

South Downs National Park Authority

SHOREHAM CEMENT WORKS

Preliminary Roost Assessment of Cliffs



South Downs National Park Authority

SHOREHAM CEMENT WORKS

Preliminary Roost Assessment of Cliffs

TYPE OF DOCUMENT (VERSION) CONFIDENTIAL

PROJECT NO. 70089630 OUR REF. NO. PRA

DATE: FEBRUARY 2022

WSP

2 London Square Cross Lanes Guildford, Surrey GU1 1UN

Phone: +44 148 352 8400

WSP.com

vsp

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Remarks	Draft			
Date	February 2022			
Prepared by	Charlotte Hewitt			
Signature				
Checked by	Adrian Hutchings			
Signature				
Authorised by	Hattie Spray			
Signature				
Project number	70089630			
Report number	PRA			
File reference	\\uk.wspgroup.com\d Works\03 WIP\ECO	central data\Projects\7 LOGY\PBRA	0089xxx\70089630 - S	horeham Cement

CONTENTS

115

	EXECUTIVE SUMMARY	3
1.	INTRODUCTION	5
1.1.	PROJECT BACKGROUND	5
1.2.	ECOLOGICAL BACKGROUND	5
1.3.	BRIEF AND OBJECTIVES	6
2.	METHODS	7
2.1.	OVERVIEW	7
2.2.	PRA OF CLIFF FACES	7
2.3.	DATES OF SURVEY AND PERSONNEL	9
2.4.	NOTES AND LIMITATIONS	10
3.	RESULTS	11
3.1.	PRA OF CLIFF FACES	11
4.	IMPLICATIONS FOR DEVELOPMENT	17
4.1.	OVERVIEW	17
4.2.	LEGAL COMPLIANCE	17
4.3.	PLANNING POLICY COMPLIANCE	18
5.	RECOMMENDATIONS	19
5.1.	AVOIDANCE AND MITIGATION MEASURES	19
5.2.	ECOLOGICAL ENHANCEMENT MEASURES	21
6.	CONCLUSIONS	22
7.	REFERENCES	23

7.1.	PROJECT REFERENCES	23
7.2.	TECHNICAL REFERENCES	23
8.	FIGURES	24

TABLES

Table 2-1 – Cliff Face Suitability to Support Roosting Bats	8
Table 3-1 – PRA Results	11

FIGURES

Figure 1 - Site Location Plan	24
Figure 2a and 2b – Bat Roosting Suitability of Cliff Faces	24

APPENDICES

APPENDIX A PHOTOGRAPHS

EXECUTIVE SUMMARY

South Downs National Park Authority (SDNPA) is seeking to produce an Area Action Plan (AAP) for the Shoreham Cement Works (the 'Site'), which will sit alongside the recently adopted South Downs Local Plan (SDLP). For the purposes of the AAP, the Site has broadly been subdivided into four areas (Areas A - D) based on current usage, with the cliffs throughout comprising Area E.

WSP was commissioned by SDNPA to complete a Preliminary Roost Assessment (PRA) of the cliff faces within the Site, to inform the baseline for the AAP. A bespoke survey methodology was used to assess the roosting suitability of the cliff faces, due to the limited guidance and understanding on bat roosts in rock within the UK. The survey methodology comprised a ground level inspection of the cliff faces to record data on various structural elements on each cliff face in addition to any notable potential roosting features. Based on the survey data recorded, cliffs were assigned a high, moderate or low roosting suitability relative to other cliffs within the Site, using criteria adapted from the best available guidance and professional judgement. The PRA survey was completed in February 2022.

The Site was found to support chalk quarry cliff faces of high, moderate and low bat roosting suitability. Cliffs of high and moderate roosting suitability are broadly set back within areas away from existing Site activities, including cliff C3 with high suitability and moderate suitability cliffs C1 and C2 in Area C, and cliffs D1 and D2 with moderate roosting suitability in Area D.

Bats and their roosts are protected under national legislation, and are a material consideration under national and local planning policy. As such, it is recommended that wherever possible, all cliffs within the Site are retained and protected from disturbance (including from construction activities and lighting) as part of any future development at the Site.

It is acknowledged that it will likely be difficult to fully eliminate the risk of disturbance during construction even if all cliff faces were retained. Therefore, it is recommended that further survey of the cliffs is undertaken in advance of development, to determine the presence or likely absence of roosting bats from the cliffs. Depending on the conditions of the cliff, further survey should comprise at-height inspections (using a mobile elevated work platform or suitably trained and experienced climber) or ground level dusk emergence and dawn re-entry surveys using appropriate thermal or infra-red technology. Further survey should be specifically targeted towards cliffs where loss or disturbance from construction activities will occur.

More general recommendations with regards to updating the existing PRA of buildings within the Site, and mitigation with regards to a sensitive lighting strategy for any future development have also been provided within this report.

۱۱SD

1. INTRODUCTION

1.1. PROJECT BACKGROUND

- 1.1.1. WSP was commissioned by South Downs National Park Authority (SDNPA) to undertake a Preliminary Roost Assessment of the quarry cliff faces at Shoreham Cement Works (hereafter referred to as the 'Site'), to support the preparation of the Shoreham Cement Works Area Action Plan (AAP). The AAP will sit alongside the recently adopted South Downs Local Plan (SDLP), which covers the period 2014-2033.
- 1.1.2. Shoreham Cement Works is allocated under Policy SD56 of the SDLP for an exemplar mixed-use development, which delivers a substantially enhanced landscape and uses that are compatible with the purposes of the South Downs National Park.
- 1.1.3. The SDNPA is currently considering four development scenarios to be outlined within the AAP, broadly relating to residential, commercial and leisure developments. These scenarios consider different levels of development and differing mixes of areas allocated to different land use categories.

1.2. ECOLOGICAL BACKGROUND

- 1.2.1. The Site area covers 44ha and is centred at grid reference TQ202087, comprising a semi-derelict cement works, inactive chalk quarry, temporary inert recycling facility and a mix of temporary business uses. The Site is located about 5km north of Shoreham and 2km south of Upper Beeding. The location of the Site is shown on Figure 1.
- 1.2.2. Cement Production began at the end of the 19th Century with permission to extract chalk within the quarry being granted in 1946. Chalk extraction and cement production ceased in 1991. The whole site is in single private ownership and the SDNPA is the sole Local Planning Authority (LPA).
- 1.2.3. For the purposes of the AAP the Site has been divided into four main areas categorised according to location, historic use, and prevailing conditions. These areas are outlined as follows:
 - Area A west of the A283, containing the former offices for the cement works, currently occupied by a variety of temporary industrial and storage uses. Linked by a tunnel under the A283 to Area B;
 - Area B immediately east of the A283, containing the large buildings of the former cement works;
 - Area C the exhausted chalk quarry area which is partly used to produce recycled aggregates;
 - Area D the rear, elevated portion of chalk available for extraction; and
 - Area E the cliffs which are present across Areas B-D and dominate the landscape within the majority of the Site.
- 1.2.4. A Preliminary Roost Assessment (PRA) of the Site was completed in 2018 (TEC, 2018), which comprised internal and external inspections of buildings and structures on Site. The PRA identified a confirmed long-eared bat *Plecotus* sp. roost in a residential structure in the north-east of the Site, and a further 16 buildings or structures with low bat roosting suitability. While the cliff faces were not subject to direct assessment, the PRA did identify the suitability of cliffs to support both summer roosting and hibernating bats, with more detailed assessment recommended.



- 1.2.5. WSP completed a Preliminary Ecological Appraisal for the AAP in February 2022, which included a desk study search for records of bat species within 2km of the Site. A total of 42 records of bat roosts were identified within 2km of the Site, the largest roost comprising a common pipistrelle *Pipistrellus pipistrellus* maternity roost approximately 1.8km south of the Site. Additional species recorded incidentally within 2km of the Site included serotine *Eptesicus serotinus*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii*, Bechstein's bat *Myotis bechsteinii*, brown long-eared bat *Plecotus auritus*, grey long-eared bat *Plecotus austriacus*, barbastelle *Barbastella barbastellus*, Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri*, and whiskered bat *Myotis mystacinus*.
- 1.2.6. WSP has separately been commissioned to undertake bat activity surveys of the Site in 2022, comprising walked transects and deployment of static bat detectors. The results of this survey will be provided in a separate report upon completion of these surveys.

1.3. BRIEF AND OBJECTIVES

- 1.3.1. SDNPA commissioned WSP to complete a Preliminary Roost Assessment (PRA) of the cliffs within the Site in November 2021. The brief was to:
 - undertake a visual inspection of the cliff faces from ground level to search for features which may provide suitable roosting opportunities for bats;
 - classify the cliff faces as having either negligible, low, moderate or high suitability to support roosting bats, in line with Good Practice Guidelines (Collins, 2016), with the type of roost that may be supported also noted; and
 - produce a report detailing the methods and results for the PRA, including recommendations for further assessment or measures for avoidance, mitigation and compensation, where appropriate.
- 1.3.2. The results of this survey, and subsequent recommendations, are included within this report.

vsp

2. METHODS

2.1. OVERVIEW

- 2.1.1. A bespoke approach to the PRA has been adopted for the following reasons.
 - The size and scale of the cliffs present limits the extent of visual inspection of potential roosting features which can be conducted safely.
 - There is currently a very sparse record of confirmed bat roosts within rock habitats across the UK, and as such the knowledge base with regards to the suitability of cliffs to support roosting bats is somewhat limited.
 - Current good practice guidance for bat roost assessments (Collins, 2016) is largely targeted towards surveys of trees and built structures rather than rock faces.
 - It is considered that an assessment of suitability across whole cliff face sections, rather than suitability of numerous individual potential roosting features is more appropriate to inform the AAP for future development of the Site.
- 2.1.2. The bespoke approach comprises a ground level assessment of cliffs across the Site to provide a classification of roosting suitability for discrete sections of cliff faces. The classification of suitability is based on a number of factors set out in Section 2.2 relating to the nature of the cliff face and the individual potential roosting features observed. This approach has been informed by good practice guidance (Collins, 2016) and the 'Bat Rock Habitat Key' (Andrews, 2021), an ongoing survey initiative designed to further understanding of the ways in which bats utilise rock-based habitats.
- 2.1.3. While the cliff faces are broadly identified within the Site as Area E, cliff faces around the Site were divided into discrete sections as far as possible based on prevailing aspect and positioning within the Site relative to the other areas (e.g. associated with Area B, Area C or Area D) for ease of identification. The location of the cliff faces surveyed are presented in Figure 2. No cliff faces were present within Area A and as such this area of the Site was not subject to survey.

2.2. PRA OF CLIFF FACES

- 2.2.1. All cliff faces within the Site (as shown on Figure 2a) were inspected from ground level to enable an assessment of their potential to support bat roosts. Due to health and safety concerns relating to the size and scale of the cliff faces, it was not possible to inspect cliff faces for evidence indicating the current or historic use of the cliffs by roosting bats.
- 2.2.2. A visual inspection of each cliff face using binoculars was completed to record information on the cliff face itself, in addition to data on any notable potential roosting features observed. This data was then considered in combination to provide a high-level indication of bat roosting suitability.
- 2.2.3. Data collected relating to the cliff faces included the following, as informed by the Bat Rock Habitat Key assessment of rock faces (Andrews, 2021):
 - landform of the cliff face (e.g. quarry, natural escarpment, crag, tor, gorge, cutting);
 - habitat present on or within the immediate surrounding of the cliff face;
 - activities (i.e. potential disturbance) within the immediate vicinity;
 - approximate height range of cliff face;
 - angle of cliff face (e.g. reclined, sheer, overhung); and
 - aspect of cliff face.



- 2.2.4. Notable potential roosting features observed on each cliff face were mapped and characterised in line with criteria set out in the Bat Rock Habitat Key (Andrews, 2021) including the following.
 - Type of potential roosting feature for crevices, defined based on orientation as either:
 - Cracks vertical crevices that extend perpendicular into the cliff face;
 - Breaks horizontal crevices that extend perpendicular into the cliff face; or
 - Flakes vertical crevices comprising a detached slab of cliff face such that the entrance is in a corner (can open top down, bottom up or flanking across the cliff face).
 - Type of potential roosting feature for voids, defined by the size of the entrance as either:
 - Mono a hole only large enough for one finger;
 - Bidoigt a hole that has enough room for two fingers;
 - Pocket a hole in the cliff face which is big enough and extends in far enough to be used as a hand hold;
 - Bucket a hole bigger than a hand but not larger than typical bucket-size; or
 - Off-width an alcove opening into the cliff face.
 - Approximate height of potential roosting feature.
 - Entrance aspect of potential roosting feature.
 - Approximate entrance width of potential roosting feature (where possible to judge from ground level).
- 2.2.5. The Bat Rock Habitat Key is designed for aerial surveys of rock forms and as such, where void features were present, it was not always possible to definitively classify the void type (e.g. mono, pocket etc) from ground level. Void classifications presented in this report should therefore be considered as approximate until further assessment can be completed.
- 2.2.6. There is currently no single accepted approach for assessing rock face suitability to support roosting bats. Therefore, using the information on the cliff face meso-environment and notable potential roosting features recorded, a set of qualitative criteria were designed to provide an indication of relative roosting suitability for each cliff face. The criteria were drafted with reference to the limited available data on known roosts within rock faces presented in the Bat Rock Habitat Key (Andrews, 2021), good practice guidance (Collins, 2016) and professional judgement. The criteria used for this assessment are set out below in Table 2-1.

Table 2-1 – Cliff Face Suitability to Support Roosting Bats

Suitability Category	Relevant criteria
High	 Solid cliff face with a southerly, south-westerly or south-easterly aspect. Numerous notable crevice or void potential roosting features present and likely to be relatively unexposed. Vegetation cover is present to afford some foraging opportunities and habitat connectivity in the immediate vicinity of the cliff face, but is not so extensive to as to completely obscure the potential features or contribute to shading within the cliff face. Cliff face is set away from disturbance features including industrial activity and associated lighting.

Suitability Category	Relevant criteria
Moderate	 Solid cliff face with an easterly or westerly aspect, which may have some scree components. Occasional notable crevice or void potential roosting features present and likely to be relatively unexposed. Vegetation cover is present to afford some foraging opportunities and habitat connectivity in the immediate vicinity of the cliff face, but is somewhat extensive resulting in some shading and the partial obscuration of potential roosting features within the cliff face. Cliff face is set away from disturbance features including industrial activity and associated lighting.
Low	 Solid cliff face with a northern, north-western, or north-eastern aspect, and may include a large scree component. Minimal notable crevice or void potential roosting features present and somewhat exposed. Vegetation cover is extensive across the cliff face, resulting in shading and the partial obscuration of potential roosting features within the cliff face. Cliff face is in proximity to disturbance features including industrial activity and associated lighting.

- 2.2.7. The size and scale of the cliffs, which in parts reach heights of approximately 60m, are such that a ground level assessment with binoculars is unlikely to capture all of the potential roosting features present. Therefore, it was not considered appropriate to include a category of 'negligible' roosting suitability within this assessment.
- 2.2.8. Similarly, because potential roosting features were present at height and therefore not able to be inspected internally with regards to cavity/void size and micro-climate, it is not possible to provide a meaningful indication of the potential to support different roost types within this assessment. Until further detailed inspections can be completed, all potential roosting features recorded are considered suitable to support maternity roosts, hibernation roosts and summer/transitional roosts.

2.3. DATES OF SURVEY AND PERSONNEL

- 2.3.1. The PRA of cliff faces was led by an experienced surveyor (Natural England survey licence number: 2019-39048-CLS-CLS). The lead surveyor has six years' experience of ecological survey, including extensive bat survey experience and has held a Natural England bat survey licence since 2018.
- 2.3.2. The PRA of cliff faces was completed on 2 and 3 February 2022 in dry conditions, ranging from bright and clear to overcast.



2.4. NOTES AND LIMITATIONS

- 2.4.1. There were no access constraints for any of the cliff faces targeted for survey.
- 2.4.2. As detailed in Section 2.1, the assessment was completed using a bespoke methodology based on the limited available information regarding bat roosts in UK rock features. It is considered that this is sufficient to provide an indication of relative bat roosting suitability across the cliffs present, and is in turn appropriate for considering the ecological baseline of the Site with regards to the development of the AAP. Recommendations for more detailed inspections of potential roosting features upon identification of more detailed development plans for the Site have been provided in this report, which should help to confirm the presence or likely absence of roosting bats from any cliff faces likely to be impacted by future development.
- 2.4.3. Quarry cliff faces are subject to change over time, with the creation and loss of crevice and void features as rocks fall away or as the cliff faces are subject to management. As such, the results of this survey should be considered valid for up to 18 months, in accordance with best practice guidance (CIEEM, 2019). Recommendations for updated assessment of the cliff faces with regards to bats are recommended in advance of any future development of the Site, as set out in Section 5.

3. RESULTS

3.1. PRA OF CLIFF FACES

- 3.1.1. One cliff face (C3) was found to have high suitability to support roosting bats, with a further six cliff faces assigned moderate suitability and the remaining five assigned low suitability. Cliffs with high and moderate roosting suitability are predominantly those set back some way from the current cement works activities, while cliffs with low roosting suitability primarily comprise those most closely associated with the access road and general site activities.
- 3.1.2. The results of the PRA, including notable potential roosting features observed, are presented in Figure 2b and below in Table 3-1. Photographs of notable potential roosting features described in Table 3-1 are provided in Appendix A.

Cliff Reference	Description	Suitability Category
Β1	 Solid, quarry cliff curved in a crescent shape, with reclined and sheer faces South and south-western aspects Approximately between 30-40m high Sheltered with dense buddleia at base of cliff and scattered scrub along its length. South-western aspect has highest suitability due to scarified nature of the cliff face, whereas the southern aspect is predominantly scree and light rock. No notable potential roosting features observed. While the cliff face features optimal aspects for roosting, the matrix of the rock face (including the coverage of scree) has resulted in an absence of notable potential roosting features. Additionally, the cliff face fronts onto an area of regular movements of heavy goods vehicles and regular disturbance. Therefore, low roosting suitability is assigned.	Low
B2	 Solid vertical quarry cliff face Western aspect Approximately10-20m high Quite sheltered due to site positioning and nearby structures Lower half comprises steep scree and dirt slopes. Limited scattered vegetation at mid bench comprising buddleia and young trees Prominent features observed along the length including: small flake approximately 30cm wide (B2.A) vertical crack in two parts, each approx. 0.5m long with approx. 30cm openings (B2.B) open flake with horizontal and vertical components, covering an area 2m long and 0.4m wide at its widest point (B2.C) wide break in overhang at join with B3 cliff, open and exposed at entrance but may narrow at angle into cavity (B2.D) 	Moderate

Table 3-1 – PRA Results



Cliff Reference	Description	Suitability Category
	Cliff face features four notable potential roosting features and a westerly aspect, but is located in close proximity to regular heavy goods vehicle movements and general construction disturbance. Moderate roosting suitability has therefore been assigned.	
В3	 Solid vertical quarry cliff face Northern aspect Approximately 20-30m high Sheltered with significant ivy cover throughout, and particularly dominant at the western extent where potential features may be obscured. Narrow band of scree is present along the base of the cliff face, otherwise solid rock is present throughout. Prominent features observed along the length, including: diagonal cracks, ranging between 0.5m – 5m long, recorded at eastern extent and in the centre of the cliff extent (B3.A) large bucket voids in lower portion of cliff, possibly associated with investigative activities, approximately 0.4m diameter (B3.B) small break beneath a large rock, approximately 0.5m long cluster of small cracks in cliff face above area of ivy growth, approximately 0.3m long (B3.C) large flake at top of cliff, approximately 0.4m long and 0.2m wide (B3.D) flake approximately 0.5m long in small clearing on cliff otherwise surrounded by ivy, approximately 0.1m wide (B3.F), above office unit, approximately 0.5m long and 0.1m wide While the cliff face supports at least six notable potential roosting features, the extensive ivy cover towards the western end of the cliff is likely to contribute to significant shading in addition to the northern aspect. Similarly, the cliff face fronts the main access road round to the rear of the cement works and as such is subject to regular heavy goods vehicle movements and disturbance. Therefore, moderate roosting suitability is assigned. 	Moderate
C1	 Solid, reclined quarry cliff face with benches, curved in a crescent shape South and south-eastern aspects Approximately 10-20m high, tapering to less than 5m high moving east to west around the length. Scree component of cliff increases moving westwards Vegetation cover is minimal throughout, with some scattered Buddleia present along the upper benches. Somewhat exposed due to high positioning within the Site One prominent feature observed, comprising a large diagonal crack approximately 3m long, with multiple openings appearing to lead back into the cliff face (C1.A). Despite the optimal southern and south-eastern aspects, and the minimal disturbance experienced in this area of the Site, a moderate 	Moderate

Cliff Reference	Description	Suitability Category
	roosting suitability has been assigned due to the relative paucity of notable potential roosting features observed.	
C2	 Solid, vertical quarry cliff face, curved in a crescent shape South-eastern and north-eastern aspects Cliff height ranges between 5-10m on south-eastern aspects, and 10-20m high on north-eastern aspects Cliff is somewhat sheltered due to position of nearby cliffs and curved shape. Limited scattered vegetation is present on shorter aspects, with significant buddleia encroachment on taller aspects which is potentially obscuring features and is resulting in shading. Prominent features recorded include the following: 	Moderate
	 Multiple cracks on south-eastern aspects at upper sections of cliff, between 0.3m and 0.5m long (C2.A) Jagged crack on north-east aspect approximately 1.5m long potentially leading into a large cavity (C2.B) Crack approximately 0.5m long on north-east aspect towards top of cliff (C2.C). 	
	Moderate roosting suitability is assigned due to the sub-optimal north- eastern aspects of the cliff, the limited number of notable features recorded, and the positioning of the cliff away from the main industrial activity of the Site.	
C3	 Solid, curved, benched quarry cliff face with sheer and overhung sections Southern and south-western aspects Southern aspect is approximately 5-10m high and benched south-western aspect is 20-30m high Cliff somewhat sheltered due to position of adjacent cliff faces Scattered vegetation is limited on southern aspect, with significant buddleia encroachment on the benches of the south-western aspect, which may be potentially obscuring potential roosting features Prominent features recorded include the following: Two cracks (one vertical and one diagonal) in close proximity, between 0.5m and 1.5m long (C3.A) Short crack approximately 0.4m long (C3.B) Crack with two entrances on outcrop leading into large cavities, each approximately 0.4m long and 10cm wide (C3.C) Multiple cracks running along the height of the cliff, approximately 5m long, on outcrop (C3.D) Around the south-west facing aspects, the cliff becomes constructed from large boulders with overhangs that feature multiple significant cracks (C3.E) 	High
	High roosting suitability is assigned due to optimal aspects of the cliff faces, the number of notable potential roosting features observed, and the relatively low disturbance experienced in this area with only minimal landscaping occurring at the time of survey.	

Cliff Reference	Description	Suitability Category
C4	 Solid, reclined quarry cliff facing with evidence of past benching somewhat faded North-western aspect 50-60m high Quite sheltered due to position of adjacent cliff faces Significant vegetation cover along the lower sections, particularly towards the southern extent where dense scrub is abundant at the base of the cliff Prominent potential roosting features include the following: three cracks on rocky outcrop at northern extent, approximately 0.5m long each (C4.A) cluster of flakes at different heights towards centre of cliff length (C4.B) cracks in ground level boulders at base of cliff, approximately 5cm wide (C4.C) open pocket void in cliff face approximately 15cm wide and high (C4.D) Cliff matrix become very scree dominated at southern end with no prominent features visible here. Scale of cliff face makes ground level survey somewhat challenging. Low roosting suitability assigned due to the limited number of notable potential roosting features observed, the sub-optimal aspect of the cliff and the significant coverage of scree and vegetation, particularly at the southern extent.	Low
C5	 Solid, vertical, benched quarry cliff face Northern aspect Approximately 30-40m high Somewhat sheltered due to positioning of adjacent cliff faces. Matrix is predominantly formed of scree apart from the upper third of the cliff along its length Scrub coverage is significant along the base and scattered along the middle bench One prominent potential roosting features observed, comprising a small crack towards the western extent (C5.A). Low roosting suitability is assigned due to the sub-optimal aspect of the cliff face, the minimal observed prominent potential roosting features and the proximity to regular heavy vehicle movements and construction activities. 	Low
C6	 Short, solid vertical section of quarry cliff outcrop Eastern aspect Approximately 10-20m high Sheltered due to positioning of adjacent cliff faces Limited vegetation cover comprising grassy edges and scattered buddleia at the base. 	Low

Cliff Reference	Description	Suitability Category
	 Prominent potential roosting features comprised a cluster of several cracks approx. 1m long at varying heights at the northern extent of the face (C6.A). Low roosting suitability is assigned due to the small number of potential roosting features observed, the sub-optimal aspect of the cliff, and the proximity to regular heavy vehicle movement and construction activities. 	
D1	 Solid, reclined quarry cliff face with some relic benching from past quarrying activities Northern aspect Soft scree more prevalent at the western extent. Approximately 20-30m high Vegetation cover, dominated by buddleia, increases across the middle bench towards the eastern extent Sheltered due to position of adjacent cliff faces Notable prominent features recorded include the following: Cracks approximately 5m long and 0.1m wide along the upper bench (D1.A) Large cracks on outcrop midway along the cliff (D1.B) Large flake approx. 0.5m long (D1.C) Moderate roosting suitability is assigned, despite the sub-optimal aspect, due to the number of potential roosting features observed and the positioning of the cliff face set back away from current activities associated with the cement works. 	Moderate
D2	 Solid, reclined quarry cliff face with relic benches from past quarrying activity. Approximately 30-40m high Western aspect Lower benches feature significantly more scree than upper sections Vegetation cover is minimal, with some buddleia scattered along the lower and middle benches Somewhat exposed due to positioning within the Site Prominent potential roosting features observed include the following: Flake approximately 0.5m long leading into cavity in upper bench (D2.A) Large off-width void approximately 0.5m x 0.5m wide at its widest point, with a diagonal crack with smaller openings running directly above (D2.B) Moderate roosting suitability assigned due to western aspect, low number of notable features observed and the positioning of the cliff face away from disturbance activities.	Moderate
D3	 Solid, vertical quarry cliff face Approximately 20-30m high at the highest point, but decreases moving east to west South aspect Vegetation cover is minimal and scattered along the middle band of the cliff 	Low

Cliff Reference	Description	Suitability Category
	 Somewhat exposed due to positioning within the Site Only prominent potential roosting feature includes a diagonal crack with two entrances approximately 0.3m long (D3.A). 	
	Low suitability assigned despite optimal aspect and positioning away from disturbance activities, due to paucity of potential roosting features observed.	

4. IMPLICATIONS FOR DEVELOPMENT

4.1. OVERVIEW

- 4.1.1. All cliffs surveyed within the Site are considered to have suitability to support roosting bats. However, due to the limitations of a ground level assessment, it was not possible to determine the presence or likely absence of roosting bats from these cliffs. Wherever possible, it is recommended that the cliffs are retained in their entirety and protected from disturbance as part of any future development scenario at the Site to avoid the risk of direct effects to bat roosts, in compliance with national legislation and planning policy set out below.
- 4.1.2. Given the nature of the Site, it is recognised that even if the cliffs were retained in their entirety, it would be difficult to completely avoid disturbance impacts during construction activities for any future development of the Site. Therefore, further targeted survey is recommended to identify the presence or likely absence of roosting bats within the cliffs, to help inform design for any future developments. Recommendations as to how the legislation and planning policy below may be satisfied are set out in Section 5.

4.2. LEGAL COMPLIANCE

- 4.2.1. Bats and their roosts are afforded a high level of protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitat Regulations'), the legislation means that it is an offence to:
 - deliberately capture, injure or kill a wild bat;
 - deliberately disturb wild bats; '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.' and
 - damage or destroy a breeding site or resting place used by this species.
- 4.2.2. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of animals when using places of shelter, and obstruction of access to places of shelter.
- 4.2.3. Due to the high level of protection afforded to bats and their habitat, mitigation for this species is governed by a strict licensing procedure administered by Natural England (normally, planning permission must be obtained before a licence can be sought). Licencing is subject to three tests, as defined under the Habitats Regulations 2017 (as amended) Regulation 55, these must also be applied by the planning authority before granting permission for activities affecting bats. For permission to be granted the following criteria must be satisfied:
 - The proposal is necessary for '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';
 - 'There is no satisfactory alternative'; and



- 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'.
- 4.2.4. Certain species of bats including the noctule bat *Nyctalus noctula*, brown long-eared bat *Plecotus auritus* and soprano pipistrelle *Pipistrellus pygmaeus* bat are also listed as a Species of Principal Importance (SPI) for the Conservation of Biodiversity in accordance with Section 41 of the NERC Act 2006. Under Section 40 of the NERC Act, public bodies (including local planning authorities) have a duty to have regard for the conservation of SPI when carrying out their functions, including determining planning applications.

4.3. PLANNING POLICY COMPLIANCE

- 4.3.1. At the national level the National Planning Policy Framework (2021) forms the basis for planning system decisions with respect to conserving and enhancing the natural environment, including bats; the ODPM circular 06/2005 also provides supplementary guidance, including confirmation that 'the presence of a protected species is a material consideration when a planning authority is considering a development proposal'.
- 4.3.2. The NPPF sets out, amongst other points, how at an overview level the 'planning system should contribute to and enhance the national and local environment by:
 - ...recognising... the wider benefits of natural capital and ecosystem services; and
 - minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures...'
- 4.3.3. A list of principles which local planning authorities should follow when determining planning applications is included in the NPPF, and includes the following:
 - '- if significant harm resulting from a development cannot be avoided...adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
 - ...opportunities to incorporate biodiversity in and around developments should be encouraged;
 - development resulting in the loss or deterioration of irreplaceable habitats should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists.'
- 4.3.4. At a local level, Strategic Policy SD9 of the SDLP states that development proposals will only be permitted where they 'conserve and enhance biodiversity'. In particular, Strategic Policy SD9 requires that 'prior to determination, up-to-date ecological information should be provided which demonstrates that development proposals; a) retain, protect and enhance features of biodiversity and geological interest (including supporting habitat and commuting routes through the site...)'.
- 4.3.5. To ensure compliance with the legislation and planning policy described above, it is recommended that all cliffs within the Site are retained and protected from disturbance (such as may occur from artificial lighting and construction activities) as part of any future development, due to the potential of these cliff faces to support a bat roost.
- 4.3.6. Where sections of cliff cannot be retained, or where potential impacts from disturbance cannot be avoided, further targeted survey will be required to determine the presence or likely absence of roosting bats from the cliff faces, as set out in Section 5.

5. **RECOMMENDATIONS**

5.1. AVOIDANCE AND MITIGATION MEASURES AVOIDANCE AND FURTHER SURVEYS

- 5.1.1. Wherever possible, it is recommended that all cliff faces within the Site are retained and incorporated into any future development designs to ensure continued habitat suitability for roosting bats and to minimise the risk of damage or disturbance to roosting bats. Where it is not possible to retain all cliff faces, cliffs identified within this report as having high or moderate roosting suitability should be retained as a priority over cliffs with low roosting suitability.
- 5.1.2. It is acknowledged that even if all cliffs are retained in a future development, construction activities are likely to be extensive and as such it will be difficult to minimise the impacts of disturbance to retained cliff faces. Therefore, further survey of the cliff faces is recommended to determine the presence or likely absence of roosting bats to help inform future development of the Site. Where cliff faces cannot be retained, such further survey should be specifically targeted towards these cliffs, in addition to the remainder of the Site.
- 5.1.3. Based on the nature of the cliffs, it is recommended that any further survey to determine presence or likely absence comprises the following:
 - At-height inspections of cliff faces where safe and practicable, an experienced and qualified climber and bat licence holder could be employed to undertake climbed inspections of the potential roosting features within the cliff faces. This method has the benefit of enabling a close inspection of potential roosting features recorded at ground level, and can result in direct observation of evidence of roosting bats (e.g. droppings or bats *in situ*), but is dependent on the stability of the cliffs to ensure a safe survey. Depending on the ground conditions of the quarry, it is possible that some potential roosting features on lower cliffs could also be subject to at-height inspection using a Mobile Elevated Work Platform (MEWP) or similar; and/or
 - Dusk emergence and/or dawn re-entry surveys surveyors will observe potential roosting features from a safe distance at ground level to watch for bats emerging from or returning to roost. Due to the nature of the cliffs, such surveys would need to be conducted using infrared or thermal imaging cameras for better visualisation of bat movements. This survey is recommended where at-height inspections aren't able to be completed for safety reasons.
- 5.1.4. While at-height inspections can be completed at any time of year, it is recommended that these are conducted during the bat active season (May to September inclusive) to inform the presence or likely absence of summer roosts. The close inspections completed during at-height inspections can also be used to determine the suitability of potential roosting features to support winter hibernation roosts (and any subsequent hibernation survey requirements as appropriate).
- 5.1.5. Dusk emergence and dawn re-entry surveys should be completed during the bat active season (May to September inclusive).
- 5.1.6. Due to the limited UK data available on roosting bats in cliff faces (as set out in Section 2.1), it is recommended that all cliff faces (where impacts cannot be avoided) are subject to three further survey visits (either at-height or dusk/dawn survey) to determine presence or likely absence of roosting bats, regardless of bat roosting suitability assigned during this survey. The survey methodology used within this report was designed to provide an indication of relative bat roosting

suitability between all of the cliffs present, to help inform an AAP for the Site, and is not directly relatable to the recommended further survey effort based on suitability set out in best practice guidance (Collins, 2016).

- 5.1.7. Findings of the further surveys should be used to inform any future development of the Site, with any confirmed bat roosts identified to be retained as a priority or otherwise subject to destruction under licence from Natural England with mitigation measures appropriate to the type of roost affected.
- 5.1.8. The scope of this report relates to the bat roosting suitability of cliff faces within the Site. Bat colonies often use a range of roost locations within different environmental conditions. As such it is important to consider the cliff faces in the context of other potential and confirmed roosting locations nearby. Previous surveys of the Site have identified a confirmed *Plecotus* sp. roost within one building, and additional buildings with bat roosting suitability (TEC, 2018). Due to the time which has elapsed since this survey effort, it is recommended that updated PRA surveys of the Site, including buildings and other structures (and further presence/likely absence surveys for roosting bats, if required) are completed in advance of any future development, to provide an updated baseline and to inform future mitigation which may be required.
- 5.1.9. More general mitigation considerations relating to roosting bats across the Site, including the cliffs and the buildings, are also provided below.

LIGHTING

- 5.1.10. The cliff faces within the Site are not currently illuminated by activities within the Site. Therefore, there is a risk that any new temporary or permanent lighting associated with both the construction phase and operational phase of any future development could have a negative effect upon potential bat roosts within the cliffs, if retained.
- 5.1.11. It is recommended that a sensitive lighting strategy is produced for any future development at the Site. The lighting strategy should be designed in adherence to best practice guidance (ILP, 2018) and with reference to the South Downs Dark Skies Technical Advice Note (SDNPA, 2021). In particular the following should be included in the strategy.
 - Any required lighting should adhere to the general lighting principles set out in Section 2 and the relevant development-specific principles in Section 3 of the Technical Advice Note (SDNPA, 2021).
 - Wherever possible, future developments should consider the use of IDA 'Dark Sky Friendly Lighting' or similar luminaires as shown in Section 11 of the Technical Advice Note (SDNPA, 2021).
 - Installation of new permanent or permanent lighting should seek to avoid direct illumination of retained cliff faces wherever possible, and specifically avoid direct illumination of identified potential roosting features and confirmed roosts.
 - Where lighting cannot be avoided, light spill should be minimised using hoods, louvres or other design features.
 - Narrow spectrum light sources should be used wherever possible to lower the range of species affected by lighting. Specifically, light sources should use warm, neutral colour temperatures below 2700k.
 - Light sources which emit ultraviolet light should be used, to avoid attracting night-flying insects which in turn may attract bats to the light and leave them vulnerable to predation.

5.1.12. It is likely that recommendations relating to lighting for future development scenarios at the Site will be refined following the results of the bat activity surveys to be completed in 2022.

5.2. ECOLOGICAL ENHANCEMENT MEASURES

- 5.2.1. Planning policy promotes the inclusion of ecological enhancement, accordingly it is recommended that consideration is given to the following enhancement measures for bats to be incorporated within any future development for the Site.
 - Inclusion of nectar-rich plant species in soft landscaping areas that are attractive to night-flying insects to enhance foraging opportunities for bats.
 - Creation of linear vegetation (treelines and hedgerows) within any landscaping scheme to provide additional commuting corridors across the Site for bats.
 - Provision of standing waterbodies to provide an additional foraging resource for bats using the site, which may benefit *Myotis* and *Nyctalus* bats in particular.
 - Installation of bat bricks or bat tubes (above those as may be required for mitigation and compensation any known roosts identified from further survey) into the fabric of any new buildings to increase the roosting opportunities on Site for bats.
- 5.2.2. It is expected that the above ecological enhancement measures will become more targeted towards any species identified as using the Site following the recommended further presence/likely absence surveys and the bat activity surveys to be completed in 2022.



6. CONCLUSIONS

- 6.1.1. The Site supports chalk quarry cliff faces of high, moderate and low bat roosting suitability (relative to each other). Cliffs of high and moderate suitability are broadly situated further back within the Site, away from current activities associated with the cement works, and feature multiple prominent potential roosting features. It is recommended that any future development for the Site seeks to retain all cliff faces, but particularly those with moderate and high roosting suitability.
- 6.1.2. The PRA surveys were undertaken as a ground level assessment, as such it was not possible to confirm presence or likely absence of roosting bats within potential roosting features recorded. Future development of the Site is likely to result in disturbance of roosting bats, if present, even if cliffs are retained. Therefore, it will be necessary to determine the presence or likely absence of roosting bats within the cliff faces to ensure future designs and mitigation can appropriately account for roosting bats in line with national legislation and planning policy.
- 6.1.3. Further surveys recommended should comprise either at-height inspections of potential roosting features by a trained and experienced climber (where safe to do so) or with MEWP where heights and ground conditions allow, or otherwise ground level dusk emergence and dawn re-entry surveys using appropriate night vision or thermal equipment.
- 6.1.4. Additional recommendations for future developments have been made with regards to lighting, to ensure that designs minimise the impacts of construction and operational lighting on roosting bats. Any future lighting strategy should be designed in accordance with best practice guidance and guidance specific to the South Downs National Park.

7. **REFERENCES**

7.1. PROJECT REFERENCES

• The Ecology Consultancy (TEC) (2018) Shoreham Cement Works, West Sussex: Preliminary Ecological Appraisal and Preliminary Roost Assessment.

7.2. TECHNICAL REFERENCES

- Andrews, H. (2021) Bat Roosts in Rock: A guide to identification and assessment for climbers, cavers and ecology professionals. Pelagic Publishing.
- Bat Conservation Trust (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd Edition). Bat Conservation Trust, London.
- Chartered Institute for Ecology and Environmental Management (CIEEM) (2019) Advice Note: On the life span of ecological reports and surveys. Available online: <u>https://cieem.net/wpcontent/uploads/2019/04/Advice-Note.pdf</u> [Accessed February 2022]
- Her Majesty's Stationary Office (HMSO) (1981). Wildlife and Countryside Act (as amended by the Countryside and Rights of Way Act 2000)
- HMSO (2006) Natural Environment and Rural Communities Act.
- HMSO (2017). The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitat Regulations)
- Institute of Lighting Professionals (ILP) (2018) Guidance Note 08/18: Bats and Artificial Lighting in the UK. Bat Conservation Trust, London. Available online: https://cdn.bats.org.uk/uploads/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lightingcompressed.pdf?v=1542109349 [Accessed February 2022].
- Ministry of Housing, Communities and Local Government (MHCLG) (2021), National Planning Policy Framework. MHCLG, London.
- South Downs National Park Authority (SDNPA) (2021) South Downs National Park Dark Skies Technical Note (Version 2) (May 2021). Available online: https://www.southdowns.gov.uk/wpcontent/uploads/2021/06/DNS-TAN-2021-Main-Document-External-Lighting.pdf [Accessed February 2022].



8. FIGURES

Figure 1 - Site Location Plan

Figure 2a and 2b – Bat Roosting Suitability of Cliff Faces



Key Shoreham Cement Works		
^{yy} A2037	dburton	
ng Castle Upper St Mary s House	216, FL DOWN	
Botolphs	EHAM	
North Lancing	SEAT	
Rrighton City		
Client: South Downs National Park Auth	ority	
Project: Shoreham Cement Works		
Title Site Location Plan		
Drawing No:FIGURE 1Drawn:Date:16/02/2022CheckedScale:7,500 @ A3Approve	JR ^{tt} CH ^{dt} OP	
	Key Shoreham Cement Works Shoreham Cement Works Image: Shoreham Cement Works Image: Strands of Castle Gastle	













Appendix A

PHOTOGRAPHS

vsp

۱۱SD

Table A-1 – Photographs of notable potential roosting features



Photo 1. Cliff B1, with low roosting suitability.

Photo 2. Cliff B2, with moderate roosting suitability.



Photo 3. Small flake in Cliff B2 (B2.A on Figure 2b)

Photo 4. Vertical crack in cliff B2 (B2.B on Figure 2b)



Photo 5. Open flake in Cliff B2 (B2.C on Figure 2b)

Photo 6. Break in Cliff B2 (B2.D on Figure 2)

vsp



Photo 7. Cliff B3, with moderate roosting suitability

Photo 8. Diagonal cracks in Cliff B3 (B3.A on Figure 2)



۱۱SD



vsp



Photo 15. Large diagonal crack in Cliff C1 (C1.A on Figure 2)

Photo 16. Cliff C2, with moderate roosting suitability



vsp







Photo 25. Gaps around overhangs on Cliff C3 (C3.E on Figure 2)

Photo 26. Cliff C4 with low roosting suitability

vsp



Photo 27. Cracks on rocky outcrop of Cliff C4 (C4.A on Figure 2)

Photo 28. Flakes on Cliff C4 (C4.B on Figure 2)



Photo 29. Cracks in ground level boulders of Cliff C4 (C4.C on Figure 2)

Photo 30. Open pocket void on Cliff C4 (C4.D on Figure 2).



Photo 31. Cliff C5, with low roosting suitability

Photo 32. Small crack in Cliff C5 (C5.A on Figure 2)





Photo 33. Cliff C6, with low roosting suitability

Photo 34. Cluster of cracks in Cliff C6 (C6.A on Figure 2)



Photo 35. Cliff D1, with moderate roosting suitability



Photo 36. Large flake in Cliff D1 (D1.C on Figure 2)

vsp





2 London Square Cross Lanes Guildford, Surrey GU1 1UN

wsp.com