



Proposed Solar Farm, Barry Docks, Wales

Stage 1 Bat Survey

For

Associated British Ports

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Contents

1. Summary and Main Recommendations	4
1.1 Summary	4
1.2 Main recommendations	4
2. Introduction	5
2.1 Development Background	5
2.2 Ecology Background	5
2.3 The Brief and Objectives	5
2.4 Limitations	5
3. Methodology	6
3.1 Stage 1 - Daytime Inspection of Potential Roosts	6
4. Results	9
5. Legal and Planning Policy Issues	20
6. Recommendations	21
6.1 Further Surveys	21
7. Conclusion	23
8. References	24
9. Appendix 1 - Bat Biology and Legislation	25
9.1 Biology	25
9.2 Site Designation	26
9.3 Species Protection	27
9.4 UK Biodiversity Action Plan and Species of Principal Importance	28
9.5 References	29

FIGURE 1 SITE LOCATION

FIGURES 2A -2E STAGE 1 BAT INSPECTION RESULTS

1. Summary and Main Recommendations

1.1 Summary

1.1.1 Associated British Ports (ABP) is proposing to construct a solar farm on a brownfield site in Barry Docks, South Wales. The exact proposals have yet to be determined but some removal of habitat or demolition of buildings may be considered as part of the feasibility study. An extended Phase 1 habitat survey was undertaken by Thomson Ecology in April 2014. This survey identified suitable foraging habitat on site for bats and a number of buildings that could support features suitable for roosting bats. Thomson Ecology was then commissioned to undertake a Stage 1 bat survey of buildings on site to identify the potential likelihood of them being used by roosting bats.

1.1.2 Internal access could not be gained to 14 of the buildings, nine (B4, B7, B8, B10, B11, B13, B16, B22 and B23) of which we were able to rule out with negligible potential to support roosting bats. Of the remaining five buildings, three (B5, B9 and B17) were classified as having low potential and two (B12 and B18) were classified as having moderate potential to support roosting bats.

1.1.3 Internal access was possible to nine of the buildings on site, two (B3 and B15) had negligible potential to supporting roosting bats, five (B1, B6, B19, B20 and B21) were classified as having low potential, and the remaining two (B2 and B14) as having moderate potential. No evidence of bats was recorded during the survey.

1.1.4 Bats are protected at national and European level and it is an offence to deliberately kill, injure or disturb a bat, or intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a bat.

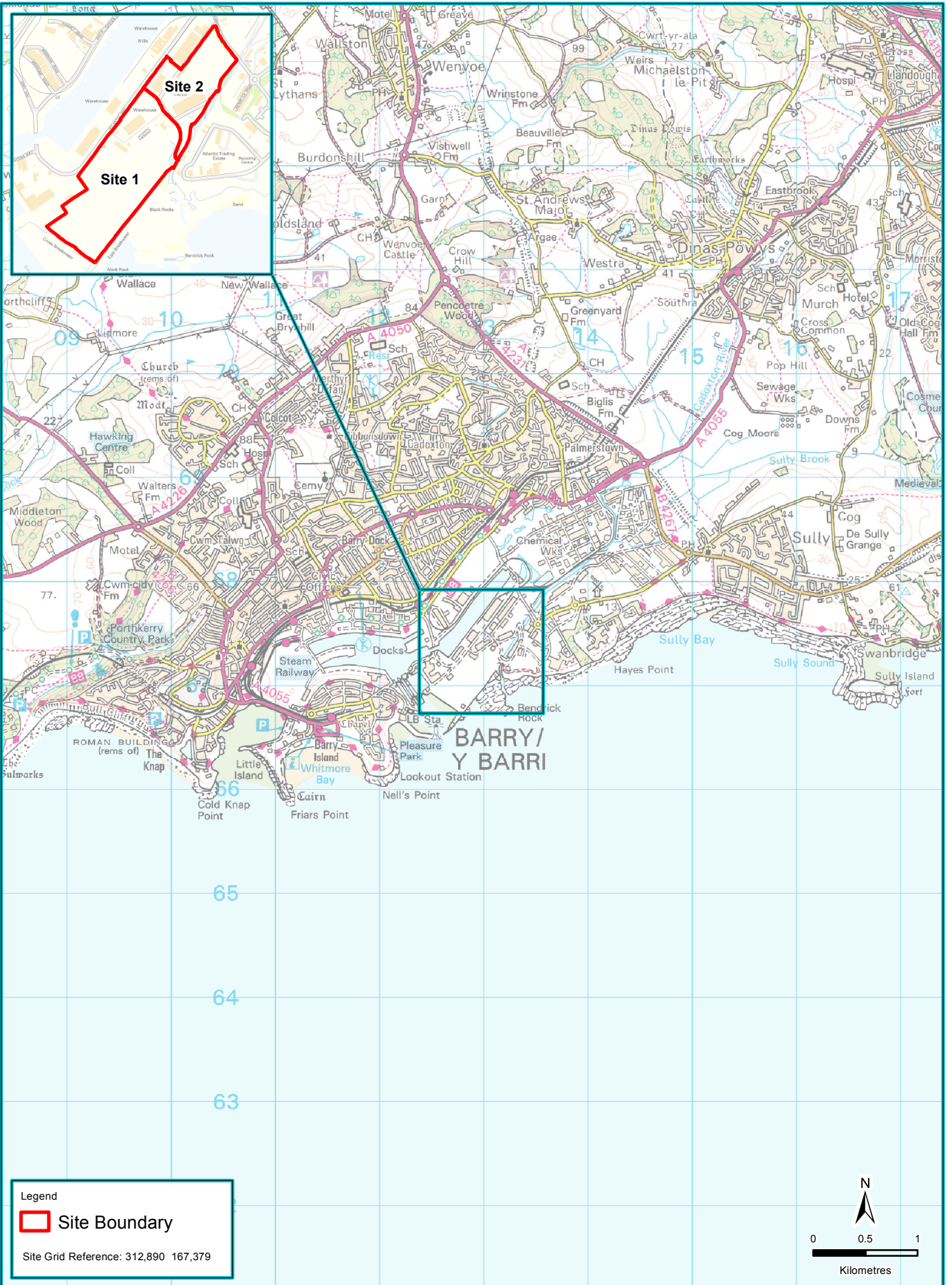
1.2 Main recommendations

1.2.1 In order to comply with relevant legislation and planning policy it is recommended to carry out further survey to determine the presence or likely absence of bats in the buildings with low or moderate potential to support roosting bats. The following surveys are recommended:

- Internal surveys of buildings B5, B9, B12 and B18;
- Two dusk emergence and pre-dawn re-entry surveys of seven buildings with low potential (B1, B5, B6, B9, B17, B19 and B21); and
- Three dusk emergence and pre-dawn re-entry surveys of four buildings with moderate potential (B2, B12, B14 and B18).

1.2.2 Surveys should be undertaken between May and October and be spaced at least one month apart. Internal surveys may increase or decrease the perceived potential of a building to support bats which may change the recommended level of survey for that building.

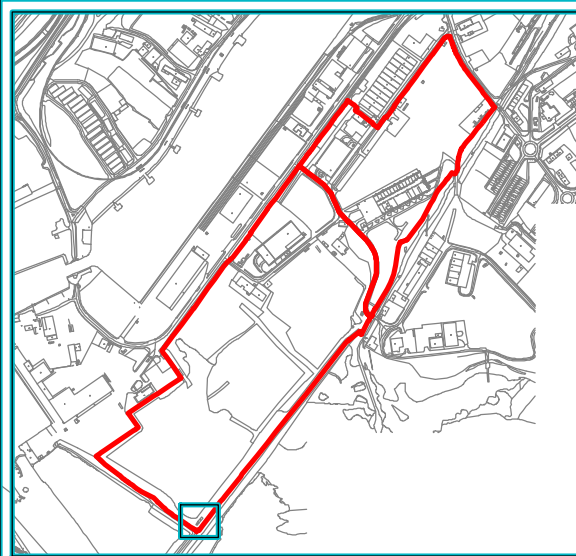
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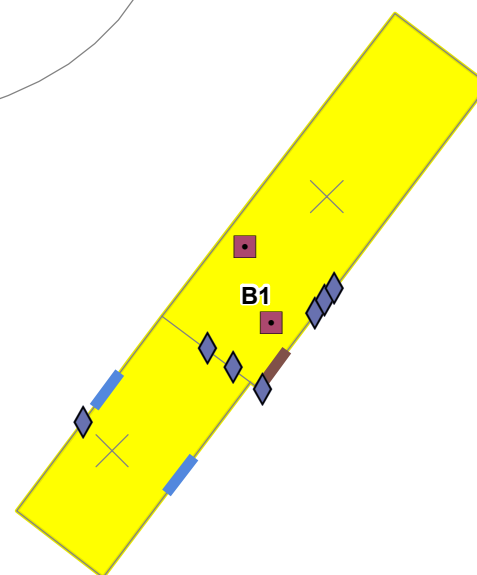
Potential Bat Access/Egress Points

-  Hole in concrete between roof and wall
-  Open manhole
-  Open door
-  Open window

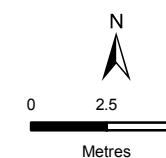
Potential of Building to Support Roosting Bats

-  Low
-  Site Boundary

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Figure Title Stage 1 Bat Inspection Results			

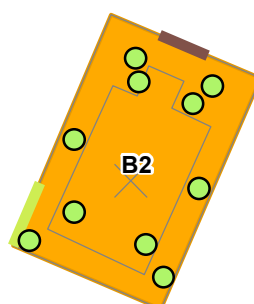
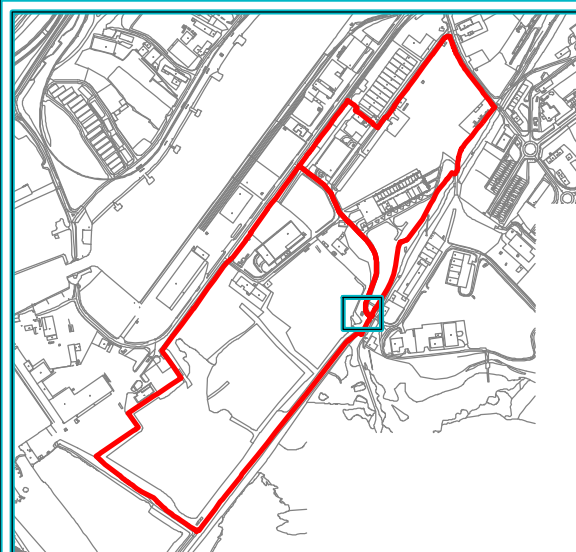
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Potential Bat Access/Egress

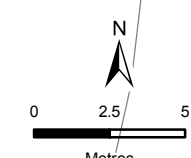
-  Gap in brick/stone work (missing mortar)
-  Large hole in wall
-  Open door

Potential of Building to Support Roosting Bats

-  Moderate
-  Site Boundary



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Figure Number 2b			
Figure Title Stage 1 Bat Inspection Results			

Legend

Potential Bat Access/Egress

- ◆ Broken window
- Chimney
- Collapsed chimney
- Gap between breeze block and wooden lintel
- Gap between wall plate and soffit
- Gap between window and roof
- Gap under flashing
- Gap under ridge tile
- Gaps in brickwork
- Gaps in corrugated sheeting
- Gaps under flashing
- Gull nesting
- ◇ Hole in soffit
- ◇ Holes in corrugated exterior
- ◇ Holes in soffit around gutter
- ▲ Lifted tiles
- ▼ Missing flashing
- ▼ Missing mortar
- ▼ Missing tiles
- Broken window
- Gap between top of door and roof
- Gap under door
- Gap under window boarding
- Hole above doorway
- Missing window

Potential of Building to Support Roosting Bats

- Moderate
- Low
- Negligible
- Site Boundary

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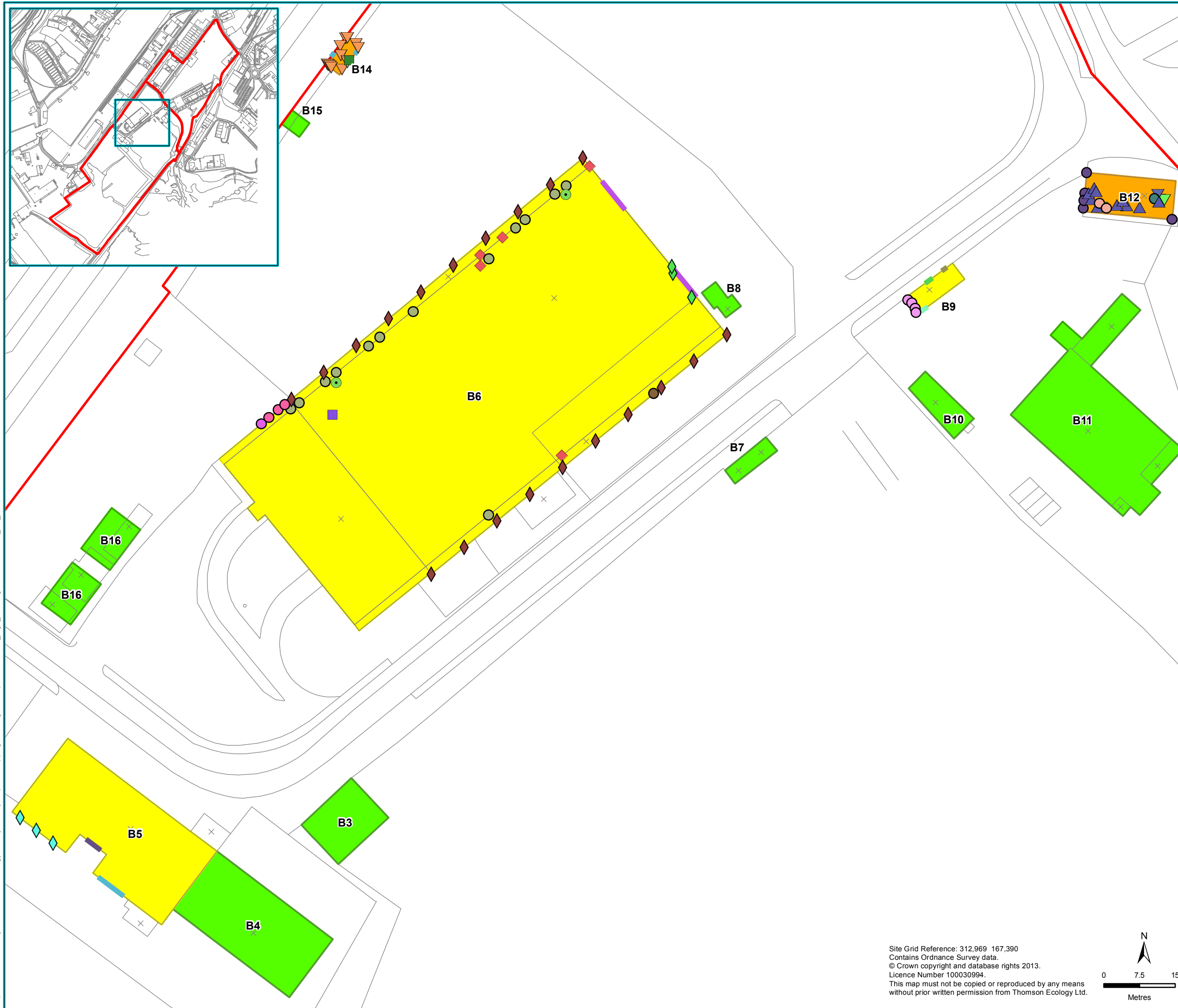
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Client
Associated British Ports

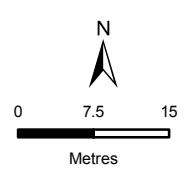
Figure Number
2c

Figure Title
Stage 1 Bat
Inspection Results



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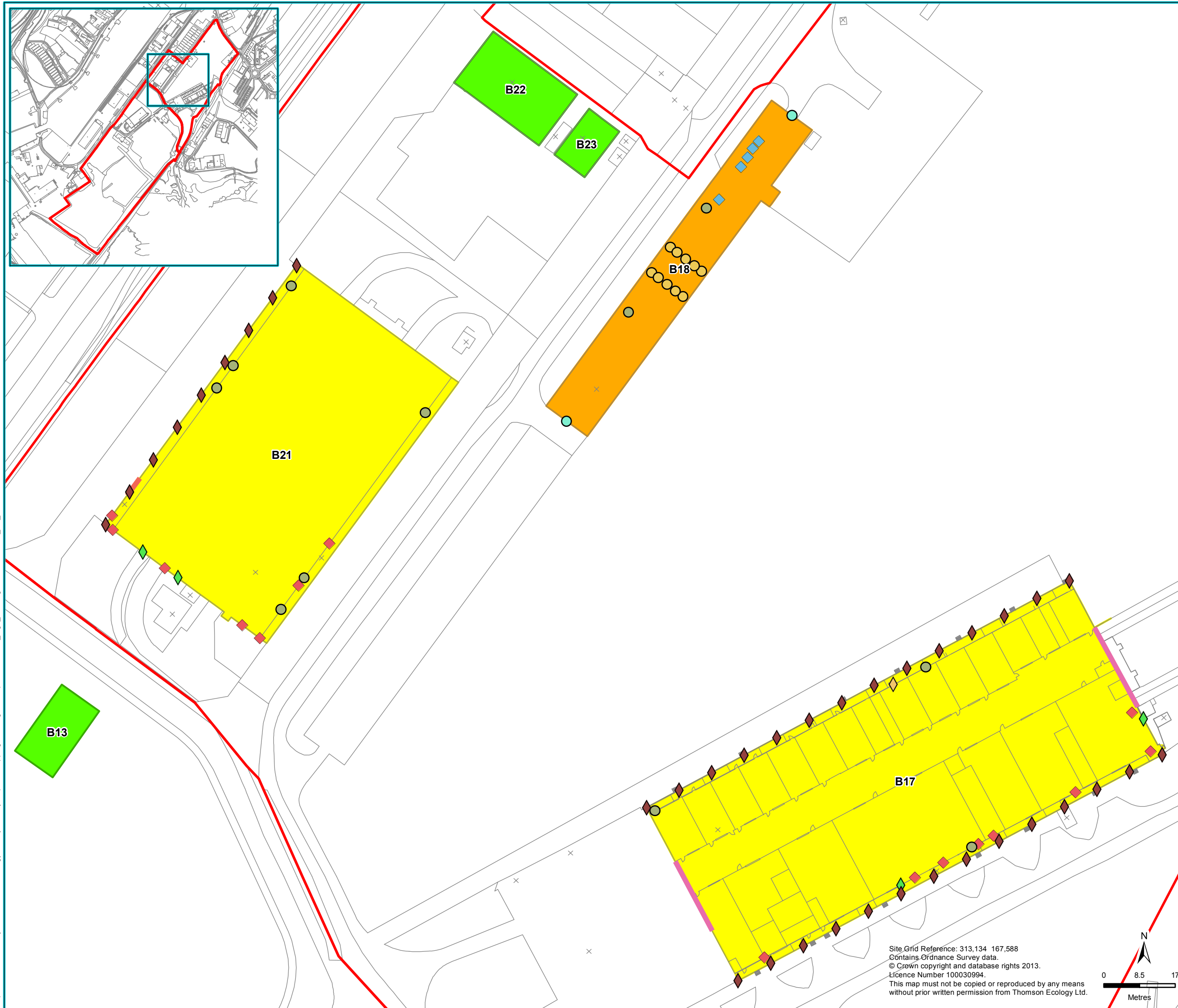
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Potential Bat Access/Egress Points

- ◆ Broken roofing
- ◆ Broken window
- Gap between breeze block and roof
- Gap in wooden vent
- Gaps in corrugated sheeting
- ◆ Hole in soffit
- ◆ Hole in wall
- ◆ Holes in soffit around gutter
- Gap between window and roof
- Open arcade

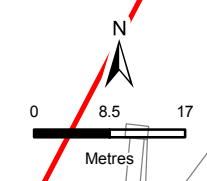
Potential of Building to Support Roosting Bats

- Moderate
- Low
- Negligible
- Site Boundary



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Figure Number		2d	
Figure Title Stage 1 Bat Inspection Results			

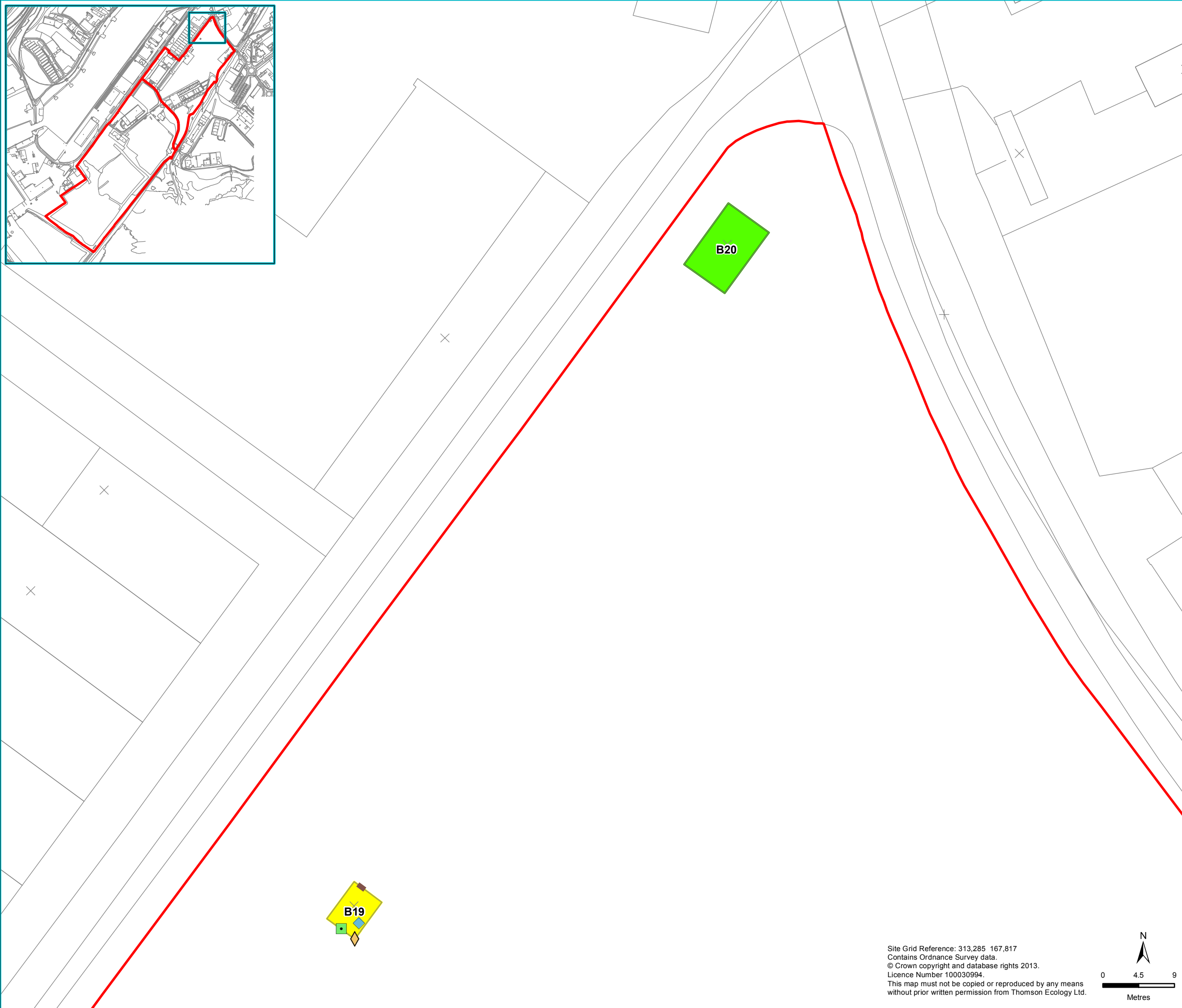
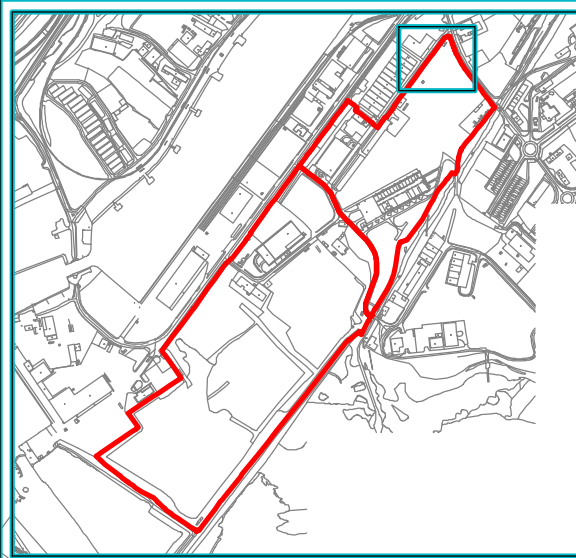
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Potential Bat Access/Egress Points

-  Broken roofing
-  Hole in wall
-  Open pipe
-  Open door

Potential of Building to Support Roosting Bats

-  Low
-  Negligible
-  Site Boundary



Drawing Ref **AABP103/15269/1**

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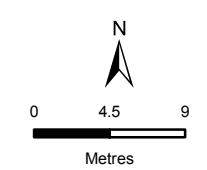
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Client **Associated British Ports**

Figure Number **2e**

Figure Title **Stage 1 Bat Inspection Results**

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2. Introduction

2.1 Development Background

2.1.1 Associated British Ports (ABP) propose to construct a solar farm on previously developed land at Barry Docks, there are no definitive plans to date, but the current proposal includes the clearance of all habitats and buildings on the sites to allow for construction of the solar farm.

2.1.2 The proposals described above are hereafter referred to collectively as 'the development'.

2.1.3 The development will be located on two adjacent areas within Barry Docks; Site 1 (central grid reference ST128671) is 21.44 ha and Site 2 (central grid reference ST132675) is 9.81 ha. Within this report the two areas have been combined and are considered within one survey area. The combined site, which is the total area affected by the development, is hereafter referred to as 'the sites'.

2.2 Ecology Background

2.2.1 Thomson Ecology undertook a desk study and extended Phase 1 habitat survey of the sites (Thomson Ecology report reference AABP103/001/002) on 10th and 11th April 2014. The desk study recorded two species of bats within 1 km of the site. The extended Phase 1 habitat survey recorded habitat on site suitable for foraging bats and many buildings that may have potential to support roosting bats. The identification numbers given to buildings in the extended Phase 1 habitat report are used in this report.

2.3 The Brief and Objectives

2.3.1 Thomson Ecology was commissioned by ABP Marine Environmental Research Limited on behalf of ABP on 1st May 2014 to undertake a Stage 1 bat survey of buildings on the sites. The brief was to:

- Carry out an external and internal inspection of up to 23 buildings for features that could support bats at the site of the proposed solar farm at Barry Docks, Barry, Vale of Glamorgan;
- Provide a combined report to include an introduction, methodology, results of the survey, a discussion of any legal or planning policy issues regarding bats in relation to the development and our recommendations as to how these may be overcome; and
- Provide appropriate digitised mapping.

2.4 Limitations

2.4.1 Internal access could not be gained to some buildings that are currently occupied by tenants. These were assessed from the outside for potential access points and many could be ruled out on this basis. Where a building could not be ruled out without internal access this is detailed in the report.

3. Methodology

3.1 Stage 1 - Daytime Inspection of Potential Roosts

3.1.1 A preliminary inspection of potential bat roosts was made from the ground with the aid of binoculars and a powerful torch. All potential roost sites that could be investigated in this way were searched for bats themselves and evidence of current or past bat use.

External inspection of building(s)

3.1.2 All buildings (B1 to B23 on Figures 2a to 2e) were assessed for their potential to support roosting bats. This includes the presence of potential roosts, access points and evidence of bats or bats themselves. Features looked for included:

- Gaps around windows, doors and lintels;
- Lifted lead flashing;
- Loose or missing roof, ridge or hanging tiles;
- Gaps between stones or bricks where mortar has fallen out;
- Other gaps or cracks between various elements of building structure;
- Presence or absence of cavity wall, weather boarding and potential access points;
- Suitable access points around eaves, soffits, barge board, and fascia;
- Wall cavities, holes and darker areas; and
- Gaps in mortise joints and lintels.

3.1.3 Evidence of roosting bats searched for included:

- Dark staining below an access point that may be caused by bat faeces;
- Staining around a hole that may be caused by the natural oils in bat fur;
- Scratch marks around the hole made by bat claws;
- Bat droppings and corpses; and
- Noises made by bats.

Internal Inspection of building(s)

3.1.4 All holes and cavities that could be investigated, and the roof void where accessible, were searched for bats themselves and evidence of current or past bat use. Evidence searched for and techniques used included:

- A torch and fibrescope were used to inspect for bats themselves and evidence of bats along ridge beams and over brick work, in wall cavities and in joins and cracks in tie beams and other large beams;

- Droppings were searched for, concentrating on the area beneath the ridge beam and hips, in darker areas, over internal lintels, tops of walls and wall cavities;
- Evidence of dark staining or marks or evidence of scratch marks around or below potential access points which may be caused by bat faeces, natural oils in bat fur or made by bat claws were looked for;
- Feeding remains, bat droppings (including characteristic smell), and remains of bats were searched for;
- Evidence of bat remains in any uncovered water tanks; and
- Cool areas within the building which may be suitable for roosting bats.

3.1.5 The information recorded for each potential roost included the site type and a description of the potential roost and its location, including aspect and height above ground level.

Categorisation of Results

3.1.6 Each building was then graded and placed into a category for its level of potential to support for roosting bats (see Table 1 for the relevant categories). This was dependent on the degree of exposure, cavity dimensions and the presence or absence of crevices considered suitable for bats to use as roosts. In addition the following factors were also considered:

- Setting & locality;
- Level of disturbance;
- Age of building or structure;
- Proximity of nearest woodland and / or water;
- Presence or absence of substantial linear features linking to woodland or other commuting and foraging habitat; and
- Size, particularly when considering potential for winter hibernation sites.

Dates of survey

3.1.7 The survey was undertaken on 20th and 21st May 2014 by licenced bat ecologist Anna Muckle MCIEEM (licence number 46618:OTH:CSAB:2013) assisted by Liz Bedford ACIEEM.

Table 1: Outline of categories of bat potential.

Type of roost	Summer or transitional roost used by non breeding bats	Maternity roost	Hibernation roost
Level of potential			
Confirmed	Presence of bats or evidence of bats. Confirmation of roost status may require further survey.		
High Bat Potential	Feature with multiple roosting opportunities for one or more species of bat. With good connectivity to high quality foraging habitat.	Feature with multiple roosting opportunities for breeding bats (size, temperature). With proximity and connectivity to high quality foraging habitat.	Large site that offers cool stable conditions with multiple roosting opportunities. With proximity and connectivity to high quality foraging habitat.
Medium Bat Potential	Feature with some roosting opportunities. With connectivity to moderate - high quality foraging habitat.	Feature providing some roosting opportunities. With some connectivity and proximity to moderate or high quality foraging habitat.	Medium sized feature with a number of roosting opportunities. With some connectivity and proximity to moderate or high quality foraging habitat.
Low Bat Potential	Feature with a limited number of roosting opportunities. With poor connectivity to foraging habitat.	Feature with a limited number of roosting opportunities for breeding bats. With low proximity and connectivity to low - moderate quality foraging habitat.	Small sized feature or feature which may be subject to disturbance or environmental variations, with a limited number of roosting opportunities. With limited connectivity to foraging habitat.
Negligible Bat Potential	Feature with no or very limited roosting opportunities for bats or where the feature is isolated from foraging habitat.	Feature with no suitable roosting opportunities for breeding bats.	Feature with no suitable roosting opportunities for hibernating bats.

4. Results

- 4.1.1** The contents of the results section are the factual results of the Stage 1 bat survey.
- 4.1.2** Internal access could not be gained to 14 of the buildings (B4, B5, B7, B8, B9, B10, B11, B12, B13, B16, B17, B18, B22 and B23 on Figures 2a to 2e) of the 23 buildings surveyed. Nine of these buildings (B4, B7, B8, B10, B11, B13, B16, B22 and B23) could be ruled out as having negligible potential from the results of the external inspection, without the need for an internal survey.
- 4.1.3** The other five buildings (B5, B9, B12, B17 and B18) are classified as having either low or moderate potential, but the assessment could change following an internal inspection to either decrease or increase the potential. Buildings B9 (Figure 2c) and B17 (Figure 2d) were classified as having low potential to support a transitional roost. Building B5 (Figure 2c) was classified as having low potential as there were suitable access points for bats although the potential roosting opportunities within the building are unknown. Building B12 (Figure 2c) was assessed as having moderate potential for a transitional and/or maternity roost and Building B18 (Figure 2d) was assessed as having moderate potential for a night perch.
- 4.1.4** Nine buildings were accessed internally; two buildings (B3 and B15) were classified as having negligible potential to supporting roosting bats, five (B1, B6, B19, B20 and B21) were classified as having low potential and two buildings (B2 and B14) were classified as having moderate potential to support roosting bat species.
- 4.1.5** In total across the sites, 12 buildings (B3, B4, B7, B8, B10, B11, B13, B15, B16, B20, B22 and B23) have negligible potential, seven buildings (B1, B5, B6, B9, B17, B19 and B21) have low potential and four buildings (B2, B12, B14 and B18) were classified as having moderate potential.
- 4.1.6** Table 2 provides a summary of the buildings' potential to support roosting bats, which is also shown on Figures 2a to 2e. A description of the buildings along with details of potential roosting and access points for bats is given in Table 3 and shown on Figures 2a to 2e.

Table 2: Summary of potential of buildings to support roosting bats.

Building	Evidence of Bats	Accessibility	Potential to Support Roosting Bats				Overall Potential to Support Roosting Bats	Shown on Figure number
			Night roost/feeding perch	Transitional	Maternity	Hibernation		
B1	None	External and limited internal access	Negligible	Low	Negligible	Low	Low	2a
B2	None	External and internal access	Moderate	Low	Negligible	Moderate	Moderate	2b
B3	None	External and internal access	Negligible	Negligible	Negligible	Negligible	Negligible	2c
B4	None	External access	Negligible	Negligible	Negligible	Negligible	Negligible	2c
B5	None	External access	Unknown	Unknown	Unknown	Unknown	Low	2c
B6	None	External and limited internal access	Low	Low	Negligible	Negligible	Low	2c
B7	None	External and internal access	Negligible	Negligible	Negligible	Negligible	Negligible	2c
B8	None	External access	Negligible	Negligible	Negligible	Negligible	Negligible	2c

Building	Evidence of Bats	Accessibility	Potential to Support Roosting Bats				Overall Potential to Support Roosting Bats	Shown on Figure number
			Night roost/feeding perch	Transitional	Maternity	Hibernation		
B9	None	External access	Unknown	Low	Unknown	Unknown	Low	2c
B10	None	External access	Negligible	Negligible	Negligible	Negligible	Negligible	2c
B11	None	External access	Negligible	Negligible	Negligible	Negligible	Negligible	2c
B12	None	External access	Negligible	Moderate	Moderate	Negligible	Moderate	2c
B13	None	External access	Negligible	Negligible	Negligible	Negligible	Negligible	2d
B14	None	External and internal access	Negligible	Moderate	Negligible	Negligible	Moderate	2c
B15	None	External and internal access	Negligible	Negligible	Negligible	Negligible	Negligible	2c
B16	None	External and internal access	Negligible	Negligible	Negligible	Negligible	Negligible	2c
B17	None	External and limited internal access	Negligible	Low	Negligible	Negligible	Low	2d
B18	None	External and limited internal access	Moderate	Negligible	Negligible	Negligible	Moderate	2d

Building	Evidence of Bats	Accessibility	Potential to Support Roosting Bats				Overall Potential to Support Roosting Bats	Shown on Figure number
			Night roost/feeding perch	Transitional	Maternity	Hibernation		
B19	None	External and internal access	Low	Negligible	Negligible	Negligible	Low	2e
B20	None	External and internal access	Negligible	Negligible	Negligible	Negligible	Negligible	2e
B21	None	External and internal access	Low	Low	Negligible	Negligible	Low	2d
B22	None	External access	Negligible	Negligible	Negligible	Negligible	Negligible	2d
B23	None	External and internal access	Negligible	Negligible	Negligible	Negligible	Negligible	2d

Table 3: Description of the buildings and details of potential roosting and access points for bats

Building	Details of building	Approx. age	Potential access points	Potential roosts	Evidence of bats	Environmental factors
B1	Water tank and pump room. Brick built with solid walls and concrete flat roof. Internal walls smooth concrete surface. Rubbish and water collected in bottom.	1940s	Open windows. Open doors. Hole in concrete below roof. Open manholes on flat roof.	In dark areas in corners of internal rooms.	None	Coastal. Close to linear parcels of dense scrub. Building approximately 70 years old. Disused.
B2	Small building with domed roof. End walls constructed of stone; side walls and roof constructed of three layers of bricks. Externally covered in ivy.	1940s	Door way on north-east face open; and opening caused by wall collapse in south-west corner.	Between brick layers; between stonework.	None	Within dense scrub. Building approximately 70 years old. Disused.
B3	Steel frame with corrugated metal sheeting forming walls and roof. Open on one side. Shipping container situated inside on one side.	1960s	Open sided structure.	None	None	Located within industrial area. Disused.
B4	Warehouse built of corrugated metal on concrete foundation. Metal roof on metal trusses.	1980s	None	None	None	Located within industrial area. Occupied.

Building	Details of building	Approx. age	Potential access points	Potential roosts	Evidence of bats	Environmental factors
B5	Warehouse of brick and corrugated metal construction.	1980s	Holes in corrugated exterior that appear to go through to inside; hole above roller door on; broken windows.	Unknown	None	Located within industrial area. Occupied.
B6	Large warehouse of brick and breeze block construction. 13 ridged hipped roof of corrugated sheeting. Top third of walls comprising windows.	1940s	Broken windows; gaps in soffit boxes around drainage pipes, gaps in corrugated sheeting, gaps under flashing, gaps in brick work, collapsed chimney.	Between wooden rafters; between wooden boarding and the roof sheeting.	None	Located within industrial dock area. Partially occupied.
B7	Single story portable building. Disused and in poor state of repair.	1990s	None	None	None	Located within industrial dock area. Disused.
B8	Two containers joined by makeshift roof.	Unknown	None	None	None	Located within industrial dock area. Occupied.

Building	Details of building	Approx. age	Potential access points	Potential roosts	Evidence of bats	Environmental factors
B9	Single storey breeze block construction with single pitch roof comprising corrugated sheeting. Wooden lintels and boards over windows on north-west side.	1980s	Gaps below lintels on south-west façade where entrance has been blocked with breeze blocks; missing window; gap under door shutter may provide access to inside; gap under window boarding.	Unknown	None	Located within industrial dock area. Occupied.
B10	Single story breeze block construction garages with flat roofs. Garage roller doors on north-east face.	1980s	None	None	None	Located within industrial dock area. Occupied.
B11	Corrugated metal warehouse with steel roof, brick water tower and domed metal shed with breeze block end walls.	1980s	None	None	None	Located within industrial dock area. Occupied.

Building	Details of building	Approx. age	Potential access points	Potential roosts	Evidence of bats	Environmental factors
B12	Single storey brick office building with a slate tiled hipped roof. Two chimneys. False ceiling internally.	1960s	Missing flashing around chimney on north-west corner; gap below wall plate and soffit, lifted tiles, missing mortar, gaps under ridge tiles, gap under flashing.	Unknown	None	Located within industrial dock area. Near to dense scrub, Occupied.
B13	Corrugated metal modern warehouse building; walls and roof of corrugated metal sheeting.	1990s	None	None	None	Located within industrial dock area. Occupied.
B14	Brick, single storey rail-siding house. Single skin walls. Internal wooden boarding to loft space with light visible between boards suggesting loft is open and moderately light.	1940s	Missing tiles, hole is roof of south-east façade, broken windows.	Chimney structure, cracks in stonework of chimney, dark areas of roof space.	None	Located within industrial dock area. Derelict.
B15	Single storey pump house, brick built with flat concrete roof. No door in wide doorway makes internal space open and exposed. Walls and ceiling smooth concrete.	1950s	Open door	None	None	Located within industrial dock area. Derelict.

Building	Details of building	Approx. age	Potential access points	Potential roosts	Evidence of bats	Environmental factors
B16	Two single portable buildings with metal frame. Well sealed and in good condition.	1970s	None	None	None	Located within industrial dock area.
B17	Large warehouse of brick and breeze block construction. 15 ridged hipped roof of corrugated sheeting. Top third of walls comprising windows. Building spilt internally into occupied units with a central arcade between them along the length of the building. Some modern brick built extensions with cavity walls on south-east and north-west sides.	1940s	Gaps in corrugated sheeting, holes in soffit, broken windows, holes in wall, lifted flashing; gaps in soffit boxes around drainage pipes.	Between wooden boarding and corrugated sheeting; between wooden rafters; inside cavity wall.	None	Located within industrial dock area. Occupied.
B18	Corrugated metal domed warehouse with wooden purlins. Middle section collapsed, northern section occupied. Southern section intact but disused.	1960s with more recent additions	Gaps in corrugated sheeting, gap in wooden vent, gap between breeze block and roof, broken roofing.	Wooden beams.	None	Located within industrial dock. Partially occupied, partially derelict.

Building	Details of building	Approx. age	Potential access points	Potential roosts	Evidence of bats	Environmental factors
B19	Rendered brick single storey shed with corrugated sheeting roof. Wooden rafters, purlins and boards visible internally. Large hole on south-east aspect of roof. Single skin walls.	1940s	Open door, damaged roof, broken window, open pipe, hole in wall.	Wooden rafters.	None	Located with industrial dock. High daytime light levels. Covered in scrub. Derelict.
B20	Brick gate house with concrete render on upper section. Stone lintels. Plasterboard and stone interior. Building is light, draughty and damp internally.	1940s	All windows broken;.	None	None	Located within industrial dock. High daytime light levels. Derelict.
B21	Large warehouse of brick and breeze block construction. 10 ridged hipped roof of corrugated sheeting. Top third of walls comprising windows.	1940s	Holes in soffits, gaps in soffit boxes around drainage pipes, broken windows, gap in corrugated sheeting, broken windows.	Between wooded boarding and corrugated roofing, wooden rafters, soffit boxes.	None	Located within industrial dock. Disused.

Building	Details of building	Approx. age	Potential access points	Potential roosts	Evidence of bats	Environmental factors
B22	Corrugated metal sheeting on metal frame.	1990s	None	None	None	Located within industrial dock. Occupied.
B23	Corrugated metal sheeting on metal and timber frame.	1980s	None	None	None	Located within industrial docks. Disused.

5. Legal and Planning Policy Issues

5.1.1 The content of the legislation and planning policy section is the legislation and planning policy issues that we know are relevant based on this Stage 1 bat survey.

5.1.2 As set out in Appendix 1, British bats receive comprehensive protection under the Conservation of Habitats and Species Regulations 2010, the Wildlife and Countryside Act 1981, as amended and the Countryside and Rights of Way Act, 2000. Taken together these make it an offence to:

- Deliberately capture, injure or kill a bat;
- Deliberately disturb a bat in such a way as to be likely:
 - to impair its ability to survive, to breed or reproduce, or to rear or nurture its young; or
 - to impair its ability to hibernate or migrate; or
 - to significantly affect the local distribution or abundance of the species to which they belong;
- Damage or destroy a breeding site or resting place of a bat; and
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.

5.1.3 Demolition of buildings B1, B2, B5, B6, B9, B12, B14, B17, B18, B19, and B21 could potentially result in disturbance of, or harm to, bats roosting within the building. Damage or destruction of a roost or obstruction to a roost could also occur during development.

5.1.4 For the development to comply with the legislation associated with bats, further surveys as outlined in Section 6.1 of this report are necessary to determine the presence or likely absence of bats.

6. Recommendations

6.1 Further Surveys

- 6.1.1** Potential for roosting bats has been recorded in 11 buildings on site; buildings B1, B2, B5, B6, B9, B12, B14, B17, B18, B19 and B21. These buildings will require further surveys to establish the presence or likely absence of bats from the buildings.
- 6.1.2** Buildings B5, B9, B12 and B18 will require an internal inspection. This may decrease or increase the perceived potential for bats in the building. Building B5 may not have any potential roosting locations internally and could be reclassified as having negligible potential and not require further surveys. Buildings B9, B12 and B18 will still have potential to support transitional roosts and so will still require activity surveys following the internal inspection. Building B17 was not accessed internally but an internal survey would be unlikely to change to the perceived potential of the building.
- 6.1.3** Under the Bat Conservation Trust (BCT) Bat Surveys Good Practice Guidelines (2012), potential roosts should be the subject of dusk emergence and pre-dawn return to roost surveys to observe each potential access point. Seven buildings with low potential (B1, B5, B6, B9, B17, B19 and B21) will require two dusk/dawn surveys and three buildings with moderate potential (B2, B12, and B18) will require three dusk/dawn surveys. A dusk/dawn survey would not be suitable for the moderate potential building as we are looking for a night roost. At this location we recommend deploying static detectors inside the building to record bat use. The recommended survey effort is shown in Table 4, below. Visits should be undertaken from May to October, inclusive, and be spaced at least one month apart, with at least one visit between May and August.

Table 4: Recommended survey effort for buildings with potential to support roosting bats

Building	Overall potential to support roosting bats	Recommended survey effort
B1	Low	Two dusk emergence and pre-dawn re-entry surveys
B2	Moderate	Three dusk emergence and pre-dawn re-entry surveys
B5	Low	Internal survey and, dependant on results, two dusk emergence and pre-dawn re-entry surveys
B6	Low	Two dusk emergence and pre-dawn re-entry surveys, including survey of bat activity inside the building
B9	Low	Internal survey plus two dusk emergence and pre-dawn re-entry surveys
B12	Moderate	Internal survey plus three dusk emergence and pre-dawn re-entry surveys
B14	Moderate	Three dusk emergence and pre-dawn re-entry surveys
B17	Low	Two dusk emergence and pre-dawn re-entry surveys
B18	Moderate	Internal survey plus three internal static detector surveys
B19	Low	Two dusk emergence and pre-dawn re-entry surveys
B21	Low	Two dusk emergence and pre-dawn re-entry surveys, including survey of bat activity inside the building

7. Conclusion

- 7.1.1** During the Stage 1 bat inspection of the 23 buildings on site, seven buildings (B1, B5, B6, B8, B17, B19 and B21) were found to have low potential to support roosting bats and four buildings (B2, B12, B14 and B18) were found to have moderate potential to support roosting bats. No evidence of bats was recorded during the survey.
- 7.1.2** For five of the buildings (B5, B9, B12, B17 and B18), the level of potential was based on external inspection only. Internal inspections are recommended for B5, B9, B12 and B18 which may increase or decrease the perceived potential of the building for bats. It is not considered that an internal inspection of B17 would increase or decrease the perceived potential for bats.
- 7.1.3** As the development could potentially result in disturbance or harm to bats if present and demolition is required, as well as potentially disturbing or destroying a place used by bats as a roost, further surveys will be required to be carried out to determine the presence or likely absence of bats from these buildings.

8. References

- 8.1.1 Hundt, L. (2012). *Bat Surveys, Good Practice Guidelines* (2nd Edition). Bat Conservation Trust (BCT), London
- 8.1.2 Thomson Ecology report reference AABP103/001/002. Desk Study and Extended Phase 1 Habitat Survey.

9. Appendix 1 - Bat Biology and Legislation

9.1 Biology

9.1.1 There are 18 British species of bats of two families, the horseshoe bats (Rhinolophidae) and vesper bats (Vespertilionidae). In Britain, there are two species of horseshoe bat both of which belong to the genus *Rhinolophus*, and the 16 species of vesper belonging to six genera (*Myotis*, *Eptesicus*, *Nyctalus*, *Pipistrellus*, *Plecotus* and *Barbastella*). Whilst there are many differences in the biology of the different species, all share certain characteristics and these are described below.

Roosting

9.1.2 Bat species utilise roost sites of varying character; some preferring tree roosts whilst others are thought to be almost entirely dependent on built structures. Most bats will have a range of available roosting sites within their range which they move between throughout the year. They are generally faithful to their roosts and a colony of bats may use the same roost site(s) year after year.

9.1.3 In winter bats hibernate, often animals gather to hibernate communally remaining in the same hibernation roost from November to February/March. Hibernation roost sites typically have a constant low temperature and high humidity levels, sites include caves, mines, thick walled buildings and hollow trees. As the temperature and day length increase in spring bats leave their hibernation roosts, either moving immediately to summer roost sites or utilising occasional, transitional roosts.

9.1.4 By June breeding females congregate in maternity roost sites where they will give birth to, and nurture young. Male bats are also occasionally found roosting in maternity roosts but during this period they mostly roost alone. Maternity roost sites include hollowed out trees, buildings and bridges. Male bats may use similar sites but also cracks and crevices in trees, under loose tiles or even amongst dense ivy growth during the summer period. Similar sites may be used by bats for brief periods during the night when they are resting or eating recently caught prey. In autumn, male bats establish mating roosts and are visited by females and then a variety of roost sites may be used until the bats return to their hibernation roosts.

Foraging

9.1.5 All British bat species feed on invertebrates, with flies, beetles, moths and other insects making up much of their diet. Areas rich in insects are therefore favoured foraging sites for bats, with woodlands, scrub, wetlands, river corridors and flower rich grasslands being favoured foraging habitats. Habitats such as intensively farmed arable land, and amenity grassland support a much lower invertebrate diversity and are therefore unfavourable foraging habitats for bats.

Commuting

9.1.6 Bats favour roost sites in close proximity to suitable foraging habitat, however given variation in prey availability, land-use change, and competition with other bats, for at least part of the year bats must commute between their roosts and foraging habitat.

9.1.7 Commuting routes tend to follow linear features in the landscape such as hedgerows, woodland edges, rivers and other watercourses, particularly when crossing areas of less favourable habitat. The distance that bats commute between roost sites and foraging areas is dependent on local geography and also the species of bat. Some species will travel up to 18km, though shorter distances are more typical.

9.2 Site Designation

9.2.1 All bat roosts in the UK receive protection under the following legislation:

- Conservation of Habitats and Species Regulations 2010, as amended (which replaces the Conservation (Habitats &c) Regulations 1994 as amended)
- Wildlife and Countryside Act 1981, as amended;
- The Countryside and Rights of Way Act 2000 (which amends the Wildlife and Countryside Act); and
- Natural Environment and Rural Communities Act 2006 (which amends the Wildlife and Countryside Act).

9.2.2 This is described in more detail under 'Species Protection' below. In addition, the most important sites for certain bat species in the UK receive further statutory protection by being designated as Special Areas of Conservation (SACs) and/or Sites of Special Scientific Interest (SSSIs).

9.2.3 Four bat species, greater and lesser horseshoe, barbastelle and Bechstein's bats, in the UK are included on Annex II of the European Community Directive of the Conservation of Natural Habitats and of Wild Fauna and Flora, referred to as the Habitats Directive. The Habitats Directive is transposed into UK law by the Conservation of Habitats and species Regulations 2010. This legislation requires that areas are designated as Special Areas of Conservation (SACs) to protect populations of these 4 bat species. To date, 9 SACs have been designated specifically to protect these species in Wales, with a further 3 SACs where their presence is a qualifying feature but not the primary reason that the site was designated.

9.2.4 Sites designated under the Wildlife and Countryside Act 1981 (WCA) are known as Sites of Special Scientific Interest (SSSIs). SSSIs received further protection under the Countryside and Rights of Way Act 2000 (CRoW) and the Natural Environment and Rural Communities Act 2006.

9.2.5 Some SSSIs are designated for the population(s) of bats that they support. The criteria for selecting SSSIs on the basis of their bat populations are provided in Guidelines for the Selection of Biological SSSIs (NCC, 1989):

- Greater horseshoe bat - all main breeding roosts and all winter roosts with 50 or more adult bats;
- Lesser horseshoe bat - all main breeding roosts containing 100 or more adult bats and all winter roosts containing 50 or more bats;
- Barbastelle, Bechstein's and grey long-eared bats - any traditional breeding roosts;
- Natterer's, Daubenton's whiskered, Brandt's, serotine, noctule and Leisler's bats - only exceptionally large breeding roosts or those with a long history of use.

- Mixed Roost sites - all hibernacula containing 4 or more species and more than 50 individuals or 3 species and 100 or more individuals or 2 species and 150 or more individuals, though these criteria may be lower in some parts of the UK.

9.2.6 Sites that qualify as SSSIs for the bat populations they support are considered to be of at least national importance for the bats they support.

9.2.7 Sites designated for nature conservation at the county level may also include bat populations as part of the site qualifying criteria, although the criteria used may vary from county to county. Such sites are protected through the planning system and there is generally a presumption against development that affects such sites in local authority development plans.

9.3 Species Protection

Legislation

9.3.1 All bat species are protected by the Conservation of Habitats and Species Regulations 2010. The Regulations make it an offence, with very few exceptions, to:

- Deliberately capture, injure or kill a bat;
- Deliberately disturb a bat in such a way as to be likely:
 - to impair its ability to survive, to breed or reproduce, or to rear or nurture its young; or
 - to impair its ability to hibernate or migrate; or
 - to affect significantly the local distribution or abundance of the species to which they belong.
- Damage or destroy a breeding site or resting place of a bat; and
- Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead bat, or any part of, or anything derived from a bat.

9.3.2 In addition to the protection given to bats under the Conservation of Habitats and Species Regulations 2010, as amended, already described, bats are also partially protected in Wales under the Wildlife and Countryside Act, which adds the following offences (with certain exceptions):

- Disturbance while it is occupying a structure or place which it uses for shelter or protection; or
- Obstructing access to any structure or place used for shelter or protection.

9.3.3 A roost is any structure or place used by bats for shelter or protection. As bats tend to re-use the same roosts year after year, the roost is protected whether bats are present or not at the time.

9.3.4 In this context, 'damage' would include such operations as treatment of wood with toxic preservatives or use of rodenticides near roosting bats while 'disturbance' includes any work in or affecting a bat roost.

9.3.5 If proposed actions, such as redevelopment of an existing building may lead to an offence under the above legislation, appropriate mitigation which seeks to avoid these impacts should be

devised and implemented under licence. Licences for 'scientific or educational', 'ringing or marking' and 'conservation' may be issued by Natural Resources Wales, licences for the reason of 'preserving public health or public safety' by the Welsh Assembly Government (WAG).

- 9.3.6** In addition to the above legislation, all bats are protected under the Bonn Convention, within which the Agreement on the Conservation of Bats in Europe (1991) or EUROBAT, establishes a mechanism for international collaboration to conserve bats and their habitats, including foraging habitats. All European bat species are covered under Appendix II of the Conservation of Migratory Species of Wild Animals (CMS).
- 9.3.7** The Hedgerow Regulations 1997 provide for the conservation of 'important' hedgerows and their constituent trees. The presence of a protected species such as bats is included in the assessment of whether a hedgerow is considered 'important' and applications to remove such hedgerows must be made to the planning authority.

Planning Policy

- 9.3.8** Planning Guidance, Technical Advice Note 5; Nature conservation and planning (TAN5) gives further direction with respect to land use and development. It states that protected species, including bats, should be a material planning consideration when local authorities are considering a development proposal that is deemed likely to result in disturbance or harm to the species or its habitat.
- 9.3.9** Natural Environment and Rural Communities Act (2006); furthermore this act places a duty on all public authorities to conserve biodiversity; conserve including preservation and enhancement.

9.4 UK Biodiversity Action Plan and Species of Principal Importance

- 9.4.1** Seven species of bat (Barbastelle, Bechstein's, greater and lesser horseshoe, brown long-eared, noctule and soprano pipistrelle) are considered to be priority species under the UK Post-2010 Biodiversity Framework (JNCC and Defra, 2012). Published in July 2012, this framework has now succeeded the UK Biodiversity Action Plan (UKBAP). The Joint Nature Conservation Committee guidance dictates that UK BAP background information on priority species and habitats still remains in use.
- 9.4.2** The seven bat species have been adopted as Species of Principal Importance for the Conservation of Biodiversity in Wales under Section 42 of the Natural Environment and Rural Communities Act 2006. Under this Act, the Secretary of State must take steps, or encourage others to take steps, to further the conservation of these species. In addition, every public authority, including local planning authorities, has a general duty to have regard for the purpose of conserving biodiversity. This duty does not extend specifically to the Section 42 list; however, guidance published by Defra indicates that the Section 42 species should be considered a priority when implementing the duty. Furthermore, TAN5 states that species of principal importance for the conservation of biodiversity should be protected from the adverse effects of development.

9.5 References

- 9.5.1 Altringham, J. (2003) British Bats. New Naturalist Series No. 93.
- 9.5.2 Bat Conservation Trust (2007). Bat Surveys, Good Practice Guidelines. BCT, London.
- 9.5.3 Entwistle, A. C., Harris, S., Hutson, A., Racey, P., Walsh, A., Gibson, S., Hepburn, I., and Johnston, J. (2002) Habitat management for bats: A guide for land managers, land owners and their advisors. JNCC, Peterborough.
- 9.5.4 Highways Agency (1996 et seq) Design Manual for Roads and Bridges, Volume 10 Environmental Design and Management, Section 4 The Good Roads Guide- Nature Conservation, Part 6 Nature Conservation Management Advice in Relation to Bats.
- 9.5.5 JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). (2012). UK Post-2010 Biodiversity Framework. Available from: <http://jncc.defra.gov.uk/page-6189>.
- 9.5.6 Mitchell-Jones, A.J. & McLeish, A.P. (1999). Bat Workers' Manual (2nd Edition). Joint Nature Conservancy Committee, Peterborough
- 9.5.7 NCC (1989) Guidelines for Selection of Biological SSSIs. Nature Conservancy Council, Peterborough
- 9.5.8 Office of the Deputy Prime Minister (2005) Planning Policy Statement 9; Biodiversity and Geological Conservation.
- 9.5.9 Russ, J. (1999). The Bats of Britain and Ireland. Alana Ecology, Shropshire.