Vale of Glamorgan Schools

Ysgol Gymraeg Bro Morgannwg and Whitmore High School
Bat Activity Survey Report

Vale of Glamorgan Council

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Quality information

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Executive Summary

AECOM was commissioned by Vale of Glamorgan Council to undertake Bat Activity Surveys at Ysgol Gymraeg Bro Morgannwg and Whitmore High School sites in Barry, South Wales. These two Sites were combined for the Bat Activity Surveys and hereafter referred to in combination as 'the Site'. The Preliminary Ecological Appraisal (PEA) completed by AECOM of Ysgol Gymraeg Bro Morgannwg (AECOM, 2018 a) and Whitmore High School (AECOM, 2018 b) included an assessment of each of the sites bat commuting and foraging suitability, this was assessed as Moderate. Walked transects and static detector surveys were undertaken between June and September 2018.

This report includes the methodologies and results of the Bat Activity Surveys and outlines potential impacts and recommendations for mitigation and enhancement.

Impacts on roosting bats and recommendations for mitigating impacts on bat roosts are not discussed in this report. This is provided in the two separate reports, Ysgol Gymraeg Bro Morgannwg Bat Roost Survey Report (AECOM, 2018 c) and Whitmore High School Bat Roost Survey Report (AECOM, 2018 d).

For Ysgol Gymraeg Bro Morgannwg; the proposed development includes a coach drop off area, the creation of a 3G sports pitch, Multi-Use Games Area (MUGA), 2G hockey pitch, grassed sports pitch, new footpaths and construction of seven new buildings. The proposed development works are due to commence in July/August 2019 and be completed by August/September 2021. AECOM understand that the development requires the thinning out of the broadleaved plantation woodland north of Bro Morgannwg Building 5 and 6 (Figure 1) to allow more natural light to the existing footway and into these buildings.

For Whitmore High School; the proposed works are for the demolition of the existing Barry Comprehensive School. Construction of the new school will comprised a main school building, playing fields, car parking, MUGA, 3G sports pitches and grassed sports pitches. Construction is due to commence in August 2019. Demolition is likely to commence in June/ July 2021.

A modest amount of bat activity was recorded and the dominant species was common pipistrelle Pipistrellus pipistrellus. Other species identified comprise soprano pipistrelle Pipistrellus pygmaeus, Nathusius' pipistrelle Pipistrellus nathusii; brown long-eared Plecotus auritus, noctule Nyctalus noctula, serotine Eptesicus serotinus, Leisler's Nyctalus leisleri, and Myotis sp. The Surveys indicate that the Site does not provide a significant foraging resource for the local population. Bat activity was recorded along the Site boundary features including, broadleaved planation woodland, rows of trees and hedgerows. The numbers and types of species recorded are considered typical for a Site located within the suburban fringe.

No further walked transect surveys are recommended. Static detector surveys are recommended in April and May 2019.

It is recommended that where the broadleaved planation woodland is to be removed to facilitate the construction of the new access footway, the gap should be kept as small as possible so that the canopy connection is retained above the footpath and the treeline not severed. External light spill near the gap must be avoided; as this will further disuse bats and increase the effect of severance. Where the broadleaved plantation woodland is being thinned works should be limited to crown lifting and removal of small saplings. The felling of larger trees should be avoided in order to maintain the canopy connection for bats.

New external lighting and removal of trees from the broadleaved woodland strip have the potential to impact on features used by foraging and commuting bats. Without mitigation, this could result in direct and in-direct habitat loss; and fragmentation and severance of habitats.

It is recommended that external lighting avoids illuminating features used by commuting and foraging bats. Best practice guidance, to avoid and reduce lighting impacts on bats, should be incorporated into any new lighting design at the Site.

Linking to BREEAM Issue LE04, as an enhancement, sensory garden planting and increase in grassland diversity are recommended to encourage insect diversity, which in turn will benefit foraging bats. Green corridors could be created and/or enhanced which would benefit foraging and commuting bats.

The Executive Summary is not a substitute for the full report. Refer to the full text for further detail.

1. Introduction

1.1 Introduction

AECOM was commissioned by Vale of Glamorgan Council to undertake Bat Activity Surveys at Ysgol Gymraeg Bro Morgannwg and Whitmore High School sites in Barry, South Wales. Hereafter referred to as 'the Site'.

The Preliminary Ecological Appraisal (PEA) completed by AECOM of Ysgol Gymraeg Bro Morgannwg (AECOM, 2018a) and Whitmore High School (AECOM, 2018b) included an assessment of each of the sites for bat commuting and foraging suitability. This was assessed as Moderate.

This report includes the methodologies and results of the Bat Activity Surveys and outlines potential impacts and recommendations for mitigation and enhancement.

Impacts on roosting bats and recommendations for mitigating impacts on bat roosts are not discussed in this report. This is provided in the two separate reports, Ysgol Gymraeg Bro Morgannwg Bat Roost Survey Report (AECOM, 2018c) and Whitmore High School Bat Roost Survey Report (AECOM, 2018d).

1.2 Site Location and Description

The Site comprises of two adjoining High School Sites Ysgol Gymraeg Bro Morgannwg and Whitmore High School (Figure 1 and Appendix A). The Site is located within a residential area on the northern outskirts of Barry, South Wales. To the east of the Site is Barry Hospital. Residential areas are located to the south and west and further east beyond the hospital

Ysgol Gymraeg Bro Morgannwg is located at OS grid reference ST10606 69022. Whitmore High School is located on the former Barry Comprehensive School Site at OS grid reference ST105316916045.

Existing habitats at Ysgol Gymraeg Bro Morgannwg comprise buildings, hardstanding, broadleaved plantation woodland, rows of trees, standalone trees, dense scrub, scattered scrub, semi-improved grassland, poor semi-improved grassland, introduced shrub, amenity grassland and standing water (ornamental pond) (Figure 1).

Existing habitats at Whitmore High School currently comprise buildings, hardstanding, amenity grassland, parkland with scattered trees, introduced shrub, rows of trees, intact species poor hedgerows, standalone trees, walls and fences (Figure 1).

1.3 Proposed Development

1.3.1 Ysgol Gymraeg Bro Morgannwg

The proposed development (HLM, Proposed Site Layout Option 4 YBM-HLM-00-00-DR-L- 00004 Revision P03, 02/08/2018) shown on Figure 2a, includes the creation of a coach drop off area, 3G sports pitch, Multi-Use Games Area (MUGA), grassed sports pitch, footways and construction of seven new buildings. There is the proposal of a 2G hockey pitch to be developed in the south-west corner, which is not currently indicated on the Proposed Site Layout on Figure 2a.

A footway will be constructed from the coach drop off area to the school buildings, through the existing strip of broadleaved plantation woodland. Some severance and loss some of the trees is required to facilitate the construction of this footway.

Refurbishment of existing school buildings is proposed and this includes; at Building 6 the addition of a mezzanine floor (which requires access to the loft space) and infill panels over some windows. At other buildings this includes replacing/ renewing roofs and the addition of cladding onto some of the other existing buildings. The final details of the refurbishment have not yet been decided, but it is understood that there will not be any roofing works on Buildings 5 or 6 and that there is no refurbishment element on Building 2, these buildings are all adjacent to the broadleaved plantation woodland strip.

The thinning of the broadleaved plantation woodland to the north of Buildings 5 and 6 (Figure 1) is proposed to allow more natural light to the existing footway and into the buildings.

No further removal of broadleaved plantation woodland, rows of trees or hedgerows is required.

There will be loss of amenity grassland and some standalone trees to facilitate the construction the new buildings. There will be loss of amenity grassland to facilitate the construction of the 3G sports pitch, MUGA and 2G hockey pitch.

Removal of dense and scattered scrub may be required to facilitate the construction of the MUGA and the new buildings to the west of the existing Buildings 8 and 10.

External lighting plans have not been developed although AECOM understand that external lighting is likely to be required at the coach drop-off area, 3G sports pitch, multi-use games area and 2G hockey pitch.

The proposed development works are due to commence in July/August 2019 and be completed by August/September 2021.

1.3.2 Whitmore High School

The proposed development (Page 4 of the Whitmore High School Engagement Session 2 dated 20 November 2018) is shown on Figure 2b, is for the demolition of the existing Barry Comprehensive School and construction of a new mixed sex 11-18 school called Whitmore High School. The school will accommodate 900, 11-16 year old pupils and 200, Sixth Form pupils and will comprise a main school building, playing fields, car parking, a MUGA, a 3G All Weather Pitch (AWP), grassed Junior Rugby Pitch and grassed Senior Rugby Pitch and grassed athletics pitch. The development will include a courtyard with natural habitat features.

The coach drop off area will be located north of the existing broadleaved plantation woodland strip, within what is currently part of Barry Comprehensive School. However, for development and planning this will sit and be assessed within the Bro Morgannwg development boundary (Figure 2a).

The proposed development will maintain existing natural habitat boundary features, including the row of trees and intact hedgerows. The area of broadleaved scattered trees in the north will be removed to facilitate the creation of the Junior Rugby Pitch. There will be loss of amenity grassland to facilitate the construction of the new buildings, sports pitches, MUGA and car park.

External lighting plans have not been developed although AECOM understand that external lighting is likely to be required at the car park, 3G all weather sports pitch and multi-use games area.

Construction of the new school building is due to commence in August 2019. The existing school buildings will be demolished once the new school is complete, demolition is likely to commence in June/ July 2021.

1.4 Objectives

- To identify nature conservation sites within 10 km of the Site Boundary designated for bats;
- To identify any known records and/or populations of bats within 2 km of the Site Boundary;
- To establish bat species composition within the Site;
- To record and map spatial distribution and temporal bat activity within the Site;
- To highlight any potential ecological constraints in respect to bats;
- To make suggestions for mitigation, compensation and enhancement of the natural features identified within the Site in respect to bats; and,
- To satisfy Mandatory Requirements under BREEAM LE04.

1.5 Legislation

All bats and their roosts in Wales are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). They are also included in Schedule 2 of the Conservation of Habitats and Species Regulations 2017, known as The Habitats Regulations. The Wildlife and Countryside Act 1981 was amended by the Countryside and

Rights of Way Act 2000 (CRoW) which adds an extra offence of recklessly disturbing roosting bats or obstructing access to their roosts; makes species offences arrestable, increases the time limits for some prosecutions and increases penalties.

The Wildlife and Countryside Act, the Habitats Regulations and the CRoW Act, together make it an offence, among other things, to recklessly, deliberately or intentionally:

- Capture, injure or kill any wild animal which is a European Protected Species (EPS),
- Disturb wild animal of any such species; and,
- Damage or destroy a breeding or resting site of any such animal.

Disturbance is defined as that which is likely:

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

A bat roost is defined as “any structure or place (including trees) which any bat uses for shelter and protection”. Because bats tend to re-use the same roosts, legal opinion is that the roost is protected whether or not the bat(s) are present at the time.

If the proposed works are likely to destroy or disturb bats or their roosts, then a European Protected Species License (EPSL) will be required from Natural Resources Wales (NRW), which would be subject to appropriate mitigation and working methods to protect bats.

This is a brief summary of the legislation. When dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

1.6 Quality Assurance

This survey and subsequent report was undertaken in line with AECOM’s Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2015 and 14001:2004 and BS OHSAS 18001:2007. In addition our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

All AECOM Ecologists who worked on this Project are members of (at the appropriate level) the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct (CIEEM, 2017) when undertaking ecological work.

2. Methodology

2.1 Desk Study

Desk studies were completed as part of the AECOM PEA and BREEAM Reports undertaken in July 2018 (AECOM, 2018a and AECOM, 2018b). In relation to bats, the objectives of the desk study were to review the existing information available in the public domain to identify the following:

- Special Areas of Conservation (SACs) and Sites of Special Scientific Interest (SSSIs) designated for bats within a 10 km radius of the Site Boundary paying due regard to Bat Conservation Trust (BCT) guidelines (Collins, 2016), using the Multi Agency Geographic Information for the Countryside (MAGIC) website (NE, 2017);
- Bat records up to 2 km from the Site Boundary, purchased from the South East Wales Biodiversity Records Centre (SEWBReC);
- Ancient Semi-Natural Woodland (ASNW), Plantation on Ancient Woodland Site (PAWS), Restored Ancient Woodland Site (RAWS) or Ancient Woodland Site of Unknown category (AWSU) within or adjacent to the Site using Ancient Woodland Inventory 2011 dataset downloaded from the Lle website (NRW, 2017);
- The Section 7 list of Priority Species of Principal Importance for Conservation of Biological Diversity in Wales; and,
- Features of ecological interest surrounding the Site, and features connecting these habitats (e.g. hedgerows, watercourses, railway lines) using aerial photographs and Ordnance Survey (OS) maps.
- The County Ecologist and Glamorgan Bat Group were consulted regarding locally designated site citations, local bat records not available from SEWBReC and any local knowledge about the area.

2.2 Bat Activity Surveys

2.2.1 Assessment of Suitable Commuting and Foraging Habitat

The Site was assessed as having 'Moderate' suitability for commuting and foraging bats (Collins, 2016) during the PEA (AECOM, 2018a, and AECOM, 2018 b). Habitats within the Site were classified into categories dependent on the presence of features suitable for bats to commute and forage. Table 2.1 provides category descriptions.

Table 2.1: Commuting and Foraging Habitat Suitability

Habitat Suitability	Descriptions
High	Continuous high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
Moderate	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
Low	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i. e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small number of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.
Negligible	Negligible habitat features on site likely to be used by commuting or foraging bats.

Source: Category descriptions drawn from Collins, 2016 to be applied using professional judgement

2.2.2 Survey Approach

Collins, 2016 recommends for Moderate habitat suitability that a walked activity transect is completed once a month between April and October. However, given the local context of the Site on the outskirts of Barry town and the dominance of the Site by low value amenity grassland, it was recommend that a proportionate combined approach to the survey effort was undertaken. This comprised: 'Low' suitability methodology for the walked transect of one visit per season (spring, summer and autumn) and 'Moderate' Suitability methodology of at least two static detector locations on five consecutive nights per month April to October.

2.2.3 Bat Activity – Walked Transects

Surveys paid due regard to Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016).

One walked transect route was developed to sample the Site. This is shown on

Collins, 2016 recommends that for a 'Low' suitability site, a walked transect is completed once per season; one survey in spring (April/ May), one survey in summer (June/July/ August) and one survey in autumn (September/ October). Dusk walked transect surveys were completed once per month in June, August and September 2018. One dusk and dawn walked transect survey within one 24 hour period was completed in July 2018 (Section 2.4 Limitations).

Each survey consisted of two surveyors walking a pre-determined transect route at a steady pace around the Site. The start point and direction was varied across the months to reduce bias.

The walked transect contained twenty Listening Points (LP) at which the surveyors stopped for three minutes. The locations of the LPs are shown on Figure 3.

Dusk transect surveys began at sunset on one occasion and 15 minutes before sunset on two occasions and the surveys continued for at least 2 hours after sunset. The dawn transect started 2 hours before sunrise and continued until sunrise.

A broadband frequency division detector was used (BatLogger M) and digital recordings made to assist with species identification if required and to confirm identifications made in the field.

The weather conditions for all of the surveys completed to date was considered to be favourable for bats. The weather conditions and survey dates are given in Table 2.2.

2.2.4 Bat Activity – Static Detector Surveys

Surveys paid due regard to Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016). Four static detector locations were selected within the Site, based on suitable habitats and the locations of the proposed development design. The locations of the static detectors are shown in Figure 4 and Appendix A: Photographs 8 - 11.

Static detector surveys were completed in June, July, August and September 2018. Static detector surveys were not completed in October 2018 (Section 2.4 Limitations). Static detector surveys are scheduled for April and May 2019.

The dates of the static detector surveys were:

- 28 June – 03 July 2018;
- 12 – 17 July 2018;
- 16 – 21 August 2018; and,
- 03 – 08 September 2018.

The static detectors were set to begin recording 30 minutes before sunset and continue until 30 minutes after sunrise for a period of five consecutive nights (Collins, 2016). Some equipment issues reduced the static detector recording time (Section 2.4 Limitations).

Full spectrum frequency detectors (Titley Scientific Anabat Swift Passive Bat Detector with omnidirectional microphone) with sample rate 500 ksps were used to obtain digital recordings of bat echolocation calls in order to determine the species present at each static detector location.

2.3 Data Analysis and Interpretation

Bat echolocation call analysis was undertaken by a suitably experienced ecologist, with support from reference material including the British Bat Calls Species Identification Guide (Russ, 2012).

The AnalookW software programme (version 4.4a) was used to analyse bat echolocation calls. A series of custom made filters in Analook were applied to the bat echolocation call data. Ten percent of pipistrelle calls and all calls of the remaining bat species were manually checked once filters had been applied, and any additional or incorrect calls were relabelled.

There are six resident species of Myotid bat in Britain. Bats of the Myotis genus are difficult to identify to species level as the echolocation calls can have overlapping frequencies and can be visually similar when viewed on bat echolocation call software, such as Analook. Therefore, all Myotid bat echolocation calls were grouped together for the purposes of calculating Bat Activity Index (BAI).

Where possible, calls with characteristics of specific Myotid bats were noted to inform the species composition within the Site.

For the walked transect data, a BAI was calculated as the number of passes divided by the survey time in 'hours'.

For the static detector survey data, a BAI was calculated as the number of passes divided by the survey time in 'nights'. Survey time was calculated to the nearest 0.5 nights, to account for differences in survey duration (Section 2.4 Limitations). The half way point for each night was calculated using the start and finish time. If the static detector failed before the half way point then 0.5 of a night was used in the BAI calculations. If the static detector failed after the half way time point the whole night was used in the BAI calculations.

Bat activity is an indication of the amount of use bats make of an area (Collins, 2016). A bat pass is defined by BCT as a sequence of greater than two echolocation calls made as a single bat flies past the microphone (BCT, 2017). A bat pass is an index of bat activity rather than a measure of number of individuals in a population (Collins, 2016).

Calculated values within this report have been given to one decimal place.

Table 2.2 Walked Transect Survey Dates and Weather Conditions

Date	Sunset/ Sunrise Time	Start Time	End Time	Surveyors	Weather (start)	Weather (end)
28/06/18	21:34	21:19	23:45	LN & LF	Wind (Beaufort scale): 0 Cloud cover (oktas): 3/8 Temperature (°C): 23.7 Humidity: 56.9% Precipitation: No rain before or during the survey	Wind (Beaufort scale): 0.8 Cloud cover (oktas): 0/8 Temperature (°C): 23.7 Humidity: 64.2% Precipitation: No rain before or during the survey
14/08/18	20:37	20:37	22:40	UJ & CM	Wind (Beaufort scale): 2 Cloud cover (oktas): 8/8 Temperature (°C): 19.0 Humidity: 79.0% Precipitation: No rain before or during the survey	Wind (Beaufort scale): 2 Cloud cover (oktas): 8/8 Temperature (°C): 18.0 Humidity: NR Precipitation: No rain before or during the survey
15/08/18	05:59	03:59	05:59	UJ & CM	Wind (Beaufort scale): 4 Cloud cover (oktas): 8/8 Temperature (°C): 19.3 Humidity: 94.4% Precipitation: Rain before the survey.	Wind (Beaufort scale): 4 Cloud cover (oktas): 8/8 Temperature (°C): 19.1 Humidity: 85.2% Precipitation: Intermittent light rain during the survey.
l24/09/18	19:08	18:53	21:03	LF & CM	Wind (Beaufort scale): 1 Cloud cover (oktas): 2/8 Temperature (°C): 15.1 Humidity: 65.5% Precipitation: No rain before or during the survey	Wind (Beaufort scale): 1 Cloud cover (oktas): 3/8 Temperature (°C): 13.0 Humidity: 68.4% Precipitation: No rain before or during the survey

NR= Not Recorded
*LN – NRW Bat Licenced Ecologist, UJ – Senior Ecologist, LF – Ecologist, CM – Ecologist.

2.4 Limitations

2.4.1 Walked Transect Surveys

Collins, 2016 recommends a walked transect in spring (April/May). The first activity survey was completed in June 2018. Four walked transect visits have been completed at the Site in June, August and September, capturing summer and autumn which are the peak months for bat activity. Results and mitigation have been based on data collected during peak seasons, and are therefore considered robust and proportionate to the urban fringe site. Static detector surveys are scheduled to be additionally conducted in April and May 2019 and therefore bat activity during the spring will be captured as part of that survey, mitigation recommendations will be re-visited and adjusted, if required, following those surveys. This is not considered to be a significant limitation to the assessment of impacts and recommendations.

The dusk transect survey began at sunset on one occasion and 15 minutes before sunset on two occasions. Collins, 2016 recommends starting at sunset or that this can be made earlier if justified. The survey method did not deviate from best practice, but the method between dates differed. The survey durations have been accounted for when calculating the Bat Activity Index (Table 3.4). Therefore, the difference in survey start time is not considered to be a limitation to the survey.

2.4.2 Static Detector Surveys

Static detector surveys were not undertaken in October 2018 because the detector at Location 4 had been vandalised and data cards destroyed during the previous September survey. The units were not re-deployed to avoid any further vandalism. Static detector surveys are scheduled to be undertaken in April and May 2019 and will be deployed during the half term period, when they are less likely to be vandalised.

In June 2018; at Location 1 the static detector ran for a period of 4.5 nights and at Location 4 the static detector ran for a period of 4 nights, this was due to battery fatigue.

In August 2018 at Location 1 the static detector ran for a period of 3.5 nights, this was due to battery fatigue. In August at Location 3 the static detector ran for a period of 2 nights, this was likely due to an internal software error on the unit which caused the detector to run in the day as well as at the scheduled time and therefore caused the batteries to drain prematurely.

3. Results

3.1 Desk Study

The desk study results in relation to bats are summarised in Table 3.1.

Table 3.1: Desk Study Results

Designation/ Feature	Description
Nationally and Internationally Designated Sites for bats within 10 km	There are no designated sites for bats within 10km.
Locally Designated Sites within 2 km	There are several locally designated sites within 2km of the Site boundary (AECOM, 2018a and b). However, none of these are designated for bats or specifically mention bat species on the citations.
Bat Species Records from the last 10 years within 2 km	The following recent (last 10 years) bat species have been recorded within 2 km of the Site: Whiskered Myotis mystacinus (nearest record 1.0 km east, injured bat), common pipistrelle Pipistrellus pipistrellus (including one activity record returned from within the Site), pipistrelle species Pipistrellus pipistrellus agg (confidential roost record 2.0 km west), brown long-eared Plecotus auritus (single record of injured bat 60 m north), lesser horseshoe Rhinolophus hipposideros (confidential roost record approximately 3.4 km north of the Site).
Priority Species – Section 7 List	The following bat species are listed on Section 7 Species of Principal Importance in Wales: Barbastelle bat Barbastella barbastellus, Bechstein's bat, Myotis bechsteinii, noctule Nyctalus noctula, common pipistrelle, soprano pipistrelle Pipistrellus pygmaeus, brown long-eared bat, greater horseshoe bat Rhinolophus ferrumequinum, and lesser horseshoe bat.
Surrounding Land Use	The Site is located in Barry. To the north-east of the Site there are some playing fields, which extend into the residential area of Colcot. To the north of the Site is the A4226 Port Road West Road, further norther there is residential housing, a golf club with grassland and scattered woodland which extends into farmland beyond, linked by hedgerows. To the east of the Site is Barry Hospital. Further east are residential areas with some scattered parkland and greenspace including a recreational park, a cemetery and allotments located east of Colcot Road. To the south of the Site are residential areas. Industrial buildings are located further to the south towards Barry Docks. To the west of the Site are the outskirts of Colcot. Beyond the residential areas are fields and scattered woodland blocks linked by hedgerows.
Ancient Woodland	2.76 Ha of ASNW is located approximately 15 m from the western Site boundary and forms the Cwm Talwg Woodlands Local Nature Reserve (LNR). There is no ASNW, RAWS or PAWs within the Site boundary.
Tree Protection Orders (TPOs)	There are no TPOs within or adjacent to the Site boundary.
Council Ecologist and Local Specialist Recorders	The County Ecologist responded stating all records are submitted to SEWBReC. The local Bat Group were contacted; no response has been received to date.

3.2 Bat Activity Survey Results

3.2.1 Walked Transects

The walked transect survey route and LPs are shown on Figure 3. The results of the transect surveys and the distribution of the bat passes recorded are shown in Figure 5.

89 bat passes were recorded in total, across three survey visits.

The results of the walked transect surveys are displayed in Tables 3.2 to 3.4:

- Table 3.2 displays the count of bat passes for each species or species group;
- Table 3.3 displays the Bat Activity Index (BAI), expressed as bat passes per hour by LP; and,
- Table 3.4 displays BAI (passes/hr), by month.

A Site Assessment Summary, discussion of results, is provided in Section 3.3.

Table 3.2: Bat Activity – Walked Transect Bat Passes – Species Composition

Month 2018	Bat Passes (Count)					
	Myotis sp.	Noctule	Indeterminate Pipistrelle Species	Common Pipistrelle	Soprano Pipistrelle	All Species
June	0	1	0	11	0	12
August	1	1	0	32	8	42
September	0	0	1	26	8	35
All Months	**1**	**2**	**1**	**69**	**16**	**89**
Percentage %	1%	2%	1%	78%	18%	100%

Table 3.3: Bat Activity – Walked Transect Results BAI (bat passes/hour) by Listening Point (Spatial Distribution)

Listening Point Reference*	BAI					
	Myotis sp.	Noctule	Pipistrelle Species	Common Pipistrelle	Soprano Pipistrelle	All Species
1BM	0.0	0.0	0.0	5.0	0.0	**5.0**
2BM	0.0	0.0	0.0	0.0	0.0	**0.0**
3BM	0.0	0.0	0.0	0.0	0.0	**0.0**
4BM	0.0	0.0	0.0	15.0	10.0	**25.0**
5BM	0.0	0.0	0.0	20.0	0.0	**20.0**
6BM	0.0	0.0	0.0	15.0	15.0	**30.0**
7BM	0.0	0.0	0.0	10.0	0.0	**10.0**
8BM	0.0	0.0	0.0	5.0	0.0	**5.0**
9BM	0.0	0.0	0.0	5.0	0.0	**5.0**
10BM	0.0	0.0	0.0	5.0	5.0	**10.0**
1WH	0.0	0.0	0.0	25.0	10.0	**35.0**
2WH	0.0	0.0	0.0	5.0	0.0	**5.0**
3WH	0.0	0.0	0.0	20.0	5.0	**25.0**
4WH	0.0	0.0	0.0	0.0	0.0	**0.0**
5WH	0.0	0.0	0.0	0.0	0.0	**0.0**
6WH	0.0	0.0	0.0	0.0	0.0	**0.0**
7WH	0.0	0.0	0.0	0.0	0.0	**0.0**
8WH	0.0	0.0	0.0	5.0	0.0	**5.0**
9WH	0.0	0.0	0.0	15.0	5.0	**20.0**
10WH	0.0	0.0	0.0	0.0	0.0	**0.0**
TOTAL	**0**	**0**	**0**	**7.5**	**2.5**	**10**

*BM = Bro Morgannwg. WH = Whitmore. See Figure 3.

Table 3.4: Bat Activity – Walked Transect Results – BAI by Month (Temporal Distribution)

Transect	All Surveyed Months 2018	June	August	September
Transect Survey Time (Hrs)	8.8	2.4	4.2	2.2
Bat Passes	89	12	42	35
BAI (Bat passes/ hour)	**10.1**	**5.0**	**10.0**	**15.9**

3.2.2 Static Detector Surveys

9,631 bat passes were recorded at the Site between June and September 2018. A total of 69 recording nights were completed. The Static Detector Locations are shown in Figure 4.

The results of the static detector surveys are presented in Tables 3.5 to 3.9:

- Table 3.5 displays the count of bat passes for each species or species group.
- Table 3.6 displays the BAI for each species or species group.
- Table 3.7 displays the count of bat passes by Static Detector Location.
- Table 3.8 displays BAI (passes/night), by Static Detector Location.
- Table 3.9 displays the bat passes and BAI (passes/night), by month.

A Site Assessment Summary, discussion of results, is provided in Section 3.3.

Table 3.5: Bat Activity Static Detector Results – Bat Passes (Count) and Species Composition

Month 2018	Static Detector Location Number	Bat Passes (Count)							
		Brown Long-eared	Myotis sp.	Noctule/ Serotine / Leisler's	Nathusius' Pip.	Indeter-minate Pipistrelle Species	Common Pipistrelle	Soprano Pipistrelle	All Species
June	**All**	**1**	**36**	**15**	**0**	**24**	**1127**	**13**	**1216**
	1	1	0	4	0	3	156	1	165
	2	0	1	4	0	4	102	2	113
	3	0	7	2	0	5	118	2	134
	4	0	28	5	0	12	751	8	804
July	**All**	**12**	**23**	**26**	**0**	**19**	**1,560**	**32**	**1,672**
	1	11	0	8	0	9	1,164	18	1,210
	2	0	8	7	0	2	201	3	221
	3	1	12	8	0	5	88	5	119
	4	0	3	3	0	3	107	6	122
August	**All**	**4**	**7**	**12**	**0**	**15**	**1357**	**29**	**1424**
	1	3	0	4	0	6	1137	19	1169
	2	1	3	3	0	3	158	8	176
	3	0	0	2	0	0	10	0	12
	4	0	4	3	0	6	52	2	67
September	**All**	**4**	**10**	**16**	**1**	**34**	**4226**	**1,028**	**5,319**
	1	2	2	6	0	6	3676	37	3729
	2	1	1	9	0	1	199	14	225
	3	1	7	1	1	27	351	977	1,365
	4	Detector vandalised – No results							
All	**Grand Total**	**21**	**76**	**69**	**1**	**92**	**8270**	**1102**	**9631**
%		0%	1%	1%	0%	1%	86%	11%	100%

Table 3.6: Bat Activity Static Detector Results – Bat Activity Index

Month 2018	Static Detector Location Number	BAI								
		Brown Long-eared	Myotis	Noctule/ Serotine/ Leisler's	Nathusius' Pipistrelle	Indeter-minate Pipistrelle Species	Common Pipistrelle	Soprano Pipistrelle	All Species	Number of Recording Nights
June	**All**	**0.1**	**1.9**	**0.8**	**0.0**	**1.3**	**60.9**	**0.7**	**65.7**	**18.5**
	1	0.2	0.0	0.9	0.0	0.7	34.7	0.2	36.7	4.5
	2	0.0	0.2	0.8	0.0	0.8	20.4	0.4	22.6	5
	3	0.0	1.4	0.4	0.0	1.0	23.6	0.4	26.8	5
	4	0.0	7.0	1.3	0.0	3.0	187.8	2.0	201.0	4
July	**All**	**0.6**	**1.2**	**1.3**	**0.0**	**1.0**	**78.0**	**1.6**	**83.6**	**20**
	1	2.2	0.0	1.6	0.0	1.8	232.8	3.6	242.0	5
	2	0.0	1.6	1.4	0.0	0.4	40.2	0.6	44.2	5
	3	0.2	2.4	1.6	0.0	1.0	17.6	1.0	23.8	5
	4	0.0	0.6	0.6	0.0	0.6	21.4	1.2	24.4	5
August	**All**	**0.3**	**0.5**	**0.8**	**0.0**	**1.0**	**87.5**	**1.9**	**91.9**	**15.5**
	1	0.9	0.0	1.1	0.0	1.7	324.9	5.4	334.0	3.5
	2	0.2	0.6	0.6	0.0	0.6	31.6	1.6	35.2	5
	3	0.0	0.0	1.0	0.0	0.0	5.0	0.0	6.0	2
	4	0.0	0.8	0.6	0.0	1.2	10.4	0.4	13.4	5
September	**All**	**0.3**	**0.7**	**1.1**	**0.1**	**2.3**	**281.7**	**68.5**	**354.6**	**15**
	1	0.4	0.4	1.2	0.0	1.2	735.2	7.4	745.8	5
	2	0.2	0.2	1.8	0.0	0.2	39.8	2.8	45.0	5
	3	0.2	1.4	0.2	0.2	5.4	70.2	195.4	273.0	5
	4	Detector Stolen – No Results								0
All	**Grand Total**	**0.3**	**1.1**	**1.0**	**0.0**	**1.3**	**119.9**	**16.0**	**139.6**	**69**

Table 3.7: Bat Activity Static Detector Results – Bat Passes (Count) by Static Detector Location (Spatial Distribution)

Month 2018	Static Detector Location Number	Bat Passes (Count)							
		Brown Long-eared	Myotis sp.	Noctule/ Serotine/ Leisler's	Nathusius' Pipistrelle	Indeterminate Pipistrelle Species	Common Pipistrelle	Soprano Pipistrelle	All Species
June – September	1	17	2	22	0	24	6133	75	6273
	2	2	13	23	0	10	660	27	735
	3	2	26	13	1	37	567	984	1630
	4	0	35	11	0	21	910	16	993
	All	**21**	**76**	**69**	**1**	**92**	**8270**	**1102**	**9631**

Table 3.8: Bat Activity Static Detector Results – Bat Activity Index by Static Detector Location (Spatial Distribution)

Month 2018	Static Detector Location Number	BAI								
		Long-eared	Myotis sp.	Noctule/ Serotine/ Leisler's	Nathusius' Pipistrelle	Indeter-minate Pipistrelle Species	Common Pipistrelle	Soprano Pipistrelle	All Species	Number of Recording Nights
June – September	1	15.1	0.1	16.3	0.0	18.3	2661.2	40.1	2751.2	18
	2	1.1	12.1	14.5	0.0	9.1	471.0	13.7	521.3	20
	3	1.1	19.4	12.1	0.1	11.6	236.6	64.5	345.3	17
	4	1.5	40.4	15.9	0.1	27.6	1500.7	94.7	1680.9	14
	All	**0.3**	**1.1**	**1.0**	**0.0**	**1.3**	**119.9**	**16.0**	**139.6**	**69**

Table 3.9: Bat Activity Static Detector Results 2018 – Bat Activity Index by Month (Temporal Distribution)

	June	July	August	September	All Survey Months
Bat Passes (Count)	1216	1672	1424	5319	9631
Survey Time (Nights)	18.5	20	15.5	15	69
Bat Activity Index (BAI) (Bat passes/ Time)	65.7	83.6	91.9	354.6	139.6

Bat Activity Index = Bat Passes/ Survey Time in Survey Nights.

3.3 Site Assessment

3.3.1 Bat Activity – Species Composition

At least eight species of bat were recorded foraging and/ or commuting within the Site. The following species and species groups have been identified:

- Common pipistrelle;
- Soprano pipistrelle;
- Nathusius' pipistrelle;
- Myotis species; (including calls with characteristics of Brandt's Myotis brandtii and Daubenton's Myotis daubentonii);
- Noctule Nyctalus noctula;
- Serotine Eptesicus serotinus;
- Leisler's Nyctalus leisleri,; and,
- Brown long-eared.

Common and soprano pipistrelles were the most commonly recorded species at the Site. Overall pipistrelle species comprised 96.6% of all passes recorded on the walked transect survey and 98.3% of the static detector survey. One pass of Nathusius' pipistrelle was recorded at Location 3 in September 2018 during the static detector surveys, indicating they are present locally. Common pipistrelles are a common and wide spread species, and typical of the species expected to be dominant at this suburban site.

In total, 89 bat passes were recorded across all three walked transect survey visits. 9,631 bat passes were recorded on the static detectors between June and September 2018. This is a modest amount of activity and does not indicate that the Site provides a significant foraging resource for the local population. The numbers and types of species recorded are considered typical for a Site located within the suburban fringe. There are woodland blocks and rough grassland, including Cwm Talwg Woodlands LNR and Fferm Walters SSSI in proximity to the Site which likely offers greater value to foraging bats.

3.4 Bat Activity – Spatial Distribution

Figure 5 shows the spatial distribution of individual bat passes recorded during the walked transect surveys. Figure 4 shows the static detector locations.

Higher levels of activity were recorded at Location 1 along the tree lined southern Site boundary (6,273 total bat passes; 2,751.2 BAI), compared to the other static detectors locations including at Location 3 (1,630, total bat passes, 345.3 BAI) and at Location 4 (993, total bat passes, 1,680.9 BAI) along the boundary area of broadleaved plantation woodland between the two schools in the centre of the Site.

During the walked transects bat activity was recorded across the Site. Linear features, including the broadleaved plantation woodland strip through the centre of the Site, hedgerows and tree lines appear to be important features for bats within the Site. The Transect LP's with the highest Bat Activity at Whitmore, 1WH and 3WH (Table 3,3, Figure 3), where along the broadleaved plantation woodland strip. The Transect LP's with the highest Bat Activity at Bro Morgannwg, 4BM, 5BM and 6BM (Table 3.3, Figure 3) where along the southern Site boundary. This reflect the results of the static surveys, that the southern Site boundary is the most used by bats at the Site, followed by the plantation woodland strip.

3.5 Bat Activity – Temporal Distribution

Of the months surveyed, September 2018 had the highest BAI for the walked transect surveys (with a BAI of 15.9) and for the static detector surveys (with a BAI of 354.6).

Young bats are typically born in June and July and during August the young are starting to leave the roosts to fly and feed. September and October is part of the bat mating period and a time when bats are extensively foraging for food as they are looking to store fat for the winter hibernation period.

4. Potential Impacts

4.1 Ysgol Gymraeg Bro Morgannwg

4.1.1 Habitat Loss

A proportion of the amenity grassland and all the scattered scrub around the existing sports courts will be removed as part of the development.

Some of the dense scrub may need to be removed to facilitate the construction of the MUGA and the new buildings to the west of the existing Buildings 8 and 10.

There was no bat activity associated with the scattered scrub habitat and limited activity levels associated with the amenity grassland habitat (Figure 5), which indicates that these areas are of low to negligible value to commuting and foraging bats at a local landscape level. The partial loss of the amenity grassland and the complete loss of the scattered scrub are unlikely to have an impact on the local bat population.

The proposed development includes a new row of planted trees to the south of the proposed new buildings which will provide the opportunity for a new commuting route and foraging habitat for bats, depending on the extent of light spill.

Some broadleaved plantation woodland will be removed for the construction of the new footway access from the new coach drop off area within Whitmore School. The area of habitat loss will be approximately 5m wide and this is unlikely to significantly reduce the amount of habitat available to foraging bats.

4.1.2 Severance and Fragmentation

The removal of some the broadleaved plantation woodland is required to facilitate the construction of the footway which runs from the coach drop off area to access the school buildings to the south. The area of habitat loss will be approximately 5 m in width to accommodate the footway and working area. Without mitigation, this has the potential to l sever the connectivity to the broadleaved plantation woodland either side of the footway, resulting in severance and fragmentation of retained areas.

The development requires the thinning out of some of the broadleaved plantation woodland to the north of Buildings 5 and 6 (Figure 1) to enable more natural light to the existing footway and into the buildings. Without mitigation, vigorous thinning out of the broadleaved plantation woodland in this area could impact upon any foraging and commuting bats using this habitat.

Lighting of this ‘gap’ with columns of lighting bollards would further deter bats. Common pipistrelles, Britain’s most numerous species, have been recorded avoiding gaps that are well lit, thereby creating a barrier effect (Hale et al 2015).

4.1.3 External Lighting

The lighting plan has not been developed. The impacts discussed below are based on the current development plans and by using professional judgement. Once lighting plans have been developed, these should be discussed with an ecologist. There is the possibility that there may be further impacts and the need for additional mitigation not discussed in this report.

Many species of bat are adverse to light, with different species having different tolerances. External lighting can make areas of previous foraging habitat unsuitable or inaccessible and therefore cause in-direct habitat loss.

4.1.3.1 Coach Drop-off Area and 3G Sports Pitch:

It is likely external lighting will be required at the coach drop-off area and 3G sports pitch. Without mitigation, this has the potential to cause in-direct habitat loss for foraging and commuting bats using; the area of broadleaved

plantation woodland located between the coach drop-off area and 3G sports pitch, the area of amenity grassland and fence line to the south and west of the 3G sports pitch. Additional external lighting in these areas also has the potential to cause in-direct habitat loss for foraging and commuting bats using areas of natural vegetation including hedgerows and areas of woodland outside of the site boundary to the north and west of the proposed 3G sports pitch.

During the walked bat transect surveys the broadleaved plantation woodland had records of foraging and commuting common and soprano pipistrelle bats (Figure 5). Static Detector Locations 3 and 4 were positioned within this habitat (Figure 4) and recorded bat activity by at least six species. However, this habitat had lower levels count of bat passes (combined 2,623) than that of the Static Detector Location 1 (6,273 passes) located along the row of broadleaved trees on the South Site boundary (Table 3.7).

During the walked transect surveys foraging and commuting common and soprano pipistrelle bats were recorded along the along the fence line and using areas of amenity grassland within the Site to the west of the proposed 3G sports pitch and using areas outside of the Site boundary to the north (Figure 5).

4.1.3.2 MUGA and 2G Hockey Pitch

It is likely that sports lighting will be required for the MUGA and 2G hockey pitch. There is potential for these facilities to be utilised outside of school hours, by the school or local ground during the evenings. Without mitigation, this has the potential to cause in-direct habitat loss for foraging and commuting bats using the dense scrub, defunct hedgerow, row of broadleaved trees.

During the walked bat transect surveys the dense scrub, defunct hedgerow, row of broadleaved trees and Bat Trees 1 and 2 had records of foraging and commuting common and soprano pipistrelle bats (Figure 5). Static Detector Location 2 was located within the dense scrub along the western boundary to the north-west of the proposed MUGA (Figure 4). This static detector recorded activity of at least five different bat species and had the third highest bat activity (Table 3.8).

4.2 Whitmore High School

4.2.1 Habitat Loss

A proportion of the amenity grassland, and all of the broadleaved scattered trees in the north will be removed as part of the development.

However, there was limited bat activity observed in association with the amenity grassland and broadleaved scattered trees habitats (Figure 5). The removal of these habitats is unlikely to have an impact on commuting and foraging bats at a local landscape level.

The proposed development includes a new area of planted trees to the south of the car park, which will provide the opportunity for new commuting and foraging habitat, depending on the external light spill. The partial loss of the amenity grassland and complete loss of the broadleaved scattered trees is unlikely to have an impact on the local bat population.

4.2.2 External Lighting

The lighting plan has not been developed. The impacts discussed below are based on the current development plans and by using professional judgement. Once lighting plans have been developed, these should be discussed with an ecologist. There is the possibility that there may be further impacts and the need for additional mitigation not discussed in this report.

4.2.2.1.1 Car Park

It is likely that additional lighting will be required for the car park. Without mitigation, this has the potential to cause in-direct habitat loss for foraging and commuting bats using the area of broadleaved plantation woodland to the west within Ysgol Gymraeg Bro Morgannwg and discussed in Section 4.1.3.1.1 above. Additional lighting in this area also has the potential to cause in-direct habitat loss for foraging and commuting bats using the row of trees to the south and reducing the likelihood of any bats using the proposed new area of planted trees for foraging and commuting.

4.2.2.1.2 MUGA and 3G All Weather Sports Pitch

It is likely that additional lighting will be required for the MUGA and 3G all weather sports pitch. There is potential for these facilities to be utilised outside of school hours, by the school or local ground during the evenings. Without mitigation, this has the potential to cause in-direct habitat loss for foraging and commuting bats using the row of trees, and area of broadleaved plantation woodland (within Ysgol Gymraeg Bro Morgannwg) to the south.

During the walked transect surveys, common and soprano pipistrelle and bats of the Myotis genus were recorded commuting and foraging along the row of trees to the south of the proposed new car park, MUGA and 3G all weather sports pitch (Figure 5).

Static Detector Locations 3 and 4 were positioned within this habitat (Figure 4) and recorded bat activity by at least six species. Static Detector Location had the second highest BAI (Table 3.8).

It is not anticipated that additional lighting will be required for the Senior Rugby Pitch and Junior Rugby Pitch or the athletics running track.

5. Recommendations for Further Surveys and Mitigation

A separate Bat Roost Survey Report for Whitmore and Bro Morgannwg (AECOM 2018c and AECOM 2018d) has been produced which incorporates mitigation for impacts on roosting bats..

5.1 Further Surveys

5.1.1 Further Surveys

Two further static detector bat activity surveys are scheduled to be completed in April and May 2019.

5.2 Recommendations for Mitigation

5.2.1.1 Habitat Loss, Severance and Fragmentation

Where the broadleaved planation woodland is to be severed to facilitate the construction of the new footway access, woodland should be kept as close as possible to the footway and the canopy of adjacent trees retained so that aerial connectivity is not severed by the new access footway.

To avoid the impacts of severance, where the broadleaved plantation woodland is being thinned out to the north of Bro Morgannwg Buildings 5 and 6 (Figure 1), the works should be limited to crown lifting and removal of small saplings. The felling of larger trees should be avoided to maintain the canopy connection for bats.

5.2.1.2 Bats and Lighting

The lighting plan has not been developed. However AECOM have identified areas where external lighting is likely to be required.

The following recommendations in line with the BCT, 2009, BCT, 2014, ILP 2018 and Gunnell et. al., 2012, best practice guidance should be incorporated into any new lighting scheme at the Site:

- Avoid lighting the gap created through the broadleaved woodland strip for the new footway. Studies have shown that bats are recorded avoiding gaps that are well lit, thereby creating a barrier effect (Hale et al 2015).
- Light spill onto confirmed roosts in Buildings 2 and 6 of Ysgol Gymraeg Bro Morgannwg and any new bat boxes must be avoided (AECOM, 2018 c);
- In the first instance, external lighting should be designed to avoid light spill onto boundary features including rows of trees, hedgerows, dense scrub and woodland edges; and,
- Light spill onto the gap created by the new access footway and onto the vegetated Site boundaries, which are used by commuting and foraging bats, should be limited to levels of 3 Lux or less.

Suggestions for mitigating the impacts of external lighting and achieving the lighting recommendations above are outlined in the ILP Guidance Note (ILP, 2018) and best practice guidance (BCT, 2009, BCT 2014 and Gunnell et. al., 2012). These include:

- Only light areas which need to be lit, and use the minimal level of lighting required to comply with guidance such as Institute of Lighting Engineers Guidance Notes for the Reduction of Obtrusive Light (2005);
- LED luminaires should be used where possible due to their sharp cut off, low intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component.
- Eliminate bare lamps and any upward pointing light;
- The spread of light should be at or near the horizontal. Flat cut off lanterns are best;
- Use narrow spectrum lamps. Using lamps with the lowest UV output possible, avoid white and blue spectrums of light;

- Lights should peak higher than 550 nm or use glass lanterns to filter UV light;
- Reduce the height of lighting columns;
- Direct lighting to where needed and avoid spillage e.g. direct lighting towards the building front/foot path and design the luminaire appropriately, including the use of shields to avoid spillage behind the lamps onto adjacent habitats. Footways could, for example, be lit using bollards to keep the light below the tree canopy;
- Street lights can be located so that rear shields face the adjacent habitats or optics selected that stop back light thereby directing light into the task area, avoiding spill onto adjacent habitats.
- Where new lighting is proposed, use lighting modelling programs to indicate where the light spill will occur;
- Any external security lighting should be set to motion sensors and short (1 min) timers;
- Limit the times that the lights are on, to provide some dark periods;
- Avoid using reflective surfaces under lights; and,
- Do not use a lamp greater than 150W for security lighting.

This will enhance the value of the Site for a number of other nocturnal species, as well as for bats.

5.3 Recommendations for Enhancing the Site for Bat Activity

Recommendations for enhancing Site ecology have been provided in Ysgol Gymraeg Bro Morgannwg PEA (AECOM, 2018 a) and Whitmore High School PEA (AECOM, 2018 b). A summary of recommendations, where they relate to current or potential bat habitat is provided below.

5.3.1.1 Improving Grassland Diversity

A different management regime will be completed for areas of grassland which are not used for sports and play areas.

New areas of grassland could be planted and managed to enhance species diversity. These areas should be mown three times a year (April, August and once during winter). http://wildseed.co.uk/page/management-of-meadows-and-grassland has more details on how to manage species-rich grasslands.

It has been assumed that the top soil will be derived from on Site. The seed mixes used should be appropriate for the subsoil type used and need to be approved by the Suitably Qualified Ecologist (SQE) prior to use. Areas should be sown with a diverse lawn mix such as:

- Emorsgate General Purpose Meadow Mixture EM2 (18 species) (www.wildseed.co.uk); or,
- Germinal (formally British Seed Houses) WFG20 Eco Species Rich Lawn (34 species) (https://www.germinal.com).

For more information including flower colour, benefits to wildlife and soil type for various species see Wildflower Meadows: How to Create One in Your Garden (Natural England, 2007), available online.

Wildflower planting will benefit invertebrates and hence birds, foraging bats and hedgehogs.

5.3.1.2 Sensory Garden

An area designated for seating could incorporate a range of native, scented plants to stimulate and soothe the senses whilst also providing habitat for wildlife, most notably pollinating invertebrates such as butterflies, bees and hoverflies using plants such as lavender, honeysuckle, rosemary, mint, thyme and wild garlic.

The emphasis should be on plant species native to the UK to be beneficial for pollinating insects. Butterflies and moths are both aesthetically interesting and useful, often being brightly coloured and important pollinators. Butterflies and moths need plants both for food and as host plants to complete their lifecycle. They are often particularly attracted to brightly coloured or highly scented flowers, making planting that is good for butterflies attractive to humans too. Appendix G gives a list of native plants that are attractive to butterflies. Gunnell et.al. 2012, Landscaping and urban design for bats and biodiversity (free to download online) has planting lists which are beneficial for invertebrates and are often scented with attractive flowers or forms. Using such species in planting, especially in proximal or linked areas, is likely to increase the value of a Site for butterflies and moths.

Note that not all of the plant species listed will be suitable for all soil types. Planting should be chosen based on the ability of the species to thrive in the local conditions.

Additional planting of invertebrate friendly planting will encourage invertebrates into the Site and be of benefit to foraging bats.

5.3.1.3 Green Corridors

Green corridors should be enhanced and created to provide habitat for wildlife and connectivity across the Site and within the surrounding area.

Existing boundary features could be enhanced to increase their value to commuting and foraging animals. This could be by planting into gaps and increasing the width through planting or incorporating grassland strips.

Planting could be of hedgerow species, with occasional native standard trees. Planting will be a diverse mixture of locally native species of value to wildlife including plants which provide fruits, nuts or berries. A native species rich seed mix, suitable for the location (such as a woodland mix or verge mix) should be used at the base, to create a ‘field margin’ of at least 3 m at from the base of the hedgerow. This should be kept ‘dark’ and light spill onto the features should be avoided, to maximise its benefits.

Tree planting or hedgerow planting within the new Whitmore car park is recommended to provide 'stepping stones' for wildlife. A row of trees could be planted between the car park and the coach drop off area, creating a new linear feature for wildlife.

Any landscape planting proposed should seek to create green corridors which provide new connectivity across or around the Site. New planting which provides connectivity from any new bat or bird boxes to the boundary features will be important.

6. References

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Figure 1: Phase 1 Habitat Map

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Project Title:

VALE OF GLAMORGAN SCHOOLS BRO MORGANNWG AND WHITMORE

Client:

VALE of GLAMORGAN
BRO MORGANNWG

LEGEND

- Site Boundary
- Trees
- Invasive Species

Prelim. Bat Roost Suitability for Buildings

- High Suitability
- Moderate Suitability
- Low Suitability
- Negligible Suitability

Prelim. Bat Roost Suitability for Trees

- High Suitability
- Low Suitability

Phase 1 Habitat Linear Features

- Row of trees - broadleaf
- Row of trees - coniferous
- Intact Hedge - Species-Poor
- Defunct Hedge - Species-Poor
- Hedge with Trees - Species-Poor
- Fence
- Wall

Phase 1 Habitat Areas

- Broadleaved woodland - plantation
- Dense/Continuous scrub
- Scattered scrub
- Broadleaved scattered trees
- SI — Semi-improved - neutral grassland
- SI — Poor semi-improved grassland
- Amenity grassland - cultivated land
- Introduced shrub - cultivated land
- Buildings
- Hard Standing

AECOM Internal Project No:

60571314

Drawing Title:

PHASE 1 HABITAT PLAN

Scale at A3: 1:2,500

Drawing No:	Rev:
FIGURE 1	001

Drawn:	Chk'd:	App'd:	Date:
GM	CM	LN	20/12/18

Filename: \\Ukcdf1fp002\ukcdf1fp002-v1ie\Projects\Environmental\Jobs - Potential\2018\2018 Q1\Vale of Glamorgan Schools\010 GIS\Bro Morgannwg\02_Maps\BM&W_Activity\Figure 1 - Phase 1.mxd

Figure 2a: Proposed Development – Ysgol Gymraeg Bro Morgannwg

Notes

Check all dimensions on site. Do not scale from this drawing
Report any discrepancies and omissions to HLM Architects

Rev	Sbty	Description	Date	By	Chk
P03		ISSUE FOR STAGE 2	02.08.2018	DP	MT
P02		ISSUE TO DESIGN TEAM	16.07.2018	KB	GW
P01		ISSUE TO DESIGN TEAM FOR COMMENT	29.06.2018	KB	MWT

Revisions

Suitability

Project

15-1054-01 YSGOL GYMRAEG BRO MORGANNWG

Client

VALE OF GLAMORGAN COUNCIL

Title

Proposed Site Layout Option 4

Drawing No.: **YBM-HLM-00-00-DR-L-00004**

Revision: **P03**

Scale @ A0: 1:500

Drawn: DP

Date: 02.08.2018

Checked: MT

HLM

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LONDON SHEFFIELD GLASGOW BELFAST CARDIFF MANCHESTER JOHANNESBURG ABU DHABI DUBAI

Figure 2b: Proposed Development – Whitmore High School

HLM Site Layout

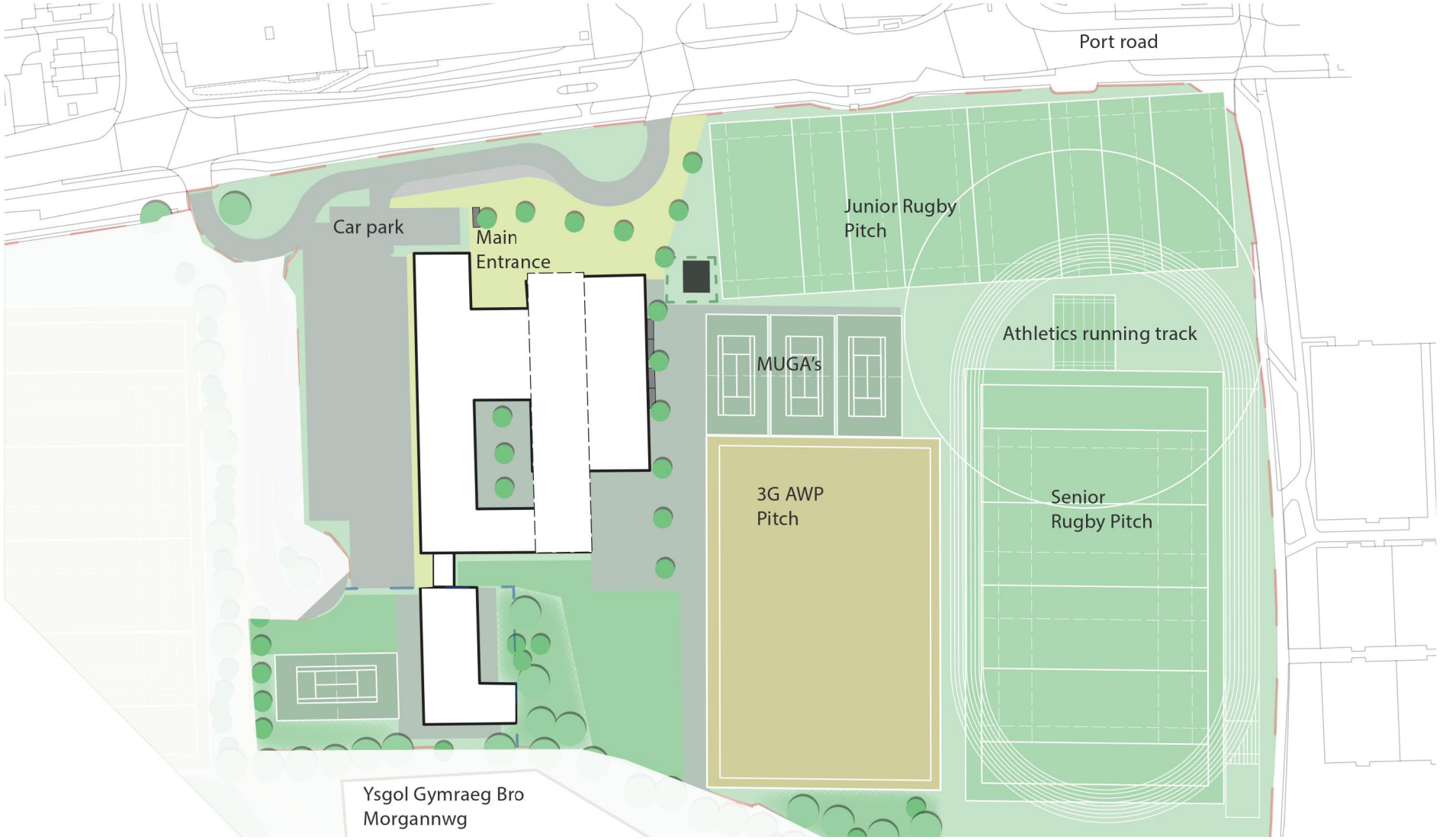
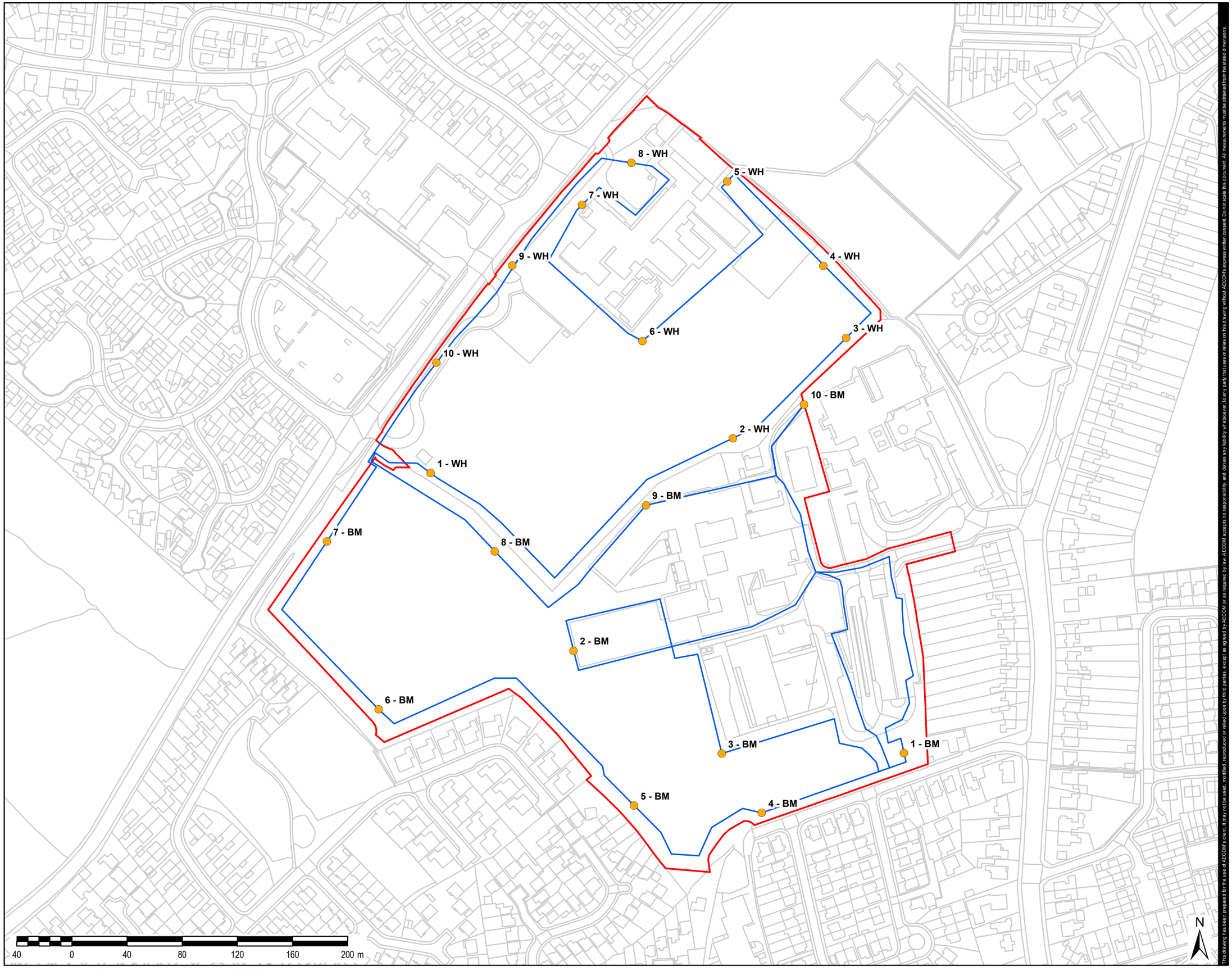


Figure 3: Bat Activity Walked Transect Route with Listening Points



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VALE OF GLAMORGAN SCHOOLS
BRO MORGANNWG AND WHITMORE

Client:

VALE of GLAMORGAN
BRO MORGANNWG

LEGEND

- Site Boundary
- Listening Point
- Walked Transect Route

AECOM Internal Project No:

60571314

Drawing Title:

BAT ACTIVITY WALKED TRANSECT ROUTE WITH LISTENING POINTS

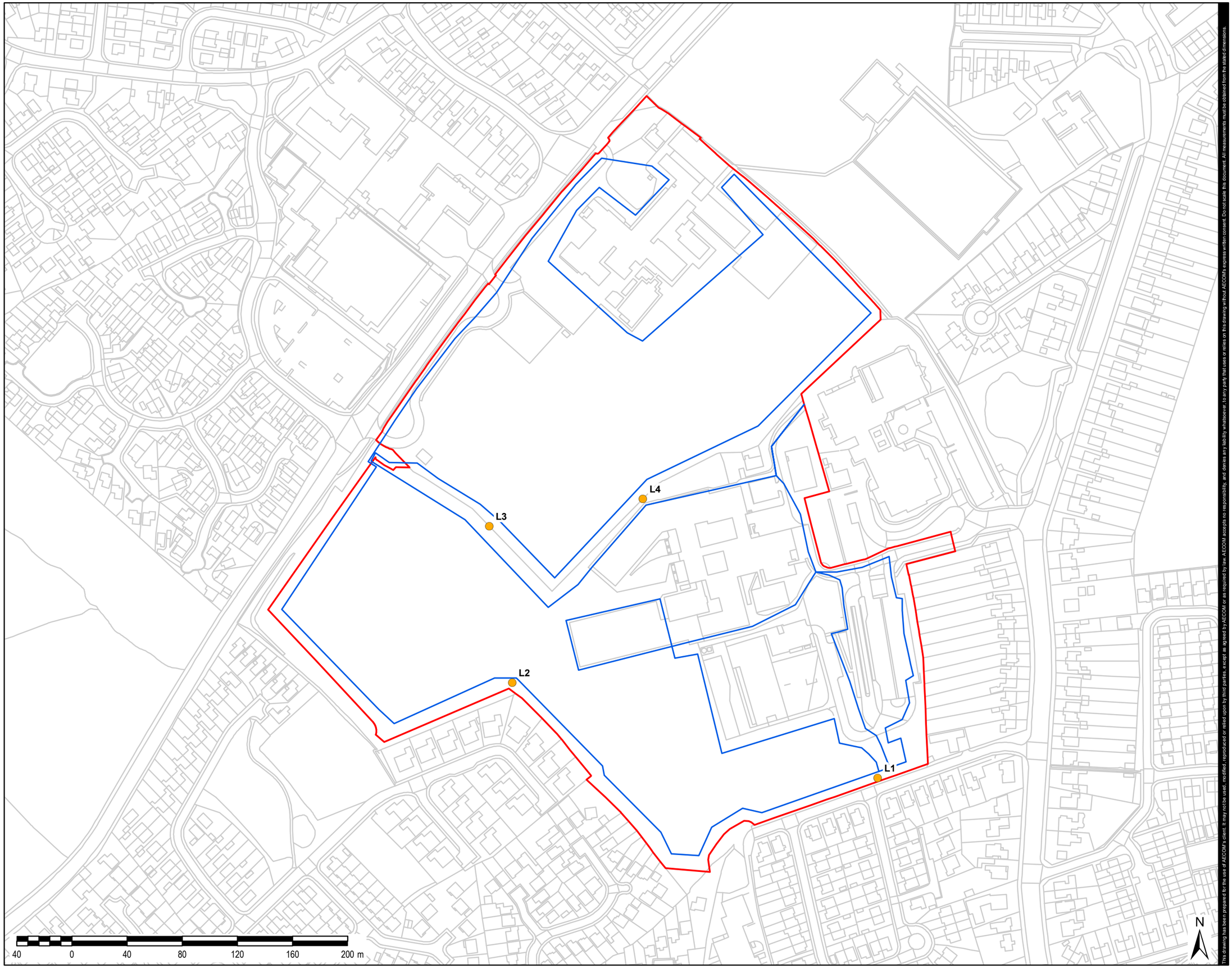
Scale at A3: 1:2,500

Drawing No:	Rev:
FIGURE 3	001

Drawn:	Chk'd:	App'd:	Date:
GM	CM	LN	12/12/18

Filename: \\Ukcdf1fp002\ukcdf1fp002-v1ie\Projects\Environmental\Jobs - Potential\2018\2018 Q1\Vale of Glamorgan Schools\010 GIS\Bro Morgannwg\02_Maps\BM&W\Figure 3 - Bat Activity Walked Transect Route with Listening Points.mxd

Figure 4: Bat Activity Static Detector Locations



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Project Title:

VALE OF GLAMORGAN SCHOOLS
BRO MORGANNWG AND WHITMORE

Client:

VALE of GLAMORGAN
BRO MORGANNWG

LEGEND

- Site Boundary
- Static Detector Location
- Walked Transect Route

AECOM Internal Project No:

60571314

Drawing Title:

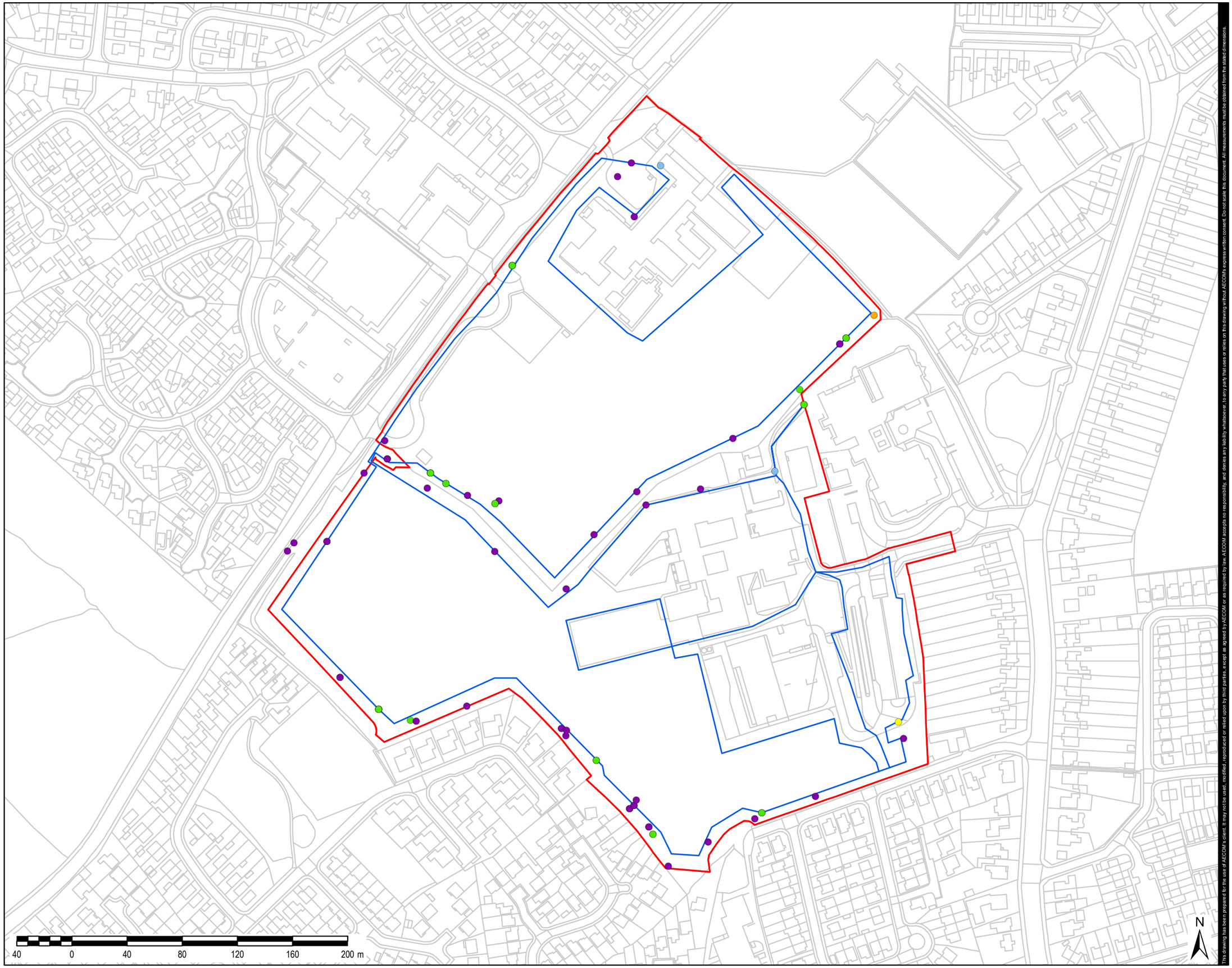
BAT ACTIVITY STATIC DETECTOR LOCATIONS

Scale at A3: 1:2,500

Drawing No:			Rev:
FIGURE 4			001
Drawn:	**Chk'd:**	**App'd:**	**Date:**
GM	CM	LN	12/12/18

Filename: \\Ukcdf1fp002\ukcdf1fp002-v1ie\Projects\Environmental\Jobs - Potential\2018\2018 Q1\Vale of Glamorgan Schools\010 GIS\Bro Morgannwg\02_Maps\BM&W\Figure 4 - Bat Activity Static Detector Locations.mxd

Figure 5: Bat Activity Walked Transect Survey Results



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Project Title:

VALE OF GLAMORGAN SCHOOLS
BRO MORGANNWG AND WHITMORE

Client:

VALE of GLAMORGAN
BRO MORGANNWG

LEGEND

- Site Boundary
- Common pipistrelle
- Pipistrelle SP.
- Soprano pipistrelle
- Noctule
- Myotis
- Walked Transect Route

AECOM Internal Project No:

60571314

Drawing Title:

BAT ACTIVITY WALKED TRANSECT SURVEY RESULTS

Scale at A3: 1:2,500

Drawing No:			Rev:
FIGURE 5			001
Drawn:	**Chk'd:**	**App'd:**	**Date:**
GM	CM	LN	12/12/18

Filename: \\Ukcdf1fp002\ukcdf1fp002-v1ie\Projects\Environmental\Jobs - Potential\2018\2018 Q1\Vale of Glamorgan Schools\010 GIS\Bro Morgannwg\02_Maps\BM&W\Figure 5 - Bat Activity Walked Transect Survey Results.mxd

Appendix A: Site Photographs

Photograph 1: Looking west across an area of amenity grassland and row of broadleaved trees in the south of the Site (Ysgol Gymraeg Bro Morgannwg).

Photograph 2: Looking north along the edge of the defunct hedgerow in the south-west of the Site (Ysgol Gymraeg Bro Morgannwg).

Photograph 3: Area of scattered scrub adjacent to the area of hardstanding within the centre of the Site (Ysgol Gymraeg Bro Morgannwg).

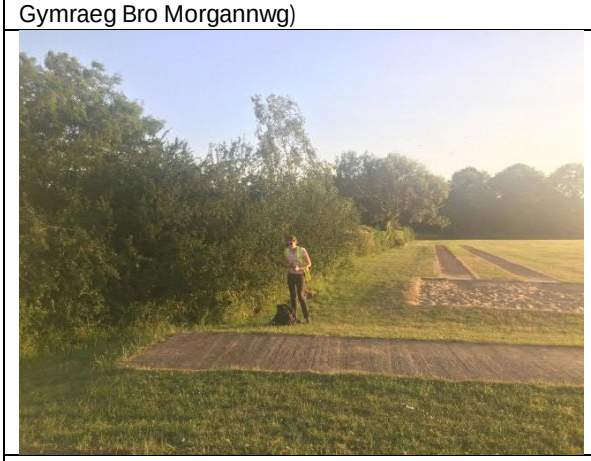
Photograph 4: Looking east along the strip of broadleaved plantation woodland between Ysgol Gymraeg Bro Morgannwg and Whitmore High School.

Photograph 5: Looking west across the north of the amenity grassland playing fields of Ysgol Gymraeg Bro Morgannwg, with the hardstanding footpath and hedgerow outside of the Site boundary also visible.

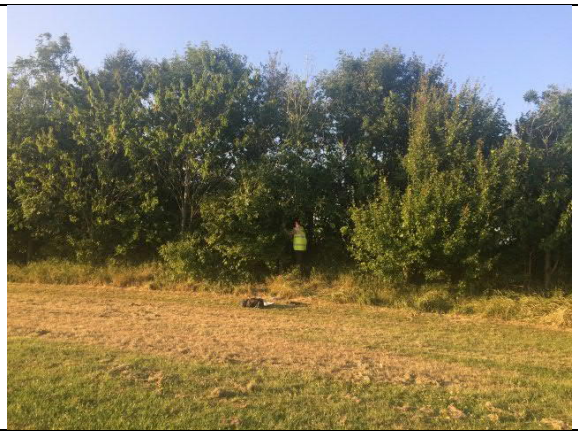
Photograph 6: An area of amenity grassland and dense scrub within the west of Ysgol Gymraeg Bro Morgannwg and the hardstanding footpath and area of woodland outside of the Site to the west.

Photograph 7: Area of dense scrub next to the hard standing car park in the south-east of the Site (Ysgol Gymraeg Bro Morgannwg)

Photograph 8: Area of Static Detector Location 1 within the South of the Site (Ysgol Gymraeg Bro Morgannwg).



Photograph 9: Area of Static Detector Location 2 within the west of the Site (Ysgol Gymraeg Bro Morgannwg).



Photograph 10: Area of Static Detector Location 3 within the broadleaved planation woodland strip in the centre of Site (Ysgol Gymraeg Bro Morgannwg).

Photograph 11: Area of Static Detector Location 4 within the broadleaved planation woodland strip in the centre of Site (Ysgol Gymraeg Bro Morgannwg).

Photograph 12: Area of broadleaved scattered trees within the north of the Site (Whitmore High School)

Photograph 13: Area of amenity grassland and intact hedgerow looking west across the north of the Site (Whitmore High School)

Photograph 14: Area of amenity grassland and intact hedgerow looking east across the north of the Site (Whitmore High School)

Photograph 15: Looking north-east across amenity grassland playing fields towards the existing buildings within the Whitmore High School site.

Photograph 16: Looking south-east across the playing fields of Whitmore High School towards the strip of broadleaved plantation woodland with Building 6 of Ysgol Gymraeg Bro Morgannwg behind.