

USW Caerleon Environmental Statement

Chapter H: Ecology

29 November 2019

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Contents

H1.0	Introduction	1
	About the Author	1
H2.0	Policy Context	2
	Legislative Framework	2
	Wildlife Legislation	3
	Further Guidance	3
H3.0	Assessment Methodology & Significance Criteria	4
	Assessment Methodology	4
	Significance Criteria	7
	Assumptions and Limitations	7
H4.0	Baseline Conditions	8
	Existing Conditions	8
H5.0	Potential Effects	27
	During Construction	28
	During Operation	32
H6.0	Mitigation and Monitoring	35
	During Construction	36
	During Operation	39
H7.0	Residual Effects	42
	During Construction	42
	During Operation	47
H8.0	Summary & Conclusions	51
H9.0	Abbreviations & Definitions	52
H10.0	References	53

H1.0 Introduction

- H1.1 This chapter of the ES assesses the likely significant effects in respect of the proposed residential development of Caerleon University Campus (hereafter referred to as the EIA site) on important ecological features; including species populations, habitats and designated sites.
- H1.2 The chapter describes: the policy context (H2); the assessment methodology (H3); the ecological baseline conditions at the EIA site and surroundings (H4); the likely significant environmental effects (H5); the mitigation measures required to prevent, reduce or offset any significant negative effects (H6); and the likely residual effects after these measures have been employed (H7).
- H1.3 The chapter is based upon the findings of detailed survey work undertaken by Tyler Grange in 2015 and Ecosulis between 2015 and 2016, and upon the results of further update ecology survey work completed by The Environmental Dimension Partnership Ltd (EDP) during 2019. The detailed findings of the ecological surveys undertaken of the EIA site are set out within Appendix H1.

About the Author

- H1.4 This chapter of the Environmental Statement (ES) has been produced by Emily Williams, a competent Principal Ecologist from The Environmental Dimension Partnership Ltd (EDP), who is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM). Emily has over 11 years-experience as an ecologist, 9 of which have been as a consultant within the private sector. Emily possesses extensive survey experience within a wide range of habitats across both terrestrial, freshwater and marine environments, and has experience in undertaking surveys for a range of protected species to inform planning applications for development (including EIA), land management/remediation schemes and habitat creation, restoration and enhancement in both England and Wales. This is in addition to the design and implementation of mitigation strategies for ecological receptors to be delivered within and alongside development proposals.
- H1.5 This chapter has been prepared with reference to The Chartered Institute of Ecology and Environmental Management's (CIEEM) Ecological Impact Assessment Guidelines.

H2.0

Policy Context

Legislative Framework

H2.1

In carrying out the ecological assessment of the proposed residential development, relevant international and national legislative instruments reflected in national, regional, county and local policies were reviewed. These included:

- Planning Policy Wales, Edition 10, December 2018 (PPW) Chapter 5: Distinctive and Natural Places;
- PPW supplementary Technical Advice Note 5 (TAN 5): Nature Conservation and Planning;
- Newport Local Development Plan (LDP) up to 2026 (adopted January 2015);
- Supplementary Planning Guidance (SPG) including Wildlife and Development (August 2015) and Trees, Woodland, Hedgerow and Development Sites (January 2017);
- Newport City Council Biodiversity Action Plan (BAP) for Newport (Local BAP or LBAP); and
- Environment (Wales) Act 2016.

H2.2

PPW and TAN5 set out particular policies in relation to the protection of biodiversity, green infrastructure, and geological conservation through the planning system. Such policies include those receiving statutory protection under existing legislative provisions and also those sites, habitats and species with such protection, thereby ensuring that the potential impacts of planning decisions on biodiversity, green infrastructure and geological conservation are fully considered.

H2.3

Locally important sites such as Sites of Importance for Nature Conservation (SINCs) are non-statutory designations declared by Newport City Council (NCC) under the provision of the *National Parks and Access to the Countryside Act 1949*. This aims to bring sites of established nature conservation value into active management for the public and to protect them from development that would adversely affect their substantive nature conservation value.

H2.4

The LDP includes strategic policies including Strategic Policy SP5, which seeks to ensure development within the countryside (beyond settlement boundaries) is appropriate and respects the landscape character and biodiversity of the immediate and surrounding areas. Policy SP9 seeks for the conservation, enhancement and management of recognised sites within the natural, historic and built environment within all development proposals.

H2.5

General policies detailed within the adopted LDP including Policy GP5, which requires development to: protect and encourage biodiversity and ecological connectivity; avoid or mitigate and compensate for negative effects to biodiversity, ensuring that there are no significant adverse effects on designated site and protected/priority habitats; ensure there are no unacceptable impacts on water quality, landscape quality, trees, woodland or hedgerows or a loss/reduction in quality of high quality agricultural land; and that proposals include an appropriate landscape scheme which enhances the site and green infrastructure.

H2.6

In addition, Countryside Policies include CE3, which seeks to safeguard features important for their visual qualities, biodiversity, recreation of amenity as 'Environmental Spaces and Corridors.' Policy CE8 sets out a requirement for the protection of locally designated nature conservation and geological sites, with unavoidable harm minimised by effective compensation, mitigation and restoration measures which aim to ensure no loss in the overall nature conservation value of the area or feature.

- H2.7 The Welsh Government is also required to ensure that its policies contribute to the conservation of the abundance and diversity of native wildlife and its habitats and minimise the adverse effects on wildlife where conflict of interest is unavoidable. In addition, the Wales Biodiversity Partnership was formed to guide and inform the biodiversity process in Wales, in fulfilment of its duty under Section 42 of the *Natural Environment and Rural Communities (NERC) Act* (2006) at that time. The Environment (Wales) Act has since become law in 2016, setting out a requirement for the sustainable management of natural resources necessary to build greater resilience into ecosystems, thereby providing a context for the delivery of multi-functional green infrastructure. Section 6 under Part 1 of this Act introduced an enhanced biodiversity and resilience of ecosystems duty for public authorities in the exercise of its function in relation to Wales. Additionally, Section 7 of this Act sets out a requirement for biodiversity lists of priority habitats and species of principle importance to conservation in Wales to be published and maintained, thereby replacing Section 42 of the NERC Act. Habitat Action Plans relevant to the EIA site include broadleaved, mixed and yew woodland, while Species Action Plans relevant to the EIA site include a number of bat species.

Wildlife Legislation

- H2.8 Animal and plant species that are considered to be threatened as a result of their rarity, vulnerability or persecution are afforded protection through both European and UK law. The *Conservation of Habitats and Species Regulations* 2017 protects a number of rare and vulnerable animal and plant species listed for protection in Europe, whilst the *Wildlife and Countryside Act*, 1981 (as amended by the *Countryside and Rights of Way Act*, 2000 and *Natural Environment and Rural Communities Act* 2006) affords protection to wild bird species requiring protection in Europe, and other rare or vulnerable native species of animals and plants, not protected under the *Conservation of Habitats and Species Regulations* 2017. In addition, the Animal Welfare Act 2006 further protects wild animals from unnecessary suffering when under the control of man and includes the *Wild Mammals (Protection) Act* 1996 which protects wild mammals from intentional cruelty and the *Protection of Badgers Act* 1992 which affords protection specifically to badgers.
- H2.9 Legislation also fully protects European Sites including Special Protection Areas (SPA), Special Areas of Conservation (SAC) and RAMSAR sites which are recommended for designation by the Joint Nature Conservation Committee (JNCC). Sites of Special Scientific Interest (SSSIs) of national importance, designated by Natural England under the *Wildlife and Countryside Act* 1981 (as amended), are also protected from any development that may destroy or adversely affect such sites, either directly or indirectly.
- H2.10 'Important' hedgerows, as defined in the Regulations are protected from removal (up-rooting or otherwise destroying) by the *Hedgerow Regulations* 1997.

Further Guidance

- H2.11 The approach taken in this assessment is made with reference to the guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM) in September 2018.

H3.0

Assessment Methodology & Significance Criteria

Assessment Methodology

Scope of the Assessment

- H3.1 The scope of the ecological impact assessment (EcIA) has been determined by current ecological investigations of the EIA site. This process informed the identification of Important Ecological Features (IEFs) pertinent to the proposals, and the likely scope of potential impacts on these receptors.

Extent of the Study Area

- H3.2 The field surveys undertaken to inform the assessment covered the EIA site boundary and, in some instances, adjacent habitats to provide contextual information and/or to ensure species populations were studied adequately. Where access to adjacent land was not available (due to landownership boundaries) assumptions have been made on the ecological character of the adjacent land based on other information.
- H3.3 An ecological desk study, which encompassed the EIA site was undertaken during May 2019 (see Appendix H1 for detailed scope and methodologies employed). A search radius of 10km from the EIA site boundary was employed for statutory designated sites of international value, 2km for sites of national importance, 2km for sites of local importance and 2km for Protected/Priority species records. The search areas reflect the sensitivity and value of potential ecological receptors and are considered to be sufficient to cover the potential Zone of Influence (ZoI) of the proposed development on these receptors, while providing contextual information to assist with determining and evaluating the baseline.
- H3.4 The extent of the impact assessment has been defined as the Zone of Influence. The Zone of Influence has been determined through a review of the baseline ecological conditions relative to the emerging masterplan and consideration of the proposed activities, as well as through liaison with other specialists involved in assessing the impacts of the proposed development as considered within the ES and other supporting documentation.

Collection of Baseline Information

- H3.5 The baseline ecology information collated by EDP during 2019 for the EIA site and its surroundings is detailed within the Ecological Baseline Report as set out within Appendix H1. The Appendix details the full methodologies employed, the subsequent findings and the implications for the proposed development. A summary of the relevant baseline investigations of the EIA site undertaken/proposed for completion during 2019 are provided below:
- A desk study in 2019 involving the request for biodiversity information from South East Wales Biodiversity Records Centre (SEWBReC) for designated sites of nature conservation value, and for records of protected and/or notable species in addition to a search of the Government's MAGIC website for additional designations;
 - An Extended Phase 1 Survey completed in May 2019;
 - A ground level visual assessment of on-site trees for bat roosting potential, completed during May 2019. All trees with moderate to high potential for roosting bats, to be impacted by development were then subject to a further detailed aerial inspection on two occasions during September 2019;

- A visual assessment of all on-site buildings associated for bat roosting potential, completed during May 2019;
- Dusk emergence/dawn re-entry surveys of buildings with roosting potential undertaken between June and August 2019;
- Manual transect surveys conducted on 24 April, 20 May, 26 June and 25 July 2019;
- Automated detector surveys conducted in April, May, June, July and August 2019;
- Badger walkover survey of the land ownership boundary during 2019;
- Habitat Suitability Index assessment of a single on-site pond for potential to support great crested newt; and
- Reptile surveys undertaken on seven occasions during May 2019 to confirm presence/likely absence of common reptiles.

H3.6 This document also considers additional baseline ecology information previously compiled by Tyler Grange in 2015 and Ecosulis during 2015 and 2016, further details of which are provided with Appendix H1 and which are summarised below:

Evaluation Methodology

H3.7 The evaluation of Important Ecological Features (IEFs) has been made with reference to the guidelines published by the Chartered Institute of Ecology and Environmental Management (CIEEM) in September 2018. The guidelines propose an approach to valuing features that involve professional judgement based on available guidance and information, together with advice from experts who know the locality of the project and/or the distribution and status of the species or features that are being considered.

H3.8 In addition, the following best practice guidance in relation to survey techniques and mitigation measures have been taken into account:

- Handbook for Phase 1 habitat survey: A Technique for Environmental Audit;
- Bat Surveys for Professional Ecologists: Good Practice Guidelines, 3rd Edition;
- Surveying Badgers;
- National Badger Survey: The history, distribution, status and habitat requirements of the Badger in Britain;
- Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*); and
- Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation.

Geographical Context

H3.9 The Guidelines recommend that the value or potential value of an ecological resource or feature be determined within a defined geographical context and recommends that the following frame of reference be used:

- International and European;
- National (Wales);
- Regional (South East Wales);

- County (Newport); and
- Local (Caerleon).

Valuing Designated Sites

H3.10 Within the UK, certain valued habitats have been assigned a level of nature conservation value through designation; and the Guidelines referred to above recommend that the reasons for this designation need to be taken into account in the assessment. Such designations include:

- Internationally important sites such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and RAMSAR sites;
- Nationally important sites such as Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs); and
- Regional/County/District important sites, which within NCC are referred to as SINCs.

H3.11 Where a feature has value at more than one designation level, its overriding value is that of the highest level.

Valuing Habitats

H3.12 The Guidelines recommend that the value of areas of habitat and plant communities should be measured against published selection criteria where available, such as those listed on Annex 1 of the Habitats Directive, or those listed as habitats of principal importance under Section 7 of the Environment (Wales) Act or on the Caerphilly Local Biodiversity Action Plan. Where areas of a habitat or plant communities do not meet the necessary criteria for designation at a specific level, the Guidelines recommend that the ecologist may consider the local context if appropriate. Additionally, consideration should also be given to the potential value of those habitats, particularly where habitats are in a degraded or unfavourable condition at the time of the assessment.

Valuing Species

H3.13 The Guidelines require consideration of all protected species as 'important' features where there is the potential for a breach in legislation. Additionally, species should be assessed according to their biodiversity value, measured against published selection criteria where available (such as those listed on Annex 1 of the Habitats Directive and those listed as habitats of principal importance under Section 7 of the Environment (Wales) Act. In assigning value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records, as well as their legal protection. The valuation of populations should make use of any relevant published evaluation criteria available at the time of assessment.

Characterising Potential Impacts

H3.14 The Guidelines state that the assessment of impacts should be undertaken in relation to the baseline conditions within the ZoI that are expected to occur if the development were not to take place. Having identified the activities likely to cause significant impacts, it is then necessary to describe the resultant changes and to assess the impact on valued ecological features.

H3.15 The Guidelines recommend that the process of identifying impacts should make explicit reference to aspects of ecological structure and function on which the feature depends. Impacts must be assessed in the context of the baseline conditions within the Zone of Influence during the lifetime of the proposed residential development.

H3.16 When describing changes/activities and impacts on ecosystem structure and function, reference should be made to the following parameters:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

H3.17 In order to characterise the likely change and impact, it is necessary to take into account all the above parameters.

Significance Criteria

H3.18 Legislation and policy guidance often require significant negative or positive impacts to be distinguished from others, although there is little guidance on how this distinction should be made. The Guidance defines an ecologically significant impact as an *“effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general”*.

H3.19 Once a potential significant impact was identified as likely to affect the integrity/favourable conservation status of a potential IEF, the value of the receptor was then used to help determine the geographical scale at which the impact is significant. If an impact is not found to be significant at the level at which the resource or feature has been valued, it may still be significant at a more local level. An impact that is of significance below a local level, or is deemed not to be significant, will be scoped out of the impact assessment.

H3.20 Although certain species and habitats may not constitute IEFs based upon their nature conservation value they may still warrant consideration during the design and mitigation of the Proposed Development on the basis of their legal protection, their implications for policies and plans, or other issues such as animal welfare issues.

H3.21 The significance of the potential impacts upon IEFs has been assessed both before and after consideration of the additional mitigation measures. The latter represents the assessment of the residual impacts of the proposals.

Consultation

H3.22 The following statutory and non-statutory Consultees have been consulted to inform the impact assessment:

- South East Wales Biodiversity Records Centre (SEWBRc).

H3.23 The assessment work has been prepared with reference to these consultations.

Assumptions and Limitations

H3.24 No further assumptions or limitations have been identified beyond those detailed within Appendix H1 in relation to this technical assessment.

H4.0

Baseline Conditions

Existing Conditions

H4.1

This section sets out the baseline context of the proposed development and should be read in conjunction with Appendix H1, where full methodologies and results of the ecological investigations are set out.

Context

H4.2

The EIA Site comprises the former Caerleon Campus of the University of South Wales. It is situated at approximate Ordnance Survey Grid Reference (OSGR) ST 33496 91290 and measures approximately 12.7 hectares (ha) in size. The EIA site is situated in the town of Caerleon, circa 1.1km north and west of the River Usk beyond which is the city of Newport.

H4.3

The EIA Site is dominated by hardstanding and buildings which are predominantly vacant in addition to areas of amenity grassland and ornamental shrub planting. Such areas are now largely unmanaged with encroaching scrub. Landscaped areas located more centrally within the EIA site are, however, still subject to frequent mowing. The north-eastern corner and eastern boundary of the EIA site is characterised by an unmanaged, tussocky grassland sward with scattered non-native and native trees contiguous with a linear belt of broadleaved woodland.

H4.4

Located within the town of Caerleon the wider landscape is dominated by residential housing. A railway line travelling north to south is circa 180m east of the EIA site, beyond which lies open countryside comprising agricultural grassland and woodland units.

Designated Sites

Statutory Designations

H4.5

The EIA site is not covered by any statutory designations; however, there are two SACs, one SPA and one Ramsar site within 10km of the site. There is also one SSSI within 2km. This is summarised in Table H4.1. Distribution maps received as part of the desk study are included in Appendix H1.

Table H4.1 Summary of Statutory Designations within the EIA Site's Potential Zone of Influence

Designation	Distance from site	Interest Feature(s)
Ramsar		
Severn Estuary	7.3km (S)	The Severn Estuary is designated a Ramsar Site for: its immense tidal range; presence of unusual estuarine communities, reduced diversity and high productivity; populations of migratory fish; bird assemblages of international importance; and fish species associated with the whole estuarine and river system.
SAC		
River Usk	1.1km (S&E)	The SAC is designated as a watercourse of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation, an Annex I habitat. The site is also designated for populations of sea lamprey (<i>Petromyzon marinus</i>), river lamprey (<i>Lampetra fluviatilis</i>) and brook lamprey (<i>Lampetra planeri</i>), twaite shad (<i>Allosa fallax</i>), Atlantic salmon (<i>Salmo salar</i>), bullhead (<i>Cottus gobio</i>) and otter (<i>Lutra lutra</i>).
Severn Estuary	7.3km (S)	This SAC is designated for its assemblage of Annex I habitats including: estuaries; mudflats and sandflats not covered by seawater at low tide; and Atlantic salt meadow. Also, a qualifying

Designation	Distance from site	Interest Feature(s)
		feature are its populations of twaite shad, sea lamprey and river lamprey.
SPA		
Severn Estuary	7.3km (S)	This SPA is designated for supporting populations of European importance, overwintering Bewick's swan (<i>Cygnus columbianus bewickii</i>) and migratory curlew (<i>Numenius arquata</i>), dunlin (<i>Calidris alpina</i>), pintail (<i>Anas acuta</i>), redshank (<i>Tringa tetanus</i>) and shelduck (<i>Tadorna tadorna</i>). The site also supports a population of European importance of passage ringed plover (<i>Charadrius hiaticula</i>) and is a wetland of international importance.
SSSI		
River Usk	1.1km (S&E)	A watercourse designated for its aquatic habitats and associated flora and fauna.

Non-statutory Designations

H4.6

Within Newport, non-statutory designations for nature conservation are known as Sites of Importance for Nature Conservation (SINCs). No part of the EIA site is covered by any non-statutory designations. However, there are 11 SINCs and 6 units of Ancient Semi-natural Woodland (ASNW) within the EIA site's potential Zone of Influence as described in Table H4.2 below and illustrated in Appendix H1.

Table H4.2 Summary of SINCs within or immediately bounding the EIA Site

Designation	Distance from Site	Interest Feature(s)
SINC		
Afon Llwyd SINC (C7)	0.4km (E)	A freshwater tributary of the River Usk that supports an otter population.
Afon Llwyd Grasslands SINC (C12 & C17)	0.6km (SE)	Large area of semi-improved marshy and dry neutral grassland used by otter.
Lodge Wood ASNW (C2)	0.6km (NW)	Ancient semi-natural woodland.
Trinity View SINC (C4)	0.7km (W)	Mosaic habitat of scrub woodland and grassland.
Coed y Gatlas ASNW (C6)	0.8km (NW)	Ancient semi-natural woodland.
Ponthir Sewage Work SINC (131)	0.8km (N)	Lowland grassland and woodland with open standing water and wetland.
Hillcroft Field ASNW (C15)	0.8km (W)	Ancient semi-natural woodland.
Graig Yr Eurych ASNW (C3)	0.9km (NW)	Ancient semi-natural woodland.
Flooded Field SINC (C16)	1.0km (S)	Large flooded fields designated for its bird population which includes lapwing (<i>Vanellus vanellus</i>) and redshank.
Moorings SINC (STJ2)	1.0km (SW)	Site contains breeding Cetti's warbler (<i>Cettia cetti</i>).
St Julians Park SINC (BE1 & C5)	1.2km (S)	A large mosaic site of improved, semi-improved and unimproved neutral grassland areas with bracken and scrub. The site also contains broadleaved woodland.
Llantarnam Abbey Bat Roost SINC (162)	1.3km (NW)	Site contains a lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) roost within the bell tower. The area is also a known otter breeding site.
Bulmore Road Fields SINC (C13)	1.4km (SE)	Semi-improved acidic grassland.
Glebelands SINC (STJ1)	1.6km (SW)	Former landfill site covered with amenity grassland, woodland and scrub. Forms part of the River Usk corridor.
Pilton Vale West SINC	1.9km (W)	Unimproved neutral-grassland with bracken slopes.

Designation	Distance from Site	Interest Feature(s)
(C11)		
Graig Wood ASNW (C1)	1.9km (NW)	Ancient semi-natural woodland.
Ancient Semi-natural Woodland (201)	2.0km (N)	Ancient semi-natural woodland.

Habitats

H4.7 A full description of the habitats within the EIA site together with their associated plans illustrating the locations of these features assessed, is set out within Appendix H1. In summary, the habitats found and described on and immediately adjacent to the EIA site include:

- Buildings and hardstanding;
- Former Amenity Grassland;
- Poor Semi-improved Grassland;
- Semi-natural Broadleaved Woodland;
- Shrub Planting;
- Scattered Trees;
- Dense and Scattered Scrub;
- Standing Water;
- Tall Ruderal Vegetation; and
- Ephemeral/Short Perennial Vegetation.

Buildings and Hardstanding

H4.8 The EIA site is dominated by buildings of varying age and construction and include former student residences, a sports hall, offices and lecture halls. These buildings are now predominantly empty. Hardstanding associated with roads, public footpaths and car park areas surround the buildings.

H4.9 Buildings and hardstanding are considered to be of negligible importance per se, although the former have potential to support protected species, namely roosting bats and nesting birds.

Former Amenity Grassland

H4.10 Pockets of amenity grassland are located throughout the EIA site whilst a sport's pitch is present within the south of the site. Such areas have predominantly fallen out of management and as such grassland habitat is relatively tall (0.3m high) and tussocky. Amenity grassland generally comprises false oat-grass (*Arrhenatherum elatius*), meadow foxtail (*Alopecurus pratensis*), cock's-foot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lunatus*). Common vetch (*Vicia sativa*), creeping cinquefoil (*Potentilla repens*), forget-me-not (*Myosotis sp.*) and bird's-foot-trefoil (*Lotus corniculatus*) are locally frequent whilst germander speedwell (*Veronica chamaedrys*), daisy (*Bellis perenne*), yarrow (*Achillea millefolium*), fescue (*Festuca sp.*), knapweed (*Centaurea nigra*), ribwort plantain (*Plantago lanceolata*) and broadleaved dock (*Rumex obtusifolius*) occur occasionally. Cuckoo flower is locally rare (*Cardamine pratensis*).

H4.11 Small discrete patches of amenity grassland often vary in their composition and are sometimes dominated by a single species not otherwise recorded at the same abundance elsewhere across

the EIA site including bird's-foot trefoil, geranium (*Geranium sp.*), black medick (*Medicago lupulina*) and sedge (*Carex sp.*).

- H4.12 Amenity grassland areas located within the centre of the EIA site are, in contrast to the rest of the site, heavily manicured and subject to frequent mowing with limited species recorded within the sward.
- H4.13 Overall, the grassland sward appears relatively diverse but given variations in its species composition often dominated by one species or another, it is considered likely that such habitats are seeded rather than occurring naturally. Amenity grassland is thus considered to be of negligible importance.

Poor Semi-improved Grassland

- H4.14 The north-eastern corner of the EIA site comprises poor semi-improved grassland sloping steeply downwards from an access road which delineates its south-western boundary towards the boundaries of residential gardens located off-site. Poor semi-improved grassland is unmanaged (up to 0.4m tall) and tussocky. Species composition is similar to amenity grassland reported above although knapweed occurs more frequently. Bramble (*Rubus fruticosus* agg.) scrub is also encroaching across this habitat whilst bracken (*Pteridium aquilinum*) is present along the north-eastern boundary with residential gardens.
- H4.15 Given poor semi-improved grassland represents a large, continuous area of habitat contiguous with bramble scrub and broadleaved woodland, this habitat is considered to be no greater than of site level importance.

Semi-natural Broadleaved Woodland (Off-site)

- H4.16 The eastern boundary of the EIA site is contiguous with an area of broadleaved woodland dominated by mature and semi-mature ash and sycamore (*Acer pseudoplatanus*). The understorey is unmanaged and comprises bramble, holly (*Ilex aquifolium*), hawthorn (*Crataegus monogyna*) and hazel (*Corylus avellana*). The ground flora community is dominated by common ivy (*Hedera helix*), with occasional common nettle (*Urtica felina*), lesser celandine (*Ficaria verna*), harts-tongue (*Asplenium scolopendrium*) and bluebell (*Hyacinthoides non-scripta*). A habitat of Principal Importance, semi-natural broadleaved woodland is considered to be of local level importance.

Shrub Planting

- H4.17 Areas of shrub planting are present throughout the EIA site and particularly in amongst the buildings and alongside public footpaths as well as delineating the western boundary of the EIA site. Shrub planting is dominated by non-native and ornamental species including lavender (*Lavandula sp.*), cherry laurel (*Prunus laurocerasus*), firethorn (*Pyracantha coccinea*), *Gunnera sp.* and Mexican orange blossom (*Choisya sp.*) although native varieties can occur and are encroaching across such habitats. Such species include bramble, apple (*Prunus sp.*) and pendulous sedge (*Carex pendula*).
- H4.18 Small sections of non-native hedgerows delineate the fenced boundaries of the EIA site and comprise single species, either privet or laurel circa 3m high and 2.5m wide.
- H4.19 Given overall dominance by non-native species with several areas that are largely isolated from one another, shrub planting is considered to be of negligible importance.

Scattered Trees

- H4.20 Also associated with areas of shrub planting are scattered mature and semi-mature trees, again comprising a mix of non-native, ornamental and native species. Species include foxglove tree (*Paulownia tomentosa*), black mulberry (*Morus nigra*), black walnut (*Juglans nigra*), copper beech (*Fagus sylvatica f. purpurea*), cut-leaved beech (*Fagus sylvatica 'Laciniata'*), giant redwood (*Sequoiadendron giganteum*), silver birch (*Betulus pendula*), beech (*Fagus sylvatica*), sweet gum tree (*Liquidambar styraciflua*) and more notably, small-leaved lime (*Tilia cordata*). Many of these specimens carry a Tree Preservation Order (TPO).
- H4.21 Non-native and native tree standards are also present within the north-east corner of the EIA site in association with poor semi-improved grassland and dense scrub comprising bramble, hawthorn (*Crataegus monogyna*), holly and blackthorn (*Prunus spinosa*). A line of trees is also present along the southern boundary of the EIA site and include silver birch, oak (*Quercus sp.*), holly, privet (*Ligustrum sp.*), semi-mature ash (*Fraxinus excelsior*), elder (*Sambuca nigra*) and sweet chestnut (*Castanea sativa*).
- H4.22 Smaller, shrubby trees approximately 4m high have additionally been planted within hardstanding and car parking areas and typically include such specimens as wild cherry (*Prunus avium*) and hornbeam (*Carpinus betulas*).
- H4.23 In respect of the potential of several trees to support protected species combined with a TPO or associated with many of them, scattered trees are considered to be of local level importance.

Dense and Scattered Scrub

- H4.24 Dense scrub dominated by bramble is typically present along the boundaries of the EIA site whilst bracken is present within the north-east corner of the site. Otherwise, scattered patches of butterfly bush (*Buddleja davidis*) were recorded across hardstanding areas where former car parks have fallen into disuse. Given the limited extent and botanical diversity, dense and scattered scrub is considered to be of negligible importance.

Standing Water

- H4.25 A small, artificial garden pond is present in the south-east corner of the EIA site and is characterised by 0.4m high, vertical concrete banks. Vegetation is limited to floating lilies whilst filamentous algae is also abundant indicating poor water quality. Although ponds are typically considered Priority habitats, given the artificial and ornamental nature of the pond combined with poor water quality and limited macrophyte diversity, this habitat is considered to be of site level importance only.

Tall Ruderal Vegetation

- H4.26 A small area of the EIA site along its eastern boundary is dominated by tall ruderal vegetation and scattered scrub which has colonised a former allotment. This habitat is dominated by common nettle although bramble patches also occur.
- H4.27 Given the limited extent and botanical diversity, tall ruderal is considered to be of negligible importance.

Ephemeral/Short Perennial Vegetation

- H4.28 Scattered patches of ephemeral/short perennial vegetation have colonised former car parking areas that have fallen into disuse. Species present include bristly ox-tongue (*Helminthotheca echioides*), perennial rye-grass, black medick, common vetch and fescue.

- H4.29 Given the limited extent and botanical diversity, tall ruderal is considered to be of negligible importance.

Habitat IEFs

- H4.30 Those habitats considered to be Important Ecological Features (IEFs) and valued at or above Local level requiring consideration within this detailed assessment are summarised within Table H4.3.

Table H4.3 Habitats of local value or higher within or in close proximity to the EIA Site

IEF	Level of Importance	Distance from Site
Severn Estuary SAC/SPA/Ramsar	International	7.3km (South).
River Usk SAC/SSSI	National	0.7km (South & East).
Afon Llwyd SINC	County	0.4km (East).
Afon Llwyd Grasslands	County	0.6km (South-East).
Semi-natural Broadleaved Woodland	Local	Adjacent to the eastern boundary of the EIA site.
Scattered Trees	Local	Across the EIA site.

- H4.31 The valued habitats noted above, together with other habitats within the EIA site of low or negligible intrinsic value, have also been found in some instances to support, or have the potential to support protected or notable species. This is discussed further within the 'Species' sub-sections below.

Protected and Priority Species

- H4.32 As set out previously, information on protected and/or notable species within or near to the EIA site were collected through a desk study and a range of field surveys. The findings of these investigations are set out in full in Appendix H1 and are summarised below.

Breeding Birds

- H4.33 Numerous bird records were returned during the desk study, the closest of which relate to areas of residential housing surrounding the EIA site. Records of red listed species¹ include lapwing (*Vanellus vanellus*), spotted flycatcher (*Muscicapa striata*), grasshopper warbler (*Locustella naevia*), linnet (*Linaria cannabina*), yellow wagtail (*Motacilla flava*), black-headed gull (*Chroicocephalus ridibundus*), curlew (*Numenius arquata*), starling (*Sturnus vulgaris*), bullfinch (*Pyrrhula pyrrhula*) and wood warbler (*Phylloscopus sibilatrix*). Amber listed species include skylark (*Alauda arvensis*), reed bunting (*Emberiza schoeniclus*), house sparrow (*Passer domesticus*) and song thrush (*Turdus philomelos*).
- H4.34 Schedule 1 species records received include those relating to barn owl (*Tyto alba*), recorded most recently in 2016 and associated with agricultural land in the wider landscape. This is in addition to records for Cetti's warbler (*Emberiza cirlus*), brambling (*Fringilla montifringilla*), green sandpiper (*Tringa ochropus*), greenshank (*Tringa nebularia*), fieldfare (*Turdus pilaris*), common crossbill (*Loxia curvirostra*), Mediterranean gull (*Ichthyaetus melanocephalus*), little ringed plover (*Charadrius dubius*), black tailed-godwit (*Limosa limosa*), red kite (*Milvus milvus*) and peregrine (*Falco peregrinus*) amongst others. Such records are predominantly associated with the wider agricultural landscape or otherwise the River Usk located 0.7km to the south and east of the EIA site.

¹ Bladwell S, Noble DG, Taylor R, Cryer J, Galliford H, Hayhow DB, Kirby W, Smith D, Vanstone A, Wotton SR (2018) The state of birds in Wales 2018. The RSPB, BTO, NRW and WOS. RSPB Cymru, Cardiff

- H4.35 Within the EIA site, dense scrub, shrub and tree planting and adjacent broadleaved woodland is considered to provide suitable breeding and foraging habitat for birds. Amenity and poor semi-improved grassland are considered less suitable for breeding, albeit likely offering foraging opportunities.
- H4.36 Habitats present on-site are, therefore, likely to support an assemblage of generalist and widespread species only. As such, the local breeding bird assemblage supported by the site is considered to be of no more than site level importance.

Bats

- H4.37 During the updated desk study completed in May 2019, SEWBReC returned 155 records for bats (not including Annex II bat species) the most pertinent of which include a brown long-eared bat (*Plecotus auritus*) roost 300m south-west of the EIA site, a common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat (*Plecotus auratus*) roost 1.8km north-east of the EIA site and a soprano pipistrelle bat (*Pipistrellus pygaemus*) maternity roost 510m south-east of the EIA site. In addition to other low status roosts for these species, records of common pipistrelle, soprano pipistrelle, brown long-eared, *Myotis* sp. and noctule (*Nyctalus noctula*) bats were recorded within 2km of the EIA site more generally.
- H4.38 With respect to Annex II bats species, SEWBReC returned two records of greater horseshoe bat (*Rhinolophus ferrumequinum*), including a night roost record in 2016 at 4.2km north-north-west of the EIA site. Furthermore, seventy-five records of lesser horseshoe bat (*Rhinolophus hipposideros*), including 60 records for their roosts, dating from 2000 to 2018 were returned from within the 6km search radius. No records were returned from the EIA site, with just two records identified within a 2km search area, one of which was for a lesser horseshoe night roost 1.98km from the EIA site.

Bat Roost Assessment: Trees

- H4.39 A ground level assessment of all trees within the EIA site for potential to support roosting bats was undertaken by Ecosulis in 2015 during which two trees with potential to support roosting bats were identified. All other on-site trees were deemed to have negligible potential to support roosting bats as they lacked any features and were immature to semi-mature.
- H4.40 During the initial ground level assessment of trees completed on 09 May 2019 one tree (T100) was considered to have high potential, thirteen (T16, T48, T60, T61, T90, T97, T105, T23.2, T23.5, T23.6, T23.7, T7.1, T7.2) were considered to have moderate potential, and a further nine trees (T7.3, T23.1, T23.3, T23.4, T53, T80, T91, T92, T94) were considered to have low potential to support roosting bats. The remaining trees on-site were assessed as having negligible potential.
- H4.41 The initial ground level tree assessment for roosting bats was undertaken with reference to the Tree Constraints Plan prepared by Steve Ambler & Sons Tree Specialists Ltd (April 2019) and provided within Appendix G1 of this ES. The numbering of the trees reported in Table H4.4 below is therefore consistent with the Tree Constraints Plan. Some of the trees were reported as part of a larger tree group and, therefore, have not been individually categorised. The findings of the initial ground level tree assessments are summarised in Table H4.4.

Table H4.4 Ground level Tree Inspection Results, May 2019

Tree ID	Species	Description (including BS5837:2012 Tree Survey Categorisation and key features)	Bat Roost Potential May 2019
T7.1	Apple tree	Three limb holes observed.	Moderate
T7.2	Apple tree	One knot hole observed facing north.	Moderate
T7.3	Apple tree	One knot hole observed.	Low
T23.1	Ash tree	Covered in dense ivy.	Low
T23.2	Pine tree	The tree has flaking bark.	Moderate
T23.3	Sequoia tree	Folds within the bark offering limited potential for roosting bats, especially immediately under the tree limbs which could provide some shelter.	Low
T23.4	Sequoia tree	Folds within the bark offering limited potential for roosting bats, especially immediately under the tree limbs which could provide some shelter.	Low
T23.5	Pine tree	Pine tree with flaking bark.	Moderate
T23.6	Ash tree	Old ash tree with rot holes visible and flaking bark.	Moderate
T23.7	Common wayfaring tree	The tree has dense ivy.	Moderate
T16	Ornamental flowering cherry	Cat B. Splits in tree trunk observed.	Moderate
T48	Sessile oak	Cat B. Splits and flaking bark.	Moderate
T53	Deodar cedar	Cat A. One limb broken off.	Low
T60	Common lyme tree	Cat A. Three rot holes observed, one on the limb and two on the main trunk.	Moderate
T61	Silver birch	Cat C. One limb hole observed approximately 4m off the ground.	Moderate
T80	Horse chestnut	Cat. U. Flaking bark.	Low
T90	Foxglove tree	Cat A. One limb hole observed.	Moderate
T91	Black mulberry	Cat. U. A pronounced split observed at the base of the tree.	Low
T92	Common walnut	Cat A. Two shallow limb holes observed.	Low

Tree ID	Species	Description (including BS5837:2012 Tree Survey Categorisation and key features)	Bat Roost Potential May 2019
T94	Lawson cypress	Cat B. The cypress is covered in ivy.	Low
T97	Apple tree	Cat U. The base of the tree is rotten with three rotten areas observed below 1m height.	Moderate
T100	Foxglove tree	Cat A. Tree with clear high roosting bat potential. One woodpecker hole observed as well as two limb holes. The tree is partly covered with ivy.	High
T105	Horse chestnut tree	Cat U. One rot hole observed at the base as well as flaking bark along the main limb reaching into the crown area.	Moderate

H4.42 Of those trees with moderate-high potential to support roosting bats, four trees are to be felled to facilitate development (T61, T97, T100 and T105). As such, further detailed aerial inspections of these trees were undertaken during September 2019 to confirm presence/infer absence of roosting bats. Following the first inspection undertaken on 03 September 2019 T100 was downgraded from high to moderate potential to support roosting bats. T105 was confirmed as being of moderate potential whilst T97 was downgraded from moderate to low potential and T61 from moderate to negligible potential. A second inspection of T100 and T105 was thus undertaken on 17 September 2019. No evidence of roosting bats was identified during the survey effort. The findings of the aerial tree assessments are summarised in Table H4.5.

Table H4.5 Aerial Inspection Results, September 2019

Tree ID	Species	Description (including BS5837:2012 Tree Survey Categorisation and key features)	Bat Roost Potential September 2019
T61	Silver Birch	Silver birch has a wound facing southern tree aspect and is present at approximately 4.5m height. The wound was very open and there was no shelter around the callus.	Negligible
T97	Apple	A wound is located along the north-east stem of the apple tree, less than 1m off the ground. The wound measures approximately 4cm in width, 8cm in height, 3cm in depth and 6cm away from the stem of the tree. Woodlice were present within the wound.	Low
T100	Foxglove	A tear out is present along western facing limb approximately 4.5m off the ground. Its depth is 30cm and measures 5cm in width. It has horizontal internal direction and is spherical or domed shaped. There were minor cobwebs present. A knot-hole is present on south-west facing limb	Moderate

Tree ID	Species	Description (including BS5837:2012 Tree Survey Categorisation and key features)	Bat Roost Potential September 2019
		approximately 4.5m off the ground. It measures 20cm in depth and 2cm in width. Woodlice were present within the knot-hole. A woodpecker hole is present within the southern facing limb. The height of the hole is approximately 3.5m off the ground. Its depth is 35cm and measures 3cm in width. Woodlice were present within the woodpecker hole.	
T105	Common Horse Chestnut	A lifting bark plate is present along north-west and south-east aspect of the tree approximately 2.2m and 2m off the ground. The height away from the step measures approximately 30cm and 5cm and the width measuring approximately 2cm.	Moderate

Bat Roost Assessment: Buildings

- H4.43 A visual assessment of on-site buildings for potential to support roosting bats, undertaken by Ecosulis in September 2015 with internal inspections of the Camelot/Dolaucothi accommodation blocks undertaken in October 2016, identified four buildings with moderate suitability to support roosting bats (B1/2, B3/4, B8 and B16). A further five buildings were assessed as having low suitability to support roosting bats (B5-7 and B10-11) with remaining buildings considered to have negligible potential. No signs of bats were recorded during visual inspections with the exception of a single, degraded bat dropping recorded on a third-floor window sill of the Camelot/Dolaucothi accommodation block.
- H4.44 Following completion of a visual assessment in 2015, an indicative emergence survey was undertaken by Ecosulis on 28 September 2015 during which four surveyors were positioned around the campus. During the survey, bat activity was recorded in order to identify potential 'hotspots' of activity around groups of buildings. During the survey, no bats were recorded emerging from or entering any of the buildings. However, there were records of very early bat activity close to sunset by Felthorpe House (B16) in the south-east corner of the EIA site, indicating presence of a roost in close proximity.
- H4.45 Initial survey effort was followed by dusk emergence and dawn re-entry surveys of nine buildings (B2-8, B10-11 and B16) with low-moderate potential to support roosting bats in May and June 2016. During the dawn survey, a single common pipistrelle was recorded re-entering Felthorpe House (B16). Four unidentified bats (presumed to be *Myotis* species following an internal visual inspection of the building) were also noted re-entering the Camelot/Dolaucothi (B1/B2) accommodation block above a window lintel on the third floor.
- H4.46 As such, Felthorpe House and the Camelot/Dolaucothi accommodation block have previously been confirmed as roosts for common pipistrelle and presumed *Myotis* bat species following the detailed survey effort undertaken by Ecosulis in 2016.
- H4.47 The results of the bat building assessment update undertaken by EDP are largely comparable to the results of initial inspections undertaken by Ecosulis in 2015 and 2016. Four buildings were considered to have moderate suitability to support roosting bats (B1/2, B3/4, B8 and B16) whilst

a further nine buildings were assessed as having low suitability to support roosting bats (B5-7 and B9-15) with buildings B9 and B12-15 upgraded from negligible to low suitability to support a bat roost. No signs of roosting bats were found during the bat building assessment update.

H4.48 The results of the update bat building assessment are summarised in Table H4.5 and further detailed at Appendix H1.

Table H4.5 Preliminary Building Inspection Results, May 2019

Building ID	Description	Evidence of Bats/Potential Roost Features	Bat Roost Potential
B1/B2: Dolaucothi/ Camelot Student Block	Three storey student accommodation. Two identical L-shaped compartments form the complete structure. The external walls are made of red brick with cavity walls. The roof is corrugated metal and lined with bitumen felt. The soffit boxes are made of timber.	The roof is generally in good condition with intact bitumen felt cover. The soffit boxes have some ventilation shafts missing which provide internal access. Rooks were observed nesting in some of them. Light ingress was visible within the loft void coming through the gap created for the wiring of the external flood light. No signs of bats.	Confirmed bat roost in 2016 by Ecosulis. No evidence of roosting bats identified during internal inspection in 2019.
B3/B4: Blaenavon/ Abergavenny Student Block	The buildings are almost identical to B1/B2. The materials are the same as listed above.	As with B1/B2 buildings, B3/B4 also have missing ventilation shafts as well as gaps observable through the external walls around flood lights. No signs of bats. No nesting birds.	Moderate summer roosting and negligible hibernation potential. No change in ecological baseline.
B5: Nursery (Security) Building	External walls are made of un-rendered brick with natural slate roof tiles and clay ridge tiles.	Some roof tiles are slightly raised, providing access opportunities internally. The loft void is well insulated with a type of paper lining and rock wool laid on the floor of the ceiling. There appears to be no potential access directly into the loft void apart from the space between the roof lining and roof tiles. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. No change in ecological baseline.

B6: Edward Anwyl	Non-rendered external brick walls, low pitched roof made of corrugated metal and bitumen felt on top. The building has several chimney fue pipes. The eaves and gable ends are enclosed with timber.	The gable ends have some gaps along the projecting eaves, which could potentially lead into the structure. The roof itself is in a good state of repair with bitumen felt intact and the chimney flue pipes tightly fitted. No light ingress was observed from the inside of the loft void, which is well maintained. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. No change in ecological baseline.
B7: Library	External walls made of brick and concrete breezeblock, with external render. The roof is flat and does not appear to provide roosting opportunities. Single storey extension is located along southern elevation and covered with concrete roof tiles. A projecting roof covered with concrete roof tiles is located along the north entrance.	There is a gap along the south-western roof corner of the extension, where mortar has fallen out. The gap appears to lead under the roof tiles. Lead flashing located along the northern elevation of the library is slightly raised providing low potential roosting opportunities. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. No change in ecological baseline.
B8: Main Building	The main building is a three storey Grade II listed manor house. The building has a clock tower positioned in its middle with the roof area possessing several complex loft voids covered with natural slate roof tiles and clay ridge tiles. The external walls are made of stone.	The building is in good condition overall with external walls intact with no missing mortar. There are several slate roof tiles which are raised and some gaps leading under the ridge tiles with missing mortar. There could be potential access leading internally along the roof valleys. The internal loft voids are in some places insulated with celotex, whereas other areas have timber cladding with no roof lining. No signs of bats. No nesting birds.	Moderate summer roosting and low hibernation potential. No change in ecological baseline.

B9: Toilet Block	The building walls are made of brick with no render covering them. The roof is made of natural slate tiles.	Natural slate tiles are raised in several places providing internal access, especially along the roof edges above the gable ends. Timber barge and fascia boards are well fitted; however, the north-western gable end is covered with light ivy. There is no access into the loft void from inside the building. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. Change in ecological baseline. Assessed as negligible potential during 2015/2016.
B10: TJ Webley	The external walls are made of stone without render. The roof is natural slate material with clay ridge tiles.	The building is, overall, in a good state of repair with few potential access points observed. There were three raised roof tiles noted behind the chimney area as well as light ingress coming into the loft void from the eaves. The loft void is, in its entirety, cladded with timber sarking. On the outside, the eaves were closed with timber and generally in good condition. There are also three brick chimneys which are coated and in good condition. No signs of bats. No nesting birds.	Low summer roosting and low hibernation potential. No change in ecological baseline.
B11: Ty Hywel	The external walls are made of stone without render. The roof is natural slate material with clay ridge tiles similar to the Ty Hywel building.	The building is of a similar structure to that of Ty Hywel. The internal roof void is lined with timber sarking. There is some light ingress visible coming internally from the roof area. Some of the natural slate tiles are raised and potentially provide access into the space between the timber sarking and the tiles themselves. No signs of bats. No nesting birds.	Low summer roosting and low hibernation potential. No change in ecological baseline.

B12-B15: Student Blocks 1, 2, 3 and 4	The student blocks are well preserved buildings with external walls made out of brick, which is partly rendered. The roof is covered with concrete tiles which are in good condition.	There are 15 student blocks, four of them positioned individually and 11 of them joined together into three units. Four of the blocks have hanging tiles at their gable ends and were, therefore, assessed as having low potential for roosting bats. Internal roof void areas appear to be tightly sealed, with some light ingress coming in through the eaves. However, the eaves have a mesh covering which is preventing access by bats. The roof is internally lined with plastic sheeting. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential of 4 student blocks. Change in ecological baseline. Assessed as negligible potential during 2015/2016.
B16: Felthorpe House	The building is made of external brick walls which are non-rendered. The roof is covered with natural slate tiles.	The building is in a good state of repair with some light ingress coming into the void around the eaves. Internally the roof void is lined with bitumen felt. Some of the roof tiles are out of alignment. No signs of bats. No nesting birds.	Confirmed bat roost in 2016 by Ecosulis. No evidence of roosting bats identified during internal inspection in 2019.

Dusk Emergence/Dawn Re-entry Surveys

- H4.49 Dusk emergence and/or dawn re-entry surveys of buildings B1/B2, B3/4, B5-B7 and B10-15 with bat roost potential have been undertaken by EDP between June and August 2019.
- H4.50 During a dusk emergence survey of building B3 on 24 June 2019, three common pipistrelle bats were identified emerging from a soffit box on the western elevation between 22:01 and 22:36. This is in addition to emergence of a single common pipistrelle bat from a soffit box on the western elevation of B3 at 22:11.
- H4.51 A dusk emergence survey of B3/B4 undertaken on 5 August 2019 identified two common pipistrelle bats emerging from the soffit box near the central gable end of the eastern elevation at 21:30 and 21:40 in addition to one common pipistrelle emerging at 21:29 from a second location.
- H4.52 During a dusk emergence survey of B1/B2 on 25 June 2019, a single common pipistrelle emerged from the soffit box on the western elevation at 22:26 whilst a possible re-entry of a common pipistrelle bat was recorded during a dawn re-entry survey on 18 July 2019 at 04:05. A single common pipistrelle bat was also observed emerging from the soffit box along the south eastern corner of B2 during a second dusk emergence survey.
- H4.53 With respect to B16, a single common pipistrelle was recorded entering a roosting feature within the eaves on the northern elevation of the building at 22:01 on 25 June 2019 On 5 August 2019,

a soprano pipistrelle bat was also observed emerging from building B16 at 21:11 specifically from a crevice located above a window lintel.

- H4.54 Based on the results, it is considered that buildings B1/B2, B3/4 and B16 each support a summer day roost for low numbers of common pipistrelle bats. B16 also supports a summer day roost for low numbers of soprano pipistrelle bats. Both B1/B2 (Camelot/Dolaucothi accommodation block) and B16 (Felthorpe House) have previously been confirmed as supporting roosts for common pipistrelle and presumed *Myotis* bat species following detailed survey effort undertaken by Ecosulis in 2016. *Myotis* bat species were not recorded roosting within B1/B2 during surveys undertaken by EDP in 2019.

Investigations of Bat Foraging/Commuting Activity

- H4.55 Bat foraging and commuting activity recorded during the course of the transect and automated detector surveys undertaken between April and August 2019 is summarised below with further detailed information provided at Appendix H1.
- H4.56 Activity surveys undertaken by Ecosulis in September and October 2015 identified moderate levels of pipistrelle (*Pipistrellus* sp.) activity with relatively high concentrations recorded along the northern boundary of the EIA site. Species recorded include common pipistrelle, soprano pipistrelle and noctule.
- H4.57 This is largely consistent with update surveys undertaken during April, May, June, July and August 2019. Six bat species/species groups (myotis bat species were not identified to species level), were confirmed to be present foraging and/or commuting within the EIA site during the course of the activity surveys. During the automated detector surveys, the vast majority of this behaviour (average 76% of Anabat recordings) related to common pipistrelle bat. Noctule, soprano pipistrelle and myotis bats were occasionally recorded, comprising 24% of all Anabat calls recorded during April, May, June, July and August. Long eared sp. and *Nyctalus/Eptesicus* sp. have only been recorded during June accounting for less than 1% of all anabat recordings. The range and proportion of species/species groups recorded during the manual transect surveys was broadly similar to that described above with regards to the automated surveys. A minimum of four species were recorded during the manual transect surveys. Overall, relatively low levels of bat activity were recorded, predominantly along the northern and eastern boundaries of the EIA site, the latter being contiguous with broadleaved woodland and unmanaged grassland. Foraging activity was also recorded in association with the southern boundary and former playing field. Activity is dominated by common pipistrelle with occasional registrations from soprano pipistrelle. Registrations of *Myotis* and noctule was also recorded within the south of the EIA site in May 2019.

Evaluation

- H4.58 An evaluation of the bat assemblage at the EIA site is provided below, with reference to the relative abundance and distribution of each bat species (with reference to the most up-to-date information on local and national species distribution^{2,3} and population trends⁴ available at the time of writing).
- H4.59 Common pipistrelle bats are common and widespread across the UK, representing the most and second most abundant species in the UK respectively. Whilst having suffered significant historic

² Battersby, J. (Ed) & Tracking Mammals Partnership. (2005) *UK Mammals Species Status and Population Trends*. First Report by the Tracking Mammals Partnership. JNCC/Tracking Mammals Partnership, Peterborough

³ <http://monmouthshirebatgroup.org/Bats-in-Monmouthshire.php>

⁴ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

declines, national population monitoring⁵ indicates that common pipistrelle bats are stable nationally and increasing. Common pipistrelle bat was found to be the dominant species utilising the EIA site during the activity surveys and was predominantly associated with the north eastern, eastern and southern edges of the site. Individual bats were also seen commuting and foraging between campus buildings with random distribution. There was a decrease in activity above the open parking space in the south-western corner of the site. With respect to roosting individuals, it is considered that buildings B1/B2, B3/4 and B16 each support a summer day roost for low numbers of common pipistrelle bats. Common pipistrelle bats using the EIA site are, therefore, considered to be of local importance.

- H4.60 Myotis bat species occur throughout most of the UK, their populations considered to be either stable or increasing in most cases⁶. Individual Myotis bats were infrequently recorded during automated detector surveys. Dusk emergence/dawn re-entry surveys of buildings undertaken by Ecosulis in 2015 noted four bats (presumed to be *Myotis* species following an internal visual inspection of the building) were also noted re-entering the Camelot/Dolaucothi (B1/B2) accommodation block indicating presence of a low status day/transitional roost within this building. However, no evidence of current roosts were identified by EDP during the update survey effort. Based upon this data, the use of the EIA site by Myotis bat species is likely to be of no more than local importance.
- H4.61 Noctule bats are widespread across the UK, with its population and range considered to remain stable in the UK⁷. Only low number of noctule bats were recorded by surveyors and static detectors between April and July 2019. An increase in the number of passes by this species was, however, recorded during August 2019. Nevertheless, noctule bats using the EIA site are therefore considered to be of site level importance.
- H4.62 Soprano pipistrelle bats are widely distributed across the UK, and whilst populations declined dramatically in the twentieth century, field survey data show statistically significant population increases⁸. Although only encountered infrequently during activity surveys, typically associated with the northern, eastern and southern boundaries of the EIA site, a summer day roost for soprano pipistrelle was identified within B16, soprano pipistrelle bats supported by the EIA site are therefore considered to be of local importance.
- H4.63 Brown long-eared bats are considered to be widespread and common across the UK with national populations considered stable. In contrast, populations of grey-long eared bat are largely limited to the south coast of England although this species is under recorded. Brown long-eared bat was recorded only once with remote detector work along the northern boundary of Felthorpe House although this species is likely to be underrepresented given it's not often picked up by bat detectors. The population of long-eared bat species supported by the EIA site is considered to be of Local importance.
- H4.64 Serotine bats are restricted to southern England and Wales where they are widespread, but scarce, albeit populations are stable nationally. With respect to Leisler's bats, this species is uncommon but widespread throughout England, Wales and Scotland. Both Leisler's and serotine bats were recorded in association with dense vegetation along the northern boundary of Felthorpe House during June 2019 with the help of remote detector surveying. Therefore, even though the recordings of serotine and Leisler's bats were scarce, they do indicate the importance of the vegetation along the south-eastern site boundary as a key commuting corridor for several species of bats. Given their rarity, serotine bats using the EIA site are considered to be of Local

⁵ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

⁶ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

⁷ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

⁸ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

Importance whilst Leisler's bats supported by the EIA Site are not considered to be significant beyond a Site context.

- H4.65 The abundance and diversity of bat species recorded on-site is considered to be typical for the sub-urban edge of Newport, with common and widespread generalist species such as common pipistrelle bats accounting for the vast majority of foraging and commuting activity. Overall, therefore, the EIA site is considered to be of local importance to the local bat population.

Badger

- H4.66 Five records for badger (*Meles meles*) were received during the update desk study; two related to setts and three to road mortalities. The closest record dated from 2016 and was for a road mortality on the A4042 located 2.1km to the west of the EIA site.
- H4.67 No evidence of badger activity was recorded by EDP during the Extended Phase 1 Habitat Survey undertaken in May 2019 and neither was any activity identified during surveys undertaken in 2015 and 2016 by Tyler Grange and Ecosulis.
- H4.68 Dense scrub, poor semi-improved and amenity grassland does provide suitable foraging habitat for this species, albeit scattered in its distribution, whilst adjacent broadleaved woodland provides suitable cover for badger and their setts.
- H4.69 In the absence of active badger setts on-site, the EIA site is considered to be of negligible importance to this species.

Dormouse

- H4.70 SEWBRc returned 30 records for dormouse (*Muscardinus avellanarius*) within 2km of the EIA site. All of the records originate from the eastern side of the River Usk, with the EIA site being located on the western side of the River Usk.
- H4.71 Suitable dormouse habitat on-site is limited to dense scrub and woodland delineating the eastern boundary of the EIA site. Such features are, however, highly fragmented across the site with no/limited connectivity to suitable habitat within the wider landscape. Although a desk study returned records of dormouse within 2km of the EIA site, such records are located beyond the River Usk which is considered a barrier to the dispersal of dormouse between the site and wider landscape.
- H4.72 Given the sub-optimal nature of habitats present on-site for dormouse, the EIA site is considered to be of negligible importance to this species.

Otter and Water Vole

- H4.73 A desk study returned several records for otter (*Lutra lutra*) associated with the Afon Llwyd 750m north of the EIA site and River Usk east and south of the EIA site. With respect to water vole (*Arvicola amphibicus*), only one record within 2km of the EIA site was returned circa 1.9km north.
- H4.74 There is no suitable habitat for either species on-site or adjacent, such that both species are presumed absent. As such, the EIA site is considered to be of negligible importance to otter and water vole.

Great Crested Newt

- H4.75 A desk study assessment returned six records of great crested newt within 2km of the EIA site. The two most recent records were located 800m south-east of the EIA site and dated from 2011 and 2012. This is in addition to records for common frog (*Rana temporaria*), common toad (*Bufo bufo*) and smooth newt (*Lissotriton vulgaris*), the closest of which are within 410m south of the EIA site.
- H4.76 A single waterbody was identified within the south-east corner of the EIA site, but which was considered unsuitable for great crested newt due to its artificial nature, poor water quality and limited macrophyte diversity. The habitat suitability assessment confirmed the pond to be of poor suitability to support great crested newt. Detailed results of the habitat suitability assessment are provided at Appendix H1. An additional waterbody was identified within 500m of the EIA site (370m south-west). However, this waterbody is located beyond a main road and residential development which is considered a barrier to the dispersal of great crested newt.
- H4.77 Terrestrial habitat on-site is limited to amenity/poor semi-improved grassland and dense scrub which is considered of limited suitability for this species and further patchy in its distribution, fragmented by buildings and hardstanding. Existing development surrounding the EIA site is considered a barrier to the dispersal of great crested newt between the EIA site and suitable habitat in the wider landscape. This species is thus presumed absent from the EIA site, with the EIA site therefore considered to be of negligible importance to this species.

Reptiles

- H4.78 Several records for common reptile species were received during the desk study including: a single record for adder (*Vipera berus*) dated 2008 approximately 1.5km south of the EIA site; six records of slow-worm (*Anguis fragilis*) dated between 2004 and 2015, with the nearest record being approximately 490m north-east; nine records of grass snake (*Natrix natrix*), with seven records in association with Caerleon Comprehensive School located approximately 665m south-west and a further two records 1.7km north; and one record of common lizard from 2007 located approximately 1.6km north of the EIA site.
- H4.79 With respect to the potential of the EIA site to support reptile species, habitat is predominantly limited to amenity and dense scrub which is considered of limited suitability for a reptile population and furthermore patchy in its distribution, fragmented by buildings and hardstanding. Unmanaged, poor semi-improved grassland within the north-east corner of the site is considered more suitable and offers opportunities for foraging and hibernating.
- H4.80 Reptile surveys undertaken by Ecosulis between mid-September and early October 2015 found no evidence of common reptiles on-site. This is in contrast to the results of the update survey effort undertaken by EDP during 2019 which confirmed presence of a small slow-worm population within the EIA site. Full details of the number of individuals and peak survey count are given in Appendix H1. Slow-worms were associated with habitats along the north-eastern and eastern boundaries of the EIA site. These areas are predominantly represented by tussocky, unmanaged poor semi-improved grassland contiguous with off-site broadleaved woodland and residential gardens. Given the small size of the population supported and limited suitable habitat available to this species on-site, the EIA site is considered to be of site level importance only to slow-worm.

Other Species Potentially Supported

- H4.81 A desk study assessment returned records for European hedgehog (*Erinaceus europaeus*), the closest being adjacent to the eastern boundary of the EIA site. European hedgehog was also recorded within the south-eastern corner of the EIA site during a manual transect survey

undertaken by EDP in April 2019. Records for stoat (*Mustella erminea*) and polecat (*Mustela putorius*) within 2km of the EIA Site were also returned, the latter of which relates to road casualties recorded over 1km away. All three species are of Principle Importance in Wales and are relatively widespread. Whilst suitable habitats exist on site for these species, such habitats also predominate the wider landscape beyond. These species are therefore not considered to be significant beyond a site context.

- H4.82 With respect to invertebrates, historical records (pre-1950s) were returned for marsh fritillary (*Euphydryas aurinia*) (an European Protected Species) and small pearl bordered fritillary greater than 2km south and north of the EIA site respectively. Other records relate to shrill carder bee (*Bombus sylvarum*) and grayling (*Hipparchia semele*), both red data book species whilst large wainscot (*Rhizodra lutosus*), identified within the wider area of Caerleon is a species of Principle importance.
- H4.83 Overall, the EIA site is considered of limited importance to an invertebrate assemblage with dense scrub, amenity/poor semi-improved grassland and buildings and hardstanding likely to support a limited assemblage of common and widespread species only.
- H4.84 With respect to notable plant species, records are largely limited to bluebell and Deptford pink (*Dianthus armeria*) (both listed under *Schedule 8 of the Wildlife and Countryside Act 1981*, as amended) and recorded in association with woodland units in the wider landscape. Records for tubular water dropwort (*Oenanthe fistulosa*), marsh stitchwort (*Stellaria palustris*), yellow bird's nest (*Monotropa hypopitys*) and the lichen species *Parmelina carporrhizans*, all red data book species, were also returned. No notable plant species were recorded during the Extended Phase 1 Habitat Survey, however, habitats present within the EIA site are considered likely to support common and widespread species only.

Species IEFs

- H4.85 Species identified as requiring consideration within the ES due to their identification as IEFs valued at or above Local level (with the exception of breeding birds and common reptiles, which are included for consideration due to legal implications) are summarised below in Table H4.6.

Table H4.6 Summary of Species IEFs requiring consideration within the EIA

IEF	Level of Importance	Distance from Site
Breeding Birds	Site	On-site
Bats (commuting/foraging)	Local	On-site
Bats (roosting)	Local	On-site (B1/2, B3/4 & B16)
Common reptiles (Slow-worm)	Site	On-site

Future Baseline

- H4.86 It is anticipated that if the proposed development did not proceed, land practices would remain the same with the majority of the EIA site falling into disuse. Without management, dense scrub and shrubs are likely to encroach across the grassland habitat and hardstanding, whilst buildings will likely degrade, and deteriorate, which could potentially make them more suitable for use by bats and nesting birds.

H5.0

Potential Effects

Introduction

- H5.1 A full description of the proposed development is provided at **Chapter C** of this ES. In summary, the proposals involve:
- The construction of up to 218 dwellings, including new build and the creation of apartments within the listed buildings that are to be converted/retained within the site;
 - Landscaping (including re-grading) and sustainable drainage works;
 - Access/Infrastructure works; and
 - Removal and translocation of specified TPO trees (the remainder of TPO trees will be retained).
- H5.2 An assessment of likely significant effects of the Proposed Development on the ecological features identified above has been undertaken based upon the Proposed Site Plan, Landscape Strategy and Detailed Soft Landscape Plan prepared for the EIA site (see Appendix H2,H3 and H4 respectively), which incorporates any inherent impact avoidance, minimisation and mitigation determined throughout the iterative assessment and design process. Those potential significant effects assessed include such inherent mitigation but, initially, in the absence of any other avoidance, mitigation and compensation measures.
- H5.3 Whilst exact details of the construction methods to be used cannot be determined with absolute certainty at this time, a number of assumptions and parameters have been fixed for the purposes of this assessment and are described fully within Chapter C – Site and Scheme Description.
- H5.4 The key inherent mitigation measures included within the proposed development pertinent to the ecological impact assessment include:
- 1 Buffering of adjacent habitats including broadleaved woodland aligning the eastern boundary of the EIA site;
 - 2 Full retention of trees and associated poor semi-improved grassland within the north-east corner of the EIA site (albeit for land take associated with implementation of pedestrian links and natural play areas). This will be enhanced through long-term management of grassland habitat;
 - 3 Retention of grassland habitats and trees associated with the southern boundary of the EIA site. This will be enhanced through long-term management of grassland habitat;
 - 4 Retention of TPO trees T2-6, T12-17, G23, T24, T30-31, T33, T43-51, T53, T60, T76, T89, T90, T92 and T101;
 - 5 Retention of trees G7.1-7.2, T16, G23.2, G23.5-23.7, T48 and T60, with moderate bat roost potential and G7.3, G23.1, G23.3-23.4, T53, T80, T90 and T92 with low bat potential;
 - 6 Retention of the building B8; and
 - 7 Implementation of a sensitive drainage design.
- H5.5 Development of the EIA site includes two main stages, namely the construction (including demolition) phase comprising all site preparation works and construction of all buildings, associated infrastructure and landscaping, and the operational phase comprising the long-term occupation of the EIA site. The effects of the proposals in relation to these two stages are discussed in turn below.

During Construction

H5.6 Construction is proposed to span across circa 5 years from 2022 to 2027 at a build rate of 40 dwellings per annum. Potential significant effects identified which could arise as a result of the construction in the absence of mitigation include the following:

- Effects of direct habitat loss due to land take upon habitats and species;
- Indirect effects to designated sites, habitats and species due to habitat degradation and damage;
- Effects of light, noise and human disturbance to habitats and species;
- Increased risk of collision to species; and
- Pollution of groundwater and surface water flows.

Statutory Designations

H5.7 NCC's Adopted Local Development Plan was previously subject to a Habitat's Regulation Assessment (HRA) in 2015⁹ which considered the likely significant effects to arise through policies inherent within the LDP including Policy H1 (Housing Sites) on European sites within the Zone of Influence, such as the Severn Estuary Ramsar/SAC/SPA and River Usk SAC.

H5.8 The HRA identified several potential effects of allocated sites on the Severn Estuary Ramsar/SAC/SPA and River Usk SAC including the following:

- 1 Barriers to migration/movement for fish species and mammals;
- 2 Flow depletion/abstraction;
- 3 Habitat loss;
- 4 Disturbance including recreation, noise, lighting and vibration;
- 5 Water quality and diffuse pollution;
- 6 Increase in suspended solids;
- 7 Aerial pollution; and
- 8 Coastal squeeze.

H5.9 The findings of the assessment concluded that the NCC's LDP, in implementation will not have a likely significant effect on the European site(s) considered as part of the HRA screening alone or in combination and thus did not require a full Appropriate Assessment (AA) under the Habitats Regulations. Nonetheless, the site considered within this EIA was not included within the LDP during the HRA process and still requires consideration at the project level.

H5.10 The proposal is, however, located 1.1 km north and west of the River Usk SAC and 7.3km north of the Seven Estuary Ramsar/SAC/SPA. Given the distance and spatial separation of the EIA site from statutory designations, combined with the localised scale/nature of proposed development, no likely significant effects arising from disturbance, barriers to movement, habitat loss, abstraction, or coastal squeeze are anticipated on designated sites.

⁹ Newport City Council/Atkins Limited (2015) Habitats Regulations Assessment Screening Report.
Available at: <http://www.newport.gov.uk/documents/Planning-Documents/LDP-2011-2026/Habitats-Regulation-Assessment--final.pdf>

- H5.11 However, impacts to the Severn Estuary Ramsar/SAC/SPA and River Usk SAC associated with a deterioration in water quality and increase in suspended solids could occur during the construction phase, as a result of the discharge of contaminated run-off and deposition of material following periods of heavy rainfall into the Afon Llwyd, which could be transferred further downstream to the River Usk and Severn Estuary. Pollution incidents could also arise as a result of leaks and spills from construction activities, resulting in the introduction of hydrocarbons and other contaminants from demolition activities, site plant or of sediment loads arising from dust deposition or spoil movement.
- H5.12 Whilst it is not possible to predict accurately the full ecological impact of a contamination/pollution event occurring on-site given that its scale and extent cannot be predicted, in the absence of mitigation negative effects are considered possible, though the spatial separation between the sites (circa 700m as the crow flies) for the River Usk reduces the likelihood of this occurring. Nevertheless, any unmitigated impact could lead to negative impacts which are considered to be temporary and reversible. Whilst the Severn Estuary and River Usk are valued at an International and European level respectively, given the small scale and extent of anticipated impacts, along with the spatial separation of the sites, such potential effects are considered to be significant at Local level only. Similar impacts may also arise with respect to the River Usk SSSI identified above.
- H5.13 With respect to other SSSI's detailed in Table H4.1, given their distance and spatial separation from the EIA site, no significant impacts are considered likely to arise. Other national designations have therefore been scoped out of this assessment accordingly.

Non-Statutory Designations

- H5.14 Similar to that reported above, impacts to the Afon Llwyd SINC and Afon Llwyd Grasslands SINC during the construction phase could potentially arise as a result of contamination/pollution incidents. The unmitigated effects upon the SINC can be characterised as a negative impact, anticipated to be temporary and reversible. Whilst the Afon Llwyd/ Afon Llwyd Grassland SINC is valued at County level, given the small scale and extent of anticipated impacts, such effects are considered to be significant at the local level only.

Habitats

- H5.15 Although located off-site, semi-natural broadleaved woodland delineates the eastern boundary of the EIA site whilst several mature and semi-mature trees, including those with assigned TPO's are scattered throughout the EIA site.
- H5.16 Woodland habitat will, however, be retained in its entirety with no net loss. Notwithstanding this there remains the potential for physical damage and/or indirect degradation of this feature to occur during construction, given the proximity of built development and/or proposed landscaping works. Retained woodland may be further subject to indirect impacts, such as soil compaction, erosion and pollution (including air pollution). In the absence of mitigation, the extent and magnitude of such negative, medium-term (i.e. duration of the construction phase), is likely to be relatively minor owing to such habitat being restricted to site boundaries, albeit the effects could be permanent and potentially irreversible. The significance of such negative effects upon broadleaved woodland is thus considered to be at the local level only.
- H5.17 Indirect effects associated with increased levels of disturbance will likely occur during the construction phase though the use of lighting and increased levels of vehicular traffic, machinery use and plant movement. Such disturbances arising can be intermittent, frequent, and/or constant throughout the construction period. Given that the majority of the works will be undertaken during daylight hours, the usage of artificial lighting will likely be limited to the early morning and early evening hours, with greater requirements for artificial lighting during

the winter months. This could potentially impact upon the woodland and the species using it (see below). The proposed development has, however, been designed to protect the woodland from the development footprint by adequately offsetting from such features through retention, enhancement and creation of suitable habitat buffers. Disturbance impacts on adjacent semi-natural broadleaved woodland are considered to be negative, temporary and reversible at the site level.

- H5.18 With respect to mature and semi-mature trees, trees G18, T39 and T100 (each with a TPO) will be felled to facilitate construction. The majority of on-site tree resource will, however, be retained and integrates into emerging landscape proposals. Nevertheless, impacts associated with loss of TPO trees is considered to be negative, permanent, and irreversible at the local level.
- H5.19 With respect to retained tree standards, there remains the potential for physical damage and/or indirect degradation during construction due to the proximity of built development and/or proposed landscaping works. In the absence of mitigation, the extent and magnitude of such, medium-term, potentially frequent impacts (i.e. duration of the construction phase), could be permanent and potentially irreversible. The significance of such negative effects upon these retained features is considered to be of local level significance.

Species IEFs

Birds

- H5.20 The loss and degradation of potential bird nesting habitats during construction will primarily be restricted to dense scrub and shrub, scattered trees and buildings throughout the EIA site. In respect of the magnitude of habitat loss and degradation, such impacts are considered negative, permanent, irreversible and of significance at the site level only.
- H5.21 The legal protection afforded to birds and their nest (their eggs and young) is considered inherent mitigation to ensure no effects relating to direct harm/injury arise in respect of the breeding bird assemblage. Therefore, negligible impact is predicted.
- H5.22 In the absence of mitigation, disturbance of nesting and foraging habitat for the breeding bird assemblage through light spill, noise, visual and human disturbance during construction could potentially occur, particularly in areas adjacent to building demolition (i.e. semi-natural broadleaved woodland), or where scrub clearance is occurring. Nesting birds sensitive to such disturbance could abandon nests and breeding territories and become displaced from other populations. Birds will be most sensitive to noise and visual disturbance occurring in the vicinity of habitats during the breeding bird season, though will likely return to such suitable habitat upon cessation of such disturbances. In absence of mitigation, negative effects arising from visual/noise/human disturbance during the construction phase upon birds are considered temporary, reversible and of site level significance only.

Bats

- H5.23 With respect to buildings present within the EIA site, update dusk emergence/dawn re-entry surveys undertaken by EDP identified a low status day roost for common pipistrelle bat in buildings B1/2, B3/4 and B16. This is in addition to a low status roost for soprano pipistrelle within building B16. A low status roost for *Myotis sp.* was previously identified by Ecosulis in 2016. No evidence of this species roosting within the building was, however, recorded during 2019.
- H5.24 B1/2 and B3/4 will be demolished to facilitate redevelopment of the EIA site resulting in loss of common pipistrelle low status roosts of local importance and a potential *Myotis sp.* bat roost. Although B16 will be retained, the building will be renovated resulting in potential

loss/disturbance to a day roost for common pipistrelle and soprano pipistrelle. Such impacts are considered significant, negative, permanent and irreversible at a local level.

- H5.25 With respect to remaining buildings on-site, although several were considered to have low-moderate potential to support roosting bats following a visual assessment undertaken by Ecosulis in 2015/2016, further dusk emergence/dawn re-entry surveys during 2015 found no evidence of roosting bats. The update visual inspection completed by EDP reconfirmed the findings of the previous assessment, although buildings B12-B15, previously considered to have negligible potential for roosting bats, were upgraded to having low potential. Further detailed emergence and re-entry surveys of buildings with bat roost potential undertaken by EDP did not identify any evidence of roosting bats within remaining buildings.
- H5.26 Development will result in the loss of several trees and tree groups across the EIA site including T100 and T105 with moderate potential to support roosting bats and T91 and T97 with low potential to support roosting bats. In the absence of roosting bats, direct impacts associated with loss of these trees are considered unlikely. Due to the transitory nature of this species group, however, a roost may establish itself at a later date in which case negative, permanent and irreversible effects associated with the loss of tree roosts and subsequent harm/injury of bats may arise.
- H5.27 Manual transect and automated bat activity surveys have confirmed that the EIA site supports low levels of foraging and commuting activity dominated by common and widespread bat species considered to be of local importance.
- H5.28 Habitats considered most important to a local bat assemblage, including grassland within the north-eastern corner and southern boundary of the site in addition to adjacent woodland, will be retained and buffered from the development footprint. Although amenity grassland and vegetation elsewhere across the site offers a foraging resource, it is limited in extent and patchy in its distribution whilst inherent lighting throughout the EIA site is likely to deter a significant bat assemblage. As such, effects associated with loss of foraging habitat and dispersal corridors are considered negligible.
- H5.29 With respect to those habitat features to be retained, degradation through damage and disturbance during the construction phase could result in the further loss of roosting and breeding sites in addition to habitat important for foraging, dispersal and migration. In the absence of mitigation, the effects of such impacts upon bats are considered to be negative, permanent and potentially irreversible. The significance of such effects upon these species is considered to be of local level significance.
- H5.30 Indirect disturbance (particularly light spill) upon potential tree roosts and commuting/foraging habitat may arise during construction. Such impacts can affect species through their physiology (such as through increased heart rates, metabolism and stress), and through their behaviour (such as through forced dispersal and/or displacement). Impacts could result in the abandonment of roosts, foraging territories and of commuting and dispersal corridors, which could significantly affect those species supported by the EIA site. Such disturbances arising can be intermittent, frequent, and/or constant throughout the construction period. However, given that the majority of the works will be undertaken during daylight hours, the usage of artificial lighting will likely be limited to the early morning and early evening hours, with greater requirements for artificial lighting during the winter months. Overall, potentially negative effects arising from indirect disturbance upon the local bat assemblage, although minor and temporary, are considered to be significant at the site level only.

Reptiles

- H5.31 Land take associated with the development proposals will result in the permanent loss of semi-natural habitat, with habitat losses confined predominantly to the interiors of the EIA site dominated by amenity grassland, scrub and shrub planting. Such habitat is, however, scattered and fragmented in its distribution, surrounded by existing hardstanding and buildings and, therefore, considered unlikely to support a common reptile population. In contrast, poor semi-improved grassland within the north-east corner of the EIA site is considered more suitable for a reptile population, being more extensive with greater structural and habitat diversity and, furthermore, is contiguous with off-site woodland habitat. Indeed, slow-worm identified during the survey effort was associated with these habitats. Poor semi-improved grassland will, however, be retained in its entirety. As such, the reduction of available habitat to a reptile population is considered negligible.
- H5.32 With respect to those habitat features to be retained, degradation through damage and disturbance during the construction phase could result in the further loss of habitat important for a common reptile population. In the absence of mitigation, the effects of such impacts upon bats are considered to be negative, permanent and potentially irreversible. The significance of such effects upon these species is considered to be of site level significance only.
- H5.33 Increased levels of traffic movements by vehicles, machinery and plant throughout the construction phase could increase the potential risk of road casualties upon this species, particularly when constructing access roads and removing vegetation across which species disperse and forage. Such impacts resulting in harm/injury to a slow-worm population are considered negative, permanent and irreversible at the site level.

During Operation

- H5.34 Potential significant effects identified which could arise as a result of the operation of the proposed development in the absence of mitigation include the following:
- 1 Effects of light and noise/visual/human disturbance to designated sites, habitats and species;
 - 2 Increased risk of collision and predation to species; and
 - 3 Alteration of surface water run-off / groundwater flow / site drainage.

Statutory Designations

- H5.35 The HRA undertaken by NCC considered the impact of a number of vulnerabilities on the Severn Estuary Ramsar/SAC/SPA and River Usk SAC/SSSI, which are pertinent during the operational phase of the proposed development including atmospheric pollution, water quality and diffuse pollution and an increase in suspended solids. Although some distance from the EIA site, the River Usk and Severn Estuary are hydrologically connected to the Afon Llwydd and several land drains within 400m of the EIA site. However, adverse impacts associated with site drainage, including surface water run-off and ground water contamination, are considered unlikely, subject to implementation of a sensitive drainage strategy in accordance with relevant planning policy which will be part of the inherent detailed design.
- H5.36 Specifically, LDP Policy SP4 (Water Resources) requires for development to minimise water consumption, protect water quality during and after construction, and result in no net increase in surface water run-off through the sustainable management of water resources including: the use of sustainable drainage systems; the reuse of water and reduction of surface water run-off through high quality design; consideration of the impact upon finite water resources; and

ensuring development is appropriately located and phased so that there is capacity in the waste water, sewerage and water supply as well as the protection of water quality.

H5.37 As such and in consideration of inherent mitigation comprising delivery of a sustainable drainage strategy pollution, impacts upon designated sites are considered negligible.

H5.38 Meanwhile, an increase in residential dwellings could lead to an increase in disturbance through recreational pressure on the Severn Estuary and River Usk. However, inherent with development proposals is the inclusion of areas of open public space within the north-east corner of the EIA site, in addition to retention and reinstatement of the former playing field as public open space combined with the availability of other open accessible green spaces within the wider landscape, impacts are considered negligible.

Non-Statutory Designations

H5.39 As outlined above, adverse impacts associated with site drainage, including surface water run-off and ground water contamination, are considered unlikely, subject to implementation of a sensitive drainage strategy in accordance with relevant planning policy which will be part of the inherent detailed design.

H5.40 Similarly, an increase in residential dwellings could lead to an increase in disturbance through recreational pressure on non-statutory designations. However, inherent mitigation inclusion provision of areas of open public space within the north-east corner of the EIA site, in addition to retention and reinstatement of the former playing field renders such impacts negligible.

Habitat IEFs

H5.41 Increased recreational usage following occupation of the proposed development may affect sensitive woodland habitat through disturbances arising from trampling, increased noise, lighting and litter. Whilst such disturbance effects are considered to be negative, permanent, irreversible and of local significance, woodland adjacent to the EIA site is located on a naturally steep slope with no formal or informal footpaths. Such naturally inaccessible terrain would likely deter unauthorised public access such that impacts associated with recreational pressures are considered unlikely. Furthermore, the provision of alternative areas of public open space will likely redirect recreational activities away from such sensitive habitats.

H5.42 With respect to increased noise and lighting, inherent mitigation measures seek to reduce such effects arising, primarily through the provision of habitat buffers between boundaries of adjacent woodland and the proposed development footprint. In the absence of mitigation, however, such impacts are considered negative, permanent and irreversible at the local level.

H5.43 With respect to scattered trees, impacts will similarly be avoided through the provision of suitable habitat buffers combined with the provision of new tree, hedgerow and shrub planting elsewhere across the EIA site. In the absence of mitigation, however, such impacts are considered negative, permanent and irreversible at the local level.

Species IEFs

Breeding Birds

H5.44 Retained habitats supporting breeding and foraging birds are potentially at risk of disturbance during the operational phase of the development, in the form of light spill and noise. Nesting birds' sensitive to such disturbance could abandon nests and breeding territories and become displaced from other populations. In the absence of mitigation, negative effects upon such species are considered permanent, irreversible, and of local significance. However, such impacts are considered to be reduced given the retention and protection of ecologically valuable habitat

including woodland, scrub and trees along the eastern boundary of the EIA site and within its north-east corner, whilst new planting along site boundaries, proposed within a landscape strategy, will further offset the development footprint away from such IEFs.

- H5.45 Increased predation of wildlife may also arise following occupation as a result of cat ownership across the development. The unmitigated impact of increased predation upon birds can be characterised as a negative effect which is probable to result, with such effects expected to be permanent and irreversible. The significance of such effects upon species is therefore considered to be of site level significance.

Bats

- H5.46 In relation to bats, an increase in disturbance arising from increased human presence, vehicular use noise and light originating from residential dwellings may affect the behaviour of species utilising those habitats on-site. The usage of artificial lighting across the EIA site could also result in detrimental effects upon bat species due to light spill upon adjacent habitats in use as foraging and commuting corridors. Such effects could result in the abandonment of roosting sites and displacement of dispersal routes across the proposed development, and may also result in the isolation of, and reduced interactions between, populations necessary to maintain genetic diversity. The continued ecological functionality of habitat corridors on-site may therefore be reduced. In the absence of mitigation, negative effects upon bat IEFs are considered to be negative, permanent, and irreversible. Such effects are considered to be of local significance. However, suitable bat habitat is already subject to some level of disturbance given the location of the EIA site within a built-up area of Newport subject to background levels of lighting, such that impacts are considered much reduced.

- H5.47 Increased predation upon bats, particularly at roost sites, may also arise following occupation as a result of cat ownership across the development. The unmitigated impact of increased predation upon species can be characterised as a negative effect which is probable to result, with such effects expected to be permanent and irreversible. The significance of such effects upon species is therefore considered to be of site level significance.

Reptiles

- H5.48 Increases in visual/noise/human disturbance and lighting could result in negative effects upon reptiles, although such impacts are considerably reduced given the retention and enhancement of suitable grassland and scrub habitat within the north-east corner of the EIA site. In the absence of mitigation, negative effects upon reptiles are thus considered negative, permanent, irreversible, and of significance at the site level.
- H5.49 Increased vehicular traffic arising following occupation could also increase levels of road-kill upon reptile individuals moving across the EIA site. The unmitigated impact of increased risk of collision to reptiles can be characterised as a negative impact, with such impacts expected to be permanent and irreversible. The significance of such impacts upon species is considered to be of significance at the site level.

H6.0

Mitigation and Monitoring

H6.1

This section sets out the principles of the avoidance, mitigation or compensation measures required to reduce any potential ecological effects to insignificant levels. Overall, many potential adverse effects have been avoided or reduced through inherent mitigation incorporated into the detailed planning drawings and drainage strategy accompanying the application, along with the spatial separation between statutory designated sites.

H6.2

Not all potential adverse effects can be avoided or reduced in severity through inherent mitigation alone. This section identifies any additional mitigation measures required to avoid, reduce or offset the potential for such significant negative effects. The key mechanisms described will include measures to:

1. Conform with relevant and pertinent legislative requirements, particularly those associated with legally protected species; and
2. Deliver and maximise opportunities for biodiversity enhancement and gain through the proposed development.

H6.3

The key mechanisms which will be implemented are:

- a) **Detailed Design Measures:** The detailed planning application includes plans that illustrate the inherent mitigation measures incorporated within the scheme, including the implementation of a sensitive drainage strategy in accordance with national and local planning policy to ensure no impacts upon aquatic features. Furthermore, poor semi-improved grassland habitat within the north-east corner of the EIA site will largely be retained and enhanced through sensitive long-term management of this feature, whilst adjacent broadleaved woodland will be protected through inclusion of a suitable buffer. There will also be the inclusion of new, native tree and shrub planting (unless proven to be resilient to climate change and/or wildlife friendly), preferably of local provenance, to compensate for the loss of habitats elsewhere. Additional detailed design measures recommended include a sensitive lighting strategy during both the construction and operational phases to ensure no/limited lighting spill to adjacent habitats, as well as the installation of bird and bat roost features upon trees and new building where appropriate;
- b) **Construction and Environmental Management Plan (CEMP) and Detailed Landscape Strategy:** Further detailed measures will be set out with respect to the management and control of the construction phase of the development to ensure protection of IEFs, in addition to details of the planting scheme and maintenance schedule for the development. The CEMP will set out in detail those measures which will require implementation with respect to the protection and enhancement of all IEFs and biodiversity in general during the demolition and construction phase of the proposed development.; and
- c) **Landscape Strategy, Detailed Soft Landscape Plan and European Protected Species Mitigation Strategies (Including Derogation Licensing)** – Detailed mitigation strategies for bats will be prepared to inform an European Protected Species (EPS) Development Licence application should planning consent be forthcoming and will set out the recommended compensation, mitigation and enhancement measures to be implemented as part of the proposals, and to ensure no significant negative effects will arise upon the favourable conservation status of EPS species following occupation. This will be further supported by the Landscape Strategy and Detailed Soft Landscape Plan submitted with the planning application which includes the post-construction management

of landscape, arboricultural, and biodiversity elements in order to ensure that a holistic approach is adopted.

- H6.4 The proposed further mitigation measures in respect of the potentially negative effects arising during the construction and occupation of the completed development are described below.

During Construction

- H6.5 All necessary ecological surveys are considered current at the time of submission, however, where relevant and depending on development timescales and phasing, certain detailed species surveys may require updating prior to commencement of the relevant phase of development. The findings will be used to inform the measures set out below.
- H6.6 Detailed measures to protect habitats and species during the construction phase have been set out within a CEMP to be submitted with a planning application whilst a detailed mitigation strategy with respect to bats will be covered within future EPS licence applications to NRW as required
- H6.7 In general, the CEMP includes mechanisms to ensure the sensitive siting of work compound(s) and storage areas, including the storage of any fuel, chemicals, plant or machinery, sensitive clearance of the EIA site and the use of artificial lighting (including security lighting). =

Designated Sites

- H6.8 To protect water quality of the Afon Llwyd and associated land drains within 200m of the EIA site, which in turn are hydrologically connected to the River Usk SAC/SSSI and Severn Estuary Ramsar/SPA/SAC, appropriate pollution control measures will be employed in accordance with the relevant Pollution Prevention Guidelines (PPGs) published by the Environment Agency¹⁰, namely PPG1 'General guide to the prevention of pollution', PPG5 'Works and maintenance in or near water', PPG6 'Pollution prevention guidance for working at construction and demolition sites', and PPG21 'Pollution incident response planning', to ensure that detrimental effects on nearby watercourse as a result of surface run-off, spillage and pollution arising throughout the construction phases are avoided.
- H6.9 **Habitats IEFs** Protective fencing will be erected as recommended within *BS5837: 2012 Trees in relation to design, demolition and construction* to physically protect retained habitats on-site with establishment of Ecological Protection Zones (EPZs)/. Protective fencing will incorporate the full root protection area of the feature to be retained and will be protected and maintained throughout the duration of all site enabling and pre-construction activities.
- H6.10 No works (other than planting), including the storage of materials, plant and machinery, will be carried out within or immediately adjacent to all areas of protective fencing/areas marked for protection as described above, so as to ensure no detrimental impacts to sensitive features arising from physical damage and/or pollution. The digging of trenches and pits for new tree and scrub planting adjacent to areas of protective fencing, where this lies inside root protection areas, will be carried out by hand only, in accordance with best practice guidance as stipulated within *BS 5837:2012*.
- H6.11 In addition, construction will be limited to daylight hours as far as possible to mitigate effects of increased visual and noise disturbance, with the use of temporary, artificial lighting avoided

¹⁰ PPGs were withdrawn in December 2015; however they remain the main source of information on good practice in Wales with respect to guidance on pollution prevention. A replacement guidance series, comprising Guidance for Pollution Prevention (GPPs), are currently in development.

during the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors to mitigate effects relating to increased use of artificial lighting.

- H6.12 This will be combined with the provision of new tree, hedgerow and shrub planting to compensate for tree loss, combined with the buffering of such habitats from development.

Species IEFs

- H6.13 Protection of species during construction will be ensured through the provisions of the CEMP and relevant NRW development licences in respect of bats, where required. As a general measure aimed at protecting species, 'tool box talks' will be provided by a suitably qualified ecologist to the principal contractor appointed by the developer, for distribution to all employees involved in any enabling works/vegetation clearance, to ensure that identification and protection of the relevant species and their habitats is understood prior to commencement.
- H6.14 Construction activities will be limited to daylight hours as far as possible to minimise disturbance to foraging and commuting habitats of value to bats and birds, and the use of lighting restricted. Where this is not possible (i.e. for security purposes) lighting will be directional, timed and low-lux, with internal/external shields installed as necessary to ensure minimal light spillage upon retained habitats, both within and adjacent to the development edge. Timed lighting will be programmed to ensure adequate dark periods between dusk and dawn across the EIA site, particularly adjacent to peripheral vegetation.
- H6.15 In addition to the habitat protection measures described above, which will deliver much of the necessary species protection, further measures for each species group are summarised below.

Breeding Birds

- H6.16 Retained bird nesting habitats will be included within Ecological Protection Zones (EPZs). This is considered to ensure the avoidance of impacts upon the local breeding bird assemblage given their likely association with those habitats retained including woodland, scrub and tree.
- H6.17 Given the protection afforded to all breeding birds, their nests, eggs and young, sensitive vegetation clearance (and building demolition) required during the pre-construction and construction phases of development should be timed to avoid the main bird breeding season (i.e. March to August inclusive). Should this seasonal constraint prove impracticable, then vegetation clearance/building demolition outside of this period should only commence following the advice and under supervision of a suitably qualified ecologist. Pre-commencement checks for active nests will be required prior to any vegetation clearance occurring during the main bird breeding season, with appropriate buffers marked out around active nests or nests under construction, until all eggs have hatched and chicks fledged. Such protection measures in relation to breeding birds should be included within the CEMP prepared for the EIA site.

Bats

- H6.18 Retained trees with bat roost potential will be included within EPZs throughout construction. Where trees with bat roost potential are to be lost to/impacted by development, in the absence of roosting bats, a development licence from NRW will not be required. Nevertheless, due to the transitory nature of tree roosting bats in particular, precautionary measures are required. Specifically, an update aerial inspection of bat roosting features previously identified will be undertaken by a suitably qualified and NRW bat licensed ecologist and/or arboricultural contractor, and within no more than 48 hours of works. Should a bat roost be confirmed within any trees to be impacted by the proposals, then a development licence from NRW will be required prior to works commencing, with sufficient replacement roosting habitat provided. Where no roosts are found but bat roosting potential remains, such trees should be subject to a

‘soft’ felling methodology by a suitably qualified arboricultural contractor with experience of working with bats, following the advice of the suitably qualified and licensed ecologist and supervised where necessary.

- H6.19 Given the absence of bat roosts identified within buildings B5-B15 present across the EIA site during the 2015/2016 surveys and update 2019 surveys, no constraints to the proposed development are anticipated such that there is no requirement to obtain a development licence from NRW prior to the proposed development of the EIA site. Nevertheless, even where update surveys confirm continued absence of a roost, a precautionary approach to demolition of buildings B5-15 is advised. Works to the roofs, soffits, bargeboards, fascias and other potential roosting features should ideally be undertaken between October to March so as to avoid the main bat roost and bird breeding seasons. Should this not be practicable, then pre-commencement checks carried out by a suitably qualified ecologist will be required immediately prior to commencement of works (see below).
- H6.20 Contractors carrying out the works should be warned of the possible presence of roosting bats and nesting birds and of their protected status. In the event of any bats (or occupied bird nests) are found during works, then all works should cease in the affected area until advice from a suitably qualified and licensed ecologist is sought.
- H6.21 Update surveys undertaken during 2019 did, however, identify a common pipistrelle day roost in B1/2, B3/4 and B16 and soprano pipistrelle day roost in B16. No evidence of roosting *Myotis* sp. was identified in B1/2 during update surveys. As such, a development licence from NRW will be required prior to the proposed development of the EIA site. In general, demolition works will necessarily be confined to the period 01 September to 31 March of any one year to avoid the main bat summer roosting season unless otherwise approved within the future NRW Development Licence. Prior to commencement of demolition works, suitable bat boxes will be installed on suitable mature trees present along the eastern woodland boundary to be retained following the advice of a suitably qualified ecologist. These will act as suitable receptor sites for bats in the unlikely event that any individuals are found and/or displaced during the demolition works and to compensate for roost loss arising as a result of demolition of the building. Soft-stripping of any features deemed to have potential for bats will be undertaken under the supervision of the named ecologist and/or accredited agents/assistants listed on the Development Licence. Contractors will remove all fascias, bargeboards, soffits, roof tiles, etc. by hand, carefully checking for any evidence of bats. In addition to the bat boxes installed on trees, further compensatory measures for roosting bats will be provided across the EIA site in the form of integrated bat boxes within the fabric of new or retained buildings, suitable for crevice dwelling bats.
- H6.22 Felthorpe House will, in contrast, be retained as part of the planning proposals for the EIA site, albeit subject to conversion/refurbishment. As such, the loft space within the building will be enhanced to provide a bat loft space which will be restricted to prevent disturbance. The mitigation will ultimately be dependant on the findings of the update survey effort, however, bat roost features may include the inclusion of bat access ridge tiles installed within the fabric of the building to provide access into the loft space as well as the cavity between roofing tiles and the loft space. The cavity will be created by placing sarking board between the rafters of the loft, against the felt, creating a 20–50mm gap between them. In addition, lifted tiles will be present across the roof to provide further opportunities for crevice-dwelling bats. The existing loft dimensions should be maintained.

Reptiles

- H6.23 Common reptiles will be protected throughout the construction phase through the adoption of precautionary measures during site clearance, ensuring harm/injury to such species are avoided.

More specifically, sensitive displacement of individuals through phased vegetation clearance of the EIA site under an ecological watching brief will be undertaken where required, with the timing of such activities ideally confined to the period late March-early October inclusive so as to avoid the reptile hibernation season.

During Operation

H6.24 Detailed ecological management prescriptions for the long-term management of newly created and enhanced habitats have been provided within a Landscape Strategy and Detailed Soft Landscape Plan for the EIA Site to be submitted with a planning application and provided at Appendix H3 and H4 respectively. The Landscape Strategy and detailed Soft Landscape Plan will define the ecological management prescriptions for habitats to be retained and/or created including trees, shrub and grassland habitats and with respect to their establishment and management for the lifetime of the development, to compensate for proposed habitat loss across the EIA site and further mitigate for potential operational impacts.

H6.25 The monitoring of bat boxes/features (including trees with bat potential, and bat features incorporated into building design), will furthermore be undertaken in accordance with derogation licence(s) where appropriate.

Designated Sites

H6.26 In respect of statutory and non-statutory designated sites, development will be implemented in accordance with a sensitive design strategy to mitigate against negative effects arising from alterations to groundwater and surface water flow due to unforeseen pollution incidents. Subject to the above, it is considered that there will be no negative indirect effects to water quality caused by the proposed development of the EIA site.

H6.27 In addition to the above, significant negative effects upon designated sites arising from increased levels of recreational usage following occupation of the proposed development will be mitigated in a number of ways, including:

- The retention and enhancement of the vast majority of grassland habitat within the north-east corner of the EIA site to be delivered for amenity and wildlife with pedestrian links and natural play areas located within this area and the wider development footprint itself;
- The retention of smaller areas of amenity grassland and tree/shrub planting within the west and south of the EIA Site to be enhanced for wildlife with inclusion of pedestrian links through such habitats;
- The retention of green open space and pedestrian links at the frontage of the main building in the centre of the EIA Site; and
- The provision of formal landscaping and tree planting across the development footprint itself.
- The appropriate maintenance and long-term management of public rights of way running through the EIA site, to include the provision of litter and dog bins and gates where appropriate; and
- The retention of the former playing field within the south-west of the EIA site as formal public open space for recreation with delivery of a Locally Equipped Area of Play (LEAP).

Habitat IEFs

- H6.28 Land take associated with built development is predominantly associated with hardstanding and the footprint of existing buildings with minor loss of semi-natural habitat comprising amenity grassland, shrub planting and trees. The Landscape Strategy has, however, sought to compensate for such losses through the retention and enhancement of poor semi-improved grassland within the north-east corner of the EIA site, albeit for land take associated with the provision of pedestrian links and natural play areas. This is in addition to the retention and enhancement of grassland along the southern boundary of the EIA site and within the west, as illustrated within the Landscape Strategy provided at Appendix H3.
- H6.29 To maximise the botanical value and further enhance the carrying capacity of such habitats to be retained, restoration and enhancement measures will include the supplementary seeding of species-poor areas, where appropriate. This will be sensitively managed in the long-term to maximise the value of foraging, dispersal, breeding and hibernation resources for protected species, including slow-worm through the implementation of a sensitive hay cutting regime, so as to promote a structurally diverse and species-rich grassland sward whilst ensuring the control of scrub encroachment. Such measures will also benefit the local bat assemblage, in addition to common reptiles, nesting birds and invertebrates.
- H6.30 Habitat creation is also intended on-site, including the creation of sustainable drainage features (swales) along the boundaries of the construction footprint that will be planted with appropriate native wetland flora, so as to diversify habitats suitable for protected species. Woodland habitat along the eastern boundary of the EIA site will also be enhanced through appropriate management of this feature with additional woodland planting implemented within adjacent grassland habitat.
- H6.31 This is in addition to the provision of extensive new tree, hedgerow and shrub planting including the transplanting of suitable specimens of native, broadleaved trees and shrubs otherwise proposed for loss to suitable receptor sites across the EIA site where appropriate. New shrub and hedgerow planting will focus on site boundaries, creating and strengthening wildlife dispersal corridors.
- H6.32 Such planting is considered to sufficiently compensate for habitat losses anticipated, whilst ensuring the protection and further enhancement of retained habitats adjacent through strengthening and broadening areas of existing woodland, treelines and hedgerows to maximise habitat function and connectivity across the EIA site and wider landscape. This will be in addition to the sensitive management of such habitats and features in order to increase their resilience and mitigate long-term disturbance effects.
- H6.33 It is further recommended for such planting to utilise a diversity of native species, preferably of local provenance, within any future planting mix, and to include species which bear fruit and are nectar and pollen rich.
- H6.34 In addition, the scheme should ensure the implementation of a sensitive lighting strategy to ensure no/limited light spill occurs within close vicinity of boundary woodland. Where lighting is required along road/pedestrian routes adjacent, lighting columns should be sited within the development footprint itself and directed away from habitat edges to minimise disturbance and light spill. Lighting should include directional, timed and/or low-lux lighting, utilising shields and/or hoods where required. Such measures could be secured via planning condition attached to any future consent.
- H6.35 The proposed measures described above would ensure there is an overall net gain in habitats of ecological value within the EIA site, thereby potentially resulting in significant positive effects at a Site to Local level.

Species IEFs

- H6.36 That habitat creation, enhancement measures described above in relation to designations and habitat IEFs will compensate for proposed habitat loss across the EIA site and, furthermore, enhance opportunities for breeding, refuge, and/or dispersal of protected species to ensure the maintenance of their favourable conservation status over the long-term.
- H6.37 In addition, the scheme will also ensure the implementation of a sensitive lighting strategy, enabling the provision of key dark corridors across the EIA site necessary to maintain dispersal, commuting and foraging routes across the EIA site to the wider landscape. Such a strategy would ensure that permanent lighting is reduced as far as possible along such key wildlife corridors to be retained, strengthened and created, including along the eastern boundary of the EIA site. Where lighting is required along road/pedestrian routes adjacent, lighting columns should be sited within the development footprint itself and directed away from habitat edges to minimise disturbance and light spill. Lighting should include directional, timed and/or low-lux lighting, utilising internal/external shields and/or hoods where required. Such measures can be secured via planning condition attached to any future consent.
- H6.38 Additional species-specific measures to minimise operational impacts and provide enhanced opportunities for species breeding and refuge are detailed below.

Birds

- H6.39 Durable bird boxes, including a range of designs to suit different species, are recommended and should be erected on retained mature trees and buildings.
- H6.40 It is recommended that the planting scheme for the EIA site includes fruit bearing species that will provide a foraging resource throughout the year.

Bats

- H6.41 New bat roosting features will be provided across the EIA site to compensate for the loss of roosts associated with B1/B2, B3/B4 and B16 and further enhance the development for roosting bats. Schwegler bat boxes should be installed upon suitable, mature trees retained along the peripheries of the EIA site and erected with a south-east/south-west facing aspect where possible and away from sources of artificial lighting. Bat box design to be installed across the EIA site should include 2F for smaller bats and 2FN for larger bats (or similar).
- H6.42 Bat roost features (such as bat tubes/bricks and/or raised ridge/roof tiles), should also be incorporated into the exterior of buildings (such as garages) where possible.
- H6.43 Additional planting of native species will be incorporated into the scheme. This will include night-scented plants such as honeysuckle, as well as a mixture of flowering plants which will flower throughout the year.

Reptiles

- H6.44 That habitat creation, enhancement measures described above in relation to designations and habitat IEFs will compensate for proposed habitat loss across the EIA site and, furthermore, enhance opportunities for common reptiles and a resident slow-worm population.
- H6.45 This will be in addition to creation of formal hibernaculum within the north-east corner of the EIA site to provide additional hibernation opportunities for reptiles and enhance the site for this group more generally.

H7.0**Residual Effects****H7.1**

A summary of the residual effects during construction and after completion is provided in Tables H7.1 and H7.2.

During Construction**H7.2**

Subject to those mitigation measures outlined above, and further detailed within the CEMP and Landscape Strategy to be submitted within a planning application, and within those method statements prepared as part of future NRW development licences relating to European Protected Species, residual effects anticipated during the construction phase with respect to Habitat and Species IEFs have been reduced to negligible levels, as summarised within Table H7.1.

Table H7.1 Residual Ecology Effects During Construction

Receptor	Nature of Effect	Sensitivity/ Significance/ Magnitude with Inherent Mitigation	Additional Mitigation Measure(s)	Residual Effect Sensitivity/ Significance/ Magnitude After Mitigation
Severn Estuary SAC/SPA/ Ramsar (International Value)	Surface/ground water run-off and pollution of the Afon Llwyd which could transfer downstream to the River Usk and Severn Estuary.	Negative, temporary, reversible (Local level)	The construction phase will adhere to those sensitive working methodologies and pollution prevention guidelines set out within the CEMP.. Further protection will be afforded through implementation of a sensitive drainage strategy.	Negligible
River Usk SAC/SSSI	Surface/ground water run-off and pollution of the Afon Llwyd which could transfer downstream to the River Usk and Severn Estuary.	Negative, temporary, reversible (Local level)	The construction phase will adhere to those sensitive working methodologies and pollution prevention guidelines set out within the CEMP.. Further protection will be afforded through implementation of a sensitive drainage strategy.	Negligible
Afon Llwyd/Afon Llwyd Grasslands SINC (County Value)	Surface/ground water run-off and pollution of the Afon Llwyd which	Negative, temporary, reversible (Local level)	The construction phase will adhere to those sensitive working	Negligible

	could transfer downstream to the River Usk and Severn Estuary.		methodologies and pollution prevention guidelines set out within the CEMP.. Further protection will be afforded through implementation of a sensitive drainage strategy.	
Semi-natural Broadleaved Woodland (Local value)	Habitat degradation and damage during construction and landscaping works leading to physical impacts to tree roots.	Negative, permanent, irreversible (Local level)	The construction phase will adhere to sensitive working methodologies including the implementation of protective fencing and pollution prevention guidelines set out within the CEMP to ensure full protection of the valued resource.	Negligible
	Disturbance impacts due to elevated noise and lighting.	Negative, temporary, reversible (Site level)	Construction activities will be restricted to daylight hours as far as possible, with use of temporary, artificial lighting to avoid the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors.	Negligible
Scattered Trees (Local value)	Loss of mature and semi-mature tree standards G18, T39 and T100 with TPOs.	Negative, permanent, irreversible (Local)	Provision of new tree, hedgerow and shrub planting to compensate for habitat loss. Translocation of trees to be removed to retained receptor areas where appropriate.	Negligible
	Habitat degradation and damage during construction and landscaping works leading to physical impacts to tree roots.	Negative, permanent, irreversible (Local level)	The construction phase will adhere to sensitive working methodologies including the implementation of protective fencing and pollution	Negligible

			prevention guidelines set out within the CEMP to ensure full protection of the valued resource.	
Breeding birds (Site Value)	Direct habitat/building loss used for breeding and shelter.	Negative, permanent, irreversible (Site level)	Sensitive timing of works to avoid the nesting bird season. Provision of new tree, hedgerow and shrub planting to compensate for habitat loss.	Negligible
	Habitat degradation and damage to retained habitats used for breeding and shelter.	Negative, permanent, irreversible (Site level)	The construction phase will adhere to sensitive working methodologies including the implementation of protective fencing to ensure no adverse impacts to retained habitats will arise which could affect breeding birds.	Negligible
	Direct harm/injury.	Negligible (subject to legal compliance)	Protection of habitats and sensitive timing of works as detailed within the CEMP.	Negligible
	Disturbance impacts due to elevated noise and lighting. Disturbance impacts upon breeding individuals due to erratic visual and noise disturbances during works.	Negative, temporary, reversible (Site level)	Protection of habitats and sensitive timing of works. Restrict construction activities to daylight hours as far as possible, with use of temporary, artificial lighting to avoid the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors.	Negligible
Roosting/ foraging/ commuting bats (Local value)	Loss of a common pipistrelle, soprano pipistrelle and potential Myotis summer day roost. Potential killing/injury during	Negative, permanent, irreversible (local level)	Adhere to sensitive working methodologies set out within the CEMP and future derogation licence prepared in relation to bats, to ensure full protection of the	Negligible

	demolition.		valued resource. Provision of new, compensatory roosting features.	
	Loss of trees T100 and T105 with moderate bat roost potential and T91 and, T97 low bat roost potential. Risk of killing and injury during tree works should a bat roost be present.	Negative, permanent, irreversible (local level)	Provision of new tree, hedgerow and shrub planting to compensate for tree loss, together with habitat buffering. Re-inspection of trees with bat potential together with sensitive clearance measures (which may require implementation under a derogation licence to be approved by NRW), will be followed to ensure no harm to roosting bats.	Negligible
	Habitat degradation and damage during construction and landscaping works adjacent to retained habitats and trees with bat roost potential.	Negative, permanent, irreversible (Local level)	Protective measures to be set out within the CEMP will ensure no adverse impacts to retained habitats will arise which could affect bats.	Negligible
	Indirect disturbance (light spill, visual and noise) of habitats.	Negative, intermittent, temporary, reversible (Site level)	Protection of habitats and sensitive timing of works as detailed within the CEMP. Management and maintenance of new planting in line with a detailed landscape strategy. Restrict construction activities to daylight hours as far as possible, with use of temporary, artificial lighting to avoid the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors.	Negligible

Common reptiles: Slow-worm (Site level)	Habitat degradation and damage during construction and landscaping works adjacent to retained grassland.	Negative, permanent, irreversible (Site level)	Sensitive clearance measures will be followed to ensure no harm to common reptiles.	Negligible
	Increased risk of collision from traffic due to increased vehicle, machinery and plant movement across the site and adjacent to sensitive habitats.	Negative, permanent, irreversible (Site level)	Restrict construction activities to daylight hours as far as possible, with use of temporary, artificial lighting to avoid the hours between dusk and dawn, with directional and low-level lighting used away from sensitive habitat corridors. Additional sensitive methodologies set out within the CEMP to control traffic and movement will further reduce the likelihood of such impacts occurring.	Negligible

During Operation

H7.3 It is considered that the mitigation measures outlined above would result in residual effects anticipated during the operational phase to have been reduced to negligible levels. Furthermore, the creation of new habitats may also result in a biodiversity gain.

H7.4 In light of the mitigation proposed, all remaining potential effects on the IEFs identified within the assessment are considered negligible, as summarised within Table H7.2 below.

Table H7.2 Residual Ecology Effects During Operation

Receptor	Nature of Effect	Sensitivity/ Significance/ Magnitude with Inherent Mitigation	Additional Mitigation Measure(s)	Residual Effect Sensitivity/ Significance/ Magnitude After Mitigation
Severn Estuary SAC/SPA/Ramsar (International value)	Surface / ground water run-off and pollution of the Afon Llwyd which could transfer downstream to the River Usk and Severn Estuary.	Negligible	Protection through sensitive drainage strategy in accordance with local and national policy.	Negligible
	Disturbance arising from an increase in recreational pressure following construction of up to 218 dwellings.	Negligible	Retention of grassland within the north-east corner and southern boundary of the site for amenity and wildlife, in addition to retention of green open space to the frontage of the main central building and existing landscaped areas in the west. Retention of the former playing field.	Negligible
River Usk SAC/SSSI (European value)	Surface/ground water run-off and pollution of the Afon Llwyd which could transfer downstream to the River Usk and Severn Estuary.	Negligible	Protection through sensitive drainage strategy in accordance with local and national policy.	Negligible
	Disturbance arising from an increase in recreational pressure following construction of up to 218 dwellings.	Negligible	Retention of grassland within the north-east corner and southern boundary of the site for amenity and wildlife. Reinstatement of the former playing	Negligible

Receptor	Nature of Effect	Sensitivity/ Significance/ Magnitude with Inherent Mitigation	Additional Mitigation Measure(s)	Residual Effect Sensitivity/ Significance/ Magnitude After Mitigation
			field.	
Afon Llwyd/Afon Llwyd Grasslands SINC (County value)	Surface/ground water run-off and pollution of the Afon Llwyd which could transfer downstream to the River Usk and Severn Estuary.	Negligible	Protection through sensitive drainage strategy in accordance with local and national policy.	Negligible
	Disturbance arising from an increase in recreational pressure following construction of up to 218 dwellings.	Negligible	Retention of grassland within the north-east corner and southern boundary of the site for amenity and wildlife in addition to retention of green open space to the frontage of the main central building and existing landscaped areas in the west. Retention of the former playing field.	Negligible
Semi-natural Broadleaved Woodland (Local value)	Disturbance from lighting and noise.	Negative, irreversible, permanent (Local level)	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan.	Negligible, possible minor beneficial with appropriate landscaping
Scattered Trees (Local value)	Disturbance from lighting and noise.	Negative, irreversible, permanent (Local level)	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan.	Negligible, possible minor beneficial with appropriate landscaping

Receptor	Nature of Effect	Sensitivity/ Significance/ Magnitude with Inherent Mitigation	Additional Mitigation Measure(s)	Residual Effect Sensitivity/ Significance/ Magnitude After Mitigation
Breeding birds (Site value)	Indirect disturbance of nesting and foraging habitats through light spill, noise and visual disturbance.	Negligible	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan. Provision of bird boxes where appropriate.	Negligible, possible minor beneficial with appropriate landscaping
	Predation by cats.	Negative, irreversible, permanent (Site level)	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan. Provision of bird boxes where appropriate.	Negligible, possible minor beneficial with appropriate landscaping
Roosting/ foraging/ commuting bats (Local value)	Indirect disturbance (light spill, visual and noise) (Permanent effect).	Negative, permanent, irreversible (Local level)	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan. Provision of bat boxes for installation upon trees, in addition to roost features to be integrated into buildings.	Negligible

Receptor	Nature of Effect	Sensitivity/ Significance/ Magnitude with Inherent Mitigation	Additional Mitigation Measure(s)	Residual Effect Sensitivity/ Significance/ Magnitude After Mitigation
	Predation by cats.	Negative, irreversible, permanent (Site level)	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan. Provision of bat boxes for installation upon trees in addition to roost features to be integrated into buildings.	Negligible
Common reptiles: slow- worm (Site value)	Indirect disturbance (light spill, visual and noise)	Negative, permanent, irreversible (Local level)	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan.	Negligible
	Increased risk of collision from traffic due to increased vehicle movement across the site, and adjacent to sensitive habitats.	Negative, permanent, irreversible (Site level)	Habitat buffering. Disturbance avoidance including sensitive lighting strategy and management and maintenance of new planting in line with the landscape strategy and detailed soft landscape plan.	Negligible

H8.0

Summary & Conclusions

- H8.1 This chapter provides an assessment of the significance and consequences of potential ecological effects upon identified IEFs arising from the proposed demolition (in part) and redevelopment of UWS Caerleon for residential development and has been prepared as part of an ES that accompanies a detailed Planning Application for residential purposes.
- H8.2 Avoidance, mitigation and compensation measures have been prepared as part of a holistic ecology strategy for the proposed development to address any potential significant effects that may arise during the construction (including demolition and remediation works) and operational phases of the proposed development. Additional measures to further ensure all residual effects are avoided, mitigated and compensated for, in addition to further enhancements recommended to enable the proposed development to deliver positive ecological gain, is also discussed.
- H8.3 Further baseline information in support of this chapter is included within Technical Appendix H1 and is referred to throughout the assessment. The approach taken in this assessment is made with reference to the guidelines published in 2018 by the Chartered Institute of Ecology and Environmental Management (CIEEM).
- H8.4 The baseline survey work has identified the following IEFs pertinent to the proposed development:
- Severn statutory Ramsar/SPA/SAC;
 - River Usk SAC/SSSI;
 - Afon Llwyd SINC and Afon Llwyd Grasslands SINC;
 - Semi-natural Broadleaved Woodland;
 - Scattered Trees;
 - Breeding Birds;
 - Roosting Bat Assemblage;
 - Foraging/Commuting Bat Assemblage; and
 - Common Reptiles.
- H8.5 The impact assessment has identified that certain actions could result in significant adverse effects on these IEFs without mitigation. Inherent avoidance, mitigation and compensation measures to be delivered through the detailed design of the proposals, including a pollution prevention strategy and sensitive drainage scheme, in addition to the implementation of a the Construction and Environmental Management Plan (CEMP) and Landscape Strategy are considered to ameliorate those significant effects identified to a residual level where no significant negative effects are likely, but where significant beneficial effects could be delivered with respect to biodiversity gain.
- H8.6 A summary of those activities during the construction and operational phases of the development impacting upon identified IEFs, including the characterisation of the unmitigated effect, the proposed mitigation, enhancement and, where necessary, compensation mechanism should any residual effects remain, are provided within Tables H7.1 and H7.2. Based on the impact assessment and consideration of the IEFs, it is concluded that the proposals will conform to the respective legislative protection afforded to these IEFs and with respect to national, regional and local planning policy requirements.

H9.0**Abbreviations & Definitions**

- 1 BAP – Biodiversity Action Plan
- 2 NCC - Newport City Council
- 3 CIEEM - Chartered Institute of Ecology and Environmental Management
- 4 CEMP - Construction and Environmental Management Plan
- 5 LDP –Local Development Plan
- 6 EcIA – Ecological Impact Assessment
- 7 ECW – Ecological Clerk of Works
- 8 EPZ – Ecological Protection Zone
- 9 ES – Environmental Statement
- 10 EIA – Environmental Impact Assessment
- 11 HAP – Habitat Action Plan
- 12 HRA – Habitats Regulations Assessment
- 13 JNCC - Joint Nature Conservation Committee
- 14 LNR – Local Nature Reserve
- 15 LDP – Local Development Plan
- 16 LBAP – Local Biodiversity Action Plan
- 17 NRW - Natural Resources Wales
- 18 PPG – Pollution Prevention Guidelines
- 19 PPW – Planning Policy Wales
- 20 POS – Public Open Space
- 21 SAC – Special Area of Conservation
- 22 SAP – Species Action Plan
- 23 SEWBReC - South East Wales Biological Records Centre
- 24 SINC – Site of Importance for Nature Conservation
- 25 SPA - Special Protection Area
- 26 SPG – Supplementary Planning Guidance
- 27 SSSI – Site of Special Scientific Interest
- 28 TAN – Technical Advice Note
- 29 IEF – Important Ecological Feature

H10.0

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USW Caerleon

**Technical
Appendix H1:
Ecology Baseline
Report**

Prepared by:
**The Environmental
Dimension
Partnership Ltd**

On Behalf of:
**Redrow Homes
(South Wales) Ltd**

November 2019
Report Reference
edp5601_r001f

Contents

Executive Summary

Section 1	Introduction, Purpose and Context	1
Section 2	Methodology (Update Baseline Investigations).....	5
Section 3	Results (Baseline Conditions)	11
Section 4	Summary of Findings	23

Appendices

Appendix EDP 1	Proposed Site Plan (Powell Dobson Architects, October 2019; Drawing Reference: 18137(05)101)
Appendix EDP 2	Proposed Landscape Strategy (edp5601_d016e 29 November 2019 DB/DL)
Appendix EDP 3	International Statutory Designated Sites
Appendix EDP 4	National Statutory and Non-statutory Designated Sites
Appendix EDP 5	Habitat Descriptions
Appendix EDP 6	Bat Survey Results
Appendix EDP 7	Habitat Suitability Index Results
Appendix EDP 8	Reptile Survey Results

Plans

Plan EDP 1	Update Habitat Survey, June 2019 (edp5601_d002a 17 July 2019 GY/EM)
Plan EDP 2	Trees Roost Assessment Results (edp5601_d001b 17 October 2019 GY/LL)
Plan EDP 3	Bat Roost Building Inspection and Roost Characterisation Survey Results (edp5601_d005b 22 August 2019 LB/LL)

Plan EDP 4	Bat Emergence/Re-Entry Survey Results on Buildings B1/2 and B3/4 (edp5601_d023 17 October 2019 GY/LL)
Plan EDP 5	Bat Emergence/Re-Entry Survey Results on Building B16 (edp5601_d024 17 October 2019 GY/LL)
Plan EDP 6	Automated Bat Detector Locations and Transect Route (edp5601_d004 17 October 2019 GY/EM)
Plan EDP 7a	April Bat Transect Survey Results 2019 (edp5601_d006a 17 October 2019 LB/EM)
Plan EDP 7b	May Bat Transect Survey Results 2019 (edp5601_d007a 17 October 2019 LB/EM)
Plan EDP 7c	June Bat Transect Survey Results 2019 (edp5601_d018a 17 October 2019 GY/LL)
Plan EDP 7d	July Bat Transect Survey Results 2019 (edp5601_d022 17 October 2019 AG/LL)
Plan EDP 8	Reptile Survey Results (edp5601_d019a 17 July 2019 JTF/LL)

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001b	LLi/ME	FD	EW	FJ 171019
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Executive Summary

- S1 This Ecology Baseline Report has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Redrow Homes (South Wales) Ltd (hereafter referred to as 'the Applicant') in relation to the proposed redevelopment of the Caerleon University Campus (hereafter referred to as 'the Application Site').
- S2 Detailed ecological assessments of the Application Site were previously undertaken by Tyler Grange in 2015 and Ecosulis during 2015 and 2016. The findings of such work were updated by EDP during 2019 to determine any material changes to those habitats and protected/notable species supported.
- S3 An Environmental Statement (ES) including Ecology (Chapter H) has been prepared by EDP on behalf of the Applicant to inform a full planning application and listed building consent for residential development of the Application Site. The proposals include the provision of up to 218 residential units, including new builds and the creation of apartments within listed buildings that are to be retained and converted, as well as associated landscaping and access.
- S4 With respect to designated sites, the Severn Estuary Ramsar, Special Protection Area (SPA) and Special Area of Conservation (SAC) is located 7.3km south of the Application Site, whilst the River Usk SAC and Site of Special Scientific Interest (SSSI) is located east and south of the Application Site. There are several non-statutory designated sites within the zone of influence of the Application Site, the most pertinent of which are the Afon Llwyd Site of Interest for Nature Conservation (SINC) located 400m east of the Application Site.
- S5 The Application Site is dominated by hardstanding and buildings which are predominantly vacant in addition to areas of amenity grassland and ornamental shrub planting. The north-eastern corner and eastern boundary of the Application Site is characterised by an unmanaged, tussocky grassland sward with scattered non-native and native trees. Such habitats are considered to be of limited/negligible ecological importance although adjacent semi-natural broadleaved woodland and trees with Tree Protection Orders (TPOs) scattered across the Application Site are considered to be of local importance. Habitats within and adjacent to the Application Site provide opportunities for bats, breeding birds, badger (*Meles meles*), common reptiles and notable mammal species including European hedgehog (*Erinaceus europaeus*).
- S6 It is considered that there are no obvious 'in principle' (significant) ecological constraints that would preclude development, and which cannot be avoided by good design. Specifically, a masterplan will seek to retain, protect and further enhance sensitive habitats present on and adjacent to the Application Site. In consideration of the confirmed presence of bat roosts within the Application Site, species-specific measures will be devised to ensure the long-term maintenance of these populations at favourable conservation status and which will be implemented in accordance with an approved Development Licence from Natural Resources Wales (NRW). Overall, EDP considers that the scheme is capable of compliance with relevant planning policy for the conservation of the natural environment at all levels, although a full

assessment is provided within Chapter H of the ES provided by EDP and submitted with a planning application.

Section 1

Introduction, Purpose and Context

- 1.1 This Ecology Baseline Report has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Redrow Homes (South Wales) Ltd (hereafter referred to as 'the Applicant') in relation to the proposed redevelopment of the Caerleon University Campus (hereafter referred to as 'the Application Site').
- 1.2 EDP is an independent environmental planning consultancy with offices in Cirencester, Cheltenham, Cardiff and Shrewsbury. The practice provides advice to private and public sector clients throughout the UK in the fields of landscape, ecology, archaeology, cultural heritage, arboriculture, rights of way and masterplanning. Details of the practice can be obtained at our website www.edp-uk.co.uk.

Site Context

- 1.3 The Application Site comprises the former Caerleon Campus of the University of South Wales. It is situated at approximate Ordnance Survey Grid Reference (OSGR) ST 33496 91290 and measures approximately 12.7 hectares (ha) in size. The Application Site is situated in the town of Caerleon, circa 1.1km west and north of the River Usk, beyond which is the city of Newport.
- 1.4 The Application Site is dominated by hardstanding and buildings which are predominantly vacant in addition to areas of amenity grassland and ornamental shrub planting. Such areas are now largely unmanaged with encroaching scrub. Landscaped areas located more centrally within the Application Site are, however, still subject to frequent mowing. The north-eastern corner and eastern boundary of the Application Site is characterised by an unmanaged, tussocky grassland sward with scattered non-native and native trees contiguous with a linear belt of semi-natural broadleaved woodland.
- 1.5 Located within the town of Caerleon, the wider landscape is dominated by residential housing. A railway line travelling north to south is circa 180m east of the Application Site, beyond which lies open countryside comprising agricultural grassland and woodland units.
- 1.6 A Proposed Site Plan and Landscape Strategy is provided at **Appendix EDP 1** and **EDP 2** respectively with habitats illustrated at **Plan EDP 1**.

Development Proposals

- 1.7 The proposals relate to a full planning application and listed building consent for residential development of the Application Site. In brief, proposed development will consist of up to 218 residential units, including new build and the creation of apartments within listed buildings that are to be retained and converted as well as associated landscaping and access. Further

details of the proposals are provided within the documents submitted along with the planning application.

- 1.8 The Application Site was subject to a previous planning application for residential development (Application Ref: 17/0781), but which was refused by Newport City Council (NCC) in light of significant adverse effects upon highway safety, traffic, residential amenity and air quality.
- 1.9 The ecological sensitivities of the Application Site have influenced the final layout through an iterative design process. Thus, the final Site Plan incorporates a degree of 'inherent' mitigation to avoid or reduce the severity of potential ecological impacts.

Background and Scope

- 1.10 To inform the previous planning application submission, as referred to above, detailed ecological assessments of the Application Site were previously undertaken by Tyler Grange in 2015 and Ecosulis during 2015 and 2016, as summarised below:
- Preliminary Ecological Appraisal report by Tyler Grange in 2015 (Report reference: 2447_R01_SC_KB_AR), including an Extended Phase 1 habitat survey;
 - Bat Habitat Suitability Assessment, Bat Activity Surveys, Reptile Presence Absence report by Ecosulis in October 2015 (Report reference: J005876), including a bat habitat suitability assessment, bat emergence survey, bat activity surveys and reptile surveys, undertaken in September to October 2015; and
 - Ecological Impact Assessment Technical Appendix I: Baseline Ecology Report by Ecosulis in January 2017 (Report reference: J006171), including the above, along with the findings of additional bat emergence/ e-entry surveys in May-June 2016 and an internal inspection of Camelot/Dolaucothi accommodation block in October 2016.
- 1.11 The findings of such work have been updated by EDP during 2019 to determine any material changes to those habitats and protected/notable species supported by the Application Site. Update surveys included an Extended Phase 1 Habitat survey and further detailed surveys with respect to bats and common reptiles.
- 1.12 This Ecology Baseline Report details the findings of the update baseline investigations undertaken by EDP in 2019 to date and assesses the current ecological status of the Application Site necessary to determine/confirm potential ecological constraints to its proposed development.
- 1.13 The remainder of this report is structured as follows:
- **Section 2** summarises the methodology employed in updating baseline ecological conditions within and around the Application Site (with further details provided within Appendices and on Plans where appropriate);

- **Section 3** summarises the baseline ecological conditions (with further details also provided within Appendices and on Plans where appropriate) and identifies and evaluates any pertinent ecological features/receptors that require further consideration through an Ecological Impact Assessment (EclA); and
- **Section 4** briefly summarises the findings that are relevant to masterplanning and an ecological assessment for the proposed development.

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Section 2

Methodology (Update Baseline Investigations)

2.1 This section of the Ecology Baseline Report summarises the methodologies employed in updating the existing ecological baseline for the Application Site. Update survey effort has been undertaken by suitably qualified ecologists using relevant best practice methodologies wherever possible. Reasons for any departure from best practice methodology are given and normally relate to the timing of EDP's commission and/or the availability of access to parts of the site or wider study area. Full details of the techniques and process adopted are, where appropriate, provided within Appendices and Plans to the rear of this report.

Desk Study

2.2 The desk study is an important element of undertaking an initial ecological appraisal of a site proposed for development, enabling the initial collation and review of contextual information, such as designated sites, together with known records of protected and priority species¹.

2.3 An update desk study was undertaken by EDP during May 2019 and involved collating biodiversity information from the following sources:

- South East Wales Biodiversity Records Centre (SEWBrEC); and
- Multi-Agency Geographic Information for the Countryside (MAGIC) website².

2.4 The desk study involved obtaining the following information:

- International statutory designations (10km radius around the Application Site);
- National statutory designations (2km radius);
- Non-statutory local sites (2km radius);
- Annex II bat species³ records (6km radius); and
- All other protected/notable species records (2km radius).

2.5 The above listed search areas are considered sufficient to cover the potential zones of influence⁴ of the proposed development in relation to designated sites, habitats and species.

¹ Species considered of key significance to sustain and improve biodiversity in Wales, as defined under Section 7 of Part 1 of the Environment (Wales) Act 2016

² www.magic.gov.uk

³ Bat species listed in Annex II of the EC Habitats Directive, namely greater horseshoe, lesser horseshoe, barbastelle and Bechstein's bats

⁴ Zone of Influence - the areas and resources that may be affected by the proposed development.

- 2.6 The distribution of pertinent designations around the Application Site is illustrated at **Appendices EDP 3** and **4** and specifically referenced within **Section 3** of this report.

Update Extended Phase 1 Survey

- 2.7 An Extended Phase 1 Habitat survey was initially undertaken by Tyler Grange in 2015 and subsequently reported by Ecosulis. To update the ecological baseline and verify the results of previous survey effort, an Update Extended Phase 1 Habitat survey was undertaken by EDP on 9 May 2019.
- 2.8 The survey technique adopted for the update habitat assessment was at a level intermediate between a standard Phase 1 survey technique⁵, based on habitat mapping and description, and a Phase 2 survey, based on detailed habitat and species surveys. The survey technique is commonly known as an Extended Phase 1 survey. This level of survey does not aim to compile a complete floral and faunal inventory for the Application Site.
- 2.9 The level of survey involves identifying and mapping the principal habitat types and identifying the dominant plant species present in each principal habitat type. In addition, any actual or potential protected species or species of principal importance are identified and scoped.
- 2.10 The distribution of habitats surveyed is illustrated at **Plan EDP 1**, with habitat descriptions included within **Appendix EDP 5**.

Limitations

- 2.11 May is within the optimal season for undertaking an Extended Phase 1 Habitat survey. The survey is, therefore, not considered to be constrained by climatic or seasonal factors.
- 2.12 Surveys were limited to recording plant species present in both vegetative and floristic forms at the time of survey. The absence of any species recorded during the survey cannot be taken to automatically infer species' absence from the Application Site.

Detailed (Phase 2) Surveys

- 2.13 The scope of the additional Phase 2 surveys undertaken at the Application Site was defined following the completion of the Update Extended Phase 1 Habitat survey in May 2019 and review of previous survey findings collated by Ecosulis in 2015 and 2016. The surveys 'scoped in' are summarised in turn below, with a brief explanation of those potential surveys 'scoped out' provided thereafter.

⁵ Joint Nature Conservation Council (2004) *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit* (reprinted with minor corrections for original Nature Conservancy Council publication).

Bat Surveys

- 2.14 The update Extended Phase 1 Habitat survey confirmed the continued presence of several trees with potential to support roosting bats within the Application Site, in addition to 16 buildings. Areas of woodland, the hedgerow network, and grassland habitats present across the Application Site are also considered to provide suitable foraging and commuting habitat for bats.
- 2.15 The following surveys for bats were therefore undertaken, with reference to national best practice guidelines⁶:
- 1) Bat Roosting:
 - a) Ground level visual assessment of all mature trees for bat roosting potential on 9 May 2019. A ground level visual assessment of onsite trees for bat roosting potential, completed during May 2019. All trees with moderate to high potential for roosting bats, to be impacted by development were then subject to a further detailed aerial inspection on two occasions during September 2019;
 - b) Internal visual inspections of onsite buildings associated with Caerleon University Campus for their potential to support roosting bats on 2, 17, 20, 23 and 31 of May 2019; and
 - c) Dusk emergence and dawn re-entry surveys of buildings with roosting potential, undertaken between June and August 2019.
 - 2) Bat foraging/commuting activity:
 - a) Manual transect surveys conducted on 24 April, 20 May, 26 June and 25 July 2019; and
 - b) Automated detector surveys conducted in April, May, June, July and August 2019.
- 2.16 Full details are provided in **Appendix EDP 6** with survey results illustrated on **Plans EDP 2-7**.

Badger Survey

- 2.17 Badger (*Meles meles*) activity within the Application Site was recorded during the Extended Phase 1 survey on 9 May 2019. During the survey, any signs of badger activity such as holes, latrines, trails, snuffle holes and hairs on fencing or vegetation were recorded. Where holes of a size and shape consistent with badgers were identified, the following signs of badger activity were searched for in order to determine whether they were currently in active use:
- Fresh spoil outside entrances;

⁶ Collins, J. (ed.) (2016). *Bat Surveys: for Professional Ecologists: Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London

- Old bedding material (typically dried grass) outside entrances;
- Holes being cleared of leaf litter;
- Badger guard hairs; and
- Fresh tracks leading to/from the holes.

Limitations

- 2.18 Badger surveys can be undertaken at any time of year and are, therefore, not limited by seasonal or climatic factors.

Amphibians (including Great Crested Newt)

Habitat Suitability Index Assessment

- 2.19 A Habitat Suitability Index (HSI) assessment, as developed by Oldham *et al.* (2000)⁷, was completed to assess the suitability of an onsite garden pond to support great crested newt (*Triturus cristatus*). The survey was undertaken during the Extended Phase 1 Habitat survey on 9 May 2019. The HSI assessment follows a standardised assessment criteria using habitat features such as water quality, fish/waterfowl presence and surrounding terrestrial habitat quality to derive a suitability score, or 'index'. Water bodies with high scores are considered more likely to support great crested newts compared to those with lower scores. HSI scores and the inferred suitability of the ponds assessed to support great crested newts are described within **Table EDP 2.1**.

Table EDP 2.1: HSI Scores and Inferred Pond Suitability.

HSI Score	Pond Suitability to Support Great Crested Newts
<0.5	Poor suitability
0.5–0.59	Below average suitability
0.6–0.69	Average suitability
0.7–0.79	Good suitability
>0.8	Excellent suitability

Reptiles

- 2.20 Overall the Application Site is considered to of low value to common reptile species, being comprised predominantly of hardstanding, buildings and amenity grassland. Suitable habitat comprising unmanaged grassland and dense scrub is however, present within the north-east corner and along the southern boundary of the Application Site.
- 2.21 To determine the presence/likely absence of reptile species within the Application Site, along with their distribution and approximate population size if present, a reptile survey was

⁷ Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10 (4), 143-155

undertaken within areas of suitable habitat. The survey involved the use of artificial reptile refugia checked on seven occasions during May 2019.

- 2.22 Full details of the reptile survey are provided in **Appendix EDP 8** and on **Plan EDP 8**.

Surveys Scoped Out

- 2.23 **Table EDP 2.2** below summarises other survey types which, while commonly required as part of an ecological appraisal for development sites, were not considered necessary/appropriate in this case.

Table EDP 2.2: Ecology surveys scoped out.

Survey Type	Reasons for scoping out
Breeding Birds	Suitable nesting habitat within the Application Site is limited to scattered trees, dense scrub and buildings. Assessments of trees and buildings for bat roosts provided an opportunity to identify any nesting birds that may be present. Given the nature and distribution of habitats on-site, however, full breeding bird surveys are not considered necessary in this instance.
Dormouse (<i>Muscardinus avellanarius</i>)	Suitable dormouse habitat is limited to dense scrub and woodland delineating the eastern boundary of the Application Site. Such features are, however, highly fragmented across the Application Site with no/limited connectivity to suitable habitat in the wider landscape. Although a desk study returned records of dormouse within 2km of the Application Site, these are located beyond the River Usk, considered a barrier to the dispersal of dormouse between the Application Site and wider landscape.
Otter (<i>Lutra lutra</i>) and Water Vole (<i>Arvicola terrestris</i>)	There is no suitable habitat for either species onsite. As such, no further survey is recommended.
Great crested newt (<i>Triturus cristatus</i>)	A single waterbody was identified onsite but is considered unsuitable for great crested newt due to its artificial nature and poor water quality. One other waterbody within 500m was identified but which is located circa 370m south-west, beyond main roads and residential development. Terrestrial habitat onsite limited to amenity/poor semi-improved grassland and dense scrub is considered of limited suitability for this species and further patchy in its distribution, fragmented by buildings and hardstanding. Existing development surrounding the Application Site is considered a barrier to the dispersal of great crest newt between the Application Site and suitable habitat in the wider landscape.
Invertebrates	The Application Site comprises predominantly hard standing and amenity grassland exhibiting poor structural and botanical diversity and as such is considered unlikely to support a notable invertebrate assemblage. No further survey is recommended in this instance.

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Section 3

Results (Baseline Conditions)

- 3.1 This section of the Ecology Baseline Report summarises current ecological conditions determined through the course of update field-based investigations described in **Section 2**, along with the existing ecology baseline derived from the previous ecological studies as described in **Section 1**. In particular, this section identifies and evaluates those ecological features/receptors considered within this report and which are pertinent in the context of the proposed development. Further technical details are, where appropriate, provided within Appendices and on Plans to the rear of this report.

Designated Sites

- 3.2 Information regarding designated sites was obtained during the Desk Study from the MAGIC website and SEWBRc. Statutory designations (those receiving legal protection) and non-statutory designations (those receiving planning policy protection only) are discussed in turn below.

Statutory Designations

- 3.3 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).
- 3.4 No part of the Application Site is covered by any statutory designations. However, there are several such designations within the Application Site's potential zone of influence. These are the Severn Estuary Ramsar, SPA and SAC which is located 7.3km south of the Application Site and the River Usk SAC and SSSI which is located east and south of the Site and is 1.1km away at its closest point. A summary of the designations is provided within **Table EDP 3.1** and illustrated at **Appendices EDP 3** and **4**.

Table 3.1: Summary of statutory nature conservation designations within the Application Site potential zone of influence.

Designation	Distance from Application Site (approx.)	Brief Description
International Designations within 10km		
Severn Estuary Ramsar Site	7.3km south	The Severn Estuary is designated a Ramsar Site for: its immense tidal range; presence of unusual estuarine communities, reduced diversity and high productivity; populations of migratory fish; bird assemblages of international importance; and fish species associated with the whole estuarine and river system.

Designation	Distance from Application Site (approx.)	Brief Description
European Designations with 10km		
Severn Estuary SPA	7.3km south	This SPA is designated for supporting populations of European importance, overwintering Bewick's swan (<i>Cygnus columbianus bewickii</i>) and migratory curlew (<i>Numenius arquata</i>), dunlin (<i>Calidris alpina</i>), pintail (<i>Anas acuta</i>), redshank (<i>Tringa tetanus</i>) and shelduck (<i>Tadorna tadorna</i>). The site also supports a population of European importance of passage ringed plover (<i>Charadrius hiaticula</i>) and is a wetland of international importance.
Severn Estuary SAC	7.3km south	This SAC is designated for its assemblage of Annex I habitats including: estuaries; mudflats and sandflats not covered by seawater at low tide; and Atlantic salt meadow. Also, a qualifying feature are its populations of twaite shad (<i>Allosa fallax</i>), sea lamprey (<i>Petromyzon marinus</i>) and river lamprey (<i>Lampetra fluviatilis</i>).
River Usk SAC	1.1km south and east	The SAC is designated as a watercourse of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation, an Annex I habitat. The site is also designated for populations of sea lamprey, river lamprey and brook lamprey (<i>Lampetra planeri</i>), twaite shad, Atlantic salmon (<i>Salmo salar</i>), bullhead (<i>Cottus gobio</i>) and otter (<i>Lutra lutra</i>).
Site of Special Scientific Interest (SSSI) within 2km		
River Usk SSSI	1.1km south and east	A watercourse designated for its aquatic habitats and associated flora and fauna.

Non-Statutory Designations

- 3.5 Non-statutory designations are also commonly referred to in planning policies as 'local sites', although in fact these designations are typically considered to be of importance at a county level. In Newport, such designations are named Sites of Importance for Nature Conservations (SINCs). Additional designated sites which should be considered at this level include Local Nature Reserves (LNRs) and Ancient Semi Natural Woodland (ASNW), where these are not covered by other designations.
- 3.6 No part of the Application site is covered by any non-statutory designations. However, there are 11 SINCs and 6 ASNWs within the Application Site's potential zone of influence as described in **Table EDP 3.2** and illustrated at **Appendix EDP 4**.

Table EDP 3.2: Non-statutory designations within the Application Site's potential zone of influence.

Designation	Distance from Application Site (approx.)	Brief Description
Afon Llwyd SINC (C7)	0.4km east	A freshwater tributary of the River Usk that supports an otter population.
Afon Llwyd Grasslands SINC (C12 & C17)	0.6km south-east	Large area of semi-improved marshy and dry neutral grassland used by otter.
Lodge Wood ASNW (C2)	0.6km north-west	Ancient semi-natural woodland.
Trinity View SINC (C4)	0.7km west	Mosaic habitat of scrub woodland and grassland.
Coed y Gatlas ASNW (C6)	0.8km north-west	Ancient semi-natural woodland.
Ponthir Sewage Work SINC (131)	0.8km north	Lowland grassland and woodland with open standing water and wetland.
Hillcroft Field ASNW (C15)	0.8km west	Ancient semi-natural woodland.
Graig Yr Eurych ASNW (C3)	0.9km north-west	Ancient semi-natural woodland.
Flooded Field SINC (C16)	1.0km south	Large flooded fields designated for its bird population which includes lapwing (<i>Vanellus vanellus</i>) and redshank.
Moorings SINC (STJ2)	1.0km south-west	Site contains breeding Cetti's warbler (<i>Cettia cetti</i>).
St Julians Park SINC (BE1 & C5)	1.2km south	A large mosaic site of improved, semi-improved and unimproved neutral grassland areas with bracken and scrub. The site also contains broadleaved woodland.
Llantarnam Abbey Bat Roost SINC (162)	1.3km north-west	Site contains a lesser horseshoe bat (<i>Rhinolophus hipposideros</i>) roost within the bell tower. The area is also a known otter breeding site.
Bulmore Road Fields SINC (C13)	1.4km south-east	Semi-improved acidic grassland.
Glebelands SINC (STJ1)	1.6km south-west	Former landfill site covered with amenity grassland, woodland and scrub. Forms part of the River Usk corridor.
Pilton Vale West SINC (C11)	1.9km west	Unimproved neutral-grassland with bracken slopes.
Graig Wood ASNW (C1)	1.9km north-west	Ancient semi-natural woodland.
Ancient Semi-natural Woodland (201)	2.0km north	Ancient semi-natural woodland.

Habitats

- 3.7 Information on habitats within and around the Application Site was obtained during the Update Extended Phase 1 survey undertaken by EDP in May 2019.
- 3.8 The distribution of different habitat types within and adjacent to the Application Site is

illustrated on **Plan EDP 1**. In addition, detailed descriptions of these habitat types are provided in **Appendix EDP 5**. A summary, and qualitative assessment, of these habitats is provided in **Table EDP 3.3**.

Table EDP 3.3: Summary of habitats within the Application Site.

Habitat/Feature	Distribution within Application Site	Intrinsic ecological value
Buildings and Hardstanding	Dominates the Application Site.	Negligible , owing to man-made structure <i>per se</i> , albeit with potential to support protected species.
Former Amenity Grassland	Located throughout the Application Site in association with landscaped areas.	Negligible , owing to fragmented nature with discrete areas surrounded by hardstanding. Low distinctiveness and botanical diversity.
Poor Semi-improved Grassland	Located within the north-east corner of the Application Site.	Site , of similar botanical diversity to amenity grassland but contiguous with other habitat types including broadleaved woodland.
Semi-natural Broadleaved Woodland (Offsite)	Delineates the eastern boundary of the Application Site.	Local , a Habitat of Principal Importance.
Shrub Planting	Landscaped areas comprising shrub planting scattered across the Application Site.	Negligible , owing to limited extent, low species diversity and dominance by non-native species.
Scattered Trees	Located throughout the Application Site.	Local , owing to maturity, potential to support protected species and TPO's assigned to several of the trees.
Dense and Scattered Scrub	Predominantly scattered along the boundaries of the Application Site.	Negligible , owing to limited extent and species diversity.
Standing Water	A small, artificial pond is present within the south-east corner of the Application Site.	Site , owing to artificial nature and poor water quality.
Tall Ruderal Vegetation	Predominantly established across former allotments adjacent to the eastern boundary of the Application Site.	Negligible , owing to limited extent and species diversity.
Ephemeral/Short Perennial Vegetation	Scattered patches present across disused car parking areas and hardstanding.	Negligible , owing to limited extent and species diversity.

Protected and/or Notable species

- 3.9 The likelihood of presence, or confirmed presence, of protected/and or notable wildlife species within the Application Site is summarised below with reference to Desk Study records, habitat suitability and detailed surveys. Further details are made available within appendices and plans where referenced.

- 3.10 Where a particular species or taxonomic group has been confirmed to be present, or presence is inferred based on habitat suitability, the ecological value or significance of the population or assemblage is assessed on a geographical scale.

Breeding Birds

- 3.11 Numerous bird records were returned during the desk study, the closest of which relate to areas of residential housing surrounding the Application Site. Records of red listed species⁸ include lapwing (*Vanellus vanellus*), spotted flycatcher (*Muscicapa striata*), grasshopper warbler (*Locustella naevia*), linnet (*Linaria cannabina*), black-headed gull (*Chroicocephalus ridibundus*), starling (*Sturnus vulgaris*), bullfinch (*Pyrrhula pyrrhula*), wood warbler (*Phylloscopus sibilatrix*), yellow wagtail (*Motacilla flava*), curlew (*Numenius arquata*) and kestrel (*Falco tinnunculus*). Amber listed species include skylark (*Alauda arvensis*), reed bunting (*Emberiza schoeniclus*), house sparrow (*Passer domesticus*) and song thrush (*Turdus philomelos*). Green listed species include dunnoek (*Prunella modularis*).
- 3.12 Schedule 1 species records received include those relating to barn owl (*Tyto alba*), recorded most recently in 2016 and associated with agricultural land in the wider landscape. This is in addition to records for Cetti's warbler (*Emberiza cirlus*), brambling (*Fringilla montifringilla*), green sandpiper (*Tringa ochropus*) greenshank (*Tringa nebularia*), fieldfare (*Turdus pilaris*), common crossbill (*Loxia curvirostra*), Mediterranean gull (*Ichthyaetus melanocephalus*), little ringed plover (*Charadrius dubius*), black tailed-godwit (*Limosa limosa*), red kite (*Milvus milvus*), hobby (*Falco Subbuteo*) and peregrine (*Falco peregrinus*) amongst others. Such records are predominantly associated with the wider agricultural landscape or otherwise the River Usk.
- 3.13 Within the Application Site, dense scrub, shrub and tree planting and adjacent broadleaved woodland is considered to provide suitable breeding and foraging habitat for birds. Amenity and poor semi-improved grassland are considered less suitable for breeding, albeit likely offering foraging opportunities. Habitats present onsite are, therefore, likely to support an assemblage of generalist and widespread species. Swifts (*Apus apus*) were recorded to be nesting within the soffit boxes of the Main Building. As such, the local breeding bird assemblage supported by the Application Site is considered to be of **Site** importance.

Bats

Desk Study

- 3.14 During the desk study completed in May 2019, SEWBRc returned 155 records of bats (not including Annex II bats) the most pertinent of which include a brown long-eared bat (*Plecotus auritus*) roost 300m south-west of the Application Site, a common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat roost 1.8km north-east and a soprano pipistrelle (*Pipistrellus pygmaeus*) bat maternity roost 510m south-east of the Application Site. In addition to other low status roosts for these species, records of common pipistrelle, soprano

⁸ Bladwell S, Noble DG, Taylor R, Cryer J, Galliford H, Hayhow DB, Kirby W, Smith D, Vanstone A, Wotton SR (2018) The state of birds in Wales 2018. The RSPB, BTO, NRW and WOS. RSPB Cymru, Cardiff

pipistrelle, brown long-eared, *Myotis* sp. and noctule (*Nyctalus noctula*) bats were recorded within 2km of the Application Site more generally.

- 3.15 With respect to Annex II bats, SEWBReC returned two records of greater horseshoe bat (*Rhinolophus ferrumequinum*), including a night roost record in 2016 at 4.2km north north-west of the Application Site, and another record from 2017, 7.9km south-west of the Application Site. Furthermore, 75 records of lesser horseshoe bat (*Rhinolophus hipposideros*), including 60 records of roosts, dating from 2000 to 2018 were returned from within the 6km search radius. No records were returned from the Application Site, with just two records identified within a 2km search area, including a lesser horseshoe night roost 1.98km north-east of the Application Site.

Investigations of Bat Roosting – Trees

- 3.16 A ground level assessment of the trees within the Application Site for potential to support roosting bats was undertaken by Ecosulis in 2015 during which two trees with potential to support roosting bats were identified. The rest of the trees across the Application were deemed to have negligible potential to support roosting bats as they lacked any features and were immature to semi-mature.
- 3.17 All the trees across the Application Site were subject to an update ground level assessment by a suitably qualified ecologist from EDP in May 2019 for the presence of, or potential to support, roosting bats. Trees were searched as thoroughly as possible from ground level, with all elevations covered where accessibility allowed.
- 3.18 During the update ground level assessment completed by EDP, one tree (**T100**) was considered to have high potential, thirteen (**T16, T48, T60, T61, T90, T97, T105, T23.2, T23.5, T23.6, T23.7, T7.1, T7.2**) were considered to have moderate potential, and a further nine trees (**T7.3, T23.1, T23.3, T23.4 T53, T80, T91, T92, T94**) were considered to have low potential to support roosting bats. The remaining trees on site were assessed as having negligible potential. The findings of the tree assessment are summarised at **Appendix EDP 6**.
- 3.19 Of those trees with moderate-high potential to support roosting bats, four trees are to be felled to facilitate development (**T61, T97, T100** and **T105**). As such, further detailed aerial inspections of these trees were undertaken during September 2019 to confirm presence/infer absence of roosting bats. Following the first inspection undertaken on 3 September 2019 **T100** was downgraded from high to moderate potential to support roosting bats. **T105** was confirmed as being of moderate potential whilst **T97** was downgraded from moderate to low potential and **T61** from moderate to negligible potential. A second inspection of **T100** and **T105** was thus undertaken on 17 September 2019. No evidence of roosting bats was identified during survey effort. The findings of the aerial tree assessments are summarised at **Appendix EDP 6** and illustrated at **Plan EDP 2**.

Investigations of Bat Roosting – Buildings

Visual Assessment

- 3.20 Caerleon University Campus comprises a complex of buildings, including the main university building at the centre of the Application Site, a library, a sports hall and several student accommodation blocks which are in good condition. These structures are evenly distributed throughout the Application Site, which a small patch of woodland delineating the eastern boundary of the Application Site and a former playing field located within the south-west corner of the Application Site.
- 3.21 A visual assessment of onsite buildings for potential to support roosting bats, undertaken by Ecosulis in September 2015 with internal inspections of the Camelot/Dolaucothi accommodation blocks undertaken in October 2016, identified four buildings with moderate suitability to support roosting bats (**B1/2**, **B3/4**, **B8** and **B16**). A further five buildings were assessed as having low suitability (**B5-7** and **B10-11**) with remaining buildings considered to have negligible potential. No signs of bats were recorded during visual inspections with the exception of a single, degraded bat dropping recorded on a third-floor window sill of the Camelot/Dolaucothi accommodation block.
- 3.22 Following completion of a visual assessment in 2015, an indicative emergence survey was undertaken by Ecosulis on 28 September 2015 during which four surveyors were positioned around the campus. During the survey, bat activity was recorded in order to identify potential 'hotspots' of activity around groups of buildings. During the survey, no bats were recorded emerging from or entering the buildings on the Application Site. However, there were records of very early bat activity close to sunset by Felthorpe House (**B16**) in the south-east corner of the Application Site, indicating presence of a roost in close proximity.
- 3.23 This was followed by dusk emergence and dawn re-entry surveys of nine buildings (**B2-8**, **B10-11** and **B16**) with low-moderate potential to support roosting bats during May and June 2016 during which a single common pipistrelle was recorded re-entering Felthorpe House (**B16**) during the dawn survey. Four unidentified bats (presumed to be *Myotis* species following internal inspection of the building) were also noted re-entering the Camelot/Dolaucothi (**B1/B2**) accommodation block above a window lintel on the third floor.
- 3.24 As such, Felthorpe House and the Camelot/Dolaucothi accommodation block have previously been confirmed as roosts for common pipistrelle and presumed *Myotis* bat species respectively following detailed survey effort undertaken by Ecosulis in 2016.
- 3.25 Results of the update visual inspection are largely consistent with existing survey results from 2015/2016 with **B1/2**, **B3/4**, **B8** and **B16** considered to have moderate potential to support roosting bats whilst **B5-7**, **B10** and **B11** were considered to have low potential. In contrast to previous results however, an update assessment considered buildings **B9** and **B12-B15** to have low potential to support roosting bats following identification of suitable roosting features (hanging tiles of the gable ends). However, no signs of roosting bats were noted during the internal inspection of these buildings. The remaining buildings onsite (were considered being of negligible potential for summer roosting bats due to lack of suitable access points.

- 3.26 The results of the internal and/or external inspections of the buildings located within the Application Site are illustrated on **Plan EDP 3**. A description of each building and their value for roosting bats is summarised within **Appendix EDP 6**.

Dusk Emergence/Dawn Re-entry Surveys

- 3.27 Dusk emergence and/or dawn re-entry surveys of buildings **B1/B2**, **B3/4**, **B5-B7** and **B10-15** with bat roost potential have been undertaken by EDP between June and August 2019.
- 3.28 During a dusk emergence survey of building **B3** on 24 June 2019, three common pipistrelle bats were identified emerging from a soffit box on the western elevation between 22:01 and 22:36. This is in addition to emergence of a single common pipistrelle bat from a soffit box on the western elevation of **B3** at 22:11.
- 3.29 A dusk emergence survey of **B3/B4** undertaken on 5 August 2019 identified two common pipistrelle bats emerging from the soffit box near the central gable end of the eastern elevation at 21:30 and 21:40 in addition to one common pipistrelle emerging at 21:29 from a second location.
- 3.30 During a dusk emergence survey of **B1/B2** on 25 June 2019, a single common pipistrelle emerged from the soffit box on the western elevation at 22:26 whilst a possible re-entry of a common pipistrelle bat was recorded during a dawn re-entry survey on 18 July 2019 at 04:05. A single common pipistrelle bat was also observed emerging from the soffit box along the south-eastern corner of **B2** during a second dusk emergence survey.
- 3.31 With respect to **B16**, a single common pipistrelle was recorded entering a roosting feature within the eaves on the northern elevation of the building at 22:01 on 25 June 2019. On 5 August 2019, a soprano pipistrelle bat was also observed emerging from building **B16** at 21:11 specifically from a crevice located above a window lintel.
- 3.32 Based on the results, it is considered that buildings **B1/B2**, **B3/4** and **B16** each support a summer day roost for low numbers of common pipistrelle bats. **B16** also supports a summer day roost for low numbers of soprano pipistrelle bats. Both **B1/B2** (Camelot/Dolaucothi accommodation block) and **B16** (Felthorpe House) have previously been confirmed as supporting roosts for common pipistrelle and presumed *Myotis* bat species following detailed survey effort undertaken by Ecosulis in 2016. *Myotis* bat species were not recorded roosting within **B1/B2** during surveys undertaken by EDP in 2019.
- 3.33 The dusk emergence and dawn re-entry survey results of the buildings located within the Application Site are illustrated on **Plan EDP 4** and **Plan EDP 5**.

Investigations of Bat Foraging/Commuting Activity

- 3.31 The results of the update bat activity surveys comprising walked transect and automated detector surveys undertaken between April and August 2019 are detailed at **Appendix EDP 6**. The approximate distribution and diversity of bat species recorded during the transect surveys is illustrated on **Plans EDP 7a-7d**.

- 3.32 With respect to foraging/commuting bats, activity surveys undertaken by Ecosulis in September and October 2015 identified moderate levels of pipistrelle activity with relatively high concentrations recorded along the northern boundary of the Application Site. Species recorded include common pipistrelle, soprano pipistrelle and noctule.
- 3.33 This is largely consistent with update surveys undertaken during April, May, June, July and August 2019. Six bat species/species groups (myotis bat species were not identified to species level), were confirmed to be present foraging and/or commuting within the Application Site during the course of the activity surveys. During the automated detector surveys, the vast majority of this behaviour (average 76% of Anabat recordings) related to common pipistrelle bat.
- 3.34 Noctule, soprano pipistrelle and myotis bats were occasionally recorded, comprising 24% of all Anabat calls recorded during April, May, June, July and August. Long eared sp. and Nyctalus/Eptesicus sp. have only been recorded during June accounting for less than 1% of all anabat recordings. The range and proportion of species/species groups recorded during the manual transect surveys was broadly similar to that described above with regards to the automated surveys. A minimum of four species were recorded during the manual transect surveys. Overall relatively low levels of bat activity were recorded, predominantly along the northern and eastern boundaries of the Application Site, the latter being contiguous with broadleaved woodland and unmanaged grassland. Foraging activity was also recorded in association with the southern boundary and former playing field. Activity is dominated by common pipistrelle with occasional registrations from soprano pipistrelle. Registrations of Myotis and noctule were also recorded within the south of the Application Site in May 2019.
- 3.35 The abundance and diversity of bat species recorded on site is considered to be typical for the sub-urban edge of Newport, with common and widespread generalist species such as common pipistrelle bats accounting for the vast majority of foraging and commuting activity. Overall therefore, the Application site is considered to be of **local** importance to the local bat population.

Badger

- 3.36 Five records for badger were received during the update desk study, two related to setts and three to road mortalities. The closest record dated from 2016 and was for a road mortality on the A4042 located 2.1km west of the Application Site.
- 3.37 No evidence of badger activity was recorded by EDP during the Extended Phase 1 Habitat survey undertaken in May 2019 and neither was any activity identified during surveys undertaken in 2015 and 2016 by Tyler Grange and Ecosulis.
- 3.38 Dense scrub, poor semi-improved and amenity grassland does provide suitable foraging habitat for this species, albeit scattered in its distribution whilst adjacent broadleaved woodland provides suitable cover for badger and their setts.
- 3.39 In the absence of active badger setts onsite, this species is considered to be of **Site** importance only.

Dormouse

- 3.40 SEWBRc returned 30 records for dormouse within 2km of the Application Site. All of the records originate from the eastern side of the River Usk with the Application Site being located on the western side of the River Usk.
- 3.41 Suitable dormouse habitat onsite is limited to dense scrub and woodland delineating the eastern boundary of the Application Site. Such features are, however, highly fragmented across the Application Site with no/limited connectivity to suitable habitat in the wider landscape. Although a desk study returned records of dormouse within 2km of the Application Site, such records are located beyond the River Usk which is considered a barrier to the dispersal of dormouse between the Application Site and wider landscape.
- 3.42 This species is thus presumed absent from the Application Site and considered to be of **Negligible** importance.

Otter and Water Vole

- 3.43 A desk study returned several records for otter associated with the Afon Llwyd 400m north of the Application Site and River Usk east and south of the Application Site. With respect to water vole, only one record within 2km of the Application Site was returned circa 1.9km north.
- 3.44 There is no suitable habitat for either species onsite or adjacent such that both species are presumed absent and considered of **Negligible** importance.

Great Crested Newt

- 3.45 A desk study assessment returned six records of great crested newt within 2km of the Application Site. The two most recent records were located 800m south-east of the Application Site and dated from 2011 and 2012. This is in addition to records for common frog (*Rana temporaria*), common toad (*Bufo bufo*) and smooth newt (*Lissotriton vulgaris*), the closest of which are within 410m south of the Application Site.
- 3.46 A single waterbody was identified within the south-east corner of the Application Site, but which was considered unsuitable for great crested newt due to its artificial nature, poor water quality and limited macrophyte diversity. The habitat suitability assessment confirmed the pond to be of poor suitability to support great crested newt. Detailed results of the habitat suitability assessment are provided at **Appendix EDP 7**. An additional waterbody was identified within 500m of the Application Site (370m south-west). However, this waterbody is located beyond a main road and residential development which is considered a barrier to the dispersal of great crested newt.
- 3.47 Terrestrial habitat onsite limited to amenity/poor semi-improved grassland and dense scrub is considered of limited suitability for this species and further patchy in its distribution, fragmented by buildings and hardstanding. Existing development surrounding the Application Site is considered a barrier to the dispersal of great crested newt between the Application Site

and suitable habitat in the wider landscape. This species is thus presumed absent and considered to be of **Negligible** importance.

Reptiles

- 3.48 Several records for widespread reptile species were received during the desk study including: a single record for adder (*Vipera berus*) dated 2008 approximately 1.5km south of the Application Site; six records of slow-worm (*Anguis fragilis*) dated between 2004 and 2015, with the nearest record being approximately 490m north-east; nine records of grass snake, with seven records in association with Caerleon Comprehensive School located approximately 665m south-west and a further two records 1.7km north; and one record of common lizard from 2007 located approximately 1.6km north of the Application Site.
- 3.49 With respect to the potential of the Application Site to support reptile species, habitat is predominantly limited to amenity grassland and dense scrub which is considered of limited suitability for a reptile population and further patchy in its distribution, fragmented by buildings and hardstanding. Unmanaged, poor semi-improved grassland within the north-east corner of the Application Site adjacent to residential gardens is considered more suitable and offers opportunities for foraging and hibernating.
- 3.50 Reptile surveys undertaken by Ecosulis between mid-September and early October 2015 found no evidence of common reptiles onsite. This is in contrast to the results of update survey effort undertaken by EDP which confirmed presence of a small slow-worm population within the Application Site. Full details of the number of individuals and peak survey count are given in **Appendix EDP 8**. Slow-worms were associated with habitats along the north-eastern and eastern boundaries of the Application Site. These areas are predominantly represented by tussocky, unmanaged poor semi-improved grassland contiguous with offsite broadleaved woodland and residential gardens.
- 3.51 Given the small size of the population support, slow-worm is considered important at the **Site** level.

Other Species Potentially Supported

- 3.52 A desk study assessment returned records for European hedgehog (*Erinaceus europaeus*), the closest being adjacent to the eastern boundary of the Application Site. European hedgehog was also observed nine times during the bat activity surveys undertaken by EDP between May and August 2019. Records for stoat (*Mustela erminea*) and polecat (*Mustela putorius*) within 2km of the Application Site were also returned, the latter of which relates to road casualties recorded over 1km away from the Application Site. All three species are of Principle Importance in Wales and are relatively widespread. Whilst suitable habitats exist onsite for these species, such habitats also predominate within the wider landscape beyond. These species are therefore not considered to be significant beyond a **Site** context.
- 3.53 With respect to invertebrates, historical records (pre-1950s) were returned for marsh fritillary (*Euphydryas aurinia*) (an European Protected Species) and

small pearl bordered fritillary (*Boloria selene*) greater than 2km south and north of the Application Site respectively. Other records related to shrill carder bee (*Bombus sylvarum*) and grayling (*Hipparchia semele*), both red data book species whilst large wainscot (*Rhizodra lutosus*), identified within the wider area of Caerleon is a species of Principle Importance.

- 3.54 The Application Site is considered of limited importance to an invertebrate assemblage with dense scrub, amenity/poor semi-improved grassland and buildings and hardstanding likely to support a limited assemblage of common and widespread species only. The local invertebrate assemblage potentially supported by the Application Site is therefore considered to of **Negligible** importance.
- 3.55 With respect to notable plant species, records are largely limited to bluebell (*Hyacinthoides non-scripta*) and deptford pink (*Dionthus armeria*) (both listed under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended)) and recorded in association with woodland units in the wider landscape. Records for tubular water dropwort (*Oenanthe fistulosa*), marsh stitchwort (*Stellaria palustris*), yellow bird's nest (*Monotropa hypopitys*) and the lichen species *Parmelina carporrhizans*, all red data book species were also returned. No notable plant species were recorded during the Extended Phase 1 Habitat survey, whilst habitats present within the Application Site are considered likely to support common and widespread species only.

Section 4

Summary of Findings

- 4.1 Based on the baseline investigations described above, the Important Ecological Features pertinent to an Ecological Impact Assessment (EclA) in respect of the proposed development at the Application Site are identified in **Table EDP 4.1**.
- 4.2 There are also habitats present within the Application Site which are considered of negligible or low (site-level) importance, including amenity grassland, poor semi-improved grassland, dense scrub, shrub planting, tall ruderal and ephemeral/short perennial vegetation, standing water, buildings and hardstanding. However, such habitats have been taken into consideration in relation to their importance in maintaining populations of protected and/ or notable species.

Table EDP 4.1: Important Ecological Features to be considered within an EclA.

Important Ecological Feature	Key Attributes	Nature Conservation Value
Statutory/Non-statutory Designated Sites		
Severn Estuary Ramsar/SPA/SAC, SSSI	Designated for its marine and associated habitats supporting significant bird and fish assemblages in addition to otter.	International
River Usk SAC & SSSI	A watercourse designated for presence of Annex I habitats and several Annex II species.	European
Afon Llywd SINC	A freshwater tributary of the River Usk that supports an otter population.	County
Afon Llwyd Grasslands	Large area of semi-improved marshy and dry neutral grassland used by otter.	County
Habitats		
Semi-natural Broadleaved Woodland (Offsite)	Suitable habitat for protected species and a potential dispersal corridor for wildlife in a primarily urban landscape.	Local
Scattered Trees	Several are assigned a TPO and further provides suitable habitat for nesting birds and roosting bats.	Local
Poor semi-improved Grassland	An area of unmanaged, grassland habitat contiguous with offsite habitats including broadleaved woodland and providing suitable habitat for protected species including foraging birds, bats and badger.	Site
Standing Water	A habitat of Principal importance albeit artificial in nature.	Site
Species		
Breeding Bird Assemblage	Habitats likely to support an assemblage of common and widespread bird species utilising the Application Site for nesting and foraging.	Site

Important Ecological Feature	Key Attributes	Nature Conservation Value
Roosting Bat Assemblage	Confirmed presence of a common pipistrelle and soprano pipistrelle roost within onsite buildings during 2019. Other buildings with present with potential to support bat roosts.	Local
Foraging/ Commuting Bat Assemblage	Six bat species/species groups (myotis bat species were not identified to species level) in low numbers typical for the locality, with an assemblage dominated by common pipistrelle.	Local
Badger	Suitable foraging habitat present onsite whilst adjacent woodland offers suitable cover and set building opportunities.	Site
Common reptiles	Small slow-worm population within north-east corner of the Application Site.	Site
Notable Mammal Species	European hedgehog confirmed present onsite with habitats offering suitable opportunities for this species, in addition to stoat and polecat.	Site

Appendix EDP 1
Proposed Site Plan
(Powell Dobson Architects, October 2019;
Drawing Reference: 18137(05)101)

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- Site Boundary
- Existing Vegetation to be Retained
- Proposed Trees
- Proposed Amenity Grass
- Species Rich Grass
- Proposed Swale
- Wildflower and Bulb Planting
- Proposed Play Surface
- Proposed Amphitheatre
- Proposed Crushed Resin Gravel Path 1.8m wide
- Proposed Mown Lawn Path



Appendix EDP 2
Proposed Landscape Strategy
(edp5601_d016e 29 November 2019 DB/DL)

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the environmental
dimension partnership

Registered office: 01285 740427 - www.edp-uk.co.uk - info@edp-uk.co.uk

date **29 NOVEMBER 2019**
drawing number **edp5601_d016e**
scale **1:1000 @ A1**
drawn by **DB**
checked **DL**
QA **CR**

client
Redrow Homes (South Wales) Ltd
project title
USW Caerleon
drawing title
Landscape Strategy

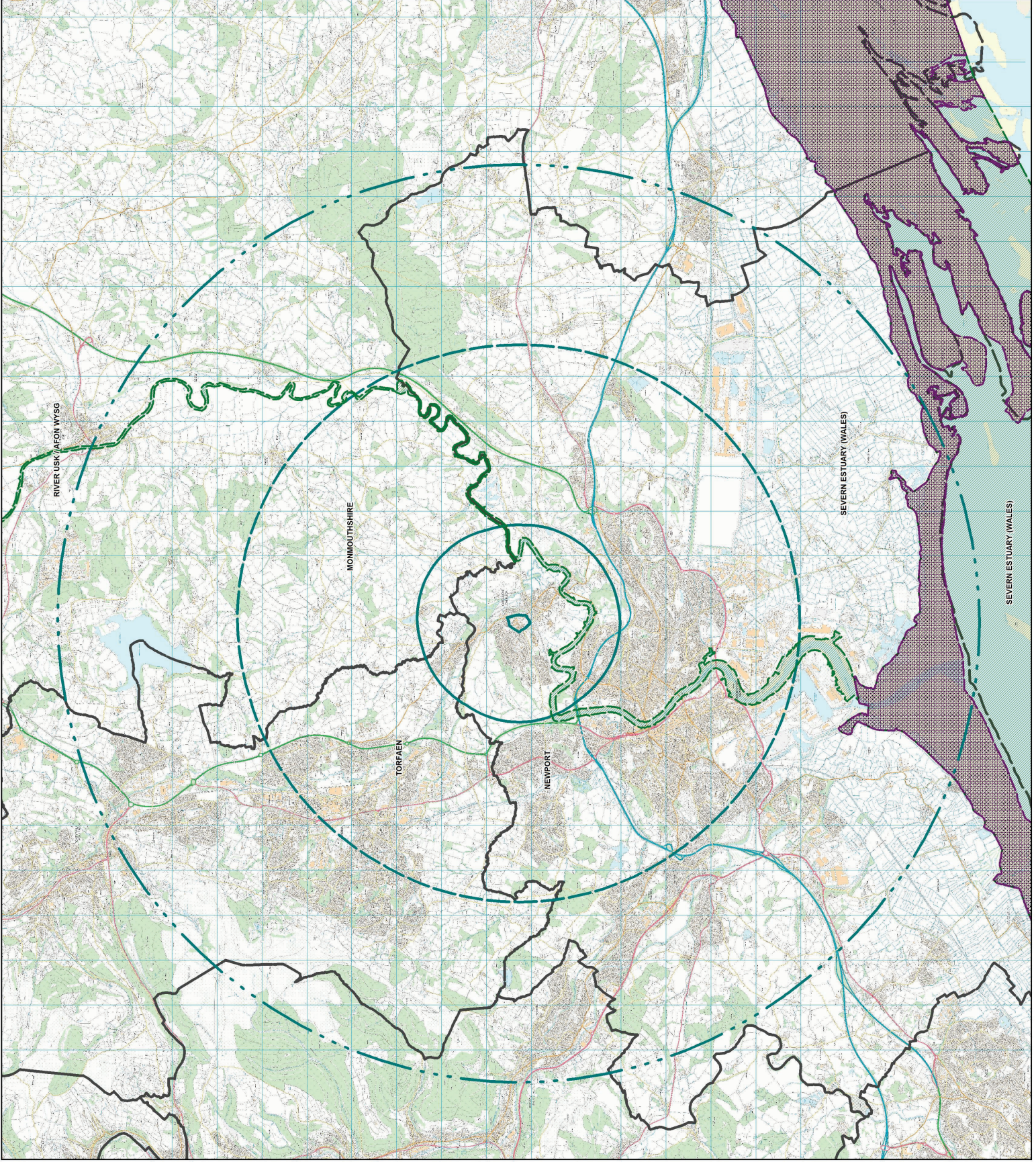
Appendix EDP 3

International Statutory Designated Sites

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**BIODIVERSITY INFORMATION
SEARCH (SPECIES AND
DESIGNATED SITES):**

**CAERLEON UNIVERSITY
CAMPUS
ST3348891284**



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Appendix EDP 4

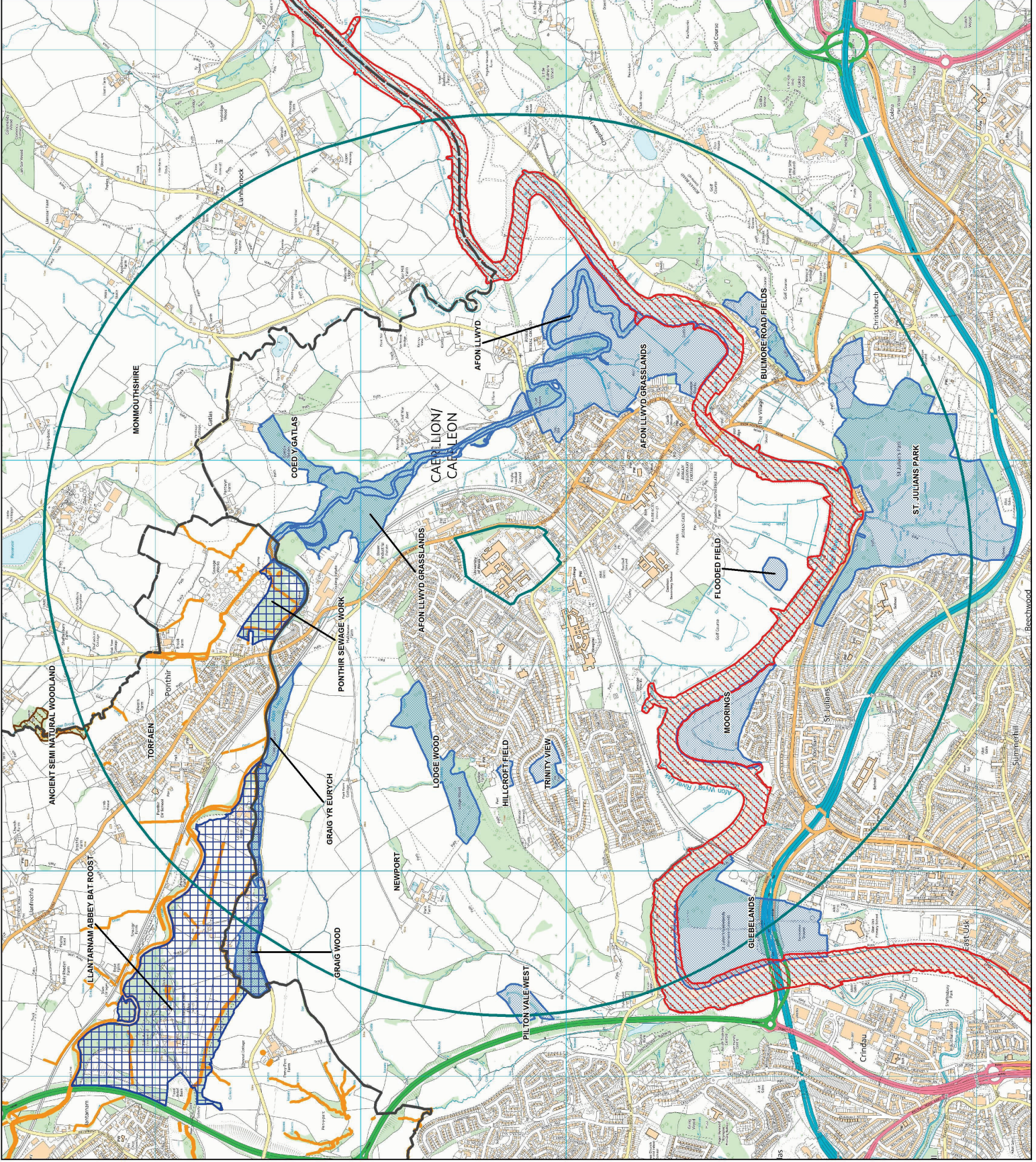
National Statutory and Non-statutory Designated Sites

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**BIODIVERSITY INFORMATION
SEARCH (SPECIES AND
DESIGNATED SITES):**

**CAERLEON UNIVERSITY
CAMPUS
ST3348891284**

- Search Area (plus 2km Search Buffer)
- Site of Special Scientific Interest
- Newport Site of Importance for Nature Conservation
- Torfaen Site of Importance for Nature Conservation
- Torfaen Site of Importance for Nature Conservation (Ancient Semi-Natural Woodland)
- Torfaen Site of Importance for Nature Conservation (Watercourses)
- Unitary Authority Boundary



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Appendix EDP 5 Habitat Descriptions

- A5.1 The principal habitats within the Application Site together with their dominant/characteristic plant species were identified during the Extended Phase 1 survey. The Extended Phase 1 Habitat survey was undertaken on 9 May 2019 by a suitably experienced surveyor, during which the weather was dry with 100% cloud cover and no wind.
- A5.2 The survey technique adopted for the initial habitat assessment was at a level intermediate between a standard Phase 1 survey technique⁹, based on habitat mapping and description, and a Phase 2 survey, based on detailed habitat and species surveys. The survey technique is commonly known as an Extended Phase 1 survey. This level of survey does not aim to compile a complete floral and faunal inventory for the Application Site.
- A5.3 The level of survey involves identifying and mapping the principal habitat types and identifying the dominant plant species present in each principal habitat type. In addition, any actual or potential protected species or species of principal importance are identified and scoped.
- A5.4 Habitats identified during Extended Phase 1 Survey are discussed in turn below and should be read in conjunction with **Plan EDP 1** appended to this report.

Limitations

- A5.5 This survey was limited to recording plant species present in both vegetative and floristic forms at the time of survey. The lack of a species being recorded from this survey does not conclude absence from the Application Site.
- A5.6 The Extended Phase 1 survey area was fully accessible at the time of the site visit and was completed during the optimal survey months of April and September inclusive. The survey was therefore not limited by seasonal or climatic conditions.

Results

Buildings and Hardstanding

- A5.7 The Application Site is dominated by buildings of varying age and construction and include former student residences, a sports hall, offices and lecture halls. These buildings are now predominantly empty. Hardstanding associated with roads, public footpaths and car park areas surround the buildings.
- A5.8 Buildings and hardstanding are considered to be of **Negligible** importance *per se*, although buildings have potential to support protected species, namely roosting bats and nesting birds.

⁹ Joint Nature Conservation Council (2004) *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit* (reprinted with minor corrections for original Nature Conservancy Council publication).

Former Amenity Grassland

- A5.9 Pockets of amenity grassland are located throughout the Application Site whilst a sport's pitch is present within the south of the Application Site. Such areas have predominantly fallen out of management and as such grassland habitat is relatively tall (0.3m high) and tussocky. Amenity grassland generally comprises false oat-grass (*Arrhenatherum elatius*), meadow foxtail (*Alopecurus pratensis*), cock's-foot (*Dactylis glomerata*) and Yorkshire fog (*Holcus lunatus*). Common vetch (*Vicia sativa*), creeping cinquefoil (*Potentilla repens*), forget-me-not (*Myosotis* sp.) and bird's-foot-trefoil (*Lotus corniculatus*) are locally frequent whilst germander speedwell (*Veronica chamaedrys*), daisy (*Bellis perenne*), yarrow (*Achillea millefolium*), fescue (*Festuca* sp.), knapweed (*Centaurea nigra*), ribwort plantain (*Plantago lanceolata*) and broadleaved dock (*Rumex obtusifolius*) occur occasionally. Cuckoo flower is locally rare (*Cardamine pratensis*).
- A5.10 Small individual patches of amenity grassland often vary in their composition and are sometimes dominated by a single species not otherwise recorded at the same abundance elsewhere across the Application Site, including bird's-foot trefoil, geranium (*Geranium* sp.), black medick (*Medicago lupulina*) and sedge (*Carex* sp.).
- A5.11 Amenity grassland areas located within the centre of the Application Site are, in contrast, heavily manicured and subject to frequent mowing with limited species recorded within the sward.
- A5.12 Overall, the grassland sward appears relatively diverse but given variations in its species composition often dominated by one species or another, it is considered likely that such habitats were seeded rather than occurring naturally. Amenity grassland is thus considered to be of **Negligible** importance.

Poor Semi-improved Grassland

- A5.13 The north-eastern corner of the Application Site comprises poor semi-improved grassland sloping steeply downwards from an access road which delineates its south-western boundary towards the boundaries of residential gardens located offsite. Poor semi-improved grassland is unmanaged (up to 0.3m tall) and tussocky. Species composition is similar to amenity grassland reported above although knapweed occurs more frequently. Bramble scrub is also encroaching across this habitat whilst bracken (*Pteridium aquilinum*) is present along the north-eastern boundaries with residential gardens.
- A5.14 Given poor semi-improved grassland represents a large, continuous area of habitats contiguous with bramble scrub and broadleaved woodland, this habitat is considered to be of **Site** level importance.

Semi-natural Broadleaved Woodland (Offsite)

- A5.15 The eastern boundary of the Application Site is contiguous with an area of mature broadleaved woodland dominated by mature and semi-mature ash and sycamore (*Acer pseudoplatanus*). The understorey is unmanaged and comprises bramble (*Rubus fruticosus* agg.), holly

(*Ilex aquifolium*), hawthorn (*Crataegus monogynea*) and hazel (*Corylus avellana*) with a ground flora community dominated by common ivy (*Hedera helix*), with occasional common nettle (*Urtica felina*), lesser celandine (*Ficaria verna*), harts-tongue (*Asplenium scolopendrium*) and bluebell (*Hyacinthoides non-scripta*).

- A5.16 A habitat of Principal Importance, semi-natural broadleaved woodland is considered to be of **Local** level importance.

Shrub Planting

- A5.17 Areas of shrub planting are present throughout the Application Site and particularly in amongst the buildings and alongside public footpaths as well as delineating the western boundary of the Application Site. Shrub planting is dominated by non-native and ornamental species including lavender (*Lavandula* sp.), cherry laurel (*Prunus laurocerasus*), firethorn (*Pyracantha coccinea*), *Gunnera* sp. and Mexican orange blossom (*Choisya* sp.) although native varieties can occur and/or are encroaching within such habitats. Such species include bramble, apple (*Prunus* sp.), and pendulous sedge (*Carex pendula*).
- A5.18 Small sections of non-native hedgerows delineate the fenced boundaries of the Application Site and comprise single species, either privet or laurel circa 3m high and 2.5m wide.
- A5.19 Given dominance by non-native species with several areas that are largely isolated from one another, shrub planting is considered to be of **Negligible** importance.

Scattered Trees

- A5.20 Also associated with areas of shrub planting are scattered mature and semi-mature trees, again comprising a mix of non-native, ornamental and native species. Species include foxglove tree (*Paulownia tomentosa*), black mulberry (*Morus nigra*), black walnut (*Juglans nigra*), copper beech (*Fagus sylvatica* f. *purpurea*), cut-leaved beech (*Fagus sylvatica* 'Laciniata'), giant redwood (*Sequoiadendron giganteum*), silver birch (*Betulus pendula*), beech (*Fagus sylvatica*), sweet gum tree (*Liquidambar styraciflua*) and small-leaved lime (*Tilia cordata*). Many of these specimens carry a Tree Preservation Order.
- A5.21 Non-native and native tree standards are also present within the north-east corner of the Application Site in association with poor semi-improved grassland and dense scrub comprising bramble, hawthorn (*Crataegus monogynea*), holly (*Ilex aquifolium*) and blackthorn (*Prunus spinosa*). A linear strip of trees is also present along the southern boundary of the Application Site and include silver birch, oak (*Quercus* sp.), holly, privet (*Ligustrum* sp.), semi-mature ash (*Fraxinus excelsior*), elder (*Sambuca nigra*) and sweet chestnut (*Castanea sativa*).
- A5.22 Smaller, shrubby trees approximately 4m high have additionally been planting within hardstanding and car parking areas and typically include such specimens as wild cherry (*Prunus avium*) and hornbeam (*Carpinus betulas*).

- A5.23 In respect of the potential of several trees to support protected species combined with a Tree Preservation Order associated with many of them, scattered trees are considered to be of **Local** level importance.

Dense and Scattered Scrub

- A5.24 Dense scrub dominated by brambles is typically present along the boundaries of the Application Site whilst bracken is present within the north-east corner of the Application Site. Otherwise, scattered patches of butterfly bush (*Buddleja davidis*) were recorded across hardstanding areas where former car parks have fallen into disuse. Given the limited extent and botanical diversity dense and scattered scrub is considered to be of **Negligible** importance.

Standing Water

- A5.25 A small, artificial garden pond is present in the south-east corner of the Application Site and is characterised by 0.4m high, vertical concrete banks. Vegetation is limited to floating lilies whilst filamentous algae is also abundant indicating poor water quality. Although ponds are typically considered Priority habitats, given the artificial construction of the pond and poor water quality, this habitat is considered to be of **Site** level importance only.

Tall Ruderal Vegetation

- A5.26 A small area of the Application Site along its eastern boundary is dominated by tall ruderal vegetation and scattered scrub which has colonised a former allotment. This habitat is dominated by common nettle, although bramble patches also occur.
- A5.27 Given the limited extent and botanical diversity, tall ruderal is considered to be of **Negligible** importance.

Ephemeral/Short Perennial Vegetation

- A5.28 Scattered patches of ephemeral/short perennial vegetation have colonised former car parking areas that have fallen into disuse. Species present include bristly oxtongue (*Helminthotheca echinoides*), perennial rye-grass, black medick, common vetch and fescue.
- A5.29 Given the limited extent and botanical diversity, tall ruderal is considered to be of **Negligible** importance.

Appendix EDP 6

Bat Survey Results

Methodology

- A6.1 The update Extended Phase 1 Habitat survey confirmed the continued presence of several trees with potential to support roosting bats within the Application Site, in addition to 16 buildings. Areas of woodland, the hedgerow network, and grassland habitats present across the Application Site are also considered to provide suitable foraging and commuting habitat for bats.
- A6.2 The following surveys for bats were therefore undertaken, with reference to national best practice guidelines¹⁰:
- 1) Bat Roosting:
 - a) Ground level visual assessment of all mature trees for bat roosting potential on 9 May 2019. A ground level visual assessment of onsite trees for bat roosting potential, completed during May 2019. All trees with moderate to high potential for roosting bats, to be impacted by development were then subject to a further detailed aerial inspection on two occasions during September 2019;
 - b) Internal visual inspections of onsite buildings associated with Caerleon University Campus for their potential to support roosting bats on 2, 17, 20, 23 and 31 of May 2019; and
 - c) Dusk emergence and dawn re-entry surveys of buildings with roosting potential, undertaken between June and August 2019.
 - 2) Bat foraging/commuting activity:
 - a) Manual transect surveys conducted on 24 April, 20 May, 26 June and 25 July 2019; and
 - b) Automated detector surveys conducted in April, May, June, July and August 2019.

Investigations of Bat Roosting – Trees

- A6.3 To determine the potential impacts of the proposed development on bats potentially roosting within trees across the Application Site, all suitable trees were subject to a visual assessment with reference to current best practice guidance¹¹.

¹⁰ Collins, J. (ed.) (2016). *Bat Surveys: for Professional Ecologists: Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London

¹¹ Collins, J. (ed.) (2016). *Bat Surveys: for Professional Ecologists: Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London

A6.4 The survey was completed by a NRW bat licensed ecologist in accordance with best practice guidelines. The visual assessments were undertaken on 9 May 2019 during which the trees were searched as thoroughly as possible from ground level, with the use of binoculars where necessary, on all elevations, where accessibility allowed. The tree assessment was undertaken with reference to the Tree Constraints Plan prepared in April 2019 by Steve Ambler & Sons Tree Specialists Ltd. A ground level tree assessment excluded parts of the woodland block located within the north-eastern boundary of the Application Site, given its proposed retention. All trees subject to survey are illustrated at **Plan EDP 2**.

A6.5 Suitable features for roosting bats sought for during the assessment included:

- Loss/peeling/fissured bark;
- Natural holes e.g. rot holes and holes from fallen limbs;
- Woodpecker holes;
- Cracks/splits or hollow tree trunks/limbs; and
- Thick-stemmed ivy.

A6.6 Signs of roosting bats sought for included:

- Bat/s roosting *in-situ*;
- Bat droppings within or beneath a feature;
- Staining around or beneath a feature;
- Oily marks (staining) around roost access points;
- Audible squeaking from the roost;
- Large/regularly used roosts or regularly used sites may produce an odour; and
- Flies around the roost, attracted by the smell of guano.

A6.7 Based upon the results of the visual assessment and features/evidence identified, the following ratings for trees were used during the assessment:

- **Known or confirmed roost** - European Protected Species (EPS) licence required for works to tree to be completed lawfully;
- **High potential** – Tree supports one or more features that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time;

- **Moderate potential** – Tree supports one or more features that could be used by bats but are unlikely to support a roost type of high conservation status;
- **Low potential** – Tree supports one or more features that could be used by individual bats opportunistically, or is of sufficient size and age to contain such features; and
- **Negligible potential** – Negligible features likely to support roosting bats.

Investigations of Bat Roosting – Detailed Aerial Tree Inspections

- A6.8 Following the initial ground level visual assessment, detailed aerial inspections were undertaken of all trees (**T61, T97, T100, T105**) which were identified as having high or moderate potential to support roosting bats and are going to be felled as a result of the proposed development.
- A6.9 The aerial tree surveys were undertaken by a suitably qualified Natural Resources Wales (NRW) bat licensed ecologist. The aerial survey was carried out using recognised arboricultural tree climbing techniques with the use of a rope, harness and ladder to allow inspection of bat roost potential features. To inspect hollows and cavities a 'Ridgid seesnake' endoscope with a 15mm and 5mm diameter head with a 6ft extension was used. This allows a full inspection of most features in which a bat may roost. A digital camera was used to capture photos of the features. Aerial tree surveys were completed on 3 September 2019 and repeated on 17 September 2019.
- A6.10 During the aerial survey, details of each potential roosting feature were recorded including the type of feature, location within the tree, height and orientation of feature, notes relating to the feature including any evidence of bats and the potential of each feature to support roosting bats (confirmed roost, high, moderate, low or negligible potential).

Limitations

- A6.11 The trees identified needing further areal inspection had good access from the ground which enabled a full inspection of all the potential roosting features (PRFs) identified. Therefore, the surveys are not deemed constraint.

Investigations of Bat Roosting – Buildings

Visual Assessment

- A6.12 Where access was permitted, an internal and external visual inspection of all buildings associated with Caerleon University Campus for any evidence of, or potential to support roosting bats, was undertaken by two NRW bat licenced ecologists in accordance with best practice guidelines. The visual assessment was undertaken on 2, 17, 20 and 23 May 2019.
- A6.13 The exterior walls and roofs of the buildings were viewed from ground level. Features such as cracks/holes in the stone/brick/wood work, gaps under roof or ridge tiles, loose/lifted lead flashing or roofing felt, cavity walls with potential access points, gaps between lintels above

doors and windows, gaps between the barge or soffit boards and outside walls, and cracks between the window frames and the walls were included in the search. Possible bat access points around the eaves and barge boarding were noted, and areas where bat droppings may accumulate such as on the ground, ledges, window sills and walls were inspected.

A6.14 The survey also involved a search of the interiors of the buildings (where accessible) for evidence indicative of past or current use by roosting bats. A systematic search for direct evidence of bat presence was undertaken, concentrating on the floors, windows, exposed surfaces and potential access points. Any evidence of bat activity, bat sounds, potential access points or potential roosting sites were noted during the site visit.

A6.15 The signs searched for comprised the following:

- Bat/s roosting *in-situ* (live, dead or parts of);
- Bat droppings within or beneath a feature/access point;
- Staining around or beneath an access point/feature;
- Oily marks (staining) around roost access points/features;
- Audible squeaking from the roost (particularly on hot summer days);
- Large/regularly used roosts or regularly used sites may produce an odour; and
- Flies around the roost, attracted by the smell of guano.

A6.16 Based upon the results of the building assessments and the features/evidence identified (as above), each was assigned with a bat roost potential category, as shown in **Table EDP A6.1**.

Table EDP A6.1: Bat Roost Potential Categories for Buildings.

Bat Roost Potential	Description
Confirmed Roost	Evidence of bats found.
High Potential	Many of the potential roosting features (listed above) present, with good foraging habitat nearby that is well connected to the Application Site.
Moderate Potential	A few potential roosting features (listed above) present with some foraging habitat nearby that is connected to the Application Site.
Low Potential	One or two roosting features present with foraging habitat nearby, but with limited connectivity.
Negligible Potential	No features present.

Limitations

A6.17 Visual assessments for roosting bats can be undertaken at any time of year. As such these investigations were not limited by seasonal or climatic factors.

- A6.18 Bats are mobile animals and will move between a series of different roost sites, frequently establishing and occupying new roost sites depending on seasonal requirements and resources available locally. This survey, therefore, only provides a snapshot of the conditions present at the Application Site at the time of survey.
- A6.19 There was no internal access to the roof void of building, **B1-B4, B8** and **B9**. It was only possible to access some of the loft spaces in building **B8**. As such suitable roosting features and evidence of bats may have been missed. All buildings were, however, subjected to further dusk emergence/dawn re-entry surveys such that the presence/inferred absence of roosting bats would be determined and further supported by existing desk study data and survey effort.

Dusk Emergence/Dawn Re-entry Surveys

- A6.20 Two dusk emergence and one dawn re-entry survey of buildings previously confirmed as supporting a bat roost (**B1/B2, B3/B4**, and **B16**) were undertaken by EDP between June and August 2019. One dusk emergence and one dawn re-entry survey of building **B8** assessed as being of moderate potential for roosting bats was undertaken in June and July 2019. One dusk emergence survey of buildings (**B5, B6, B7, B10, B11, B12, B13, B14** and **B15**) assessed as being of low potential for roosting bats were undertaken in June and July 2019.
- A6.21 The surveys were undertaken by suitably experienced surveyors, including NRW bat licensed ecologists, to provide adequate coverage of all elevations of the buildings and suitable roosting features/access points previously identified during the roost assessment (refer to **Plan EDP 3** for surveyor locations). Detailed field notes and recordings were made to allow for *in-situ* and *ex-situ* identification and analyses. The surveyors used Elekon Batlogger M bat detectors.
- A6.22 Each dusk emergence survey commenced approximately 15 minutes before sunset and continued for 1.5 hours after sunset. Each dawn re-entry survey commenced approximately 1.5 hours before sunrise and continued until 15 minutes after sunrise. A summary of the survey including date, timings and weather conditions is included within **Table EDP A6.2**.

Table EDP A6.2: Summary of Dusk Emergence Surveys at UWS Caerleon.

Date	Start/ Finish Time	Sunset/ Sunrise Time	Time Recorded	Temp (C°)	Cloud (%)	Rain	Wind (Beaufort Scale)	Buildings Surveyed
24.06.19	21:19 - 23:04	21:34	Start	20	50	Nil	2	B3/B4, B8
			End	19	100	Light drizzle	2	
25.06.19	21:19 - 23:04	21:34	Start	20	100	Nil	1	B1/B2, B16
			End	19	100	Nil	2	
01.07.19	21:18 - 23:03	21:33	Start	19	20	Nil	2	B5-7, B9-15
			End	15	20	Nil	3	

Date	Start/ Finish Time	Sunset/ Sunrise Time	Time Recorded	Temp (C°)	Cloud (%)	Rain	Wind (Beaufort Scale)	Buildings Surveyed
18.07.19	03:45 - 05:30	05:15	Start	15	70	Nil	2	B1/B2
			End	15	55	Nil	1	
19.07.19	03:46 - 05:31	05:16	Start	18	90	Nil	0	B3/B4, B8, B16
			05:16	19	100	Light drizzle	1	
05.08.19	20:39 - 22:24	20:39	Start	18	20	Nil	3	B3/B4, B16
			End	17	90	Nil	3	
06.08.19	20:37 - 22:22	20:52	Start	18	90	Nil	4	B1/B2
			End	17	50	Nil	3	

Limitations

- A6.23 The surveys were undertaken at an appropriate time of year and as such are not considered to be limited by seasonal or climatic factors. Light drizzle was recorded on 25 June 2019, but which commenced from 22:50 when any bats present will have already emerged. Light drizzle was also recorded at the end of the dawn re-entry survey on 19 July 2019, from 04:45 onwards. The rain became heavier from 05:05 onwards but by this time, most bats would have already returned to their roosts. As such, weather conditions are not considered to have affected the outcome of this assessment.

Investigations of Bat Foraging/Commuting Activity

Manual Transect Surveys

- A6.24 Manual transect surveys were undertaken across the Application Site to identify areas of bat foraging activity and commuting routes used by bats with surveys completed in April, May, June and July 2019. Full details including the survey type, date, timing, and weather conditions during each of the transect surveys undertaken to date during 2019 is given in **Table EDP A6.3**. Weather conditions were largely optimum for bat surveys, being relatively warm with light winds and no rain.

Table EDP A6.3: Date, timing and weather conditions of bat activity surveys.

Survey date	Dusk/ dawn	Survey time	Sunrise/ sunset time	Weather conditions			
				Temp (°C)	Cloud (%)	Rain	Wind (Beaufort scale)
24.04.2019	Dusk	20:22- 22:22	20:22	13.0-12.0	50-90	None	2-1
20.05.2019	Dusk	21:04- 23:04	21:04	17.0-13.0	80-30	None	2
26.06.2019	Dusk	21:34- 23:34	21:34	16.9	100	None	4

Survey date	Dusk/ dawn	Survey time	Sunrise/ sunset time	Weather conditions			
				Temp (°C)	Cloud (%)	Rain	Wind (Beaufort scale)
25.07.2019	Dawn	03:24- 05:24	05:24	18.0	0-10	None	2

A6.25 Manual transect surveys were completed by experienced bat surveyors across one transect survey route designed to provide a representative cover of potential foraging or commuting habitats onsite; namely individual trees, adjacent habitat and non-native hedgerow boundaries. The transect route also continued between several buildings and recorded bat activity near them. Each transect route was walked at a slow and steady pace. All bats were recorded, and their behaviour marked on survey maps in order to characterise the value of the Application Site and its component habitats to foraging and commuting bats. **Plans EDP 7a-7d** illustrate the transect route walked during the surveys.

A6.26 Activity surveys were conducted using Batlogger bat detectors, with observations of the time, location, and activity of all bats seen or heard recorded. Bats were identified on the basis of their characteristic echolocation calls, which were recorded where appropriate and analysed using computer sonogram analysis (AnalogW 3.9f and Batsound 4.03) to confirm species identification. Species of Myotis bat (*Myotis sp.*) and long-eared bat (*Plecotus sp.*) are difficult to tell apart solely from their echolocation calls and were therefore grouped as such.

Automated Detector Surveys

A6.27 To supplement the bat transect survey data and to provide a more robust assessment of activity by horseshoe bat species (which are often under-recorded by transect surveys), bat activity within the Application Site was also sampled using static bat detectors which automatically trigger and record bat echolocation calls. Anabat Express detectors (hereafter referred to as 'Anabats') were deployed at two locations within the Application Site, as shown on **Plan EDP 6**.

A6.28 Anabats were deployed in the illustrated locations for five consecutive nights on four occasions - once during April 2019, once during May 2019, once during June 2019 and once during July. Following failure of an anabat during July 2019, bat detectors were redeployed onsite during August 2019. On each occasion, the Anabats were fixed securely in their location, with an external microphone attached 1.0-2.0m above ground and directed away from the tree/branch to maximise detection sensitivity. Minimum night time air temperatures were recorded by a nearby local weather station. **Table EDP A6.4** gives the sampling dates and microphone details for the Anabats deployed during the three sampling periods.

Table EDP A6.4: Anabat sampling dates and microphone details.

Sampling Period	Location Number	Microphone		Min temp (°C)
		Height (m)	Direction	
24 -28 April 2019	1	2.0m	south-west	7.0
	2	2.0m	south-west	7.0

Sampling Period	Location Number	Microphone		Min temp (°C)
		Height (m)	Direction	
20-27 May 2019	1	1.5m	north-west	10.0
	2	1.5m	south-west	10.0
26-31 June 2019	1	1.0m	west	11.8
	2	2.0m	north	12.5
24-29 July 2019	1	2.0m	south-east	14.3
	2	2.0m	north	18.3
1-5 August 2019	1	2.0m	south-east	13.5
	2	2.0m	north	13.0

A6.29 The sound files recorded by the Anabats were filtered for each of the UK's bat species/species groups using Analook software's filter function. The parameters for the species filters are based on those proposed by Chris Corben and Kim Livengood¹² and have been fine-tuned using known call parameters for each of the species. All files passing the various filters were checked manually using sonogram analysis in accordance with published guides¹³ to confirm the species identification of each bat call.

Limitations

A6.30 Due to climatic and environmental factors in the immediate vicinity of each of the Anabat locations, the sensitivity of each Anabat had to be adjusted and was therefore not consistent across all locations. This can affect the number of bat calls recorded by each detector and has been taken into account when describing bat activity levels in the results section.

A6.31 In addition, the identification of calls and species using Analook software is dependent upon the quality of the recording made which can be influenced by the following factors, which may limit levels of activity and species recorded:

- Weather conditions – rainfall and wind;
- Distance of bat from Anabat;
- Presence of obstructions through which the noise must pass i.e. trees; and
- Proximity of other noise sources such as roads.

A6.32 The Anabat deployed at Position 1 during June 2019 failed after the second night such that no further data was recorded during the deployment. In consideration of results obtained to date, this is not considered to have affected an assessment of the Application Site.

A6.33 The Anabat deployment at Position 2 during July 2019 failed after the second night such that no further data was recorded during the deployment. As this was the second time when one of

¹² Taken from Analook W training course and workshop, September 2013

¹³ Russ (2012). *British Bat Calls, a guide to species identification*. Pelagic Publishing, Exeter

the detectors has failed, another deployment was undertaken immediately in August to compensate for the loss of this data.

Results

Desk Study

- A6.34 During the updated desk study completed in May 2019, SEWBrEC returned 155 records of bats (not including Annex II bats) the most pertinent of which include a brown long-eared bat (*Plecotus auritus*) roost 300m south-west of the Application Site, a common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat roost 1.8km north-east and a soprano pipistrelle (*Pipistrellus pygaemus*) bat maternity roost 510m south-east of the Application Site. In addition to other low status roosts for these species, records of common pipistrelle, soprano pipistrelle, brown long-eared, *Myotis* sp. and noctule (*Nyctalus noctula*) bats were recorded within 2km of the Application Site more generally.
- A6.35 With respect to Annex II bats, SEWBrEC returned two records of greater horseshoe bat (*Rhinolophus ferrumequinum*), including a night roost record in 2016 at 4.2km north-west of the Application Site, and another record from 2017 7.9km south-west of the Application Site. Furthermore, 75 records of lesser horseshoe bat (*Rhinolophus hipposideros*), including 60 records of roosts, dating from 2000 to 2018 were returned from within the 6km search radius. No records were returned from the Application Site, with just two records identified within a 2km search area, including a lesser horseshoe night roost 1.98km north-east of the Application Site.
- A6.36 A ground level assessment of the trees within the Application Site for potential to support roosting bats was undertaken by Ecosulis in 2015 during which two trees with potential to support roosting bats was identified. The rest of the trees across the Application Site were deemed to have negligible potential to support roosting bats as they lacked any features.
- A6.37 A visual assessment of onsite buildings for potential to support roosting bats, undertaken by Ecosulis in September 2015 with internal inspections of the Camelot/Dolaucothi accommodation blocks undertaken in October 2016, identified four buildings with moderate suitability to support roosting bats (**B1/2**, **B3/4**, **B8** and **B16**). A further five buildings were assessed as having low suitability (**B5-7** and **B10-11**) with remaining buildings considered to have negligible potential. No signs of bats were recorded during visual inspections with the exception of a single, degraded bat dropping recorded on a third-floor window sill of the Camelot/Dolaucothi accommodation block.
- A6.38 Following completion of a visual assessment in 2015, an indicative emergence survey was undertaken by Ecosulis on 28 September 2015 during which four surveyors were positioned around the campus. During the survey, bat activity was recorded in order to identify potential 'hotspots' of activity around groups of buildings. During the survey, no bats were recorded emerging from or entering the buildings on site. However, there were records of very early bat activity close to sunset by Felthorpe House (**B16**) in the south-east corner of the Application Site, indicating presence of a roost in close proximity.

- A6.39 This was followed by dusk emergence and dawn re-entry surveys of nine buildings (**B2-8, B10-11** and **B16**) with low-moderate potential to support roosting bats during May and June 2016 during which a single common pipistrelle was recorded re-entering Felthorpe House (**B16**) during the dawn survey. Four unidentified bats (presumed to be *Myotis* species following internal inspection of the building) were also noted re-entering the Camelot/Dolaucothi (**B1/B2**) accommodation block above a window lintel on the third floor.
- A6.40 As such, Felthorpe House and the Camelot/Dolaucothi accommodation block have previously been confirmed as roosts for common pipistrelle and presumed *Myotis* bat species following detailed survey effort undertaken by Ecosulis in 2016.

Investigations of Bat Roosting – Trees

- A6.41 During the initial ground level assessment of trees completed on 9 May 2019 one tree (**T100**) was considered to have high potential, thirteen (**T16, T48, T61, T90, T97, T105, T23.2, T23.5, T23.6, T23.7, T7.1, T7.2**) were considered to have moderate potential, and a further nine trees (**T7.3, T23.1, T23.3, T23.4, T53, T80, T91, T92, T94**) were considered to have low potential to support roosting bats. The remaining trees onsite were assessed as having negligible potential.
- A6.42 The initial ground level tree assessment for roosting bats was undertaken with reference to the Tree Constraints Plan prepared by Steve Ambler & Sons Tree Specialists Ltd (April 2019). The numbering of the trees reported in **Table EDP A6.5** below is therefore consistent with the Tree Constraints Plan. Some of the trees were reported as part of a larger tree group and therefore they have not been individually categorised. The findings of the initial ground level tree assessments are summarised in **Table EDP A6.5**:

Table EDP A6.5: Ground Level Tree Inspection Results, May 2019

Tree ID	Species	Description (including BS5837:2012 Tree Survey Categorisation and key features)	Bat Roost Potential May 2019
T7.1	Apple tree	Three limb holes observed.	Moderate
T7.2	Apple tree	One knot hole observed facing north.	Moderate
T7.3	Apple tree	One knot hole observed.	Low
T23.1	Ash tree	Covered in dense ivy.	Low
T23.2	Pine tree	The tree has flaking bark.	Moderate
T23.3	Sequoia tree	Folds within the bark offering limited potential for roosting bats, especially immediately under the tree limbs which could provide some shelter.	Low
T23.4	Sequoia tree	Folds within the bark offering limited potential for roosting bats, especially immediately under the tree limbs which could provide some shelter.	Low
T23.5	Pine tree	Pine tree with flaking bark.	Moderate
T23.6	Ash tree	Old ash tree with rot holes visible and flaking bark.	Moderate
T23.7	Common wayfaring tree	The tree has dense ivy cover.	Moderate

Tree ID	Species	Description (including BS5837:2012 Tree Survey Categorisation and key features)	Bat Roost Potential May 2019
T16	Ornamental flowering cherry	Cat B. Splits in tree trunk observed.	Moderate
T48	Sessile oak	Cat B. Splits and flaking bark observed.	Moderate
T53	Deodar cedar	Cat A. One limb broken off with the potential to provide area for individually roosting bats.	Low
T60	Common lyme tree	Cat A. Three rot holes observed, one on the limb and two on the main trunk.	Moderate
T61	Silver birch	Cat C. One limb hole observed approximately 4m off the ground.	Moderate
T80	Horse chestnut	Cat. U. Flaking bark was noted as potential roosting features.	Low
T90	Foxglove tree	Cat A. One limb hole observed.	Moderate
T91	Black mulberry	Cat. U. A pronounced split observed at the base of the tree.	Low
T92	Common walnut	Cat A. Two shallow limb holes observed.	Low
T97	Apple tree	Cat U. The base of the tree is rotten with three rotten areas observed below 1m height.	Moderate
T94	Lawson cypress	Cat B. The cypress is covered in ivy, which could potentially offer some limited bat roosting potential.	Low
T100	Foxglove tree	Cat A. Tree with clear high roosting bat potential. One woodpecker hole observed as well as two limb holes. The tree is partly covered with ivy.	High
T105	Horse chestnut tree	Cat U. One rot hole observed at the base as well as flaking bark along the main limb reaching into the crown area.	Moderate

Investigations of Bat Roosting – Detailed Aerial Tree Surveys

A6.43 Following further detailed aerial inspections of trees during September 2019 with moderate-high potential for roosting bats, no bats or evidence of bats were seen during the visual inspections. Tree **T105** was, however, confirmed to be of moderate potential to support roosting bats whilst **T97** was downgraded to low potential and **T61** to negligible potential. **T100** previously assessed as high potential to support roosting bats was downgraded to moderate potential to support roosting bats.

A6.44 Of those trees with moderate-high potential to support roosting bats, four trees are to be felled to facilitate development (**T61**, **T97**, **T100** and **T105**). As such, further detailed aerial inspections of these trees were undertaken during September 2019 to confirm presence/infer absence of roosting bats. Following the first inspection undertaken on 3 September 2019 **T100** was downgraded from high to moderate potential to support roosting bats. **T105** was confirmed as being of moderate potential, whilst **T97** was downgraded from moderate to low potential and **T61** from moderate to negligible potential. A second inspection of **T100** and

T105 was thus undertaken on 17 September 2019. No evidence of roosting bats was identified during survey effort. The findings of the aerial tree assessments are summarised in **Table EDP A4.6**. The location of trees with bat roosting potential is depicted on **Plan EDP 2**.

Table EDP A4.6: Summary of results from the aerial tree assessments.

Bat Potential	Tree No.	Species	PRF Present	Signs of Bat Presence
Negligible	T61	Silver Birch	Silver birch has a wound facing southern tree aspect and is present at approximately 4.5m height. The wound was very open and there was no shelter around the callus.	None.
Low	T97	Apple Tree	A wound is located along the north-east stem of the apple tree, less than 1m off the ground. The wound measures approximately 4cm in width, 8cm in height, 3cm in depth and 6cm away from the stem of the tree. Woodlice were present within the wound.	None.
Moderate	T100	Foxglove Tree	A tear out is present along western facing limb approximately 4.5m off the ground. Its depth is 30cm and measures 5cm in width. It has horizontal internal direction and is spherical or domed shaped. There were minor cobwebs present. A knot-hole is present on south-west facing limb approximately 4.5m off the ground. It measures 20cm in depth and 2cm in width. Woodlice were present within the knot-hole. A woodpecker hole is present within the southern facing limb. The height of the hole is approximately 3.5m off the ground. Its depth is 35cm and measures 3cm in width. Woodlice were present within the woodpecker hole.	None.
Moderate	T105	Common Horse Chestnut Tree	A lifting bark plate is present along north-west and south-east aspect of the tree approximately 2.2m and 2m off the ground. The height away from the step measures approximately 30cm and 5cm and the width measuring approximately 2cm.	None.

Investigations of Bat Roosting – Buildings

Visual Inspection

A6.45 A description of each building and its value for roosting bats is summarised within **Table EDP A6.7** and illustrated at **Plan EDP 3**.

Table EDP A6.7: Preliminary Building Inspection Results, May 2019.

Building ID	Description and Photo	Evidence of Bats/Potential Roost Features	Bat Roost Potential
B1/B2: Dolaucothi/ Camelot Student Block	 Three storey student accommodation. Two identical L-shaped compartments form the complete structure. The external walls are made of red brick with cavity walls. The roof is corrugated metal and lined with bitumen felt. The soffit boxes are made of timber.	The roof is generally in good condition with intact bitumen felt cover. The soffit boxes have some ventilation shafts missing which provide internal access. Rooks were observed nesting in some of them. Light ingress was visible within the loft void coming through the gap created for the wiring of the external flood light. No signs of bats.	Confirmed bat roost in 2016 by Ecosulis. No evidence of roosting bats identified during internal inspection in 2019.
B3/B4: Blaenavon/ Abergavenny Student Block	 The buildings are almost identical to B1/B2. The materials are the same as listed above.	As with B1/B2 buildings, B3/B4 also have missing ventilation shafts as well as gaps observable through the external walls around flood lights. No signs of bats. No nesting birds.	Moderate summer roosting and negligible hibernation potential. No change in ecological baseline.
B5: Nursery (Security) Building	 External walls are made of un-rendered brick with natural slate roof tiles and clay ridge tiles.	Some roof tiles are slightly raised, providing access opportunities internally. The loft void is well insulated with a type of paper lining and rock wool laid on the floor of the ceiling. There appears to be no potential access directly into the loft void apart from the space between the roof lining and roof tiles. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. No change in ecological baseline.

Building ID	Description and Photo	Evidence of Bats/Potential Roost Features	Bat Roost Potential
B6: Edward Anwyl	 Non-rendered external brick walls, low pitched roof made of corrugated metal and bitumen felt on top. The building has several chimney flue pipes. The eaves and gable ends are enclosed with timber.	The gable ends have some gaps along the projecting eaves, which could potentially lead into the structure. The roof itself is in a good state of repair with bitumen felt intact and the chimney flue pipes tightly fitted. No light ingress was observed from the inside of the loft void, which is well maintained. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. No change in ecological baseline.
B7: Library	 External walls made of brick and concrete breezeblock, with external render. The roof is flat and does not appear to provide roosting opportunities. Single storey extension is located along southern elevation and covered with concrete roof tiles. A projecting roof covered with concrete roof tiles is located along the north entrance.	There is a gap along the south-western roof corner of the extension, where mortar has fallen out. The gap appears to lead under the roof tiles. Lead flashing located along the northern elevation of the library is slightly raised providing low potential roosting opportunities. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. No change in ecological baseline.

Building ID	Description and Photo	Evidence of Bats/Potential Roost Features	Bat Roost Potential
B8: Main Building	 The main building is a three storey Grade II listed manor house. The building has a clock tower positioned in its middle with the roof area possessing several complex loft voids covered with natural slate roof tiles and clay ridge tiles. The external walls are made of stone.	The building is in good condition overall with external walls intact with no missing mortar. There are several slate roof tiles which are raised and some gaps leading under the ridge tiles with missing mortar. There could be potential access leading internally along the roof valleys. The internal loft voids are in some places insulated with celotex, whereas other areas have timber cladding with no roof lining. No signs of bats. No nesting birds.	Moderate summer roosting and low hibernation potential. No change in ecological baseline.
B9: Toilet Block	 The building walls are made of brick with no render covering them. The roof is made of natural slate tiles.	Natural slate tiles are raised in several places providing internal access, especially along the roof edges above the gable ends. Timber barge and fascia boards are well fitted; however, the north-western gable end is covered with light ivy. There is no access into the loft void from inside the building. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential. Change in ecological baseline. Assessed as negligible potential during 2015/2016.

Building ID	Description and Photo	Evidence of Bats/Potential Roost Features	Bat Roost Potential
B10: TY Webley	 The external walls are made of stone without render. The roof is natural slate material with clay ridge tiles.	The building is, overall, in a good state of repair with few potential access points observed. There were three raised roof tiles noted behind the chimney area as well as light ingress coming into the loft void from the eaves. The loft void is, in its entirety, clad with timber sarking. On the outside, the eaves were closed with timber and generally in good condition. There are also three brick chimneys which are coated and in good condition. No signs of bats. No nesting birds.	Low summer roosting and low hibernation potential. No change in ecological baseline.
B11: Ty Hywel	 The external walls are made of stone without render. The roof is natural slate material with clay ridge tiles.	The internal roof void is lined with timber sarking. There is some light ingress visible coming internally from the roof area. Some of the natural slate tiles are raised and potentially provide access into the space between the timber sarking and the tiles themselves. No signs of bats. No nesting birds.	Low summer roosting and low hibernation potential. No change in ecological baseline.

Building ID	Description and Photo	Evidence of Bats/Potential Roost Features	Bat Roost Potential
B12-B15: Student Blocks 1, 2, 3 and 4	 The student blocks are well preserved buildings with external walls made out of brick, which is partly rendered. The roof is covered with concrete tiles which are in good condition.	There are 15 student blocks, four of them positioned individually and 11 of them joined together into three units. Four of the blocks have hanging tiles at their gable ends and were, therefore, assessed as having low potential for roosting bats. Internal roof void areas appear to be tightly sealed, with some light ingress coming in through the eaves. However, the eaves have a mesh covering which is preventing access by bats. The roof is internally lined with plastic sheeting. No signs of bats. No nesting birds.	Low summer roosting and negligible hibernation potential of 4 student blocks. Change in ecological baseline. Assessed as negligible potential during 2015/2016.
B16: Felthorpe House	 The building is made of external brick walls which are non-rendered. The roof is covered with natural slate tiles.	The building is in a good state of repair with some light ingress coming into the void around the eaves. Internally the roof void is lined with bitumen felt. Some of the roof tiles are out of alignment. No signs of bats. No nesting birds.	Confirmed bat roost in 2016 by Ecosulis. No evidence of roosting bats identified during internal inspection in 2019.

A6.46 The above results are largely comparable to the results of visual buildings inspections undertaken by Ecosulis in 2015 and 2016. An update assessment, however, considered buildings **B12-B15** to have low potential to support roosting bats following identification of suitable roosting features.

Dusk Emergence/Dawn Re-entry Survey

A6.47 Dusk emergence and/or dawn re-entry surveys of buildings **B1/B2**, **B3/B4** and **B5B15** with bat roost potential have been undertaken by EDP between June and August 2019.

A6.48 During a dusk emergence survey of building **B3** on 24 June 2019, three

common pipistrelle bats were identified emerging from a soffit box on the western elevation between 22:01 and 22:36. This is in addition to emergence of a single common pipistrelle bat from a soffit box on the western elevation of **B3** at 22:11.

- A6.49 A dusk emergence survey of **B3/B4** undertaken on 5 August 2019 identified two common pipistrelle bats emerging from the soffit box near the central gable end of the eastern elevation at 21:30 and 21:40 in addition to one common pipistrelle emerging at 21:29 from a second location.
- A6.50 During a dusk emergence survey of **B1/B2** on 25 June 2019, a single common pipistrelle emerged from the soffit box on the western elevation at 22:26 whilst a possible re-entry of a common pipistrelle bat was recorded during a dawn re-entry survey on 18 July 2019 at 04:05. A single common pipistrelle bat was also observed emerging from the soffit box along the south-eastern corner of **B2** during a second dusk emergence survey.
- A6.51 With respect to **B16**, a single common pipistrelle was recorded entering a roosting feature within the eaves on the northern elevation of the building at 22:01 on 25 June 2019. On 5 August 2019, a soprano pipistrelle bat was also observed emerging from building **B16** at 21:11 specifically from a crevice located above a window lintel.
- A6.52 Based on the results, it is considered that buildings **B1/B2**, **B3/B4** and **B16** each support a summer day roost for low numbers of common pipistrelle bats. **B16** also supports a summer day roost for low numbers of soprano pipistrelle bats. Both **B1/B2** (Camelot/Dolaucothi accommodation block) and **B16** (Felthorpe House) have previously been confirmed as supporting roosts for common pipistrelle and presumed *Myotis* bat species following detailed survey effort undertaken by Ecosulis in 2016. *Myotis* bat species were not recorded roosting within **B1/B2** during surveys undertaken by EDP in 2019.
- A6.53 The dusk emergence and dawn re-entry survey results of the buildings located within the Application Site are illustrated on **Plan EDP 4** and **Plan EDP 5**.

Investigations of Bat Foraging/Commuting Activity

- A6.54 Bat foraging and commuting activity recorded to date during the transect and automated detector surveys undertaken between April 2019 and August 2019 is summarised by species/genus below and illustrated on **Plans EDP 7a-7d**. The following should be read in conjunction with these plans and automated detector survey results in **Tables EDP A6.8-A6.13**.
- A6.55 With respect to foraging/commuting bats, activity surveys undertaken by Ecosulis in September and October 2015 identified moderate levels of pipistrelle activity with relatively high concentrations recorded along the northern boundary of the Application Site. Species recorded include common pipistrelle, soprano pipistrelle and noctule.
- A6.56 This is largely constant with update surveys undertaken during April, May, June, July and August 2019. Six bat species/species groups (myotid bat species were not identified to species level), were confirmed to be present foraging and/or commuting within the Application

Site during the course of the activity surveys. During the automated detector surveys, the vast majority of this behaviour (average 76% of Anabat recordings) related to common pipistrelle bat. Noctule, soprano pipistrelle and myotis bats were occasionally recorded, comprising 24% of all Anabat calls recorded during April, May, June, July and August. Long eared sp. and *Nyctalus/Eptesicus* sp. have only been recorded during June accounting for less than 1% of all anabat recordings. The range and proportion of species/species groups recorded during the manual transect surveys was broadly similar to that described above with regards to the automated surveys. A minimum of four species were recorded during the manual transect surveys. Overall relatively low levels of bat activity were recorded, predominantly along the northern and eastern boundaries of the Application Site, the latter being contiguous with broadleaved woodland and unmanaged grassland. Foraging activity was also recorded in association with the southern boundary and former playing field. Activity is dominated by common pipistrelle with occasional registrations from soprano pipistrelle. Registrations of *Myotis* and noctule was also recorded within the south of the Application Site in May 2019.

Evaluation

- A6.57 An evaluation of the bat assemblage at the Application Site is provided below, with reference to the relative abundance and distribution of each bat species (with reference to the most up-to-date information on local and national species distribution^{14,15} and population trends¹⁶ available at the time of writing).
- A6.58 Common pipistrelle bats are common and widespread across the UK, representing the most and second most abundant species in the UK respectively. Whilst having suffered significant historic declines, national population monitoring¹⁷ indicates that common pipistrelle bats are stable nationally and increasing. Common pipistrelle bat was found to be the dominant species utilising the Application Site during the activity surveys and was predominantly associated with the north eastern, eastern and southern edges of the Application Site. Individual bats were also seen commuting and foraging between campus buildings with random distribution. There was decrease in activity above the open parking space in the south-western corner of the Application Site. With respect to roosting individuals, it is considered that buildings **B1/B2**, **B3/B4** and **B16** each support a summer day roost for low numbers of common pipistrelle bats. Common pipistrelle bats using the Application Site are, therefore, considered to be of local importance.
- A6.59 Myotis bat species occur throughout most of the UK, their populations considered to be either stable or increasing in most cases¹⁸. Individual Myotis bats were infrequently recorded during automated detector surveys. Dusk emergence/dawn re-entry surveys of buildings undertaken by Ecosulis in 2015 noted four bats (presumed to be *Myotis* species following an internal visual inspection of the building) were also noted re-entering the Camelot/Dolaucothi (**B1/B2**) accommodation block indicating presence of a low status day/transitional roost within this

¹⁴ Battersby, J. (Ed) & Tracking Mammals Partnership. (2005) *UK Mammals Species Status and Population Trends*. First Report by the Tracking Mammals Partnership. JNCC/Tracking Mammals Partnership, Peterborough

¹⁵ <http://monmouthshirebatgroup.org/Bats-in-Monmouthshire.php>

¹⁶ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

¹⁷ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

¹⁸ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

building. However, no evidence of current roosts was identified by EDP during update survey effort. Based upon this data, the use of the Application Site by Myotis bat species is likely to be of no more than local importance.

- A6.60 Noctule bats are widespread across the UK, with its population and range considered to remain stable in the UK¹⁹. Only low number of noctule bats were recorded by surveyors and static detectors between April and July 2019. An increase in the number of passes by this species was, however, recorded during August 2019. Nevertheless, noctule bats using the Application Site are therefore considered to be of site level importance.
- A6.61 Soprano pipistrelle bats are widely distributed across the UK, and whilst populations declined dramatically in the twentieth century, field survey data show statistically significant population increases²⁰. Although only encountered infrequently during activity surveys, typically associated with the northern, eastern and southern boundaries of the Application Site, a summer day roost for soprano pipistrelle was identified within **B16**. Soprano pipistrelle bats supported by the Application Site are therefore considered to be of local importance.
- A6.62 Brown long-eared bats are considered to be widespread and common across the UK with national populations considered stable. In contrast, populations of grey-long eared bat are largely limited to the south coast of England although this species is under recorded. Brown long-eared bat was recorded only once with remote detector work along the northern boundary of Felthorpe House although this species is likely to be underrepresented given it's not often picked up by bat detectors. The population of long-eared bat species supported by the Application Site is considered to be of Local importance.
- A6.63 Serotine bats are restricted to southern England and Wales where they are widespread, but scarce, albeit populations are stable nationally. With respect to Leisler's bats, this species is uncommon but widespread throughout England, Wales and Scotland. Both Leisler's and serotine bats were recorded in association with dense vegetation along the northern boundary of Felthorpe House during June 2019 with the help of remote detector surveying. Therefore, even though the recordings of serotine and Leisler's bats were scarce, they do indicate the importance of the vegetation along the south-eastern Application Site boundary as a key commuting corridor for several species of bats. Given their rarity, serotine bats using the Application Site are considered to be of Local Importance whilst Leisler's bats supported by the Application Site are not considered to be significant beyond a Site context.
- A6.64 The abundance and diversity of bat species recorded on site is considered to be typical for the sub-urban edge of Newport, with common and widespread generalist species such as common pipistrelle bats accounting for the vast majority of foraging and commuting activity. Overall therefore, the Application Site is considered to be of local importance to the local bat population.

¹⁹ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

²⁰ Bat Conservation Trust, 2018. The National Bat Monitoring Programme. Annual Report 2017

Table EDP A6.8: Total Bat Passes per Transect per Month.

	April		May		June		July	
	T1	T2	T1	T2	T1	T2	T1	T2
Common pipistrelle	9	9	10	12	11	16	38	55
<i>Myotis sp.</i>	0	0	0	2	0	0	0	0
Noctule	0	0	0	1	0	0	0	0
Soprano pipistrelle	2	0	1	2	0	1	3	2
Total	11	9	11	17	11	17	41	57

Table EDP A6.9: Total Bat Passes from joined transects per Month.

	April	May	June	July
Common pipistrelle	18	22	27	93
<i>Myotis sp.</i>	0	2	0	0
Noctule	0	1	0	0
Soprano pipistrelle	2	3	1	5
Total	20	28	28	98

Table EDP A6.10: Automated Detector Survey Results April 2019. (*Less than 1%).

Position	Bat Species	Number of Bat Passes Recorded per Night					Total	% of Total
		24 April	25 April	26 April	27 April	28 May		
1	Common pipistrelle	5	15	0	0	7	27	87
	Soprano pipistrelle	2	0	0	0	2	4	13
	Total	7	15	0	0	9	31	100
2	Common pipistrelle	10	7	0	8	14	39	85
	<i>Myotis sp.</i>	1	0	0	0	0	1	2
	Soprano pipistrelle	2	1	0	3	0	6	13
	Total	13	8	0	11	14	46	100

Table EDP A6.11: Automated Detector Survey Results May 2019. (*Less than 1%).

Position	Bat Species	Number of Bat Passes Recorded per Night					Total	% of Total
		20 May	21 May	22 May	23 May	24 May		
1	Common pipistrelle	4	12	18	4	20	58	87
	<i>Myotis sp.</i>	0	0	1	0	0	1	1
	Noctule	0	0	0	0	1	1	1
	Soprano pipistrelle	2	2	2	0	1	7	11
	Total	6	14	21	4	22	67	100
2	Common pipistrelle	0	5	3	3	1	12	80
	Noctule	1	0	0	0	1	2	13
	Soprano pipistrelle	0	0	1	0	0	1	7
	Total	1	5	4	3	2	15	100

Table EDP A6.12: Automated Detector Survey Results June 2019. (*Less than 1%).

Position	Bat Species	Number of Bat Passes Recorded per Night					Total	% of Total
		26 June	27 June	28 June	29 June	30 June		
1	Common pipistrelle	35	60	Detector Failed.			95	95
	Noctule	0	4				4	4
	Total	35	64				99	100
2	Common pipistrelle	32	68	71	61	33	265	90
	<i>Myotis sp.</i>	0	1	2	1	0	4	1
	Noctule	0	3	1	1	2	7	2
	Soprano pipistrelle	0	3	5	2	4	14	5
	Long eared bat	0	0	1	0	0	1	*
	<i>Nyctalus/ Eptesicus sp.</i>	1	1	0	0	1	3	1
	Total	33	76	80	65	40	294	100

Table EDP A6.13: Automated Detector Survey Results July 2019. (*Less than 1%).

Position	Bat Species	Number of Bat Passes Recorded per Night					Total	% of Total
		25 July	26 July	27 July	28 July	29 July		
1	Common pipistrelle	10	9	7	12	13	51	67
	Noctule	9	2	2	2	5	20	26
	<i>Myotis</i> sp.	0	1	1	0	0	2	3
	Soprano pipistrelle	0	0	0	1	0	1	1
	<i>Pipistrelle</i> sp.	0	1	0	1	0	2	3
	Total	19	13	10	16	18	76	100
2	Common pipistrelle	163	109	Detector Failed.			272	91
	<i>Myotis</i> sp.	1	4				5	2
	Noctule	8	3				11	4
	Soprano pipistrelle	8	2				10	3
	Total	180	118	N/A	N/A	N/A	298	100

Table EDP A6.14: Automated Detector Survey Results August 2019. (*Less than 1%).

Position	Bat Species	Number of Bat Passes Recorded per Night					Total	% of Total
		1 August	2 August	3 August	4 August	5 August		
1	Common pipistrelle	19	22	41	16	24	122	47
	Noctule	1	1	1	0	0	3	1
	<i>Myotis</i> sp.	0	2	1	3	0	6	2
	Soprano pipistrelle	2	23	16	52	38	131	50
	Total	22	48	59	71	62	262	100
2	Common pipistrelle	146	13	12	17	21	209	64
	<i>Myotis</i> sp.	1	0	0	1	0	2	1
	Noctule	40	4	39	8	0	91	28
	Soprano pipistrelle	18	2	3	0	0	23	7
	Total	205	19	54	26	21	325	100

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Appendix EDP 7 Habitat Suitability Index Results

Table EDP A7.1: Pond Habitat Suitability Assessment of onsite waterbodies.

Suitability Index	Criteria	Definition	Possible Score	P1
SI₁	Geographic Location	Zone A - optimal	1	0.5
		Zone B - marginal	0.5	
		Zone C - unsuitable	0.01	
SI₂	Pond Area	Pond surface area to the nearest 50m ²	*	0.05
SI₃	Permanence	Never Dries	0.9	0.9
		Rarely dries (Dries no more than 2/10 years or in drought only)	1	
		Sometimes dries (Dries between 3/10 years to most years)	0.5	
		Dries annually	0.1	
SI₄	Water Quality	Good (abundant & diverse invertebrate community)	1	0.33
		Moderate (moderate invertebrate community)	0.67	
		Poor (low invertebrate diversity, few submerged plants)	0.33	
		Bad (clearly polluted, pollutant tolerant invertebrates present, no submerged plants)	0.01	
SI₅	Shade	% shade of pond perimeter to at least 1m from the shore	*	0.6
SI₆	Waterfowl	Absent (no evidence of waterfowl, excluding moorhen)	1	1.0
		Minor (waterfowl present, though little impact)	0.67	
		Major (severe impact of waterfowl)	0.01	
SI₇	Fish	Absent (no records of fish stocking and no fish seen during survey)	1	1.0
		Possible (no evidence of fish, but conditions suggest presence)	0.67	
		Minor (small numbers of crucian carp, goldfish or stickleback)	0.33	
		Major (dense populations of fish present)	0.01	
SI₈	Pond Count	No. ponds within 1 km of survey pond not separated by major barriers and divided by 3.14	*	0.1
SI₉	Terrestrial	Good (extensive habitat offering good opportunities for foraging and shelter surrounding pond)	1	0.67
		Moderate (habitat offering opportunities for foraging and shelter, but not extensive and does not completely surround pond)	0.67	
		Poor (habitat with poor structure, offering limited opportunities for foraging and shelter)	0.33	
		None (No suitable habitat around pond)	0.01	
SI₁₀	Macrophytes	% pond surface area occupied by macrophyte cover (excluding duckweed) and submerged plants reaching the surface	*	0.85
HSI Score = (SI₁*SI₂*SI₃*SI₄*SI₅*SI₆*SI₇*SI₈*SI₉*SI₁₀)^{1/10}				0.44
Pond Suitability (<0.5 = poor; 0.5-0.59 = below average; 0.6-0.69 = average; 0.7-0.79 = good; >0.8 = excellent)				Poor

* Score extrapolated from graphs within Oldham et al. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10 (4), 143-155

Appendix EDP 8 Reptile Survey Results

Methodology

- A8.1 Overall the Application Site is considered to of low value to reptiles, being comprised predominantly of hardstanding, buildings and amenity grassland. Suitable habitat comprising unmanaged grassland and dense scrub is however, present within the north-east corner and along the southern boundary of the Application Site.
- A8.2 Therefore, to confirm the presence or likely absence of reptiles and the extent of their usage of the Application Site, detailed refugia-based reptile surveys were undertaken. With reference to best practice guidance²¹²², seven survey visits were undertaken in May 2019.
- A8.3 A total of 105 artificial refugia, comprising bitumen undertile felt cut to approximately 1m x 0.5m, were deployed within suitable reptile habitat across the Application Site on 24 April 2019. The approximate location and number of reptile refugia is illustrated on **Plan EDP 8**.
- A8.4 Reptile refugia were left undisturbed *in situ* for a minimum period of 10 days prior to the commencement of reptile surveys. Detailed weather conditions recorded during each survey visit undertaken are summarised in **Table EDP A8.1**.

Table EDP A8.1: Date, timing and weather conditions of reptile surveys undertaken during May 2019.

Visit No.	Date	Start-Finish Time	Air Temp (°C)	Wind Speed (Beaufort)	Cloud Cover (%)	Rain
1	07.05.2019	10:30-11:50	13.1-14.6	1-2	9	None
2	10.05.2019	13:45-15:00	18.0-24.0	1-5	10-9	None
3	13.05.2019	11:10-12:30	12.0	1-5	10-2	None
4	17.05.2019	14:00-15:10	10.0-12.0	0-4	100	None
5	24.05.2019	13:30-14:40	18.0	1-4	90-100	None
6	28.05.2019	15:20-16:45	16.0	1-4	30-90	None
7	31.05.2019	10:45-11:50	14.0-16.0	1-2	65-75	Light drizzle

²¹ Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth

²² DMRB (2005) *Nature conservation advice in relation to reptiles and roads. Volume 10, Section 4, Part 7, HA/116/05.* DMRB

- A8.5 During each survey visit, artificial refugia were individually checked by an experienced ecologist with any reptiles observed recorded, along with notes on their life stage (adult/juvenile) and sex.
- A8.6 The peak survey count (maximum number of individuals recorded during any one survey visit) was then used to estimate approximate population size for each reptile species recorded. Estimates of population size followed the approach given in the withdrawn draft reptile mitigation guidelines²³; and are summarised with respect to widespread reptiles in **Table EDP A8.2**.

Table EDP A8.2: Population Size Class Estimates

Species	Population Size Class Category		
	Small	Medium	Large
Slow-worm	< 10	10 - 40	> 40
Common Lizard	< 5	5 - 20	> 20
Grass Snake	< 5	5 - 10	> 10
Adder	< 5	5 - 10	> 10

Limitations

- A8.7 Reptile surveys undertaken within the Application Site were generally completed during suitable weather conditions and within recognised optimal month for reptile surveys. The temperatures recorded for all reptile surveys in 2019 were mostly within the recommended parameters for optimal conditions, with the exception of one occasion when the temperature did rise above 20°C (at the end of the second visit) and light rain was recorded during bi 7. This is not considered to have affected the results, particularly given similar numbers of reptiles continued to be identified.

Results

Desk Study

- A8.8 Several records for widespread reptile species were received during the desk study including: a single record for adder (*Vipera berus*) dated 2008 approximately 1.5km south of the Application Site; six records of slow-worm (*Anguis fragilis*) dated between 2004 and 2015, with the nearest record being approximately 490m north-east; nine records of grass snake, with seven records in association with Caerleon Comprehensive School located approximately 665m south-west and a further two records 1.7km north; and one record of common lizard from 2007 located approximately 1.6km north of the Application Site.
- A8.9 Reptile surveys undertaken by Ecosulis between mid-September and early October 2015 found no evidence of common reptiles onsite. This is in contrast to the results of update survey effort undertaken by EDP which confirmed presence of slow-worm within the Application Site (refer to **Plan EDP 8** for location). Full details of the number of individuals and peak survey count are given in **Table EDP A8.3**.

²³ Natural England (2011) *Natural England Technical Information Note TIN102 Reptile Mitigation Guidelines*. WITHDRAWN

Table EDP 8.3: Number, and peak survey count, of slow worm recorded within the Application Site.

Visit	Visit Date	Slow worm	
		Adult	Juvenile
1	07.05.2019	0	0
2	10.05.2019	0	0
3	13.05.2019	0	0
4	17.05.2019	1	0
5	24.05.2019	0	0
6	28.05.2019	1	0
7	31.05.2019	0	1
Peak Survey Count:		1	
Population Size Class Estimate:		Low	

A8.10 One adult male, one adult female and one juvenile slow-worm were identified during survey visits 4, 6 and 7 respectively. The male slow-worm was found along the north-eastern edge of the Application Site, while the female and the juvenile slow worm were identified adjacent to one of the student accommodation blocks along eastern edge of the Application Site. Both habitats are represented by predominantly unmanaged and tussocky poor semi-improved grassland and are contiguous with broadleaved woodland. Based on the maximum count of one individual during a single survey, the slow-worm population utilising the Application Site is confirmed as small.

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Plans

Plan EDP 1	Update Habitat Survey, June 2019 (edp5601_d002a 17 July 2019 GY/EM)
Plan EDP 2	Trees Roost Assessment Results (edp5601_d001b 17 October 2019 GY/LL)
Plan EDP 3	Bat Roost Building Inspection and Roost Characterisation Survey Results (edp5601_d005b 22 August 2019 LB/LL)
Plan EDP 4	Bat Emergence/Re-Entry Survey Results on Buildings B1/2 and B3/4 (edp5601_d023 17 October 2019 GY/LL)
Plan EDP 5	Bat Emergence/Re-Entry Survey Results on Building B16 (edp5601_d024 17 October 2019 GY/LL)
Plan EDP 6	Automated Bat Detector Locations and Transect Route (edp5601_d004 17 October 2019 GY/EM)
Plan EDP 7a	April Bat Transect Survey Results 2019 (edp5601_d006a 17 October 2019 LB/EM)
Plan EDP 7b	May Bat Transect Survey Results 2019 (edp5601_d007a 17 October 2019 LB/EM)
Plan EDP 7c	June Bat Transect Survey Results 2019 (edp5601_d018a 17 October 2019 GY/LL)
Plan EDP 7d	July Bat Transect Survey Results 2019 (edp5601_d022 17 October 2019 AG/LL)
Plan EDP 8	Reptile Survey Results (edp5601_d019a 17 July 2019 JTF/LL)

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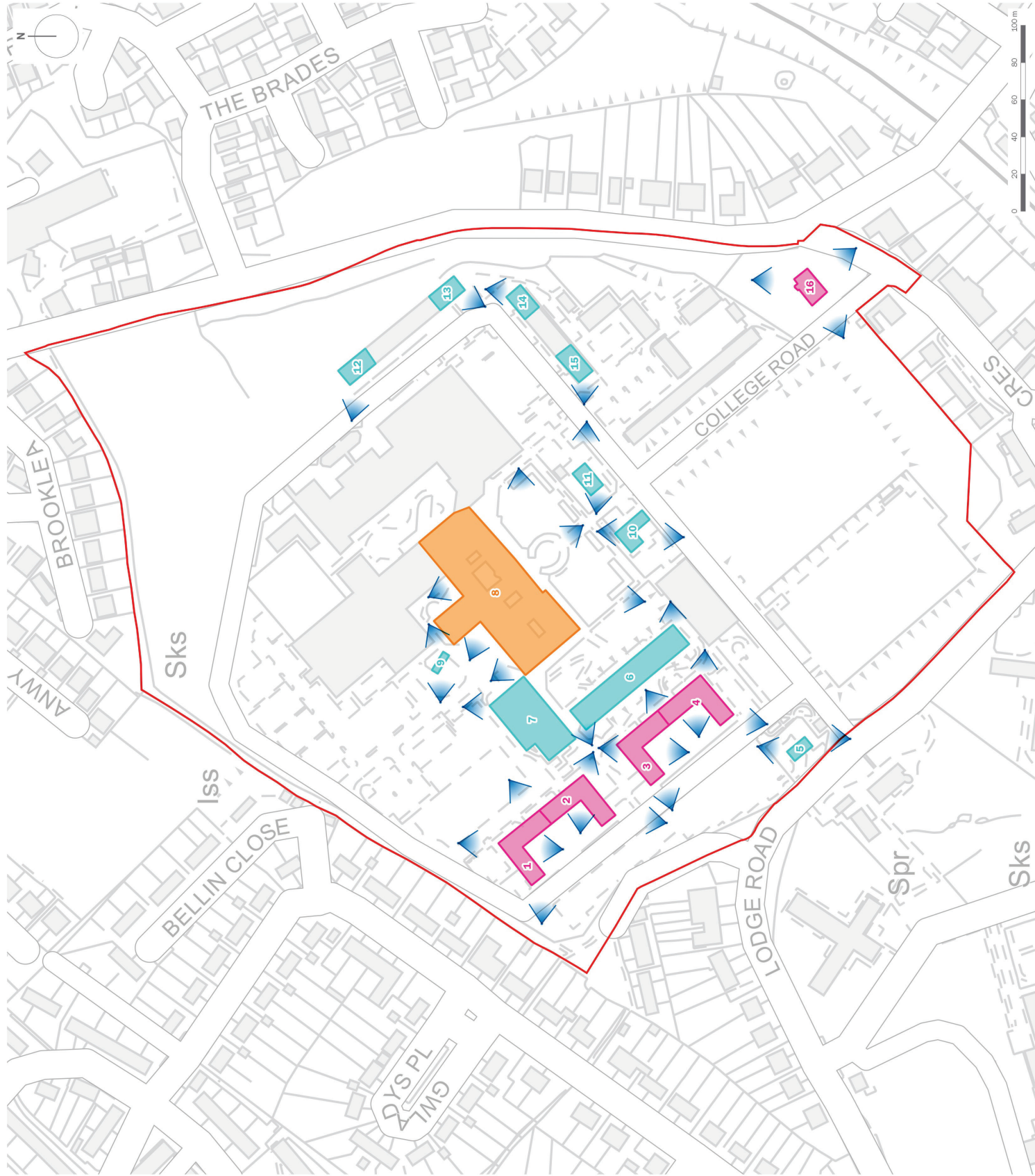


Site Boundary	Broadleaved Semi-natural Woodland	Poor Semi-Improved Grassland	Amenity Grassland	Dense Continuous Scrub	Ephemeral/Short Perennial	Shrub Planting	Former Allotment	Buildings	Hardstanding	Intact Species-poor Hedgerow	Fence	Wall	Scattered Trees (Broad-leaved)	Scattered Scrub
SI	A													
Redrow Homes (South Wales) Ltd	USW Caerleon	Redrow Homes (South Wales) Ltd	USW Caerleon	Redrow Homes (South Wales) Ltd	USW Caerleon	Redrow Homes (South Wales) Ltd	USW Caerleon	Redrow Homes (South Wales) Ltd	USW Caerleon	Redrow Homes (South Wales) Ltd	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon
client	project title	drawing title	Plan EDP 1: Update Habitat Survey, June 2019	date	17 JULY 2019	drawing number	edp5601_d002a	scale	1:2,000 @ A3	drawn by	GY	checked	EM	JTF
Redrow Homes (South Wales) Ltd	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon	USW Caerleon



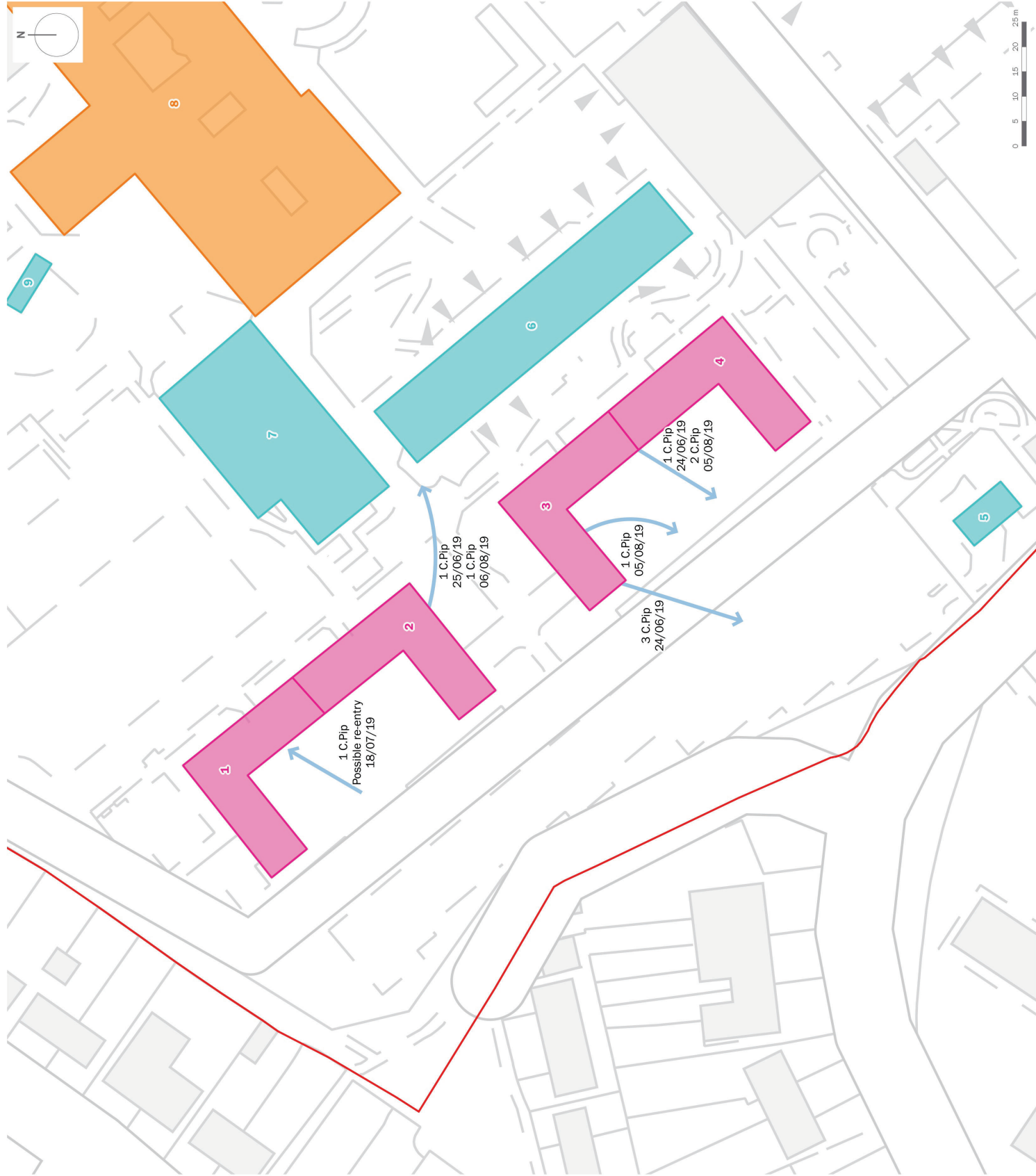
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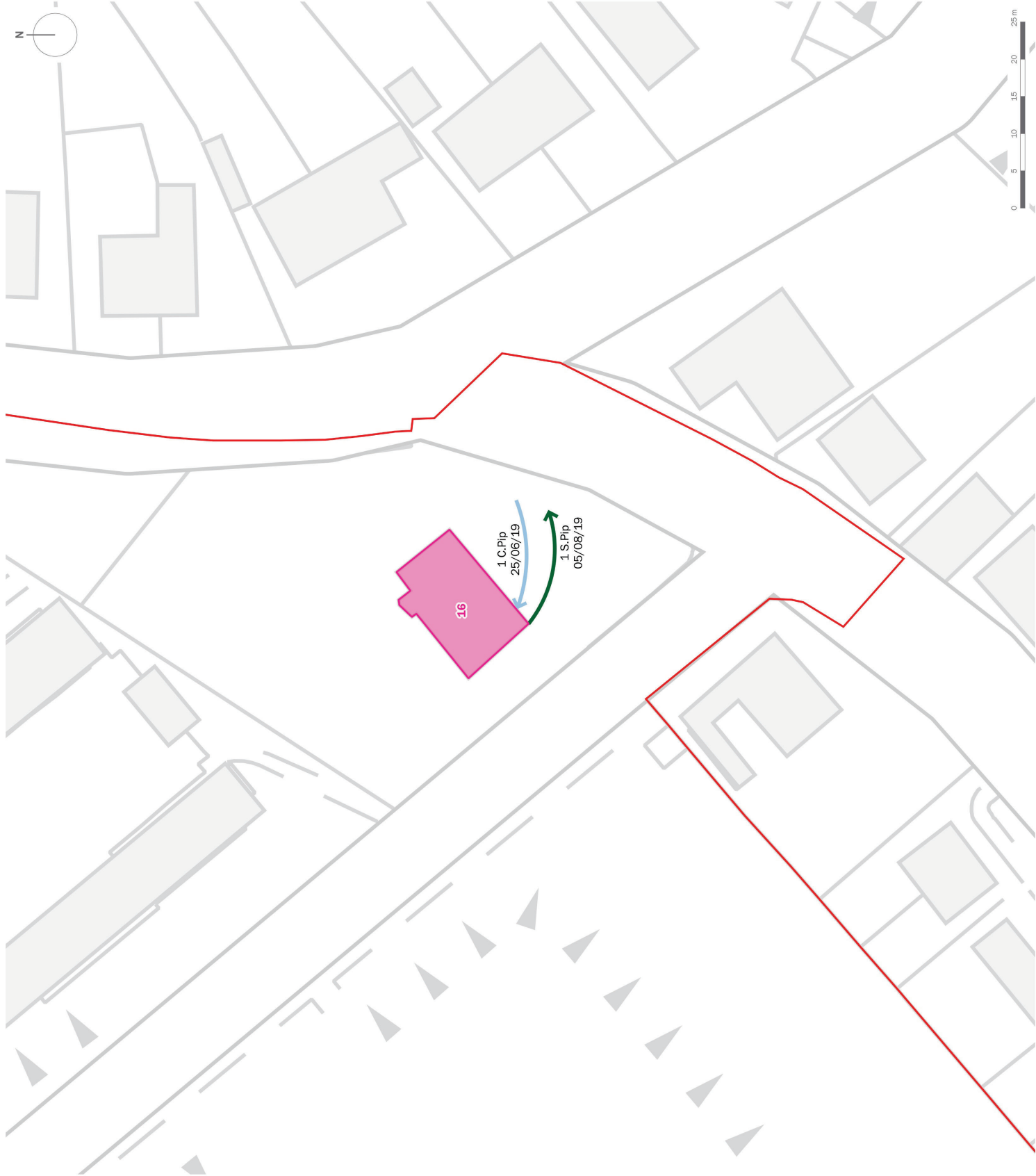
Registered office: 01285 740427 - www.edp-uk.co.uk - info@edp-uk.co.uk



- Site Boundary
- Bat Emergence/Re-entry Surveys
- Confirmed Roosts During 2019
- Moderate Roost Potential
- Low Roost Potential
- Surveyor Positions

client	Redrow Homes (South Wales) Ltd		
project title	USW Caerleon		
drawing title	Plan EDP 3: Bat Roost Building Inspection and Roost Characterisation Survey Results		
date	22 AUGUST 2019	drawn by	LB
drawing number	edp5601_d005b	checked	LL
scale	1:2,000 @ A3	QA	GY





Site Boundary

Bat Emergence/Re-entry Surveys



Confirmed Roosts During 2019



Common Pipistrelle Re-entry



Soprano Pipistrelle Emergence

client

Redrow Homes (South Wales) Ltd

project title

USW Caerleon

drawing title

**Plan EDP 5: Bat Emergence/Re-Entry Survey
Results on B16**

date

17 OCTOBER 2019

drawn by

GY

drawing number

edp5601_d024

checked

LL

scale

1:500 @ A3

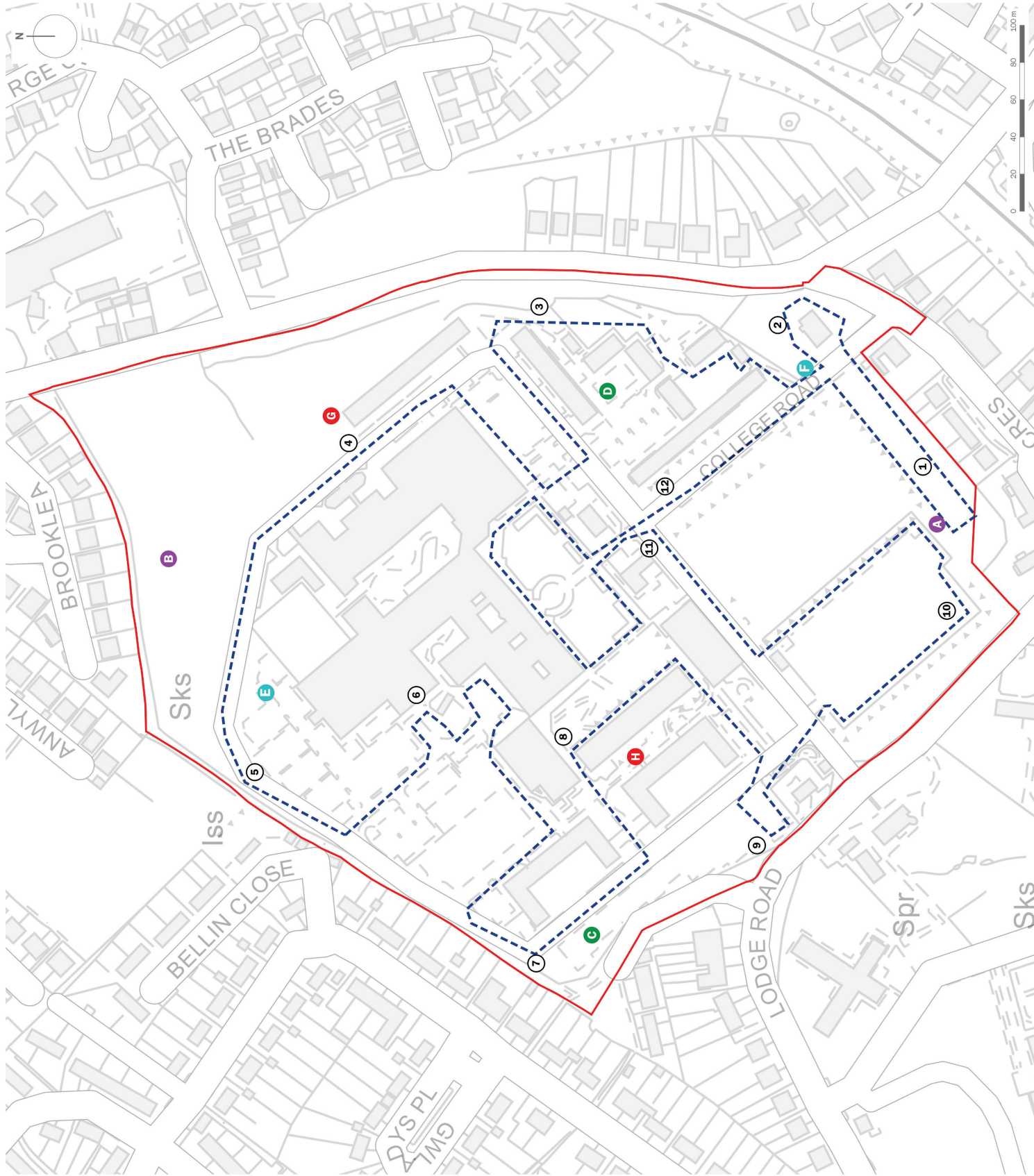
QA

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Site Boundary

Bat Transect Route

Listening Points

Automated Detector (Anabat)
Locations April

Automated Detector (Anabat)
Locations May

Automated Detector (Anabat)
Locations June

Automated Detector (Anabat)
Locations July and August

1

A

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A

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client

Redrow Homes (South Wales) Ltd

project title

Caerleon University Campus

drawing title

Plan EDP 6: Automated Bat Detector
Locations and Transect Route

date

17 OCTOBER 2019

drawn by

GY

drawing number

edp5601_d004

checked

EM

scale

1:2,000 @ A3

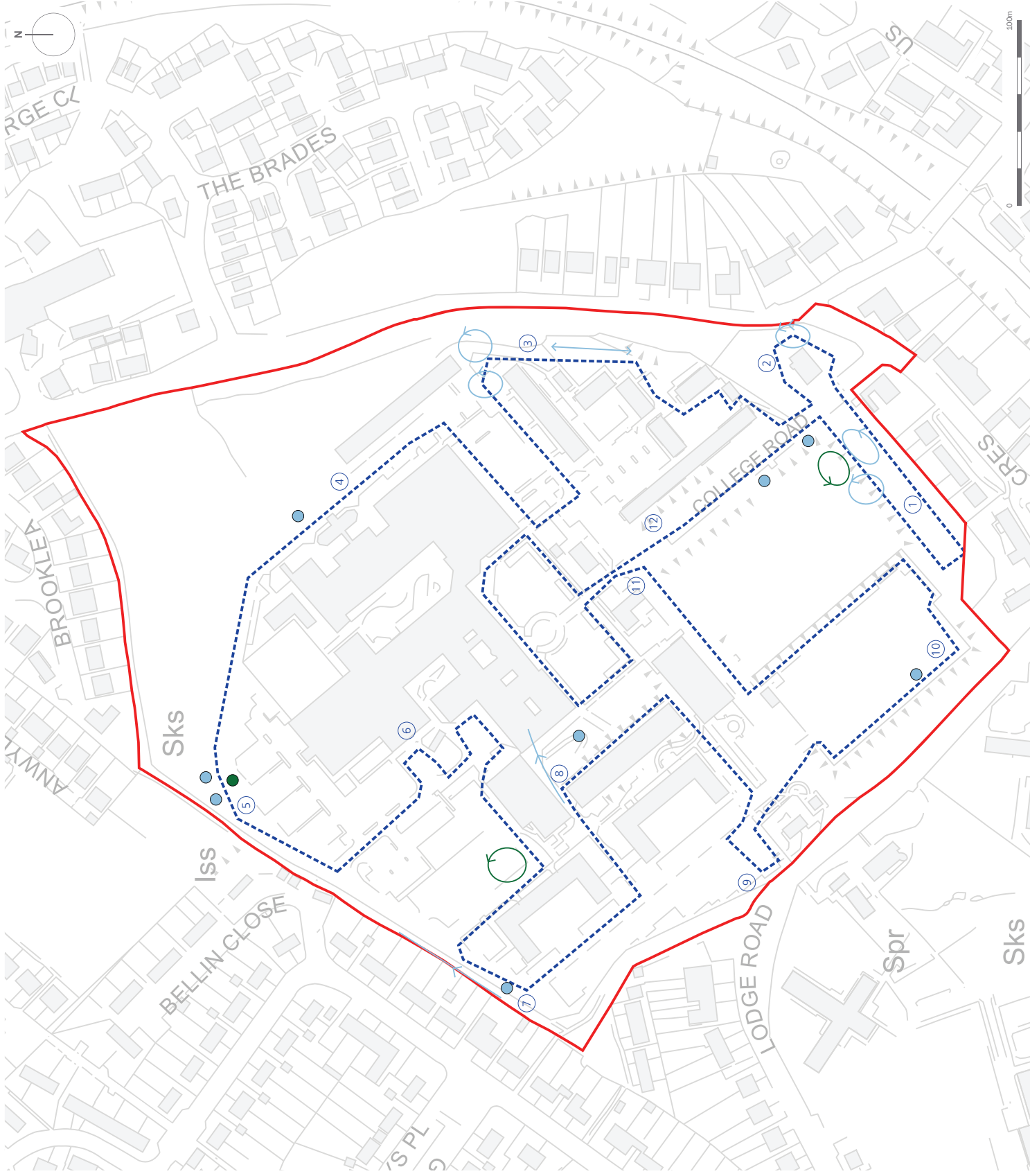
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Site Boundary

Bat Activity (Colour denotes species)

Heard but not seen

Bat commuting (one chevron per bat)

Foraging Behaviour

Foraging Behaviour

Bat Species

Common pipistrelle

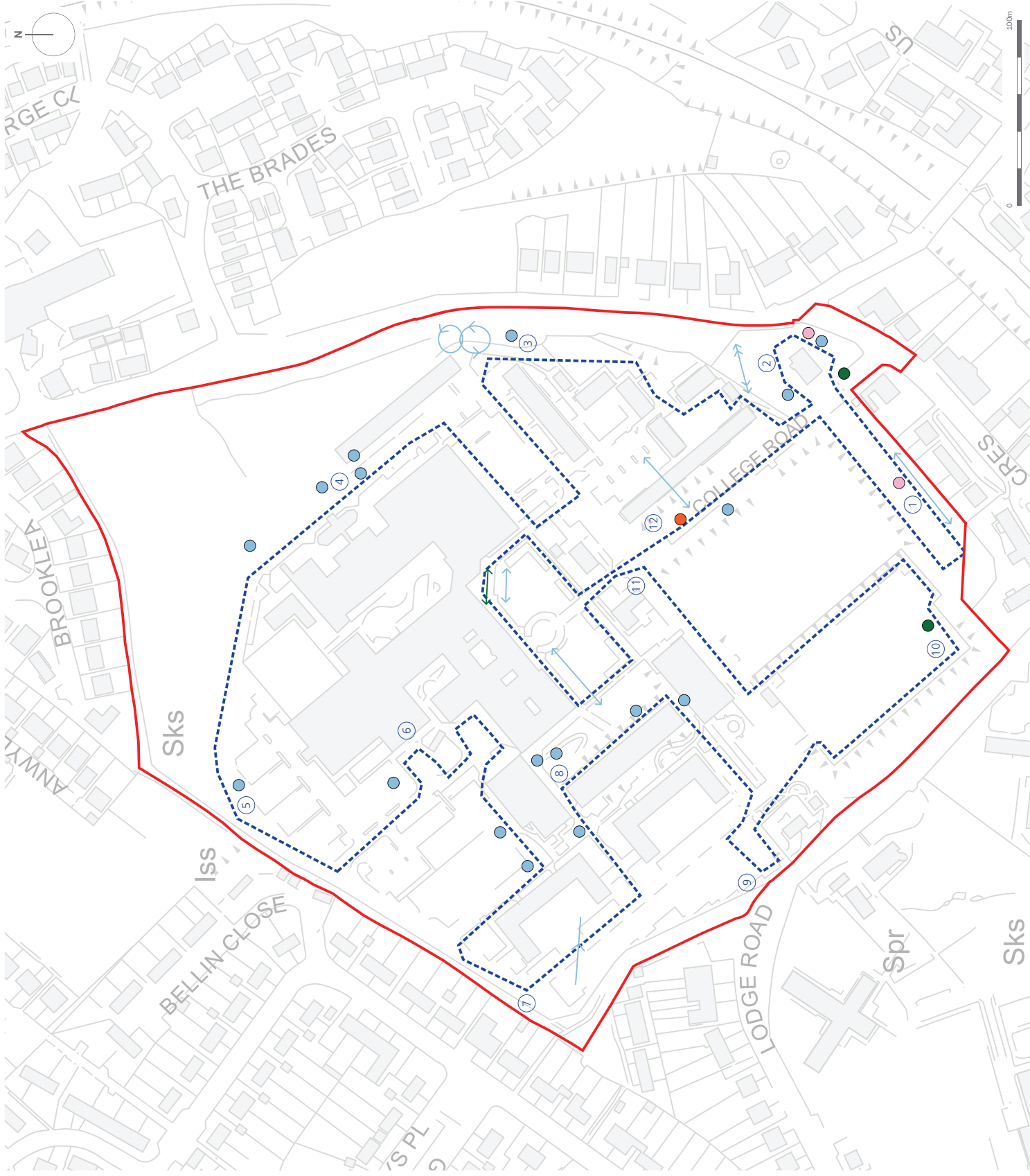
Soprano pipistrelle

Transect Routes

Transect Route

Listening Points

client	Redrow Homes (South Wales) Ltd
project title	USW Caerleon
drawing title	Plan EDP 7a: April Bat Transect Survey Results 2019
date	17 OCTOBER 2019
drawing number	edp5601_d006a
scale	Refer to scale bar
drawn by	LB
checked	EM
QA	GY



- Site Boundary
- Bat Activity (Colour denotes species)
- Heard but not seen
- Bat commuting (one chevron per bat)
- Foraging Behaviour
- Foraging Behaviour

Bat Species

Common pipistrelle

Soprano pipistrelle

Myotis Sp.

Noctule

Transect Routes

Transect Route

Listening Points

client

Redrow Homes (South Wales) Ltd

project title

USW Caerleon

drawing title

Plan EDP 7b: May Bat Transect Survey Results 2019

date

17 OCTOBER 2019

drawing number

edp5601_d007a

scale

Refer to scale bar

drawn by

LB

checked

EM

scale

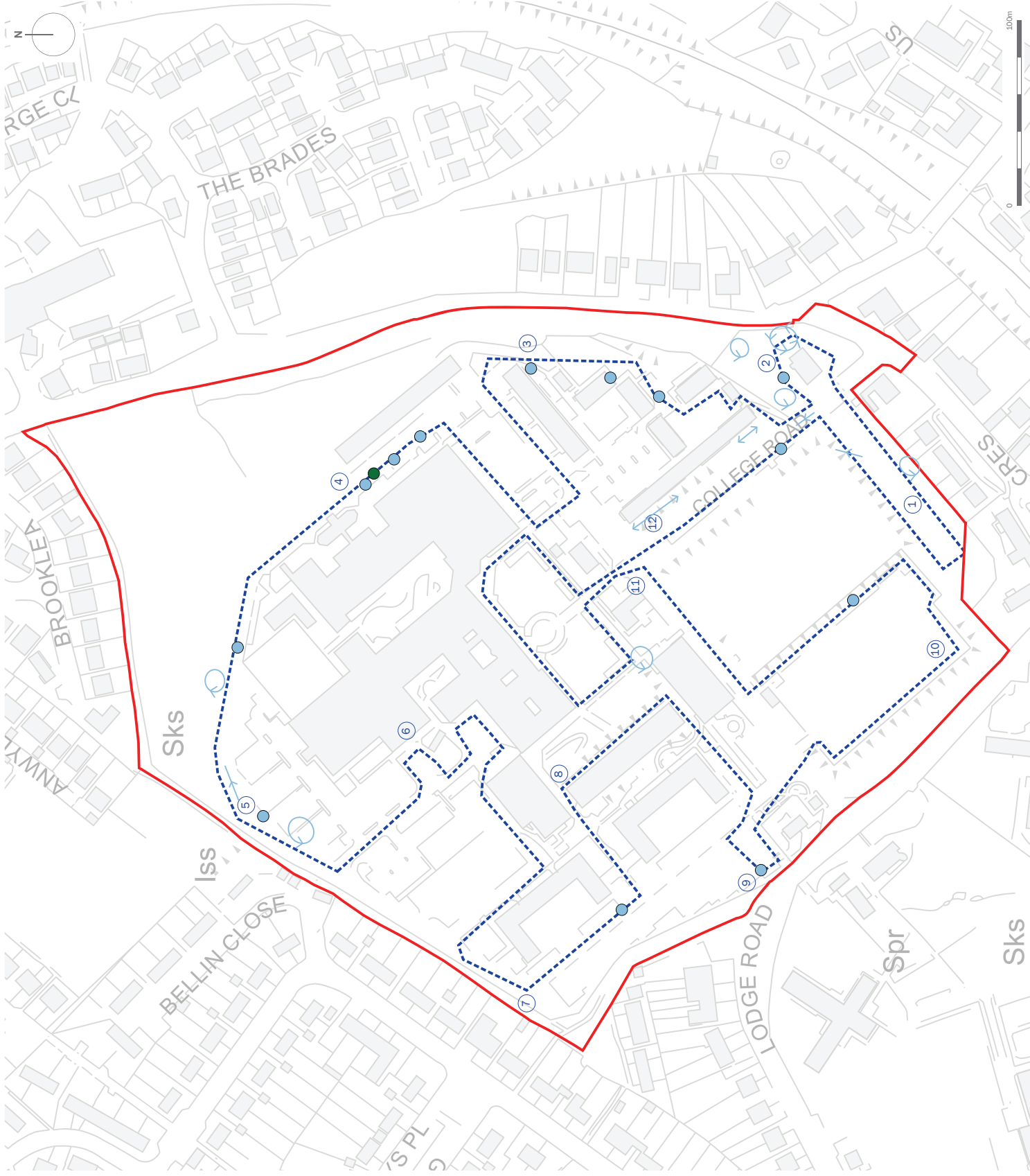
QA

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Site Boundary

Bat Activity (Colour denotes species)

Heard but not seen

Bat commuting (one chevron per bat)

Foraging Behaviour

Foraging Behaviour

Bat Species

Common pipistrelle

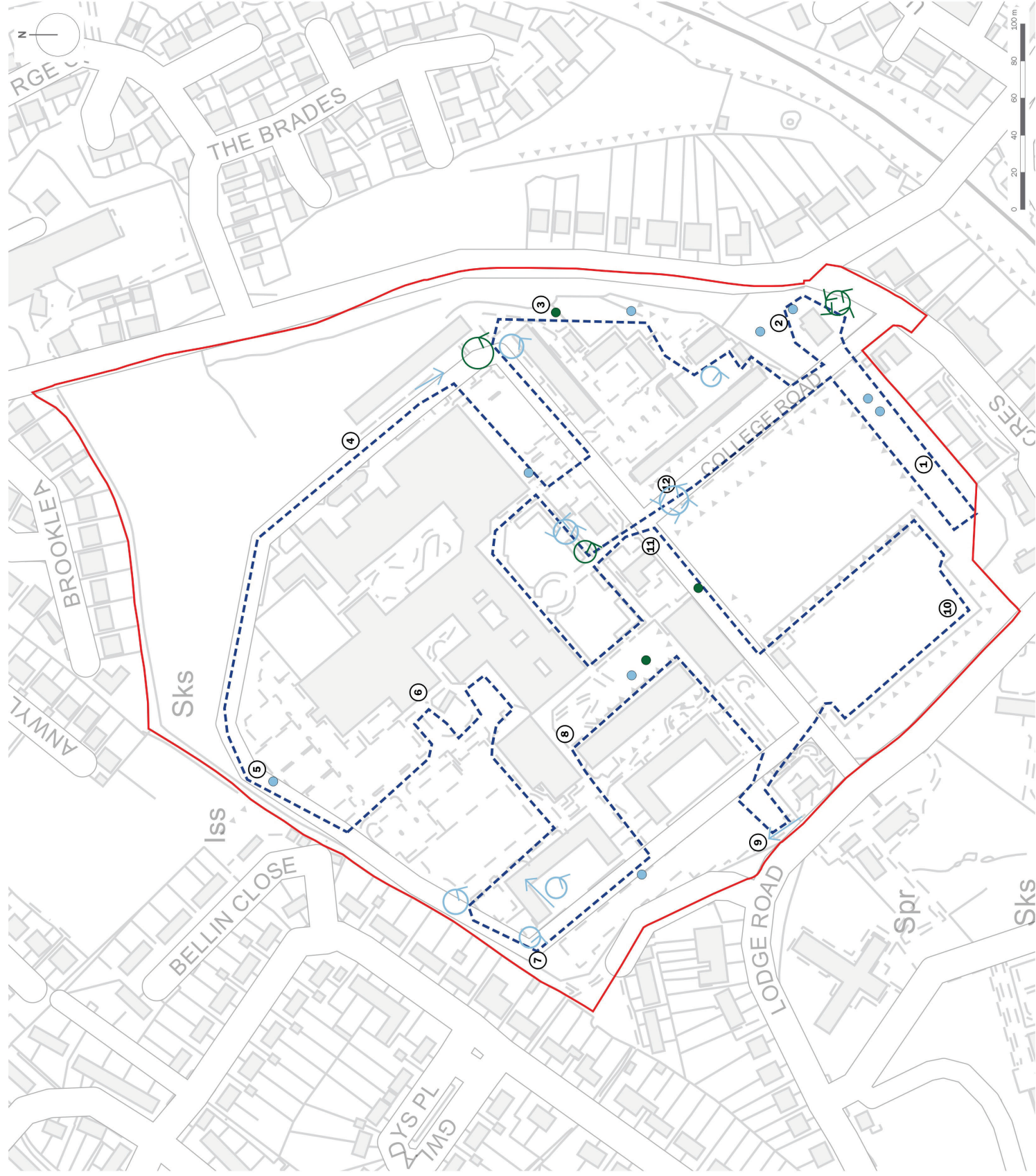
Soprano pipistrelle

Transect Routes

Transect Route

Listening Points

client	Redrow Homes (South Wales) Ltd		
project title	USW Caerleon		
drawing title	Plan EDP 7c: June Bat Transect Survey Results 2019		
date	17 OCTOBER 2019	drawn by	GY
drawing number	edp5601_d018a	checked	LL
scale	Refer to scale bar	QA	JTF



Site Boundary

Bat Activity (Colour Denotes Species)

Heard but Not Seen

Foraging Behaviour

Foraging Behaviour

Bat Species

Common pipistrelle

Soprano pipistrelle

Transect Routes

Listening Points

Transect Routes

client	Redrow Homes (South Wales) Ltd		
project title	USW Caerleon		
drawing title	Plan EDP 7d: July Bat Transect Survey Results 2019		
date	17 OCTOBER 2019	drawn by	AG
drawing number	edp5601_d022	checked	LL
scale	1:2,000 @ A3	QA	CR



- Site Boundary
- Slow Worm Locations
- Broadleaved Semi-natural Woodland
- Poor Semi-Improved Grassland
- Amenity Grassland
- Dense Continuous Scrub
- Ephemeral/Short Perennial
- Shrub Planting
- Former Allotment
- Buildings
- Hardstanding
- Intact Species-poor Hedgerow
- Fence
- Wall
- Scattered Trees (Broad-leaved)
- Scattered Scrub

client	Redrow Homes (South Wales) Ltd
project title	USW Caerleon
drawing title	Plan EDP 8: Reptile Survey Results
date	17 JULY 2019
drawing number	edp5601_d019a
scale	1:2,000 @ A3
drawn by	JTF
checked	LL
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