

Global Centre of Rail Excellence
Phase 1A and 2A

2022/23 Bat Survey Report

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1 Introduction

Description of project

- 1.1 The Global Centre of Rail Excellence (GCRE) is a rail testing centre project that will be delivered by GCRE Ltd on behalf of the Welsh Government. The GCRE site occupies 475 hectares of land within and surrounding the Nant Helen Surface Mine and Onllwyn Coal Washery (approximate central Ordnance Survey Grid Reference (OSGR) SN 84698 10547). It is located within the counties of Powys and Neath Port Talbot.
- 1.2 The first phase of the development, "Phase 1A", is contained within the northern extent of the Onllwyn Coal Washery site and will involve the construction of rolling stock storage sidings, along with supporting 25 kV overhead line infrastructure. Phase 2A of the Washery Area is a continuation of the works undertaken in Phase 1A. The purpose of the works is to facilitate the infrastructure required for the operation of the GCRE. The works will include demolition of remaining buildings and hardstanding, removal of rail tracks, removal and replacement of the Onllwyn Bridge, installation of new rail infrastructure, and construction of new buildings, roads and services. The extent of 'Site' (encompassing Phases 1A and 2A) is shown on **Figure 1** in **Appendix 1**.

Background to commission

- 1.3 Ove Arup & Partners Ltd (Arup) carried out bat emergence/return to roost surveys within the Phase 2A Site in 2019 to inform an assessment of impacts as part of the Environmental Impact Assessment (EIA) process.
- 1.4 BSG Ecology were commissioned by Dalcour Maclaren in August 2022 to update the bat survey data to inform the scope of the ecological protection and habitat management plans for the Site. These were issued in October 2022 (BSG Ecology 2022a & 2022b) with recommendations for further survey work. Dalcour Maclaren subsequently commissioned the further work in early December 2022. This comprised:
- Inspection of an additional bridge ('Northern Bridge' with reference to **Figure 1** in **Appendix 1**) in the western part of the Site. This structure had not been surveyed in 2022.
 - An additional emergence survey of three structures: the Northern Bridge, 'Brick Structure', and 'Eastern Wall' (with reference to the building locations on **Figure 1**). The Brick Structure, and Eastern Wall were assessed (in BSG Ecology 2022b) as having 'Moderate' suitability to support roosting bats (with reference to the categories of bat roost suitability of buildings in Collins, 2016); however, only one survey (of a recommended two surveys) was completed in 2022 (and reported in BSG Ecology 2022b).
 - Hibernation survey of four structures identified in BSG Ecology (2022b) as suitable to support hibernating bats: the 'Southern Bridge', Brick Structure, Western Wall, and Eastern Wall (with reference to the building locations on **Figure 1**). In addition, hibernation surveys of the Northern Bridge were also completed.

Aims of study

- 1.5 This report sets out the findings of additional bat survey work carried out at the Site during the winter of 2022/23, and in May 2023. The aim of the surveys was to extend the survey work completed in 2022 to comply with recommendations in industry standard guidance (Collins, 2016).

2 Methods

Field survey

- 2.1 A total of eight buildings / structures within the Phase 1A site and twenty-five buildings and structures within the Phase 2A site were inspected for their suitability to support roosting bats in 2022. Two additional structures: a Brick Structure in the western extent of the Phase 2A Site, and a wall (Eastern Wall) adjacent to building B32b in the eastern part of the Site, were identified by Dalcour Maclaren in mid-September 2022, and subsequently inspected by Gareth Lang on 21 September 2022. The survey methods and results are presented in the 2022 bat survey reports for the Phase 1A and 2A sites (BSG Ecology, 2022a & 2022b).
- 2.2 Potential impacts on the northern of two bridges within the Site was also identified in early December 2022, and subsequently inspected ahead of hibernation monitoring survey work by Gareth Lang on 18 December 2022.
- 2.3 The location of the 'Northern Bridge' is provided on **Figure 1**.
- 2.4 The inspection was completed in accordance with Bat Conservation Trust (BCT) guidance (Collins, 2016). Features potentially providing access into cavities, including gaps in walls, were inspected from ground level for evidence of bats (such as staining from fur or the presence of droppings) using a high-powered torch and close-focussing binoculars.
- 2.5 The structure was assigned a category indicating the suitability of potential roost features (PRFs) for roosting bats ('Negligible', 'Low', 'Moderate' or 'High') in accordance with the categories of bat roost suitability of buildings in Collins, (2016).

Emergence survey

- 2.6 An emergence surveys of three structures were completed with reference to the BCT survey guidance (Collins, 2016). These were: the Northern Bridge, Brick Structure, and Eastern Wall. The locations of these structures are provided on **Figure 1**.
- 2.7 The assessment of the Brick Structure and Eastern Wall (in BSG Ecology 2022b) concluded that these structures were of 'Moderate' suitability to support roosting bats. However, only one (of two survey visits recommended in Collins, 2016) were completed at each of these in 2022 (and reported in BSG Ecology, 2022b).
- 2.8 An additional survey of these structures, and a survey of the Northern Bridge was undertaken on 18 May 2023. Surveyors were positioned to observe all PRFs identified during the building inspection surveys, with observations supplemented by infra-red or thermal imaging cameras.
- 2.9 The camera equipment used on the surveys were:
 - FLIR T650 high resolution thermal imaging camera.
 - SANNCE 1080p infrared security system with two high resolution cameras.
 - Sony Nightshot video camera with separate infrared illuminator lamp.
- 2.10 Each surveyor used a full spectrum Anabat Scout bat detector to supplement visual observations and for recording calls for subsequent identification.
- 2.11 Surveyors noted any bat activity heard or seen (including emergence or re-entry) on an annotated plan. Field notes included a record of the time of each bat encounter, allowing records to be cross-referenced with the recorded data.

- 2.12 The survey started 15 minutes before sunset and continued for 1.5 hours after sunset. These timings are in line with industry standard guidance (Collins, 2016) and cover the peak times when bats are likely to be leaving their roosts.
- 2.13 Details of the survey dates, times and weather conditions are provided in **Table 2**.

Table 2 Details of the buildings /structures surveyed and surveyors

Structure ID	Date and time of survey	Weather Conditions	Surveyors*
Northern Bridge	18 May 2023	Temperature: 16°C	KR
Eastern Wall	Start = 20:50	Wind Speed: 1bft**	JG, RL, BG
Brick Structure	End = 22:35 (Sunset = 21:05)	Rain: Nil Cloud Cover: 7/8***	LM

*BG = Becky Gibbs, GL = Gareth Lang, , KR = Kirsty Rogers, LM = Louise Morton; RL = Rhys Lewis.

**Beaufort scale (an empirical measure for describing wind intensity based on observed sea conditions. 3Bft = 8-12 mph).

***Okta scale (an estimate of how many eighths of the sky are covered in cloud, ranging from 0 oktas (completely clear sky) through to 8 oktas (completely overcast)).

Hibernation survey

- 2.14 The Northern Bridge, Southern Bridge, Brick Structure, Eastern Wall, and Western Wall were identified as suitable to support hibernating bats. These structures feature deep cavities in block walls that may provide stable temperatures during the winter. However, given the bat assemblage recorded during the emergence survey work, the value of these structures as hibernation sites was considered to be low, and use limited to common species of bat.
- 2.15 Survey work was carried out in accordance with industry standard guidance (Collins, 2016) and covered the period of the year (December to February inclusive) when bats are most likely to be in hibernation.
- 2.16 Surveys involved close inspection of accessible cavities using a torch and endoscope from ground-level and up to 4 m in height with use of a ladder. Inspection surveys were completed by Gareth Lang (assisted by Alice Connell) on 18 December 2022; 09 January 2023; 18 January 2023; and 14 February 2023.
- 2.17 Four Wildlife Acoustics SM MiniBat detectors were deployed at the Site in December 2022, January 2022 and February 2023 (one at each of the Northern Bridge, Southern Bridge, Brick Structure, and Eastern Wall¹). Detectors were left in place for a period of 14 nights in each month. The survey periods and detector locations are presented in **Table 3** (below). The detectors were programmed to record between 30 minutes before sunset and 30 minutes after sunrise throughout each survey period.

¹ Detectors located at the Brick Structure and Southern Bridge were considered close enough to the Western Wall (both within 20 m) that a fifth detector was not required.

Table 3. Details of the buildings /structures surveyed and surveyors

Building ID	Survey Period	Number of Nights (Total HH:MM)
Northern Bridge	18/12/2022 – 31/12/2022	14 (226:52)
	18/01/2023 – 31/01/2023	14 (213:38)
	14/02/2023 – 27/02/2023	14 (191:19)
Southern Bridge	18/12/2022 – 31/12/2022	14 (226:52)
	18/01/2023 – 31/01/2023	14 (213:38)
	01/02/2023 – 14/02/2023	14 (202:42)
Brick Structure	18/12/2022 – 31/12/2022	14 (226:52)
	18/01/2023 – 31/01/2023	14 (213:38)
Eastern Wall	18/12/2022 – 31/12/2022	14 (226:52)
	18/01/2023 – 31/01/2023	14 (213:38)
	01/02/2023 – 14/02/2023	14 (202:42)

Data analysis

- 2.18 Bat calls were analysed using Analook W software and labelled according to species to cross reference with surveyor records. The species analysis follows the call parameters as describe in Russ (2012).
- 2.19 For pipistrelle species the following criteria, based on measurements of peak frequency, were used to classify calls:
- Common pipistrelle *Pipistrellus pipistrellus* ≥ 42 and < 49 kHz
 - Soprano pipistrelle *Pipistrellus pygmaeus* > 51 kHz
 - Nathusius' pipistrelle *Pipistrellus nathusii* < 39 kHz
 - Common pipistrelle / Soprano pipistrelle ≥ 49 and < 51 kHz
 - Common pipistrelle / Nathusius' pipistrelle ≥ 39 and < 42 kHz
- 2.20 In addition, calls by bat species of the *Myotis* genus were not identified to species level. Bats in this genus cannot reliably be separated on calls alone due to the overlap in call characteristics between the species.

Limitations to methods***Emergence surveys***

- 2.21 The survey was carried out at dusk only. Current data on bat emergence and re-entry times suggests that a high proportion of bats returning to roosts do so before dawn re-entry surveys typically commence (Andrews & Pearson; 2017). Dawn surveys are, therefore, at risk of missing the return of bats to roosts. The use of thermal imaging and infra-red cameras also reduces the risk of missing bats emerging from a building / structure after sunset during a dusk emergence survey. It is therefore considered that the absence of dawn surveys has not resulted in a constraint on the survey.

Hibernation Surveys

- 2.22 The detectors at the Northern Bridge and Brick Structure failed to record during the initial deployment in February 2023. Both detectors were redeployed in mid-February; however, no data was collected by the detector at the Brick Structure, and it was assumed to have failed. Whilst no

activity data was obtained at the Brick Structure during February, the data successfully collected in December and January do not indicate the presence of a hibernation roost. In addition, the Brick Structure was fully inspected from ground-level on four occasions, and no evidence of hibernation was recorded. Therefore, the absence of one month of data at this location is not considered to be a constraint on the survey outcome.

- 2.23 Not all cavities within the Eastern Wall or North Bridge could be inspected, as some were beyond safe reach. However, activity data for both locations was collected over a total of 42 nights during the winter, the results of which do not indicate the presence of a local hibernation roost. This is, therefore, not considered to be a constraint on the survey.

Personnel

- 2.24 The team for this project included the following members of staff.
- Gareth Lang BSc MSc ACIEEM, NRW bat survey licence number S088802. Gareth led the dusk emergence surveys and completed the hibernation survey work. Gareth has more than 10 years' experience in bat survey work and has completed building inspections and emergence survey of a wide variety of structures supporting several species of bat.
 - Janine Burnham ACIEEM reviewed this report. Janine has been a professional consultant for 7 years, and has extensive experience with protected species licences, in the production of ES Chapters and in the technical review of various written outputs.
 - Joanne Conway BSc. PG Cert; Joanne assisted with the building inspections and dusk emergence surveys. Joanne has more than 5 years' experience of bat survey work.
 - Kirsty Rogers MSc has worked in ecological consultancy for 9 years. She holds licences to survey bats in England and Wales has extensive experience of carrying out emergence/return to roost surveys and building inspections for bats.
 - Becky Gibbs BSc. Becky assisted with the building inspections and dusk emergence surveys. Becky is a registered bat carer and has undertaken emergence surveys and building inspections for bats over the last three years.
 - Alice Connel BSc MSc. Alice assisted with the hibernation surveys. Alice had previously undertaken bat emergence survey work during the summer and Autumn of 2022.
 - Rhys Lewis BSc. Rhys assisted with the emergence survey work. Rhys has gained experience of bat survey work throughout 2023.
- 2.25 A summary of each BSG staff member's experience and competence as a professional ecologist is provided at <http://www.bsg-ecology.com/people/>

3 Results

Building Inspection

- 3.1 The Northern Bridge was assessed as having a 'Low' suitability to support roosting bats.
- 3.2 The structure is a high bridge over a rail line. Stone-block walls are in a generally good condition with intact mortar. Two drain gaps between blocks on the southern wall are present at approximately 1 m above ground. Narrow gaps are present between the top of the wall and steel bridge. The drain gaps were considered to be suitable for hibernating bats.
- 3.3 The assessment and description of the Southern Bridge, Brick Structure, Western Wall and Eastern Wall are presented in the 2022 bat survey report for the Phase 2A site (BSG Ecology, 2022b).
- 3.4 Photographs are provided in **Appendix 2**.

Dusk emergence surveys

- 3.5 Common and soprano pipistrelle were the only species recorded during the survey on 18 May 2023. No bats were recorded emerging from any of the structures surveyed.
- 3.6 The earliest pass was recorded at 21:21 (31 minutes after sunset) at the Eastern Wall. Most activity (7 passes) was recorded at the Northern Bridge; however, activity was associated with the bank and scrub immediately north of the bridge. Three passes were recorded at the Eastern Wall, and two passes at the Brick Structure.

Hibernation Surveys

- 3.7 No hibernating bats, or evidence of recent use by bats (such as staining, droppings, or smell) was recorded during the close inspection surveys between December 2022 and February 2023 inclusive.
- 3.8 A total of 34 bat passes were recorded during 2,358 hours of data collection. Common and soprano pipistrelle were the only species recorded during the work. No passes were recorded within 20 minutes of sunset, or within 2 hours of sunrise. The earliest passes (three passes by common pipistrelle) were 25 minutes after sunset on 07 February 2023 at the Southern Bridge. Two further passes were recorded at 26 minutes after sunset on the same date. It is likely that these passes relate to a single foraging individual.
- 3.9 No passes were recorded at the Brick Structure during the survey. Two passes were recorded at the North Bridge (both common pipistrelles at 56 minutes after sunset on 25 January 2023), and four passes were recorded at the Eastern Wall (all common pipistrelles; two on 20 January 2023, and one each on 21 December 2022 and 11 February 2023). The remaining 28 passes were recorded at the Southern Bridge (16 soprano pipistrelles recorded over 5 dates, and 12 common pipistrelles recorded over 5 dates). All passes at the Southern Bridge were within 1 hour of sunset, except for one date (25 December 2022) when three passes occurred at 01:10. No earlier passes on this date were recorded.
- 3.10 Potential impacts on bats as result of the proposed development are detailed in the following section with recommendations for mitigation and enhancement measures to ensure that the proposed works are compliant with current wildlife legislation.

4 Potential Impacts and Recommendations

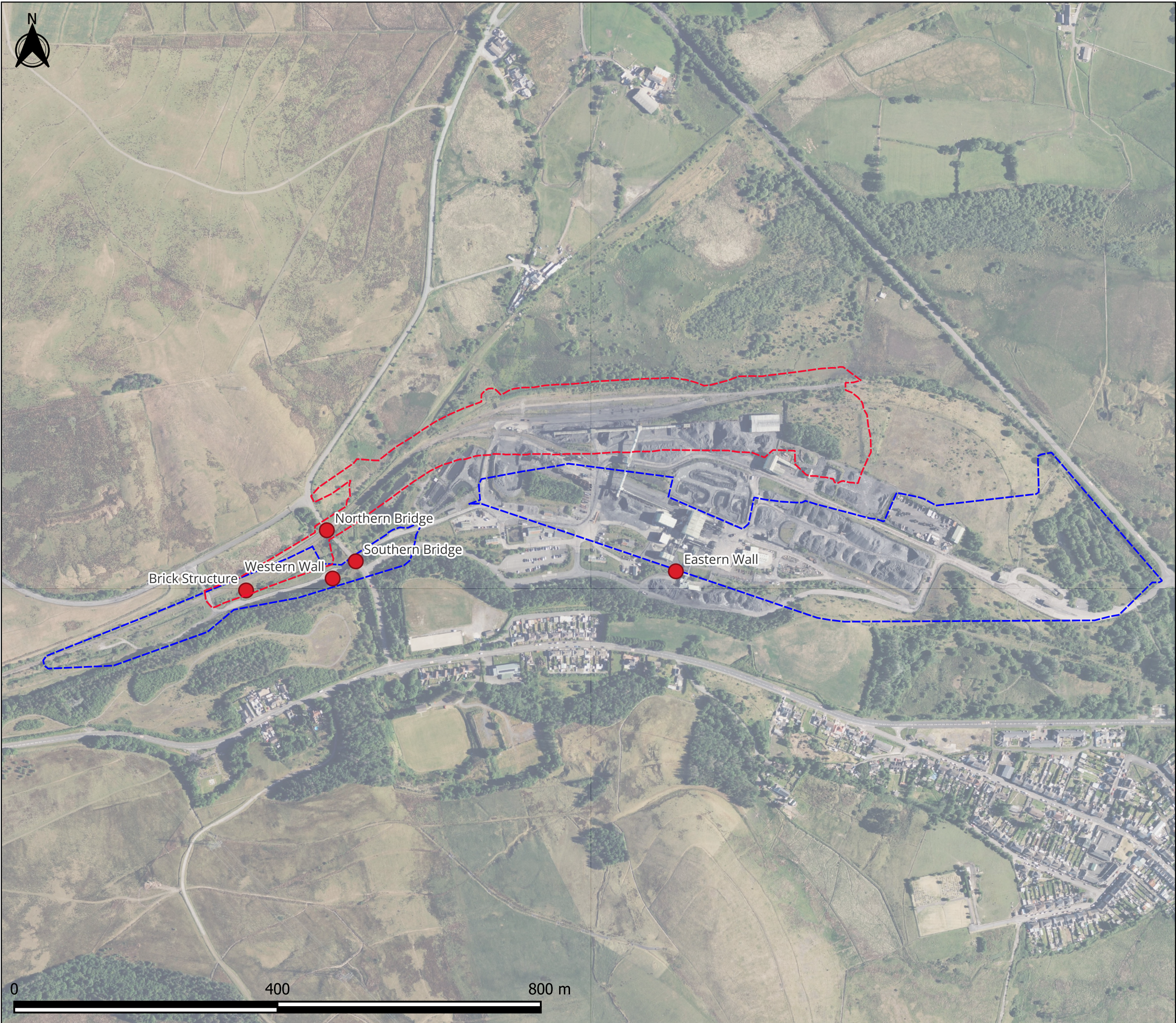
- 4.1 Bats and their roosts are fully protected under the Wildlife and Countryside Act 1981 (as amended), and through the Conservation of Habitats and Species Regulations 2010 (as amended). See **Appendix 3**.
- 4.2 The survey results do not indicate the presence of a regularly used roost or hibernation roost within the Northern Bridge, Southern Bridge, Brick Structure, Western Wall or Eastern Wall. Activity was very low, and the timing of passes did not indicate nearby emergence from or return to a roost. This is supported by an absence of evidence of bats found during the close-inspection work.
- 4.3 Emergence survey work in 2022 confirmed two bat roosts (both of low numbers of common pipistrelle bat) in buildings within the Phase 2A site. At least four species of bat were recorded within the Site throughout the 2022 surveys. These were common and soprano pipistrelle, noctule *Nyctalus noctula* and bats in the genus *Myotis*. However, the value of the bat community within the Site is likely to be low.
- 4.4 Recommendations with regard to the demolition of buildings containing bat roosts (and nesting birds) are provided in the 2022 bat survey report for the Phase 2A site (BSG Ecology, 2022b).
- 4.5 Whilst no bat roosts were confirmed within the structures surveyed during 2023, it is possible that bats will move roost locations regularly and exploit other roost opportunities within the Site. Therefore, structures within the Site assessed as having Moderate (or higher) suitability to support roosting bats (the Southern Bridge, Brick Structure and the Western and Eastern Walls) are likely to contribute to the roosting resource within the Site. As a precautionary measure, the demolition of these buildings and structures should also be carried out under the licenced method statement required for the buildings containing confirmed roosts.
- 4.6 It is unlikely that works to the Northern Bridge (assessed as having low suitability for bat roosts) will have a significant negative impact on the favourable conservation status of the local bat population. However, these structures should be inspected by a suitably experienced ecologist immediately prior to works taking place to confirm likely absence of roosting bats.
- 4.7 Construction work and lighting has potential to disturb bats foraging within the Site through increased activity and light spill. Light spill onto dark corridors within the Site could also interrupt bat flight lines and impact on bats commuting across it. Measures to reduce the risk of impacts on foraging and commuting bats during the construction phase are presented in the Ecological Protection Plan for the Phase 1A Site (BSG Ecology 2022c) and should also be implemented for the Phase 2A works.

5 References

- Andrews, H. & Pearson, L. (2017). A review of empirical data in respect of emergence and return times reported for the UK's 17 native bat species. Andrews Ecology, Somerset. Available at <http://battreehabitatkey.co.uk/wp-content/uploads/2017/06/AEcol-REVIEW-OF-EMERGENCE-AND-RETURN-EMPIRICAL-DATA-2017-Ver.-4.pdf> > Accessed: 12/10/2022
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Appendix 1: Figures

(overleaf)



- Legend
- Phase1A Site
 - Phase2A Site
 - Building Locations



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PROJECT TITLE
GLOBAL CENTRE FOR RAIL EXCELLENCE

DRAWING TITLE
Figure 1: Building Locations - Phase 1A and 2A

DATE: 26/05/2023	CHECKED: JB	SCALE: 1:5,500
DRAWN: GL	APPROVED: GL	VERSION:1.0

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Area measurements for indicative purposes only.

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Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Appendix 2: Photographs

Building / structure ID Refer to Figure 1 for location.	Photograph
Northern Bridge View of northern wall	
Northern Bridge View of southern wall	

Northern Bridge Drainage cavity on southern wall.	 A close-up photograph of a stone wall made of large, irregular grey stones. A small, dark, rectangular opening is visible in the center, which is a drainage cavity. Some small green plants are growing from the cracks in the masonry.
Southern Bridge	 A photograph showing a view through a large, dark, rectangular opening in a stone wall. The opening is part of a bridge structure. A paved road leads through the opening, and green foliage is visible on the sides and in the background.
Western Wall	 A photograph of a stone wall, likely a retaining wall, made of large, irregular stones. The wall is covered with green vegetation, including grass and small plants. The wall is situated on a hillside, and a paved road is visible in the foreground.

Building / structure ID Refer to Figure 1 for location.	Photograph
Eastern Wall	 A photograph showing a stone wall constructed from dark, rectangular stones. The wall is situated on a grassy slope. To the left of the wall, a portion of a light-colored building with a dark roof is visible. The foreground is covered with green and yellow vegetation.
Brick Structure	 A photograph of a brick wall made of red bricks. The wall is partially covered with dark, possibly moss or lichen, and is surrounded by tall grass and some shrubs. The background shows a line of trees under a blue sky.

Appendix 3: Summaries of Relevant Legislation

European protected species (Animals)

The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.

“European protected species” (EPS) of animal are those which are shown on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 43 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:

- a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
- b. Possess or control any live or dead specimens or any part of, or anything derived from a these species
- c. deliberately disturb wild animals of any such species
- d. deliberately take or destroy the eggs of such an animal, or
- e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place

For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—

- a. to impair their ability—
 - i. to survive, to breed or reproduce, or to rear or nurture their young, or
 - ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- b. to affect significantly the local distribution or abundance of the species to which they belong.

Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works and by Natural Resources Wales in Wales. In accordance with the requirements of the Regulations (2017, as amended), a licence can only be issued where the following requirements are satisfied:

- a. The proposal is necessary ‘to preserve 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’
- b. ‘There is no satisfactory alternative’
- c. The proposals ‘will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.’

Definition of breeding sites and resting places

Guidance for all European Protected Species of animal, including bats and great crested newt, regarding the definition of breeding and of breeding and resting places is provided by The European Council (EC) which has prepared specific guidance in respect of the interpretation of various Articles of the EC Habitats Directive. Section II.3.4.b) provides definitions and examples of both breeding and resting places at paragraphs 57 and 59 respectively. This guidance states that 'The provision in Article 12(1)(d) [of the EC Habitats Directive] should therefore be understood as aiming to safeguard the ecological functionality of breeding sites and resting places.' Further the guidance states: 'It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place.'