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Preliminary Roost Assessment and Phase 2 Bat Survey Report

Harcombe House
Park Lane
Ropley
Hampshire
SO24 0BE

January 2024

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QUALITY CONTROL		
The information which we have prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct.		
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<p>This report remains valid for 12 months from date of issue.</p> <p>Survey data are valid for 12-18 months from the date the survey was undertaken.</p>		

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1. EXECUTIVE SUMMARY

- 1.1. Darwin Ecology Ltd was commissioned to undertake a full set of bat surveys to inform proposals for the pool house and northern wing of Harcombe House, Park Lane, Ropley, SO24 0BE. The assessment was required to support a planning application for the erection of a single and double storey rear extension and a new indoor swimming pool following the demolition of an existing swimming pool building, conservatory and a single storey lean-to at the rear of the property. This report is an informative report for the client **only** which is to be updated when finalised plans are created. This assessment was informed by a desk study, internal / external building inspection and emergence / re-entry surveys for bats.
- 1.2. A bat scoping assessment at Harcombe house was undertaken in 2014 by Hampshire Ecological Services Ltd who found the void space in the northern wing contained roughly 1000 droppings. Phase 2 surveys undertaken by Sue Harris Bat Surveys in 2014 found the northern wing to be used by a single brown long-eared *Plecotus auritus* and a single common pipistrelle *Pipistrellus pipistrellus*. In addition, during these surveys a maternity roost for common pipistrelle was incidentally recorded on the main house.
- 1.3. During the building inspection by Darwin Ecology in 2022, the pool house and the northern wing were assessed for their potential to support roosting bats. In the void described above there were roughly 50 bat droppings on the gable end and next to the ridge beam (DNA analysis confirmed these droppings as both brown long-eared and natterer's bats *Myotis nattereri*). Externally, the pool house and northern wing had a number of potential roosting features under clay roof tiles. The building was categorised as a confirmed roost due to the number of fresh droppings found within the loft void. This inspection was updated in 2023 with the same results.
- 1.4. During the emergence surveys by Darwin Ecology conducted in 2022, a peak total of a single natterer's bat, a single brown long-eared and a single common pipistrelle bat were recorded. Emergence surveys were conducted in 2023 to update the data and identified a peak count of two brown long-eared and one common pipistrelle. An overall peak count of one natterer's, two long-eared bat and one common pipistrelle was recorded across five roosts; one for brown long-eared and two each for common pipistrelle and natterer's bat.
- 1.5. Recommendations are provided and an appropriate EPS licence and full mitigation plan will be required. To inform a licence and to inform this report, further details of the bat licence gained for the site in 2018 will be needed. This can be gained through a freedom of information request or by the client if they have any further details. This information **must** be looked at before finalising any mitigation strategy and is required for a bat licence application.
- 1.6. Potential compensation for the roost and further enhancements to the site for bats and other wildlife have been provided in this report. It is highly recommended that the small loft void remains unaffected.

2. INTRODUCTION AND BACKGROUND

- 2.1. Darwin Ecology Ltd was commissioned to undertake a full set of bat surveys to inform proposals for the pool house and northern wing of Harcombe House, Park Lane, Ropley, SO24 0BE¹. The assessment was required to support a planning application for the erection of a single and double storey rear extension and a new indoor swimming pool following the demolition of an existing swimming pool building, conservatory and a single storey lean-to at the rear of the property. This assessment was informed by a desk study, internal / external building inspection and emergence / re-entry surveys for bats.
- 2.2. A bat scoping assessment at Harcombe house was undertaken in 2014 by Hampshire Ecological Services Ltd who found the northern wing, which included three garages at the time, contained a number of bat droppings as well as a small void where the pool house meets the northern wing which contained roughly 1000 droppings. Phase 2 surveys were then undertaken by Sue Harris Bat Surveys in May and June 2014 and found the northern wing to be used by a single brown long-eared bat and a single common pipistrelle. In addition, during these surveys the main house (not specifically surveyed) was reported to hold a maternity roost for common pipistrelle bats.
- 2.3. The survey and report follow the Bat Conservation Trust (BCT) Good Practice Guidelines (2023).
- 2.4. The subsequent EclA follows the roost assessment methodology set out by Wray *et al.* (2010) and the CIEEM Guidelines for EclA in the UK and Ireland (2018).

Site Overview

- 2.5. The site is located in a rural area 0.7 km south of Ropley, a small village east of Winchester.
- 2.6. The site comprises a detached two-storey residential dwelling with a series of attached annex buildings including the pool house and northern wing. The house has an extensive garden area containing a lake, wild-flower meadow and is bordered by woodland to the east (**see Figure 1**).
- 2.7. The wider landscape is comprised of mostly arable farmland and fragmented areas of woodland. The small village of ropley is to the north (**see Figure 2**).

¹ Ordnance Survey (OS) Grid Reference: SU 63835 30760

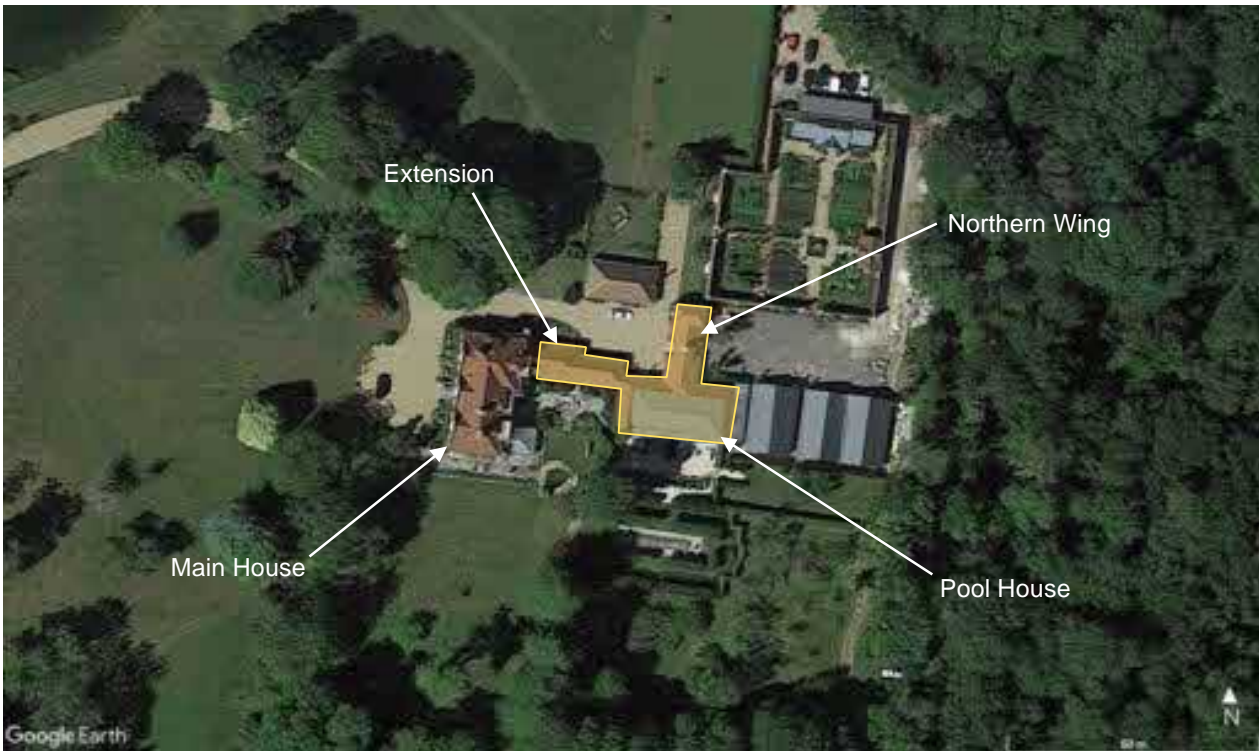


Figure 1: Site location within the local landscape. The area surveyed is highlighted in yellow. (Copyright Google Earth, 2023)

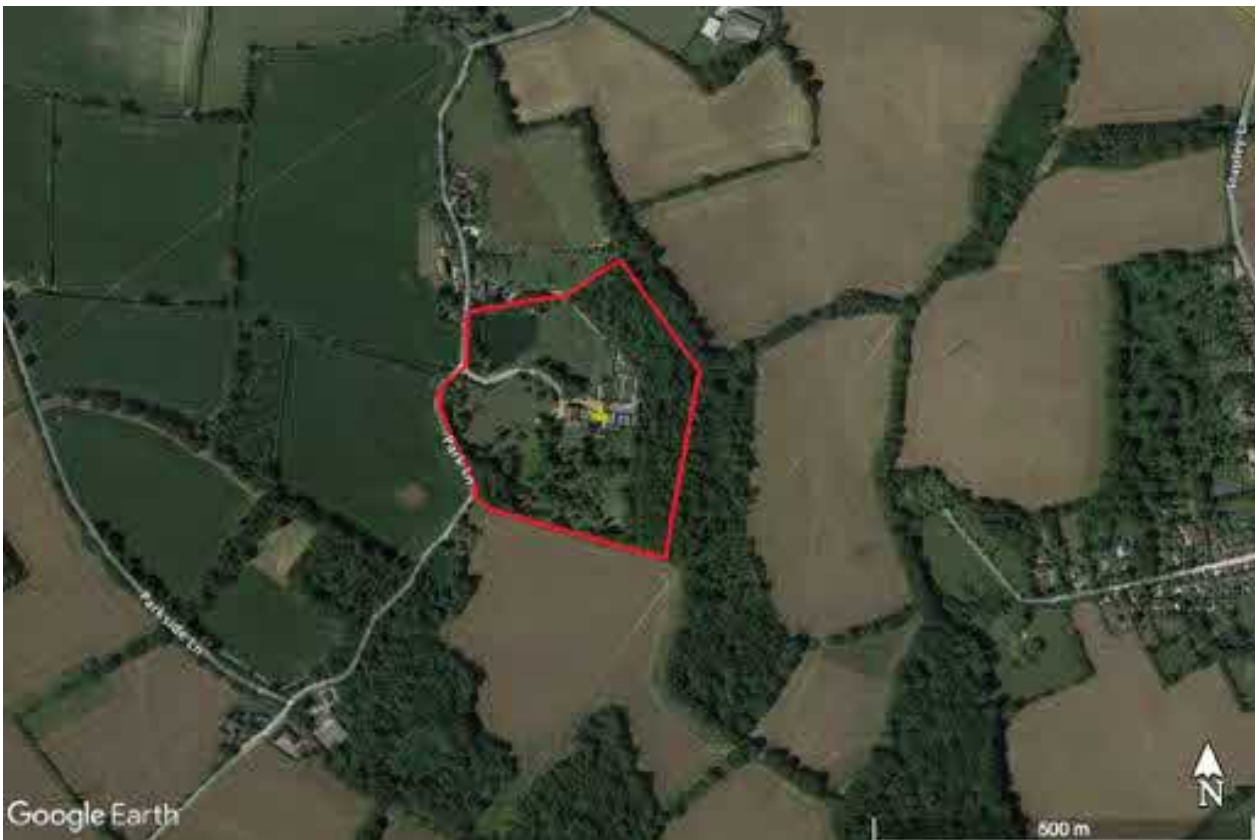


Figure 2: Site location within the wider landscape with a rough ownership boundary (Copyright Google Earth, 2023)

Scope of Assessment

- 2.8. The process of EclA aims to identify, quantify and evaluate the potential effects of development-related or other proposed actions on habitats, species and ecosystems.
- 2.9. Potential effects on the following ecologically sensitive receptors have been considered during the EclA:
- Statutory designated sites; and
 - Features of potential importance (such as loft voids or external crevice features).
- 2.10. The aim of this report is to:
- Identify and describe bats roosts present within the site;
 - Classify the the type of roost present (e.g. day roost, maternity roost etc);
 - Carry out an impact assessment of the proposed works and how they will directly / indirectly affect bats and their roosts;
 - Outline the relevant legislation and protection afforded to bats; and
 - Provide avoidance, compensation, mitigation and enhancement measures recommended to avoid harm / injury to roosting bats.

3. LEGISLATION & POLICY

General Wildlife Legislation

- 3.1. Wildlife in the United Kingdom (UK) is protected through European and national legislation, supported by national and local policy and guidance. Development can contribute to conservation and enhancement goals outlined by these various legislation and policy by retaining and protecting the most valuable ecological features within a site and incorporating enhancements to provide biodiversity net gain.
- 3.2. This section provides a brief summary of the principle legalisation and policy that triggers the requirement for PRA and further ecological assessments in the UK. The presence of protected species within a site are a material consideration during the planning process. PRAs and any necessary further ecological assessments provide an ecological baseline for a site and evaluation of the potential impact of proposals.
- 3.3. It is the responsibility of those involved with development works to ensure that the relevant legislation is complied with at every stage of a project. Such legislation applies even in the absence of related planning conditions or projects outside the scope of the usual planning process (i.e. permitted development projects or projects requiring Listed Building Consent only).

Bat Legislation

- 3.4. In England and Wales, all bat species and their roosts are legally protected under the European *Habitats Directive (1992)*; the *Conservation of Habitats and Species Regulations (2017)*; the *Wildlife and Countryside Act (1981) (as amended)*; the *Countryside and Rights of Way Act, 2000*; and the *Natural Environment and Rural Communities Act (NERC, 2006)*.
- 3.5. Barbastelle (*Barbastella barbastellus*), Bechstein's (*Myotis bechsteinii*), greater horseshoe (*Rhinolophus ferrumequinum*), lesser horseshoe (*Rhinolophus hipposideros*), brown long-eared, soprano pipistrelle, and noctule (*Nyctalus noctula*) bats are all species of principal importance in England under *Section 41* of the *Natural Environment and Rural Communities Act 2006*.
- 3.6. You will be committing a criminal offence if you:
 - Deliberately capture, injure or kill a bat;
 - Intentionally or recklessly disturb a roosting bat 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; or
 - Intentionally or recklessly obstruct access to a bat roost.

- 3.7. The government's statutory conservation advisory organisation, Natural England, is responsible for administering EPS licenses that permit activities that would otherwise lead to an offence.
- 3.8. A licence can be obtained if the following three tests have been met:
- Regulation 53(9)(a) - there is "no satisfactory alternative" to the derogation, and;
 - Regulation 53(9)(b) - the derogation "will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" and;
 - Regulation 53(2)(e) - the derogation is for the purposes of "preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequences of primary importance for the environment".

National Planning Policy

- 3.9. The *National Planning Policy Framework (2023)* aims to minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity. Chapter 15 'Conserving and enhancing the natural environment' details what local planning policies should seek to consider with regard to planning applications.
- 3.10. Planning policies and decisions should contribute to and enhance the natural and local environment by:
- 174 a)* Protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
 - 174 b)* Recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
 - 174 d)* Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
 - 175)* Plans should: distinguish between the hierarchy of international, national and local designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement

of natural capital at a catchment or landscape scale across local authority boundaries;

176) Great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural beauty which have the highest status of protection in relation to these issues. The conservation and enhancement of wildlife and cultural heritage are also important considerations in these areas, and should be given great weight in National Parks and Broads. The scale and extent of development within all these designated areas should be limited, while development within their settings should be sensitively located and designed to avoid or minimise adverse impacts on the designated area.

3.11. Specific policies regarding habitats and biodiversity comprise:

179) To protect and enhance biodiversity and geodiversity, plans should:

- a) identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation and
- b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species and identify and pursue opportunities for securing measurable net gains for biodiversity.

180) When determining planning applications, local planning authorities should apply the following principles:

- a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- b) development on land within or outside of Sites of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the feature of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and

d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around development should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

- 3.12. *Circular 06/05: Biodiversity and Geological Conservation* provides guidance on the application of the law relating to planning and nature conservation and complements the *National Planning Policy Framework*.
- 3.13. *Biodiversity 2020: A strategy for England's wildlife and ecosystem services* provides the *UK Biodiversity Action Plan* and country level biodiversity strategies for England, based on the list of habitats and species listed on *Section 41* of the *Natural Environment and Rural Communities Act 2006*. These are considered the habitats and species of principal importance requiring conservation action.

Local Planning Policy

- 3.14. East Hampshire District Council is currently reviewing its Local Plan. Relevant policies of the draft Local Plan are provided below but may be subject to change following adoption of the new plan. Relevant policies include:

Policy S17: Development in the countryside

S17.1 The countryside will be protected for its landscape, natural resources and ecological value as well as its intrinsic character and beauty.

Policy S18: Landscape

S18.4 Where appropriate, proposals will be required to include a comprehensive landscaping scheme to ensure that the development would successfully integrate with the landscape and surroundings.

Policy S19: Biodiversity, geodiversity and nature conservation

S19.1 To conserve, protect, enhance and contribute to biodiversity, geodiversity and the natural environment, new development will only be permitted if it can be clearly demonstrated that:

- a) it will not have an adverse effect on the integrity of an international, national or locally designated site. The level of protection afforded to these sites is commensurate with their status within this hierarchy;

- b) it does not result in the loss of irreplaceable habitats and/or deterioration in geodiversity, for example important trees, woodlands, hedgerows, rivers and river corridors;
- c) the development results in a net gain in biodiversity wherever possible;
- d) development avoids the fragmentation and isolation of habitats and wildlife corridors within or close to the development site;
- e) opportunities to conserve, protect and enhance biodiversity and contribute to wildlife and habitats connectivity are taken where possible, including the preservation, restoration and recreation of priority habitats, ecological networks and the protection and recovery of priority species populations.

S19.2 Where development proposals do not comply with the above they will only be permitted if it has been clearly demonstrated that there is an overriding public need for the proposal which outweighs the need to safeguard biodiversity and/or geodiversity and there is no satisfactory alternative with less or no harmful impacts. In such cases, as a last resort, compensatory measures will be secured to ensure no net loss of biodiversity and, where possible, provide a net gain.

S19.3 Applications for development must include adequate and proportionate information to enable a proper assessment of the implications for biodiversity and geodiversity.

Policy DM25: The local ecological network

DM25.1 Development which results in harm to the local ecological network will not be permitted unless the need for and benefits of the development outweighs the harm, if harm cannot be avoided measures which mitigate or compensate that harm will be required.

DM25.2 Applications for development must include adequate and proportionate information to enable a proper assessment of the implications for the local ecological network. They must be supported by mitigation plans and or compensation plans informed by the assessment of harm which will deliver a net gain for biodiversity and which set out the long-term management of any measures.

Policy DM26: Trees, hedgerows and woodland

DM26.1 Planning permission will be granted where the approach to the planting, retention and protection of trees, hedgerows and woodlands:

- a) reflects, conserves or enhances the existing landscape and integrates the development into its surroundings, adding scale, visual interest and amenity;
- b) encourages adaptation to climate change by providing shade, shelter and cooling;
- c) adequately protects existing trees and hedgerows including their root systems prior to, during and after the construction process;

- d) would not result in the loss or deterioration of irreplaceable habitats including ancient woodland and ancient or veteran trees; and
- e) includes proposals for the successful implementation, maintenance and management of landscape and tree planting schemes.

DM26.2 The Local Planning Authority will refuse planning permission for proposals that threaten the retention of trees, hedgerows, and woodland or adversely affects the importance to the site's character, an area's amenity or the movement of wildlife, unless:

- a) the need for, and benefits of, the development in that location clearly (following due process) out-weigh the loss; and
- b) adequate mitigation and compensation measures can be agreed with the Local Planning Authority.

Policy S20: Wealden Heaths Phase II Special Protection Area (SPA)

S20.1 No net gain in residential dwellings or Gypsy, Traveller and Travelling Showpeople pitches or plots will be permitted within 400m of the Wealden Heaths Phase II SPA boundary, unless in agreement with Natural England an Appropriate Assessment demonstrates that there will be no adverse effects on the integrity of the SPA.

S20.2 Development within the 400m to 5 km core catchment boundary around the Wealden Heaths Phase II SPA boundary must be supported by a Habitats Regulations Assessment setting out details of any potential impacts from the development on the interest features of the SPA and avoidance and/or mitigation measures proposed.

S20.3 The types of mitigation measures will depend on the size of the proposed development and are to be delivered prior to occupation and in perpetuity.

S20.4 Planning permission will only be granted where an Appropriate Assessment concludes that there are no adverse effects on the integrity

Policy S21: Thames Basin Heaths SPA

S21.1 Development proposals for residential development resulting in a net increase in dwellings or Gypsy, Traveller and Travelling Showpeople pitches or plots within the buffers of the Thames Basin Heaths Special Protection Area (TBHSPA) must be supported by a Habitats Regulations Assessment setting out the likely impacts of the development on the interest features of the SPA and details of any avoidance and/or mitigation measures proposed.

S21.2 The mitigation measures will include the provision of, or contributions towards Suitable Alternative Natural Green Space (SANGS) and contributions towards Strategic Access Management and Monitoring (SAMM).

S21.3 Large scale residential development (over 50 new dwellings) within 5-7km of the SPA will be assessed individually and, if needed, bespoke mitigation will be required in accordance with Natural England guidance.

S21.4 Planning permission will only be granted where an Appropriate Assessment concludes that there are no adverse effects on the integrity of the TBHSPA.

Policy S21: Solent SPAs

S22.1 Development proposals for residential development resulting in a net increase in dwellings or Gypsy, Traveller and Travelling Showpeople pitches or plots within the 5.6km buffer of the Solent SPAs must be supported by a Habitats Regulation Assessment setting out the likely impact of the development on the interest features of the Solent SPAs and details of any mitigation measures proposed.

S22.2 Mitigation could be:

- a) a financial contribution; or
- b) a developer provided package of measures associated with the proposed development designed to avoid or mitigate any likely significant effect on the SPAs subject to meeting the tests of the Habitats Regulations; or
- c) a combination of measures in (a) and (b) above.

S22.3 Planning permission will only be granted where an Appropriate Assessment concludes that there would be no adverse effects on the integrity of the Solent SPAs.

Policy S22: Green infrastructure

S23.1 Development will be supported provided that:

- a) a. it protects and enhances the integrity, quality, connectivity and multi-functionality of the existing green infrastructure network and individual sites;
- b) it enhances green infrastructure, through provision within the site, and supports the findings and guidance set out in the updated Green Infrastructure Strategy;
- c) any adverse impacts on the green infrastructure network are fully mitigated through the provision of green infrastructure on site or, where feasible, through appropriate off-site compensatory measures; and
- d) where new green infrastructure is provided within new development, suitable arrangements are in place for its future funding, maintenance and management. This could be through seeking contributions from developers or through a site management company, where appropriate.

S23.2 Development proposals that would result in the loss of green infrastructure will only be supported if an appropriate replacement is provided that is of equivalent or better value in terms of quantity, quality and accessibility.

Biodiversity Action Plan for Hampshire

3.15. To advance biodiversity conservation in Hampshire, the following objectives have been identified:

- to audit the nature conservation resource of Hampshire;
- to identify from the audit habitats and species of priority nature conservation concern, including those which are locally distinct;
- to prepare action plans for habitats and species of priority concern and follow through with programmes of implementation and monitoring;
- to ensure that data on habitats and species is sufficient to enable effective implementation and monitoring of biodiversity objectives;
- to review general issues affecting biodiversity, such as agriculture and development, and chart a course of appropriate action;
- to raise awareness and involvement in biodiversity conservation across all sectors;
- to encourage individuals and organisations to review their role in biodiversity conservation and the resources required, and develop their own action in response to the Biodiversity Action Plan for Hampshire;
- to maintain an ongoing partnership which will co-ordinate, develop and support action for biodiversity;
- to monitor and review progress towards meeting the above objectives and the targets set out in the habitat and species action plans; and
- to periodically update the Biodiversity Action Plan for Hampshire and its component habitat and species action plans to take account of changing circumstances.

4. METHODOLOGY

Desk Study

- 4.1. A desk study was undertaken for designated sites and bat species and habitat records within 2 km of the site:
- The MagicMap website was reviewed, to obtain information on any designated sites of nature conservation interest within 2 km of the site and details of any EPS licences issued within 2 km;
 - The East Hampshire District Council Planning Portal was searched for past and pending planning applications in the last two years that may have associated ecological documents detailing results of bat surveys; and
 - Google Maps and OS Leisure Maps was utilised to view aerial photographs and maps to assess the ecological context of the site within the wider landscape.

Building Inspection

- 4.2. Ecologist Lewis Hooper BSc (Hons)² conducted a building inspection at the site on 25th May 2022. This inspection was updated by Assistant Ecologist George Ridgway BA MA on the 27th June 2023. These inspections were undertaken in accordance with the following methodology:

External Survey

- 4.3. An investigation was carried out of external features with potential for use by roosting bats, such as gaps under roof and ridge tiles, gaps at soffit boxes or fascias. A search for bat droppings was made beneath each potential entry/exit point identified where accessible. The surveyor used binoculars and powerful, low-heat LED torch.

Internal Survey

- 4.4. An investigation was carried out of the roof void (including the floor and walls) for signs of bats roosting and the access potential into the roof void for bats. The surveyor looked for bats, bat droppings, likely access points, signs of feeding, dead bats, scratch marks and staining, and made a suitability assessment of the structure of the roof.

Potential to support roosting bats

- 4.5. The building was assessed for its potential to support roosting bats as detailed in Table 1 below which is taken from the Bat Conservation Trust 2016 guidelines Table 4.1 and Table 7.3.

² Class 1 Bat Licence: 2022-10407-CL17-BAT

Table 1: Roost Classification from the Bat Conservation Trust (2016) guidelines.

Category	Description of roosting habitat	Number of surveys required
Negligible	Negligible habitat features on site likely to be used by roosting bats.	No further surveys
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, protection, appropriate conditions and or suitable surrounding habitat to be used on a regular basis by large numbers of bats.	Single survey between May to August
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, condition and surrounding habitat but unlikely to support a roost of high conservation status.	Two separate surveys between May-August.
High	A structure with one or more potential roost sites that are obviously suitable for use by a larger number of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.	Three separate surveys

Emergence / Re-Entry Surveys

- 4.6. Three dusk emergence surveys were conducted during the 2022 survey season. Surveys were undertaken in line with BCT Good Practice Guidelines (2016), with any limitations outlined below.
- 4.7. The surveyors who conducted each survey are listed in **Table 2** below.
- 4.8. Surveyors were positioned strategically around the building(s) in order to provide adequate coverage of all elevations. Surveyors focused on any features identified during the Preliminary Roost Assessment (PRA) as having potential to be used as bat access points. The location of the surveyors and building numbers / names are shown on **Figure 3, Bat Survey Results**.
- 4.9. Dusk surveys began 15 minutes prior to sunset and lasted 1.75 hours after sunset. Surveyors recorded bat activity using hand-held Echometer Touch detectors connected to Android or iPhone devices. Analysis of recordings was undertaken after the surveys to confirm species identification. Observations recorded during surveys included bat access points, bat species, time, and type of activity (e.g. emergence, re-entry, commuting, foraging, etc.). Incidental records of bats within the vicinity of the building (but not necessarily roosting) were also recorded.
- 4.10. A Canon AX20 video camera and Black Sun 2 B502 infra-red illuminator were also used to film bat activity at a fixed position, covering an aspect of the building not visible to the surveyors. The video footage was reviewed following the survey to identify any bat activity captured and any significant activity patterns and access points were identified and recorded.
- 4.11. A summary of the survey dates and weather conditions are provided in **Table 2**.

Table 2: Emergence and re-entry survey dates and weather conditions

Date	Survey type	Sunset/sunrise time	Start Weather Conditions	End Weather Conditions	Surveyors
15/08/2022	Dusk	20:25	Rain: 0 Wind: 1 Cloud cover: 80% Temperature: 21°C	Rain: 0 Wind: 1 Cloud cover: 80% Temperature: 19°C	Lewis Hooper BSc (Hons) George Ridgeway BA Maddy Simmonds BSc (Hons)
30/08/2022	Dusk	19:54	Rain: 0 Wind: 0 Cloud cover: 0% Temperature: 20°C	Rain: 0 Wind: 0 Cloud cover: 0% Temperature: 19°C	Lewis Hooper BSc (Hons) Libby Pinches BSc (Hons) Abigail Harrington BSc (Hons)
15/09/2022	Dusk	19:18	Rain: 0 Wind: 1 Cloud cover: 100% Temperature: 16°C	Rain: 0 Wind: 1 Cloud cover: 100% Temperature: 15°C	Lewis Hooper BSc (Hons) George Ridgeway BA
27/06/2023	Dusk	21:23	Rain: 0 Wind: 0 Cloud cover: 100% Temperature: 18°C	Rain: 0 Wind: 0 Cloud cover: 80% Temperature: 16°C	George Ridgeway BA Jenny Denny BA (Hons) Ellie Kemp BS (Hons) MSc Elliot Lewis BSc (Hons) MSc
19/07/2023	Dusk	21:09	Rain: 0 Wind: 1 Cloud cover: 10% Temperature: 19°C	Rain: 0 Wind: 1 Cloud cover: 20% Temperature: 16°C	Jenny Denny BA (Hons) Elliot Lewis BSc (Hons) MSc Sarah Alexander

Evaluating Bat Roosts

- 4.12. The value of the bat roosts on site was assessed in accordance with the article published in the CIEEM, In Practice Magazine - *Valuing Bats in Ecological Impact Assessment* (Wray, et al., 2010).
- 4.13. Roosts are assigned a relative ecological value based on the rarity of the species (**Table 3**) and categorisation of roost type (**Table 4**), informed by survey results. Once a value has been calculated, robust mitigation for any impacts identified from the proposed development can be determined.

Table 3: Categorising bat species by distribution and rarity

Rarest	Rare	Common
Greater horseshoe Bechstein's Alcathoe Greater mouse-eared Grey long-eared Barbastelle	Lesser horseshoe Whiskered Brandt's Daubenton's Natterer's Leisler's Noctule Nathusius' pipistrelle Serotine	Common pipistrelle Soprano pipistrelle Brown long-eared

Table 4: Valuing bat roosts

Geographic Frame of Reference	Roost Type
District, Local or Parish	Feeding perches (common species) Individual bats (common species) Small numbers of non-breeding bats (common species) Mating sites (common species)
County	Maternity sites (common species) Small number of hibernating bats (common and rarer species) Feeding perches (rarer/rarest species) Individual bats (rarer/rarest species) Small numbers of non-breeding bats (rarer/rarest species)
Regional	Mating sites(rarer/rarest species) including well-used swarming sites Maternity roosts (rarer species) Hibernation sites (rarest species) Significant hibernation sites for rarer/rarest species or all species assemblages
National/UK	Maternity sites (rarest species) Sites meeting Sites of Special Scientific Interest (SSSI) guidelines
International	Special Areas of conservation (SAC) sites

Limitations

- 4.14. The surveys were undertaken in accordance with the best practice guidelines within the peak bat activity period (May to September inclusive). The results are therefore considered to be an accurate representation of the general use of the building(s) by roosting bats.
- 4.15. Three dusk surveys were undertaken with the use of infrared cameras instead of conducting a dawn survey in line with the recommendations and research findings outlined in the interim guidelines published by Bat Conservation Trust in 2022.
- 4.16. Nevertheless, bats may use roosting features intermittently throughout the year and may be present in larger or smaller numbers depending on their breeding cycle, weather conditions and in response to disturbance. Bats may be present at other times of the year and the results in this report should therefore be viewed in the context intended.
- 4.17. The desk study does not include data from the local environmental records centre (LERC). However, following CIEEM guidelines (2017) it is possible to conduct a robust assessment without the need of LERC data, for example for small-scale projects or on sites such as;
- a field in active arable cultivation where there is no impact on any hedges, trees or water bodies;
 - small areas of cultivated garden/amenity grassland, as above; or
 - small urban sites comprising mostly asphalt or compacted hardstanding.
- 4.18. The impacts of the proposed development are restricted to the building and an area of cultivated garden which will be lost under the footprint of the replacement dwelling. Therefore the lack of LERC data is not considered a limitation to the ecological assessment of the site.

5. SURVEY RESULTS

Desk Study

- 5.1. There are no statutory designated sites within 2 km of Harcombe House.
- 5.2. The site sits within the Impact Risk Zone relating to Alresford Pond SSSI which is located 4.2 km north west of the site which is designated for its standing water, fens, marsh, swamp and scrub which hold an array of notable species, none of which are deemed to be present on site.
- 5.3. There are five records of EPS licences for bats within 2 km of the site including one on site:
 - 2015-13002-EPS-MIT: This licence was granted in 2015 for the destruction of a resting place of brown long-eared bat and common pipistrelle at Harcombe House.
 - 2016-25542-EPS-MIT: This licence was granted in 2016 for the destruction of a resting place for brown long-eared bats, approximately 1 km east of the site.
 - EPSM2012-4707: This licence was granted in 2012 for the destruction of a breeding site and resting place for common pipistrelle, soprano pipistrelle and natterer's bat, approximately 1.05 km north of the site.
 - 2016-25566-EPS-MITL: This licence was granted in 2016 for the damage to a resting place for common pipistrelle, brown long-eared bat and serotine *Eptesicus serotinus*, approximately 1.54 km north of the site.
 - 2019-43231-EPS-MIT: This licence was granted in 2019 for the destruction of a breeding site for common pipistrelle and brown long-eared bat, approximately 1.71 km northwest of the site.

Local Habitats

- 5.4. Priority habitat is present in the wider ownership of the site. The southern section of the wider ownership comprises priority deciduous woodland and a small block of traditional orchard. The priority deciduous woodland extends into the woodland to the east of the site which is also classified as ancient and semi-natural woodland. Further priority habitats within 1 km of the site comprise further priority deciduous woodland and traditional orchard.
- 5.5. Within the site, the habitat due to be impacted consists of hardstanding and ornamental planting only. In the wider ownership there is amenity grassland, semi-improved grassland, two ponds and scattered trees.

Building Inspection

External Assessment

- 5.6. The main house is a two storey detached dwelling. It is a red brick building with a distinctive dutch gable fronted elevation believed to date back to the early 1900's. The main house was not assessed or surveyed.
- 5.7. The main house has a series of attached annex buildings constructed in the last decade,. These are an extension, a pool house, and a northern wing consisting of a washroom, archway, garage and living space within a tower structure. The extent of these sections are illustrated in **Figure 3** in the Emergence Survey Results section of this report.
- 5.8. The roof of these structures are primarily hipped with handmade clay tiles however the pool house contains a large plastic roof over the pool itself. The tiles, although in good condition, show a number of gaps which provide opportunities for roosting bats. There is a small clock tower located at the centre of the northern wing which has lead flashing at its base which was in good condition with no lifting. The eaves around the northern wing are open and lead into internal space. The eaves on the extension are mostly sealed but there are some small gaps which lead into the void present. Wooden cladding is present in areas on the northern wing, primarily on the northern tower structure. This is shiplap cladding which does not show any lifting for roosting opportunities.

Internal Assessment

- 5.9. Internally, there is no void areas within the pool house or the tower in the northern wing. There are voids within the main area of the northern wing and the extension.

Northern wing

- 5.10. A single small void measuring roughly 1.5 m in height, 2-3 m in width and 3-4 m in length is present in the northern wing between the archway and the pool house. This void has a timber frame and a block gable at one end which lead to a further void and open garage area. Within the void 50 bat droppings were found stuck to the wall, to the timber ridge beam and on the fibreglass insulation on the floor. These dropping were of mixed ages but some appeared to be fresh. Following DNA analysis the droppings were confirmed to be belonging to be brown long-eared bat and natterer's bat. The 2023 update survey recorded a similar number of droppings in the same location with some appearing to be fresh, indicating that the void has been in continued use.

Extension

- 5.11. There is a void within the connecting extension between the main house and the pool house. This void measures 17 m long, for 7 m of this length the void is 6 m wide and 2.5 m high to the apex whilst for the remaining 10m of length the void reduces to 4.5 m wide and 2 m to the apex. The void is timber-framed with foil insulation lining the tiles but no

insulation of the flooring. Rodent droppings were identified throughout the void. No evidence of bats was identified in this void.

Building Inspection Photos



Image 1: A view looking at the south and east elevations of the pool house. The area of plastic roof is visible.



Image 2: A view of the western elevation of the pool house.



Image 3: A view of the southern elevation of the extension.



Image 4: A view of the northern elevation of the extension.



Image 5: A view of the western elevation of the northern wing comprising the washroom, archway and garage



Image 6: A view of the tower at the northern end of the northern wing.



Image 7: The eaves around the northern wing are open, providing access to any voids present.



Image 8: A view of the area of the loft in the extension which is wider and higher to the apex.



Image 9: The extension void becomes narrower and the apex height is lower.



Image 10: A view inside the small void present in the northern wing.



Image 11: Bat droppings were found on a block gable end leading north. This image is from 2022 but a similar amount was found in 2023.



Image 12: A view of the open garage area between the archway and the tower which is likely linked to the void in

Emergence / Re-Entry Survey Results

Survey 1

- 5.12. During the dusk emergence survey on 15th August 2022, one natterer's bat and one common pipistrelle emerged from roof tiles on the north elevation of the northern wing.
- 5.13. Overall, activity levels were moderate to high with regular foraging by common pipistrelle over the archway as well as passes by brown long-eared, noctule and soprano pipistrelle.

Table 5: 15.08.2022 - Dusk emergence survey.

Timing	Species	Activity	Time of Activity	Roost type	No. of bats	Structure	Fig 3 Ref.
Start: 20:42 Sunset: 20:57	Natterer's myotis	Emergence	20:57	Day roost	1	Eaves of far north section of the building	A
End: 22:45	Common pipistrelle		20:49		1	Roof tiles on far north section of the building	B

Survey 2

- 5.14. During the dusk emergence survey on 30th August 2022, a single common pipistrelle was seen emerging from the northern wing above the archway.
- 5.15. Overall, activity levels were moderate with regular foraging by pipistrelles to the north as well as passes by soprano pipistrelle, brown long-eared and a single Myotis to the south.

Table 6: 30.08.2022 - Dusk emergence survey.

Timing	Species	Activity	Time of Activity	Roost type	No. of bats	Structure	Fig 3 Ref.
Start: 20:42 Sunset: 20:57 End: 22:45	Common pipistrelle	Emergence	20:11	Day roost	1	From ridge tile or roof tile over archway	C

Survey 3

- 5.16. During the dusk emergence survey on 15th of September 2022, a single common pipistrelle and long-eared bat were seen emerging from the northern wing above the archway.
- 5.17. Overall, activity during the survey was moderate with regular foraging and social calling from common pipistrelle throughout the survey as well as occasional soprano pipistrelle passes and a single pass from a myotis species.

Table 7: 15.09.2022 - Dusk emergence survey.

Timing	Species	Activity	Time of Activity	Roost type	No. of bats	Structure	Fig 3 Ref.
Start: 20:42 Sunset: 20:57	Brown long-eared bat	Emergence	20:02	Day roost	1	Gap at eaves of the west elevation of the archway	D
End: 22:45	Common pipistrelle		20:02		1	Roof tiles above the archway	E

2023 Update Emergence Survey Results

Update Survey 1

- 5.18. During the dusk emergence survey on 27th June 2023, three bats were recorded emerging from the building. A single common pipistrelle emerged from a roof tile on the north elevation of the northern wing. Two brown long-eared bats were recorded on camera emerging from a gap in the eaves on the west elevation of the archway.
- 5.19. Overall activity was moderate with regular common pipistrelle and soprano pipistrelle foraging over the buildings and the adjacent walled garden throughout the survey. Towards the end of the survey, a single brown long-eared pass was recorded.
- 5.20. A single common pipistrelle was incidentally recorded emerging from a dormer on the east elevation of the main house. Whilst the exact emergence location wasn't observed, this dormer has hanging tiles on the cheeks so it is likely the these offer roosting opportunities.

Table 8: 27.06.2023 - Dusk emergence survey.

Timing	Species	Activity	Time of Activity	Roost type	No. of bats	Structure	Fig 3 Ref.
Start: 21:08	Common pipistrelle	Emergence	21:41	Day roost	1	Roof tiles on far north section of the building	B
Sunset: 21:23 End: 23:08	Brown long-eared bat		22:13 - 22:19		2	Gap at eaves of the west elevation of the archway	F

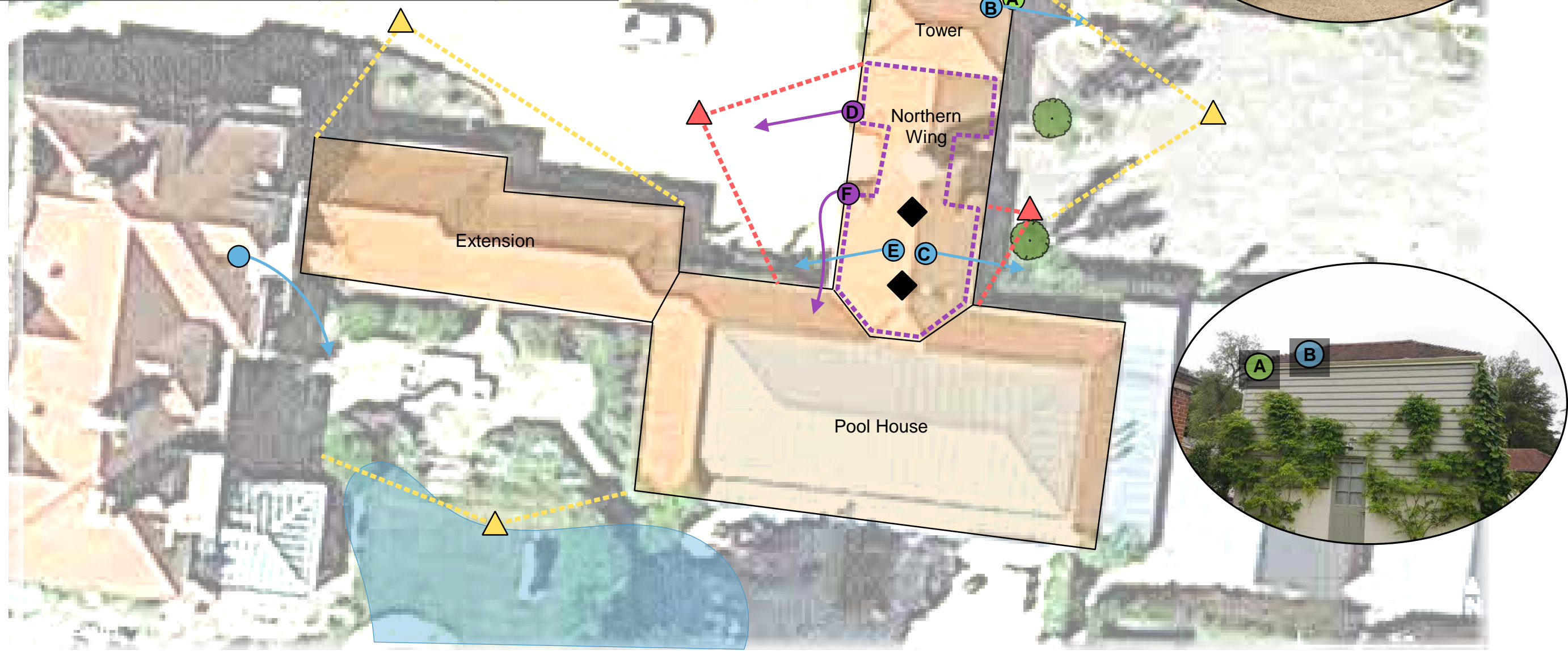
Update Survey 2

- 5.21. During the dusk emergence survey on 19th July 2023, a single common pipistrelle emerged from a roof tile on the north elevation of the northern wing, the same location as in the first update survey.
- 5.22. Overall activity was low. No activity was recorded until 21:40 at which point common pipistrelle began to forage constantly to the north of the building. Individual passes from brown long-eared, serotine and noctule were also recorded.












Table 9: 19.07.2023 - Dusk emergence survey.

Timing	Species	Activity	Time of Activity	Roost type	No. of bats	Structure	Fig 3 Ref.
Start: 20:54 Sunset: 21:09 End: 22:54	Common pipistrelle	Emergence	21:46	Day roost	1	Roof tiles on far north section of the building	B

Reference	Feature	Species	Date Observed
A	Eaves of north elevation of northern tower	1 x Natterer's myotis	15.08.2022
B	Roof tiles on northern tower	1 x Common pipistrelle	15.08.2022 27.06.2023 19.07.2023
C	Ridge tile above archway to east	1 x Common pipistrelle	30.08.2022
D	Eaves of western elevation	1 x Brown long-eared	15.09.2022
E	Ridge tile above archway to west	1 x Common pipistrelle	15.09.2022
F	Eaves of western elevation	2 x Brown long-eared	19.07.2023



*NOTE Areas are indicative and are not shown to exact scale.

	Building surveyed		Emergence/Re-entry Location (coloured by species)	Bat Species
	Surveyor Location with view lines		Bat Flight Path (coloured by species)	 Common Pipistrelle
	Camera Location with view lines		Area of Continuous Bat Activity (coloured by species)	 Brown Long-eared
	Location of bat droppings		Outline of void identified as a roost (coloured by species)	 Natterer's Bat



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Project: Harcombe House

Figure 3: Emergence/ Re-entry Survey Results

Date: November 2023

6. IMPACT ASSESSMENT

Designated Sites

- 6.1. It is not anticipated that the proposed works will impact any statutory designated sites, priority habitats or ancient woodlands through land take. There will be no net increase in residential units and therefore no resulting impacts to surrounding designated sites, green space and wildlife sites through increased footfall.

Evaluation of Bat Roosts on Site

- 6.2. Previous survey conducted in 2014 by Sue Harris Bat Surveys found a maternity roost on the main house. The main house was not surveyed in 2022 or 2023 but a maternity roost of pipistrelles was noticed.
- 6.3. The areas surveyed at Harcombe House (the pool house, connecting extension and northern wing) are confirmed to support a single brown long-eared roost, two natterer's bat roosts and two common pipistrelle roosts (one of which has two access points, C and E). A peak count of one natterer's, one long-eared bat and one common pipistrelle were recorded over the five surveys.
- 6.4. See **Table 9** for value of each roost in accordance with Wrey *et al.*, 2010. Impact of works.

Table 9: Value of bat roosts at Harcombe House.

Species	Rarity	Roost Type	Value
Brown Long-Eared	Common	Day Roost	Local, District, or Parish
Natterer's Bat	Rare		County
Common pipistrelle	Common		Local, District, or Parish

Roost Impact Assessment

- 6.5. Impacts will involve the demolition of the current swimming pool and parts of the ground floor conservatory, kitchen and utility room on the eastern aspect. Works will extend to the first floor in the current location of the internal staircase to add a second story to the library. (see figure 4 below). Internal alterations will be made within these spaces and along the link joining the main house and swimming pool.
- 6.6. The demolition of the existing pool and associated link corridor will have a temporary impact on a section of the loft void within the northern wing of the house. Works will require a small section of the roof currently joining the northern wing and the link corridor to create suitable space to demolish and rebuild the new swimming pool before they are rejoined again. This will have a direct impact on the loft void being used by both natterers and brown long-eared bats. These impacts are considered to be temporary, as the void will be reinstated following the completion of works.

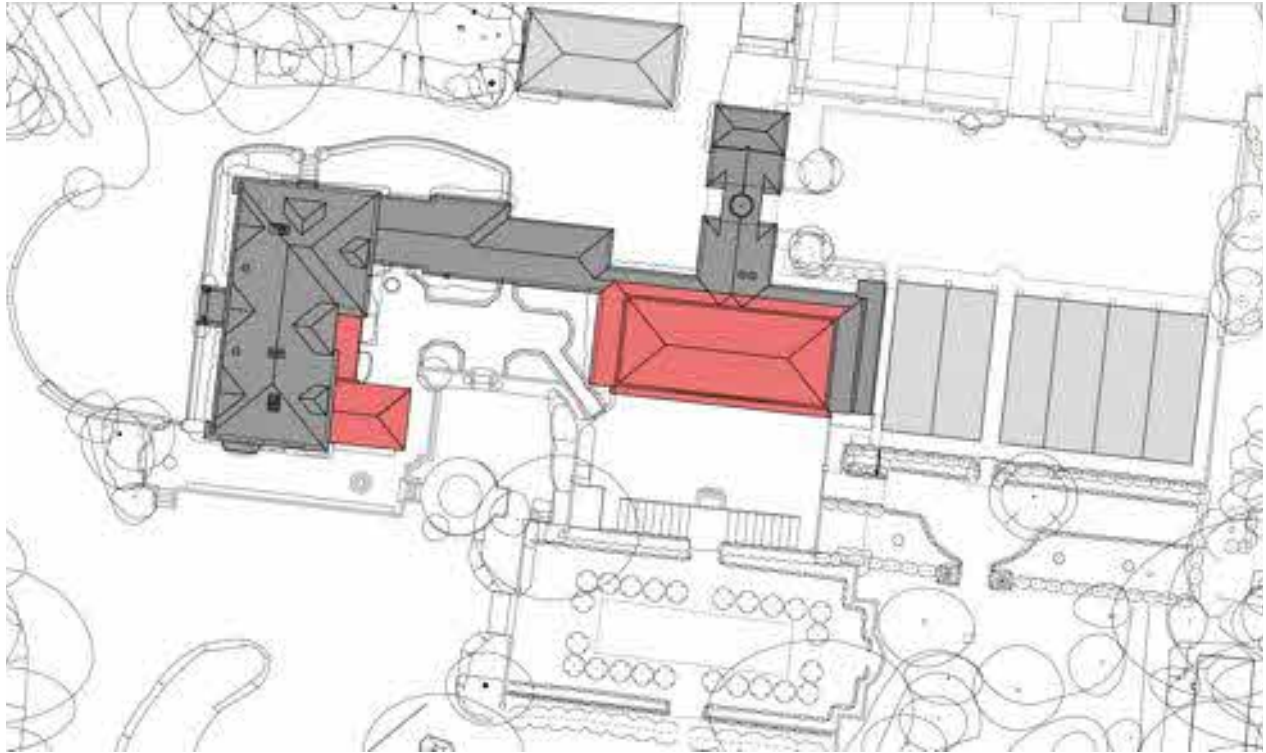


Figure 4: Highlighted areas are due to be demolished

Mitigation

- 6.7. The following mitigation strategy provides details of the mitigation measures to minimise the risk of killing or injury of individual bats. A detailed compensation strategy cannot be drawn up at this time.
- 6.8. In line with the Bat Mitigation Guidelines (Mitchell-Jones, 2004) the roosts are of **low** conservation status. Any works in proximity to the areas surveyed have potential to harm bats through the destruction, disturbance or modification of a roosting site, with the additional risk of injury or killing of bats in their roosts.
- 6.9. In the absence of mitigation, the works due to be undertaken will therefore result in an offence under the *Conservation of Habitats and Species Regulations (2017)*. An EPS licence will be required to allow for these works.
- 6.10. *EPS Mitigation Licence:* A licence application can be submitted following planning approval by the Local Planning Authority (LPA) and a licence must be granted prior to any works commencing on site with potential to impact bats or their roosts. Licences will be issued by Natural England if the three licensing tests detailed in Section 3 are met. Whilst Natural England aim to provide licensing decisions within 30 working days, current processing times have ranged between 30 and 60 working days.

- 6.11. Please note that such licences will only be granted where it can be shown that there will be no detriment to the species of bat concerned. As such, suitable mitigation measures will still be required. Mitigation measures will be proportionate to the level of use by bats on site and to the species roosting on site. Mitigation will include measures to ensure that bats are not harmed during the proposed works and to ensure that there is long-term provision of roosting opportunities on site. Input from a registered consultant (or their accredited agent) will be required during licensable activities at the site (such as roof removal).
- 6.12. To inform a licence and to inform this report, further details of the bat licence gained for the site in 2018 will be needed. This can be gained through a freedom of information request or by the client if they have any further details. This information **must** be looked at before finalising any mitigation plans and is required for a bat license application.
- 6.13. *Timing of Works:* The majority of works affecting summer bat roosts can take place between March and October, avoiding the winter hibernation season (November to February inclusive). In the event that further emergence/re-entry surveys identify maternity roosts at the site, works would also be required to avoid the main maternity season (June to August inclusive).
- 6.14. *Toolbox Talk:* Before commencing any work on site, all contractors will be inducted by a licensed bat ecologist or accredited agent in a tool box talk, to ensure they are aware of the risks to wildlife on site, particularly the presence of bat roosts, their legal protection and of working practices to avoid harming bats and other species in order to ensure working practices on site follow legal requirements.
- 6.15. *Ecological Supervision:* Immediately prior to any works on site, the buildings must be subject to an internal and external survey by a suitably qualified and licensed bat ecologist to ensure as far as possible that no bats are present. In addition, hand removal / soft strip of internal features suitable for use by bats must be done very cautiously and under supervision by a bat licensed ecologist.
- 6.16. *Bat Boxes:* To provide a compensatory roosting and safe release site for bats during demolition works, at least three bat boxes will be installed prior to works commencing on site. This box will remain on site in perpetuity. The location will be determined by a licensed bat ecologist to ensure likelihood of repeated use is increased. The bat boxes will be installed at a height of at least 4m, preferably on a southern un-cluttered aspect with good connectivity to linear features such as other mature trees and hedgerows.
- 6.17. *Roofing Membrane:* **NO breathable roofing membrane will be permissible in any part of the building that may be used by bats.** Breathable roofing membrane creates a lethal entanglement hazard to bats. Any deviation from this will need to be approved by the ecologist who can provide details regarding alternative ventilation methods.
- 6.18. *Timber Treatment:* Any use of timber-treatment or pest control treatment must be selected from the approved lists for safe use in or near bat roosts which can be provided on request.

- 6.19. *Lighting:* Any new external lighting must be directed to avoid light spillage onto vegetation, particularly linear habitat features such as woodland edges or potential roosting sites within trees and buildings. Bats are sensitive to light and could potentially avoid the area if access points or the surrounding areas become lit. Appropriate lighting options will prevent negative impact on bats potentially using the habitats on site and should be approved by a suitably qualified and licensed bat ecologist. Lighting plans should be approved and signed off by a licensed bat ecologist prior to submission, to ensure the scheme is suitable for bats. If appropriate measures are taken to reduce light spillage from the development, it is likely that there will be no negative impacts on local bat populations.
- 6.20. See **Appendix 1** for further information on designing lighting to minimise impacts on bats.
- 6.21. *Habitats:* The proposals do not result in significant loss of foraging habitat for bats, however, a wildlife friendly landscaping scheme is recommended to enhance the site for bats and other wildlife.

Alternative Roost Provision for Brown Long-Eared Bats and Natterer's Bats

- 6.22. As brown long-eared and natterer's bats are using the loft internally, it is highly recommended that this is retained in its current state with access via the eaves and ridges remaining. Should this not be possible, an alternative void space must be provided, which must be a minimum of 5m x 5m with a height of 2.5m to the apex. The void must be lined with Type 1F bitumen felt, and the roof must be tiled and have a wet ridge and wet verges. Access points must comprise a minimum of 2 x gable end mortar gap features, 2 x ridge tile access points and 2 x lifted tile access points. The internal void space must include additional crevice provisions, such as a triple ridge beam or squeeze box feature.

Compensation Provision for Common Pipistrelle Bats

- 6.23. If common pipistrelle roosts are to be affected then a replacement like for like must be provided in the form of a raised tile or ridge tile feature (see **Appendix 2**).
- 6.24. A full mitigation plan outlining all compensation and enhancement plans must be created by a suitably qualified ecologist once planning is granted to allow for a licence to be submitted.

7. ENHANCEMENT RECOMMENDATIONS

- 7.1. National planning policy states that all developments should seek to enhance onsite biodiversity whether impacts on protected species are recorded or not. Incorporating enhancement features into new or renovated buildings should be carefully considered. These features can be simple and inexpensive, please see below for specific recommendations.

Wildlife Beneficial Landscaping Scheme

- 7.2. Any future landscape planting should seek to enhance biodiversity, improve connectivity to the surrounding habitats and provide food and shelter for a wide range of wildlife. All amenity planting and formally landscaped areas should be designed using a variety of plant species beneficial for wildlife. These do not necessarily have to be native but should be chosen for their ability to provide nectar or fruit and should be non-invasive species. There are a number of specialist seed mixes available specific to certain soil types, growing conditions and designed to benefit different groups of species such as bees or butterflies and moths.
- 7.3. All habitats should be managed in a suitable way to encourage a wide variety of insects and other wildlife to use the site.
- 7.4. Further information regarding habitat creation, enhancement and management can be provided on request and submitted with further survey results for the final planning application.

Bats

- 7.5. At least three Greenwood small hollow bat boxes, or similar, can be installed on mature trees, the location would be determined by a licensed bat ecologist to ensure likelihood of repeated use is increased. The bat boxes will be installed at a height of at least 4m, preferably on a southern un-cluttered aspect with good connectivity to linear features such as other mature trees and hedgerows (see **Appendix 2**).

Bird Boxes

- 7.6. Tree-mount bird boxes can also be installed on any mature trees or building on site (see **Appendix 3**). Bird boxes should be installed at least 4 m from ground level and with unobstructed air space in front.

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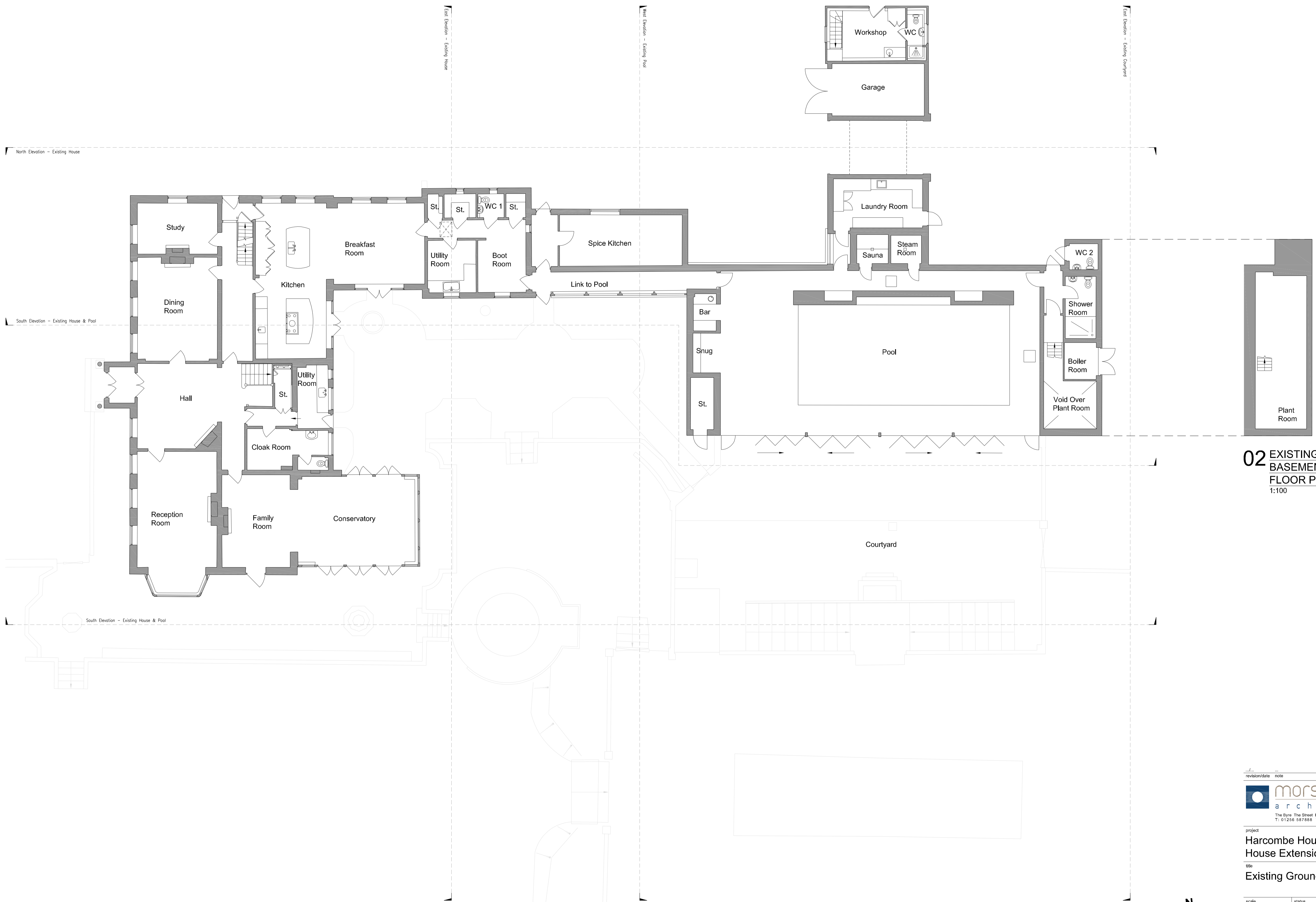
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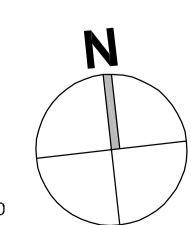
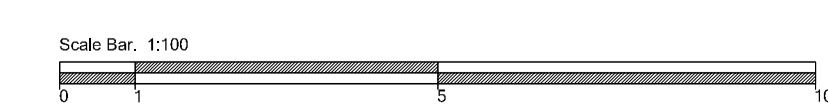
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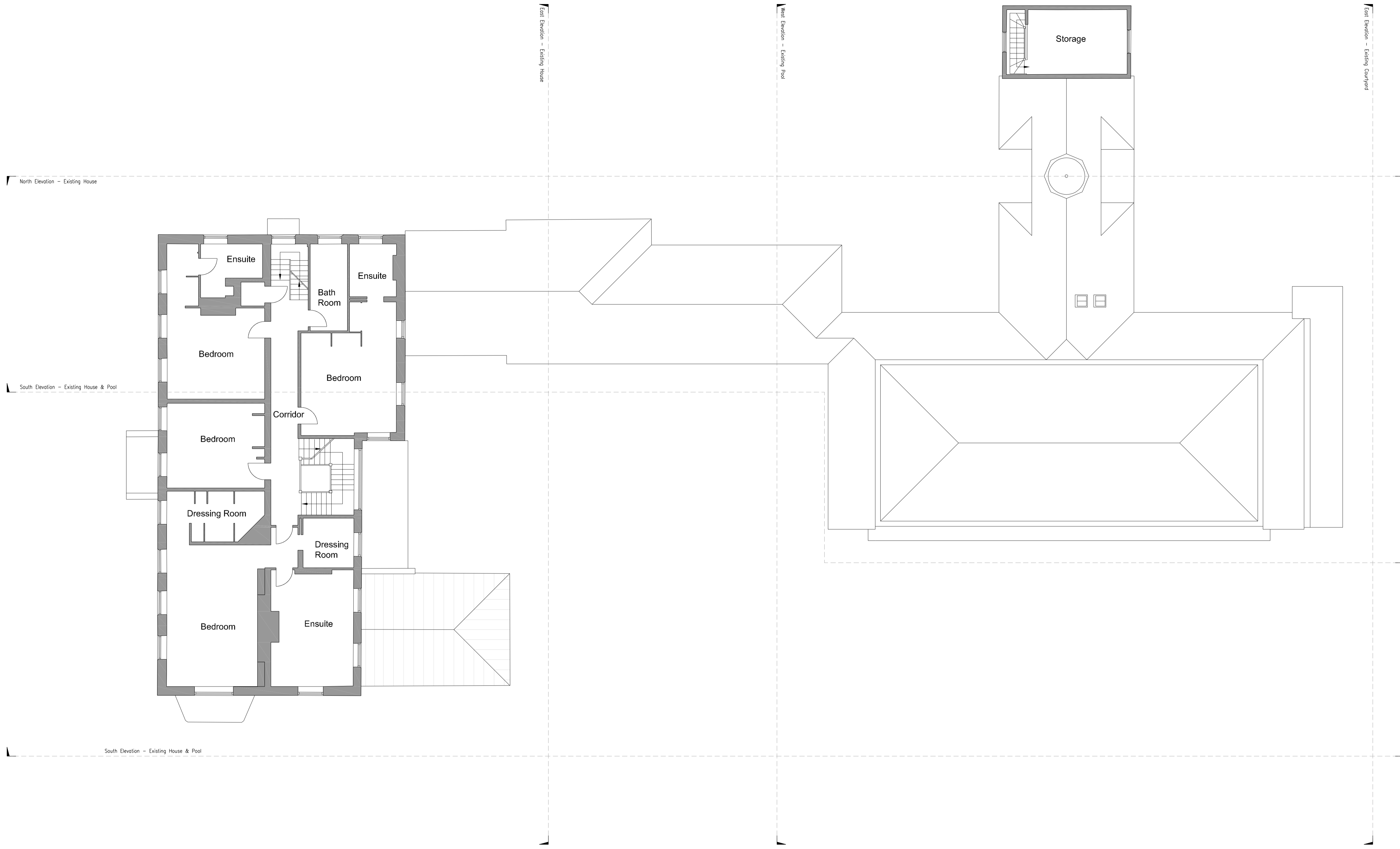


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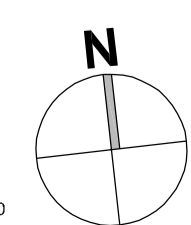
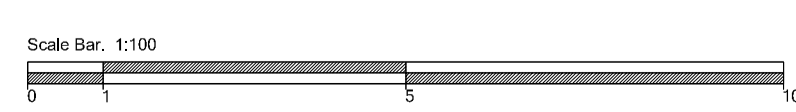
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Harcombe House House Extension & Pool	
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849	004
status/revision	
PL00	
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01 EXISTING FIRST FLOOR PLAN
1:100



revision/date	note



project
Harcombe House
House Extension & Pool
 title
Existing First Floor Plan

scale	status
1:100 @A1	PLANNING
job no. 849	dwg no. 005
status/revision PL00	

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West Elevation - Existing House With Proposed Pool To Rear

East Elevation - Proposed Library

West Elevation - Proposed Pool

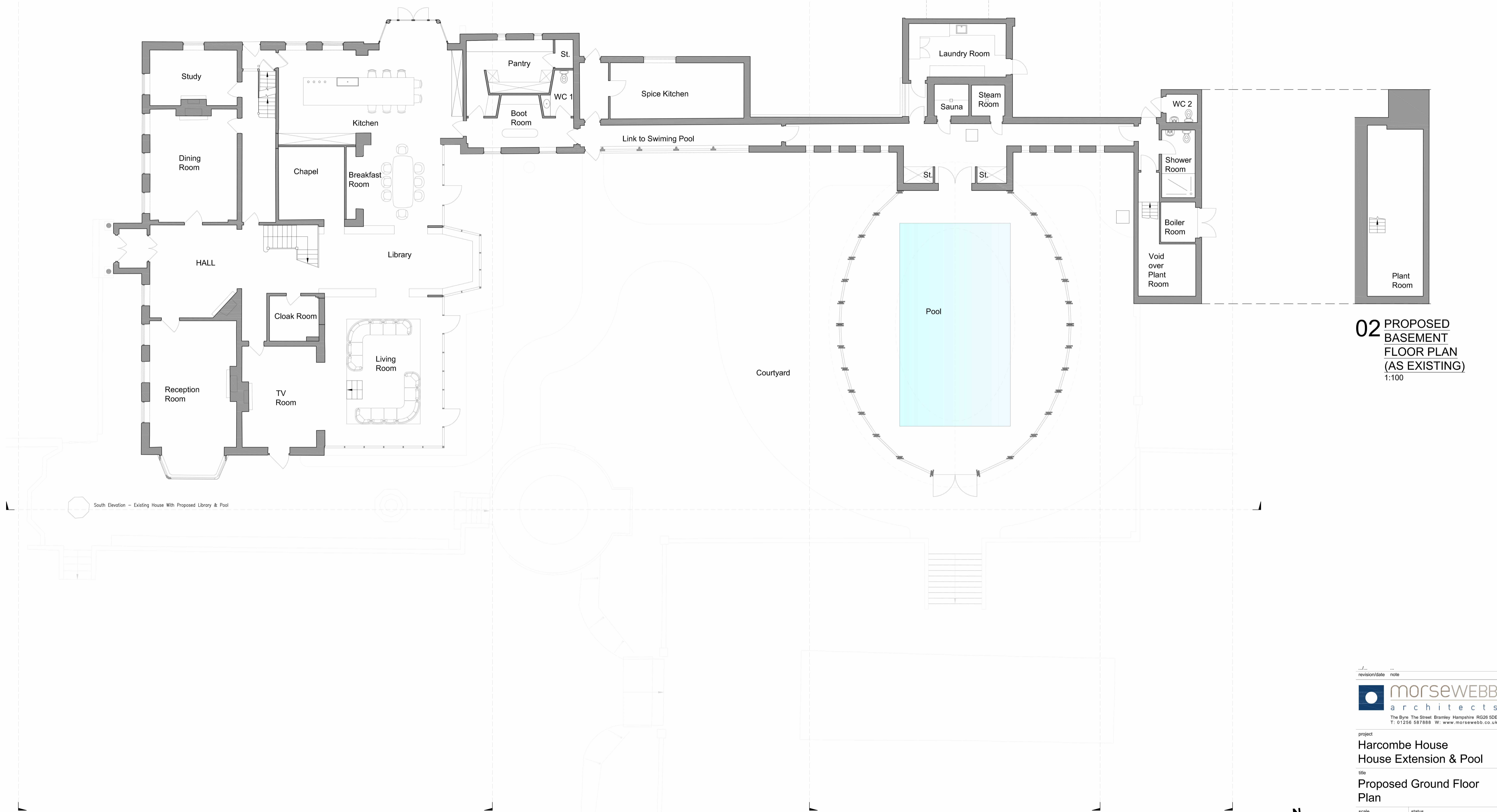
East Elevation - Proposed Pool

East Elevation - Proposed Courtyard

	Existing GIA m ²	Proposed GIA m ²	Additional GIA m ²
Basement	27	27	0
Ground Floor	642	697	55
First Floor	215	242	27
Second Floor	180	180	0
Total	1064	1146	82

	Existing Volume m ³	Proposed Volume m ³	Additional Volume m ³
Swimming Pool Building	480	620	140

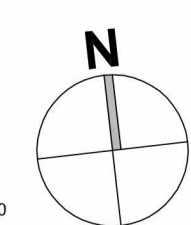
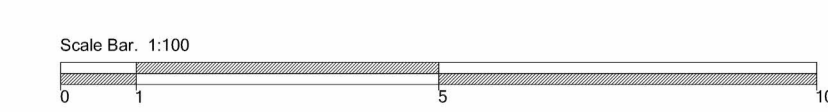
North Elevation - Proposed Bay Window



South Elevation - Existing House With Proposed Library & Pool

02 PROPOSED
BASEMENT
FLOOR PLAN
(AS EXISTING)
1:100

01 PROPOSED GROUND FLOOR PLAN
1:100



revision/date note

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project
**Harcombe House
House Extension & Pool**

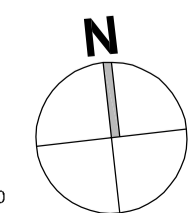
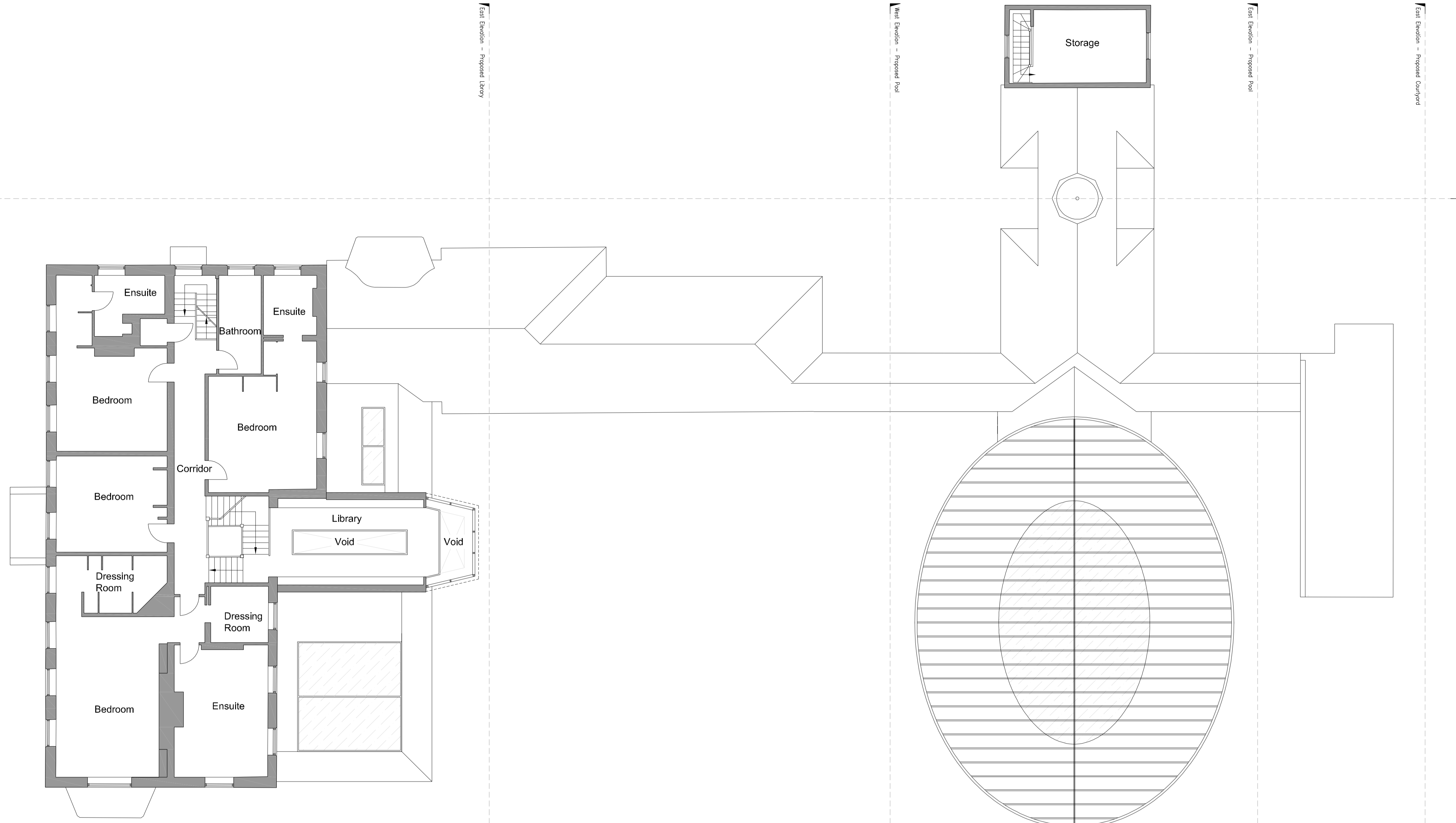
title
**Proposed Ground Floor
Plan**

scale 1:100 @A1	status PLANNING
job no. 849	dwg no. 013
	status/revision PL00

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	Existing GIA m ²	Proposed GIA m ²	Additional GIA m ²
Basement	27	27	0
Ground Floor	642	697	55
First Floor	215	242	27
Second Floor	180	180	0
Total	1064	1146	82

	Existing Volume m ³	Proposed Volume m ³	Additional Volume m ³
Swimming Pool Building	480	620	140



revision/date note



project
Harcombe House
House Extension & Pool
 title
Proposed First Floor Plan

scale	status	
1:100 @A1	PLANNING	
job no.	dwg no.	status/revision
849	014	PL00



THE IMPACT OF LIGHTING ON BATS

Bats favour a dark environment for both roosting and foraging as they are adapted to low-light conditions. Artificial lighting will disturb bats if the lighting covers roost access points, flight paths or foraging habitats.

The main peak of nocturnal insect abundance occurs at dusk and a delay in emergence results in a lower foraging rate for bats.

Artificial lighting creates a 'vacuum effect' for nocturnal insects. During the night nocturnal insects use the light of the moon* to navigate. However, artificial lighting and even sky glow above cities obscures the natural moonlight as it is closer

and radiates light in multiple directions.

Some species of bats have been recorded foraging around street lights such as Pipistrelle species and Nyctalus species. However, species that are less tolerant of artificial light are at a disadvantage when foraging as insects are drawn away from these species usual foraging grounds into the zones of artificial light.

Lighting must be considered in context to any development as increased lighting may cause roost abandonment, reduced reproductive success, and reduced foraging. Mitigation to reduce the impacts of lighting for bats is therefore of great importance in bat conservation.

Table 1: Summary of predicted impact of lighting for each species/genus

Impact	High	Medium	Low
Behaviour			
Maternity roost	All species	-	-
Night roost	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>	-
Emergence	All species	-	-
Foraging	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	-	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>
Commuting	<i>Rhinolophus hipposideros</i> <i>Rhinolophus ferrumequinum</i> <i>Myotis</i> spp. <i>Plecotus</i> spp.	-	<i>Pipistrellus</i> spp. <i>Nyctalus</i> spp. <i>Eptesicus serotinus</i> <i>Barbastella barbastellus</i>
Swarming	All species	-	-
Hibernation	All species	-	-

*For more information see Warrant, E., and Dacke, M. (2016) Visual Navigation in Nocturnal insects. *Physiology*, 31, 182-196.



TYPES OF BAT BOXES



Schwegler 2F Double Front Panel

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle and Myotis species
- A second inner wooden panel is fitted adjacent to the front panel imitating a cavity wall



Schwegler 1FD Double Front Panel

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle and Myotis species
- A second inner wooden panel is fitted adjacent to the front panel imitating a cavity wall
- Small entrance hole discourages birds from using the box



Vincent Pro Bat Box

- Manufactured from timber and recycled plastic
- The front and the top of the box is black, which helps heat absorption
- Suitable for a range of species including pipistrelle species, Myotis species, and brown long-eared bats.
- No maintenance required



Schwegler 2FN

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for pipistrelle species, Myotis species, serotine, brown long-eared, noctule and Leisler's bats
- Dual entrance
- Birds and dormice have also been found using this box
- A newer model is now available, Schwegler 3FN, designed with smaller entrance holes which discourage birds and dormice



Schwegler 1FS Large Colony Box

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for a range of bats including pipistrelle species, Myotis species, Noctule, and brown long-eared bats
- Three grooved inner wooden panels are connected to the front panel, which are ideal for bats to cling to.
- Accommodates large summer colonies



Schwegler 1FF Colony Box

- Manufactured from long-lasting woodcrete
- Lifetime - 20-25 years
- Suitable for a range of crevice dwelling bats including pipistrelle species, barbastelle, noctule, and brown long-eared bats
- Rough wooden surface for bats to cling onto and climb



Greenwoods Ecohabitats Small Hollow Bat Box

- Manufactured from long-lasting ecostyrocete
- Lifetime - 20-25 years
- Suitable for a range of bats preferring a cavity space, including pipistrelle species, myotis species, noctule, and brown long-eared bats
- Suitable for hibernating bats



How to Install

Integrated Bat Boxes



Integrated bat boxes can be installed into the brickwork of buildings to provide a roosting spot for bat species.

Being embedded in the masonry of a building, they do not impact the exterior seal of structure and are commonly integrated in new builds.

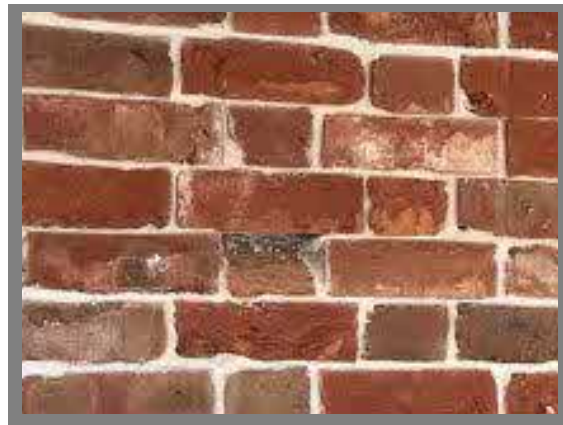
With some modification or bespoke design, integrated bat boxes can be installed in such a way that it does not interfere with a building's exterior facade.

The 1FR bat tube has a 45 degree angle for bats to land on and crawl upwards into the bat tube. It has been designed to be installed within or adjacent to the the external skin of the block work or brickwork.

For a rendered finish, the 1FR bat tube can be built into the external skin of breeze blocks (acting as a block) and be rendered over (ensuring the access point is left clear). Ridges should be created in the render immediately below the access point, which will aid the bats when crawling into the bat tube.

For a brickwork finish, the 1FR bat tube should be installed within the brickwork, set back slightly to allow the front to either be rendered over or for a continuity of brick slips to be mortared over the top of the tube. The upper brick slip should overlap the access point and the lower brick slip should be in line with the 45 degree angle of the bat tube.

Alternatively, **Habibat** bat tubes can be purchased that are designed for brickwork design and can be custom made.



Sources of light that can disturb bats include; light spill via windows, floodlighting, car headlights, roadside lighting, security lighting, aesthetic lighting of waterways, and aesthetic illumination of buildings. Glare will affect bats over greater distance than the target area directly illuminated.

Avoidance is the most effective method, but if this is not possible the following measures should be considered.

What lighting should I use?

- Low pressure sodium lights or 'warm' LEDs
- Wavelength above 540nm
- Colour temperature below 2700K
- Shielded lights that prevent light spill above a 70 degree angle
- Passive infrared (PIR) motion sensors



What to avoid:

- Lighting roost entrances, flightpaths, and foraging or commuting routes
- Reflective surfaces beneath lighting
- High level lights
- Non-directional lighting

Lighting should be considered at an early stage allowing impacts to be minimised through the design of the site.

Key Points

- Keep lighting intensity to the minimum level required
- Limit the times that lights are on to provide some dark periods (e.g. switching installations off between midnight and 5am)
- Dim lighting according to demand
- As an alternative to lighting pathways use paving materials that reflect moonlight
- Low level lighting allows darkness to be retained within higher vegetation
- Set dark habitat buffers - lighting should always be a minimum of 25m from vegetated margins and 40m from waterbodies
- Incorporate dark corridors within the site
- Compensate for the loss of dark areas by enhancing other dark areas
- Consider building design - install internal lighting away from windows