

Preliminary Roost Assessment of buildings
None observed
<i>Potential roost features (PRF)</i>
Northern elevation – Small holes and cracks in brick walls. Crack in render on western chimney stack. Crack between main building and ‘extension’ on western side. West elevation (north) – several slipped roof tiles and small gaps between tiles and ridge tiles. South elevation (west) – Some missing roof tiles and gaps between tiles and ridge tiles. Small gaps beneath lead flashing around base of chimney stack. West elevation (south) – Possible gaps beneath lead flashing at top of wall and hole in ‘soffit’ where flashing is bulged out. South elevation (east) – render (recently?) removed. Small holes and cracks in brickwork, including around windows. Possible gaps behind remaining render towards top of wall. Gap near bottom of south eastern corner of chimney stack, between brick and boards/render. East elevation – Gaps under lifted lead flashing beneath windows and at top of walls/eaves. Multiple small gaps between plywood and walls.
<i>Overall suitability for roosting bats</i>
High
Abingdon Road culver
<i>External description</i>
A River Thames tributary enters the site via a culvert under the Abingdon Road, before traversing the site and exiting via culvert under building B5. The culvert and retaining walls of the channel were of brick construction, in places densely overgrown with ivy.
<i>Internal description</i>
Not accessed internally.
<i>Evidence of bats</i>
None observed
<i>Potential roost features (PRF)</i>
Cracks and gaps in retaining walls and, potentially, behind the ivy
<i>Overall suitability for roosting bats</i>
Moderate



B1, south and east elevations with hole on eastern elevation



B1 gap under barge board



B2 south elevation



B2, cracks/gaps around lintel



B3, north & west elevations incl gap/hole



B3, south and east elevations



B3, hole in barge point/possible entry point SW cnr



B4, west elevation incl. gap between wall and roof (L) and east elevation (R)





B5, north elevation with single storey 'extensions' (L & C) and crack between main house and extension on western elevation (R)



B5, north elevation

B5, west elevation (north)



B5, 'extension' west elevation (north, L) and south elevation (west, R)



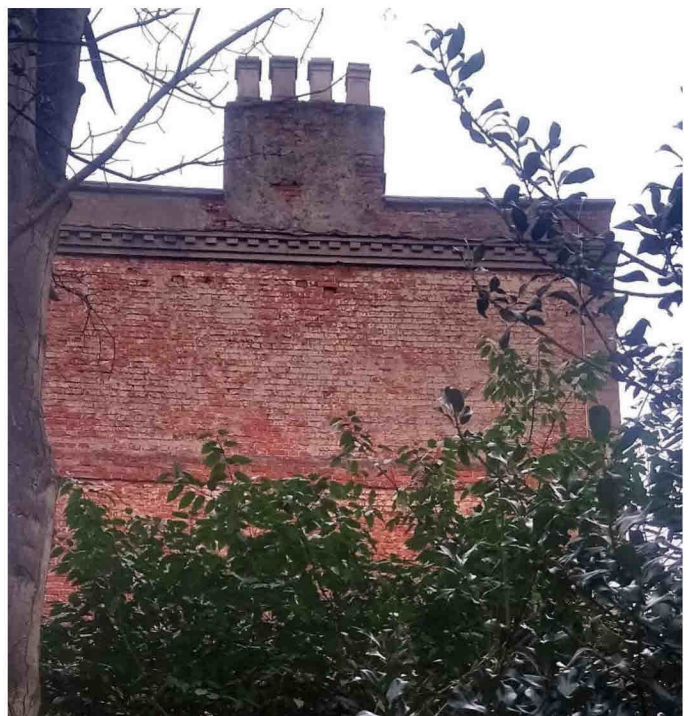
B5, east elevation



B5, gaps under lead flashing beneath windows



B5, west elevation (south) with gap under lead flashing and upper part of south elevation (east)





B5, eastern end of single storey extension on north side of building (L) and gaps behind plywood cladding, east elevation (R)



Eastern end of B5's roof void showing large water tank occupying most of the space



Western end of B5's roof void showing showing exposed timbers and sarking in good condition



River Thames tributary which enters site via a culvert under the Abingdon Road, traverses then exits via culvert under building B5

Bat DNA Analysis

- 4.2.3 No bats droppings were found in the B5 roof void so no DNA analysis was undertaken.

Bat Presence/Absence Surveys

- 4.2.4 Building B5 was assessed as high suitability for roosting bats, the culvert as moderate suitability, and B1/B2/B3/B4 as low suitability. Three surveys were carried out targeting the following features:

- ▶ Dusk emergence survey 4 May 2022: B5, culvert, B1/B2/B3/B4
- ▶ Dawn re-entry survey 25 May 2022: B5, culvert
- ▶ Dawn re-entry survey 15 June 2022: B5

- 4.2.5 Sample sonograms recorded at the site are given at Appendix III.

Survey 1

- 4.2.5.1 Sunset on 4 May was at 20:33; the survey started at 20.18 and ended at 22.10. No roosting bats were recorded emerging from any of the buildings during the survey.
- 4.2.5.2 The culvert was monitored with a Canon XA11 infrared camera; this recorded at least 23 occasions of one or more bats flying out of or into the culvert. Similar behaviour was observed under B5 and, combined with the extensive foraging behaviour observed over the water (see below), points to the watercourse including the culverts providing a frequently used foraging and commuting route. No bats were observed roosting in the culvert's retaining walls.
- 4.2.6 High levels of foraging activity were recorded with near constant, multi-bat, multi-species bat passes observed over the water, between 20.48 and 22.10, to both the west and east of B5. Occasional passes were recorded to the north of B5 as well. The most abundant species were common and soprano pipistrelles, with occasional Daubenton's, other *Myotis* bats and noctule.

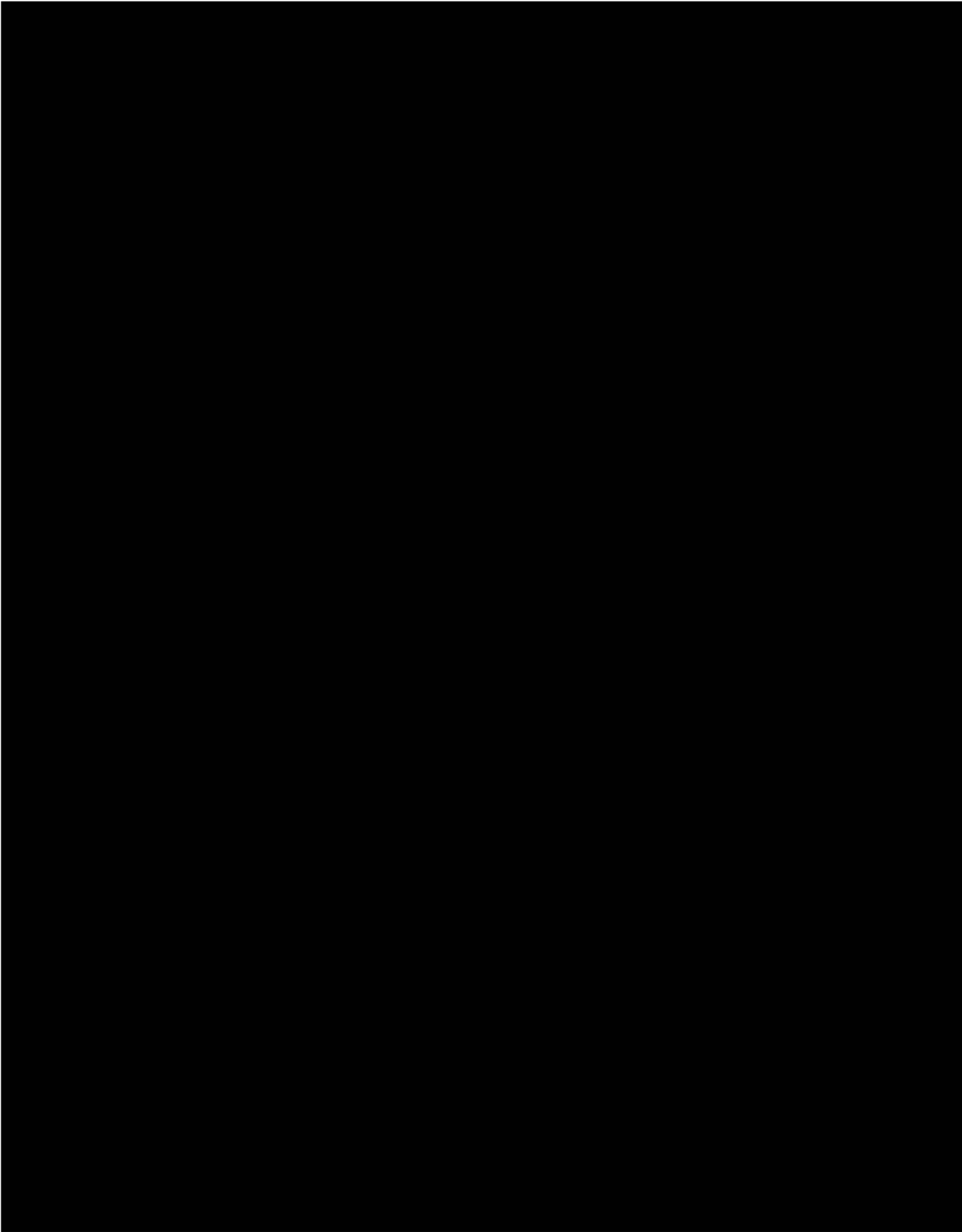
Survey 2

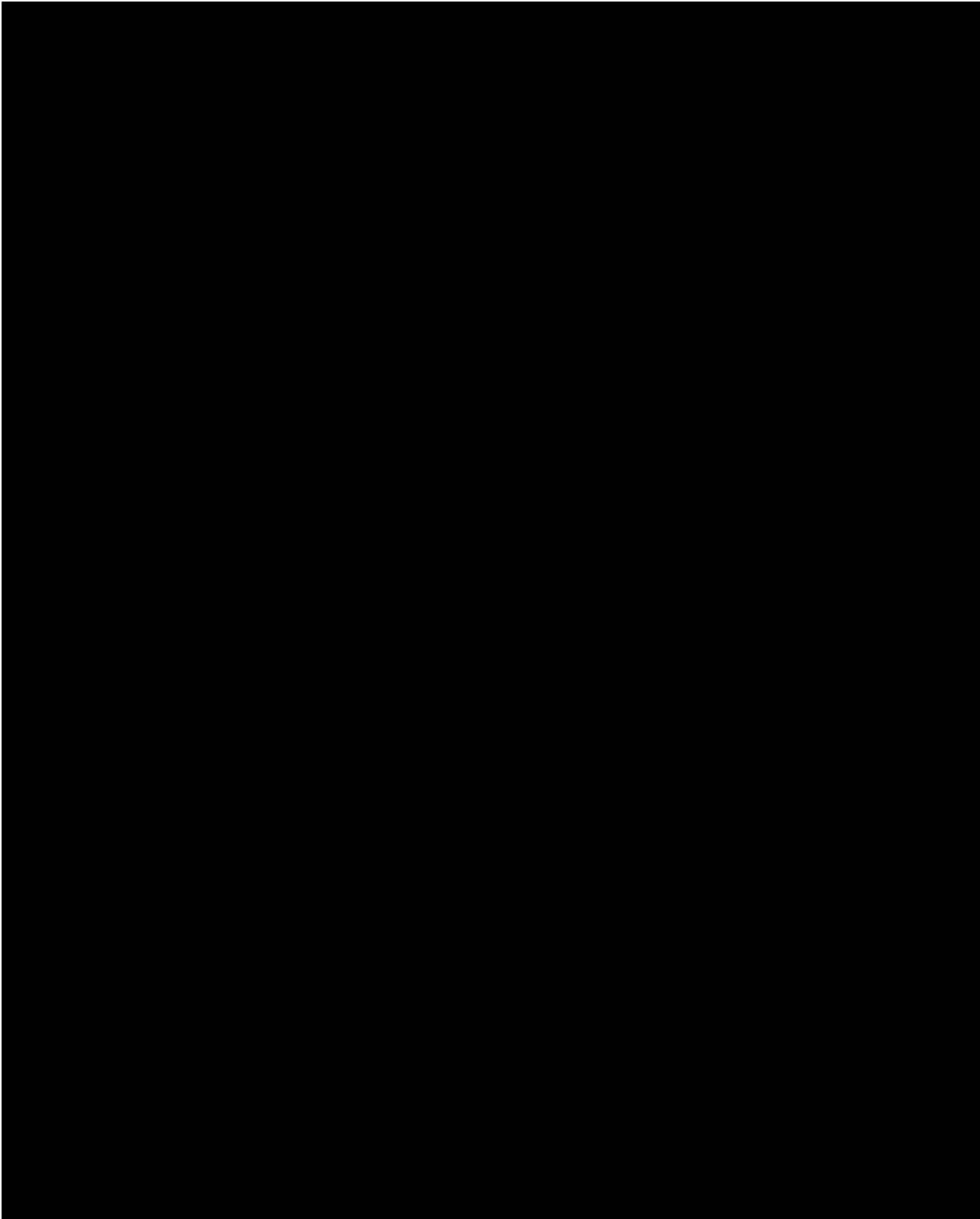
- 4.2.6.1 Sunrise on 25 May was at 04.59; the survey started at 03.27 and ended at 05.14. No roosting bats were recorded re-entering building B5 during the survey. The culvert was monitored with a Canon XA11 infrared camera; this recorded at least 31 occasions of one or more bats flying out of or into the culvert. No bats were observed roosting in the culvert's retaining walls.

- 4.2.7 High levels of foraging activity were recorded with near constant, multi-bat, multi-species bat passes observed over the water, between 03.27 and 04.32, to both the west and east of B5. Occasional passes were recorded to the north of B5 as well. The most abundant species were common and soprano pipistrelles, with occasional Daubenton's, other *Myotis* bats and noctule.

Survey 3

- 4.2.8 Sunrise on 15 June was at 04.46; the survey started at 03.10 and ended at 05.01. No roosting bats were recorded re-entering building B5 during the survey.
- 4.2.9 Again, high levels of foraging activity were recorded with near constant, multi-bat, multi-species bat passes observed to both the west and east of B5, between 03.10 and 04.00 when activity levels gradually began to subside. The last foraging bat, a common pipistrelle, was observed at 04.29. Then at 04.39, in daylight conditions, a single soprano pipistrelle flew into site from the south and appeared about to roost at the south-west corner of B5; the bat repeatedly flew up to the soffit overlooking the water as if about to enter but at 04.45 flew off to the south instead.
- 4.2.10 The most abundant species were common and soprano pipistrelles, with occasional Daubenton's, other *Myotis* bats, noctule and one serotine.





5 Evaluation

5.1 Introduction

5.1.1 This chapter presents an assessment of likely impacts to roosting bats [REDACTED] as a result of the development proposals before making recommendations for avoidance, mitigation, enhancement or compensatory measures.

5.2 Roosting Bats

Presence or Absence of Bats

5.2.1 The survey results provide a good level of confidence that roosting bats were absent from buildings B1/B2/B3/B4, B5 and the culvert under Abingdon Road during the 2022 peak breeding season.

5.2.2 Surveys were carried out at an appropriate time of year and weather conditions were within acceptable parameters. The results are therefore considered to provide an accurate account of the bat roost status of these structures.

Species Assemblage

5.2.3 Species diversity recorded during the presence/absence surveys included five confirmed species. Their local and national conservation status is listed in Table 5.1 (BCT, 2010; Mathews *et al.*, 2018; Russ, 2021, Oxfordshire Bat Group⁵). All five of these species have previously been recorded within 2km of the site, as confirmed during the desk study stage.

Table 5.1: Conservation status of recorded bat species (abundance and distribution)

Species	Oxon abundance/distribution	UK abundance/distribution	UK status
Serotine	Widespread though uncommon; few known roosts	Uncommon, widespread, southern England	Vulnerable
Daubenton's	Widespread, though few known roosts	Widespread, fairly abundant	Least concern
Noctule	Uncommon though widespread	Uncommon, widespread, absent in Scotland	Least concern
Common pipistrelle	Common and widespread	Widespread, abundant	Least concern
Soprano pipistrelle	Common and widespread	Fairly common, widespread	Least concern

⁵ Oxfordshire Bat Group, accessed online [11/07/2022]: <https://www.oxfordshirebats.org/oxfordshire-bats.php>

Impact Assessment

Designated sites

- 5.2.4 No designated sites notified for their bat populations will be affected by the proposals for the site.

Roosts – buildings/structures

- 5.2.5 No bat roosts in buildings/structures will be affected by the proposals for the site.

Foraging and commuting habitats

- 5.2.6 High levels of foraging and commuting bat activity were recorded over the water with bats repeatedly flying under the two existing culverts, one under Abingdon Road, the other under building B5. Proposals for the site include two new pedestrian bridges over the River Thames tributary to connect the new building with the existing buildings (see Figure 1.2 and Appendix V). The west bridge will measure c.1.2m width, the east bridge c.2.0m width, and both will be raised c.1.0m over the water which is comparable to the height of the culvert under Abingdon Road. Both these bridges will occupy a significantly narrower span of the river than the existing culverts, and the latter do not appear to be deterring the bats' usage of the watercourse. No significant impacts are therefore predicted to result from installation of the new bridges, provided the recommendations in relation to artificial lighting listed below are implemented.

Summary

- 5.2.7 In conclusion, the survey results demonstrate that there are unlikely to be any direct or indirect impacts to bats, their breeding/resting places or foraging/commuting habitats as a result of the proposed development. Bats are not considered to present a constraint to development proposals for the site.

Recommendations for Avoidance and Mitigation

- 5.2.8 No specific avoidance, mitigation or compensation measures for bats are required to be implemented as part of the currently proposed scheme because no roosting bats were recorded. However, precautionary measures are nevertheless advised and are listed in Table 5.2.

Table 5.2: Recommended precautionary measures for roosting bats

#	Recommended precautionary measures
R1	The current report is based on three presence/absence surveys for Building B5, two surveys for the Abingdon Road culvert and one survey for B1/B2/B3/B4 during the 2022 active season, which is proportionate to the buildings' suitability for roosting bats. If commencement of the works is significantly delayed (e.g. by more than 18 months from the survey date), updated active season surveys will need to be undertaken to record any changes in roosting status.
R2	The survey results indicate that bats are likely to be absent from buildings B1/B2/B3/B4, B5 and the Abingdon Road culvert. In the unlikely event that bats are encountered during the works, site operatives will be advised to cease activity in the vicinity while advice from an ecologist is

#	Recommended precautionary measures
	sought. The ecologist will then assess the most appropriate course of action before works continue.
R3	Adopt 'soft felling' techniques to reduce the risk to roosting bats when felling or lopping low suitability trees (see further details below). Tree felling or remedial works should be undertaken during March-April or September-October to avoid critical maternity and hibernation periods.
R4	Avoid the use of external lighting, or keep its use to the minimum required for its intended purpose, during both construction and operation. This will be of benefit to nocturnal species e.g. bats. Further specifications are detailed below. Lighting of the river corridors through the site and adjacent to the east will be avoided.
R5	Buildings, hedgerows, trees and shrubs within the survey area are suitable for nesting birds. Negative impacts on breeding birds will be avoided by undertaking clearance and demolition works which would result in removal of potential nesting habitats (including vegetation and buildings) outside of the bird breeding season, which runs from 1 March to 31 August. Removal of nesting bird habitats will therefore be carried out between September and February. Any construction works undertaken within the bird breeding season where suitable bird breeding habitat exists will require a site check for nesting birds by a suitably qualified ecologist. This will take place no more than two days prior to works commencing. This is to ensure that no disturbance to active bird nests occurs. If a nest is found it must be cordoned off and works adjacent to the nest must be delayed until such time that the chicks have fledged from the nest. This will be supervised by a suitably qualified ecologist.

Soft felling of low suitability trees

5.2.9 It is currently anticipated that moderate suitability trees T5 and T9 (see Appendix I) will not be affected by the proposals. Low suitability trees including those at T1-T4, T6-T8 and T10-T11 are less likely to support roosting bats and do not require emergence and re-entry surveys. If tree felling or remedial works are required for low suitability trees, works should be undertaken with reasonable precaution regarding the risk to bats as follows:

- ▶ Appointment of a suitably qualified Ecological Clerk of Works (ECoW) to oversee works to low suitability trees.
- ▶ Tree felling or remedial works should be undertaken during March-April or September-October to avoid critical maternity and hibernation periods.
- ▶ Where possible, potential roosting features (for example, splits, cracks, rot holes, loose bark and broken branches) should be thoroughly re-inspected using an endoscope immediately prior to the works.
- ▶ Trees with potential bat roosting features should be felled in sections with limbs carefully lowered to the ground. Incisions should be made at least 50cm from the potential roost features if possible.
- ▶ If limbs or large branches require removal, consideration should be given to cracks which may close (crushing any bats inside) once the weight of the limb has been removed. If the crack cannot be thoroughly inspected, the crack should be wedged open prior to removal of the limb/branch.

- ▶ Once the works are complete, tree sections should be checked on the ground and allowed a rest period of 24 hours in order that any individual bats are given the opportunity to relocate.
- ▶ Should a bat be encountered during the felling or remedial works, site operatives will be advised to cease activity in its vicinity while advice is sought from the supervising ecologist. No attempt should be made to handle a bat unless it is in immediate danger.

Artificial lighting

5.2.10 To minimise the general risk of disturbance to roosting, foraging and commuting bats on and around the site during and after construction, it is recommended that the following lighting precautions are considered during the detailed design stage (ILP/BCT, 2018):

- ▶ Lighting will not be directed towards the river corridors through the site and adjacent to the east, or towards any newly created bat roosts.
- ▶ All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- ▶ LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- ▶ A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component.
- ▶ Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).
- ▶ Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- ▶ The use of specialist bollard or low-level downward directional luminaires to retain darkness above should be considered. However, this often comes at a cost of unacceptable glare, poor illumination efficiency, a high upward light component and poor facial recognition, and their use should only be as directed by the lighting professional.
- ▶ Column heights should be carefully considered to minimise light spill.
- ▶ Only luminaires with an upward light ratio of 0% and with good optical control should be used (refer to ILP guidance for the reduction of obtrusive light).
- ▶ Luminaires should always be mounted on the horizontal, i.e. no upward tilt.
- ▶ Any external security lighting should be set on motion-sensors and short (1min) timers.
- ▶ As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.