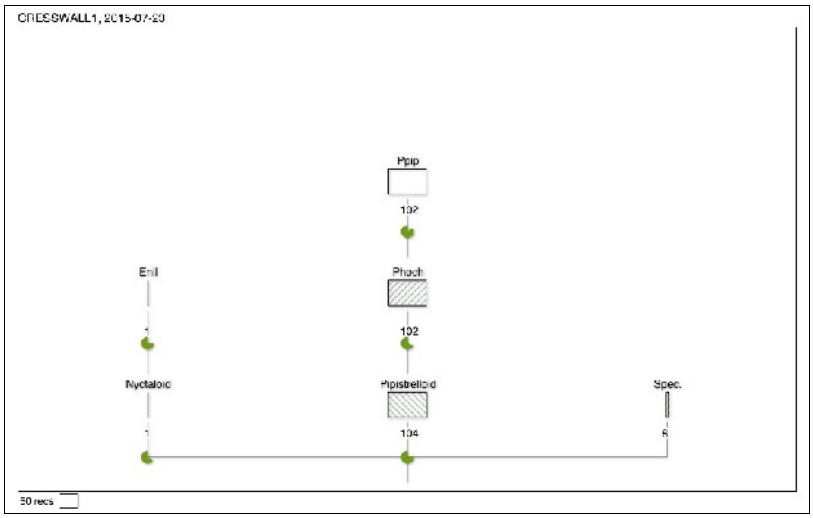
Table A. Designated Areas of Ecological Significance in 2km radius

Table B. Bird species recorded within a 1-2km radius of the application area			
Common Kingfisher	*Alcedo atthis*	**Barnacle Goose**	*Branta leucopsis*
Peregrine Falcon	*Falco peregrinus*	**Little Plover**	*Charadrius dubius*
Short-eared Owl	*Asio flammeus*	**Eurasian Hobby**	*Falco subbuteo*
Little Egret	*Egretta garzetta*	**Barn Owl**	*Tyto alba*
European Golden Plover	*Pluvialis apricaria*	**Black-tailed Godwit**	*Limosa limosa*
Redwing	*Turdus iliacus*	**Fieldfare**	*Turdus pilaris*
Brambling	*Fringilla montifringilla*	**Red Kite**	*Milvus milvus*
Black-tailed Godwit	*Limosa limosa*		

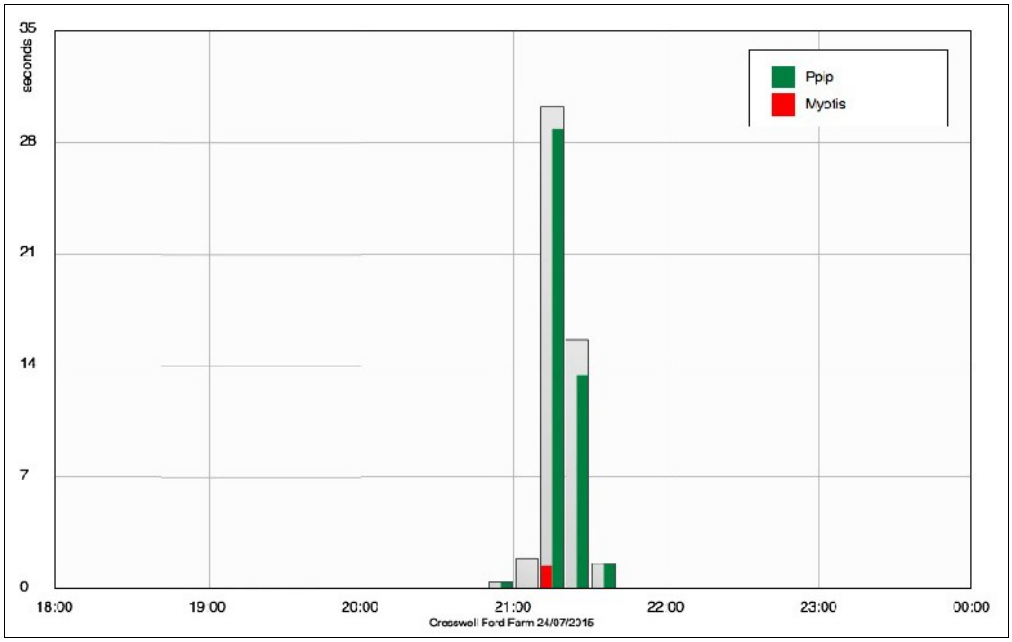
Appendix 3: Surveyor location

Figure A. Position of surveyors Ken Wainman (KW) (SW of barn); Alison Wainman (AW)(NE of barn) and Mark Weston (MW)(east of barn).

Appendix 4: Data analysis



Overall representation of species recorded onsite (NB. Spec= BLE)



Activity histogram showing a normal distribution; Survey 1/ 24th July 2015