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Preliminary Ecological Appraisal
The Abbey Senior School

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Executive Summary
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Executive Summary

Eight Associates has been commissioned by The Abbey School to carry out a desktop study, Phase 1 habitat survey, protected species risk assessment, bat building and tree assessment and BREEAM ecology assessment in connection with the proposed construction of a new dining hall and an extension to the sixth form at The Abbey Senior School.

This report details an analysis of records from the local wildlife records centre, the existing ecology of the site, its potential for relevant protected species and how the development will enhance the ecological value of the surrounding area. It also outlines the legislation for these protected species, reviews Reading Borough Council biodiversity policy the likely BREEAM credits to be achieved against the BREEAM Land Use and Ecology 2018 criteria LE 02–LE 05, under the BREEAM UK New Construction 2018 scheme.

Key habitats present	Buildings, hardstanding, amenity grassland, introduced shrub, scattered trees, dense scrub
Protected species potential	Birds, Bats and Reptiles
Further surveys recommendations	It is assumed that standard pollution prevention measures will be implemented during construction If trees are to be removed as part of the works a nesting bird watching brief will be needed where clearance/demolition works are to commence within the bird nesting season (March–August). A dusk emergence survey will be required for the cluster of four trees proposed to be removed with dense ivy cover on the southern boundary of the site. Any trees to be removed which exhibit bat potential should be soft–felled. Night–time work, using artificial lighting, should be avoided. Where this is not possible, construction lighting should be minimised and directed away from trees, shrubs and other natural habitats, to minimise disturbance to notable species, such as bats, which may be using habitats within or adjacent to the site.
Ecological enhancements	Incorporation of a biodiverse green roof Installation of three bird boxes Installation of two bat boxes External lighting designed in line with BCT guidance Incorporation of native or fruiting and flowering plant species. Stag beetle loggery / Reptile habitat feature Hedgehog corridors

Executive Summary (continued)

The anticipated BREEAM 2018 New Construction credits can be summarised as follows:

- LE 02 – Identifying and understanding the risks and opportunities for the project

  Two out of two credits to be awarded
- LE 03 – Managing Negative Impacts on Ecology

  Three out of three credits to be awarded
- LE 04 – Change and enhancement of ecological value

  Three out of four credits to be awarded and an exemplary credit (where the ecologist's recommendations are adopted).
- LE 05 – Long Term Ecology Management and Maintenance

  Two out of two credits to be awarded (where the building manager commits to maintain the site's proposed ecological features)

Recommendations have been made to mitigate against the loss of ecological features, and to enhance the site in line with Reading Borough Council biodiversity policy, with the aim to provide a net gain for biodiversity on the site.

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Introduction
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Introduction

Eight Associates has been commissioned to undertake a Phase 1 habitat survey, protected species risk assessment, bat building and tree assessment and BREEAM ecology assessment of The Abbey Senior School in Reading, Berkshire.

This report is based on a field survey using standard Phase 1 survey methodology (JNCC, 2010). The Phase 1 survey is designed to identify the broad habitat types present, to assess the potential of habitats to support protected species and to assist in providing an overview of the ecological interest at a site. It is generally the most widely used and professionally recognised method for initial ecological site appraisal.

The site currently comprises the existing Abbey Senior School buildings and sports courts. The site is located in Reading, Berkshire, within an urban setting. The site is bounded by Crown Place to the north, University of Reading London Road Campus to the north and east, Kendrick Road to the west and Reading School Morgan Road Playing Fields and residential properties to the south. The site covers approximately 14,527m^2 in total, and the National Grid Reference for the centre of the site is SU 72191 72680.

Current proposals consist of the construction of a new dining hall and an extension to the sixth form at The Abbey Senior School. A green roof above the dining hall is included as part of the designs. Site Plans can be found in Appendix A.

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Phase 1 Habitat Survey Methodology

Preliminary Ecological Appraisal

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Desktop Study

A desktop study was undertaken using data from the local records centre, Thames Valley Environmental Records Centre (TVERC). The data search provided evidence of statutory and non-statutory habitats, protected, notable and key species recorded within a 1km radius of the site. The data was reviewed to identify any habitats or species within the surrounding area that may be negatively impacted by the development. Records older than 10 years were removed from the analysis to give a more accurate view of the area's current notable species assemblage.

Multi-Agency Geographic Information for the Countryside (MAGIC) Maps was used to provide evidence of Statutory Sites and key habitats within a 1km radius of the Site in order to identify the potential for any habitats or species within the surrounding area to be negatively impacted by the development. The Woodland Trust Ancient Tree Inventory was also checked for any Ancient Trees recorded within 50m of the Site.

Phase 1 Habitat Survey

A survey was carried out to assess the ecology of the site on 19th November 2019 conducted by ecologist Gemma Golding. The survey provided an initial site survey (Phase 1 habitat survey), which involved the identification of habitat types present and assessment of the possibility for protected species on site. This report summarises the findings from this survey.

The survey was carried out prior to any works being done at the site. The time of year was suboptimal for Phase 1 habitat surveys. The survey represents the site's existing ecology prior to the initial site preparation works, i.e. before RIBA Stage 5, and after RIBA Stage 1.

The site survey was based upon the standard Phase 1 survey methodology (JNCC, 2010). An inventory of habitats present on site was recorded and mapped. Plant species nomenclature followed Stace (2010) for vascular plant species. The site was also checked for the presence of invasive plant species as defined by Schedule 9 of the Wildlife and Countryside Act, 1981, as amended.

A Phase 1 Habitat Plan, contained within Appendix B, shows the habitats present at the site survey and photographs illustrate the key habitat features observed within the site.

Protected species assessment

An assessment of the site's potential to support protected species was carried out, based on the results of the desk study, observations made during the site survey, an assessment of the suitability of on-site and adjoining habitat, and information on the distribution of these species.

Protected species thought to be relevant to the site include:

- Birds
- Bats, and
- Reptiles.

A summary of the legislation surrounding these protected species is in Appendix D.

Limitations	The survey was undertaken in November, at a time of year when certain botanical species are not readily identifiable. However, due to the suburban location of the application site and nature of the habitats present, the timing of the survey is not considered to be a significant limitation to this report. It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment.

Bat building and tree assessment

A daytime inspection of the building was additionally undertaken on 19th November 2019. The primary aims of the building inspection were to look for evidence of roosting bats and to assess the level of bat roosting potential in order to determine the need for further surveys.

With regards to the external inspection of the building, the perimeters of the buildings were walked and the exterior of each section of the building was assessed with the aid of binoculars and a high-powered torch. Notes were made on the construction type and features providing potential access points and roosting opportunities for bats, including (but not exclusively):

- Suitable gaps beneath roof tiles;
- Suitable access points via any other roof features e.g. beneath ridge tiles;
- Gaps created by missing mortar in brickwork / rendering; and,
- Access via eave level gaps.

For internal inspection, notes were made relating to the relevant characteristics of internal features providing potential access points and roosting opportunities for bats, including (but not exclusively):

- Suitable gaps between tiles and roofing liner if present;
- Access points via eaves; and,
- Gaps between timbers.

Bat Evidence

The surveyor searched for direct evidence of the presence of bats in the internal and external inspections in the form of:

- Bats in situ;
- Feeding remains such as butterfly/moth wings;
- Bat droppings;
- Dark staining caused by bat faeces;
- Splashes and staining caused by urine;
- Polished surfaces at a possible access point;
- Staining caused by the natural oils in bat fur; and,
- Scratch marks made by bat claws.

Bats do not always leave visible signs of their presence on the external features, and if left these signs can be washed away by wet weather.

Assessment of bat roost potential

The building was then assessed as to its potential to support roosting bats and placed into one of the five following categories:

Confirmed	Evidence of roosting bats identified
High	Building with numerous potentially suitable roosting sites, including at least one feature that may potentially be used as a hibernaculum.
Medium	Building with numerous potentially suitable roosting sites.
Low	Building with a few potentially suitable roosting sites.
Negligible	Building with a negligible number of potentially suitable roosting sites.

Limitations

It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no investigation can ensure the complete characterisation and prediction of the natural environment.

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Desktop Study Results
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Results	MAGIC Maps was used to provide evidence of Statutory Sites and key habitats within a 1km radius of the Site in order to identify the potential for any habitats or species within the surrounding area to be negatively impacted by the proposed construction work at The Abbey Senior School. The Woodland Trust Ancient Tree Inventory was also checked for any Ancient Trees recorded within 50m of the Site.
Woodland Trust Ancient Tree Inventory	No Ancient Trees have been recorded on the Inventory within 50m of the Site.
Notable Habitats	There seven parcels of deciduous woodland (the closest of which is 385m east), one parcel of coastal and floodplain grazing marsh (1km south west), and one parcel of woodpasture and parkland BAP priority habitat (1km south east) within 1km of the site. Using Ordnance Survey maps, no ponds or watercourses were identified within 500m of the site. The nearest watercourse is the River Kennet, 612m north of the site.
Drinking Water Safeguard Zones	Drinking Water Safeguard Zones are areas in which the use of certain substances must be carefully managed to prevent the pollution of raw water sources that are used to provide drinking water. A Drinking Water Safeguard Zones situated at our site is designated as at risk from Benzo-A-Pyrene, Nitrite, 2-4 D, Carbetamide, Chlorthal, Chlorotoluron, Glyphosate, MCPA, Mecoprop, Metaldehyde, Metazachlor, Propyzamide and Quinmerac.
Designated sites	The desk-based search identified no Statutory designated sites with European or National statutory designations within a 1km radius of the site. Whilst there are no statutory designated sites within 1km of the site boundary, the site itself falls within a Site of Special Scientific Interest (SSSI) Impact Zone. SSSI Impact Zones are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals. The proposed work does not fall into any of the at-risk categories for this SSSI Impact Zone. As such, it is unlikely that Natural England need to be contacted regarding likely impacts on SSSIs.

Designated sites (continued)

The data search completed by TVERC identified three sites with non-statutory designations within 1km of the site:

Site Name	Distance from site	Site description
River Kennet/Kennet and Avon Canal Local Wildlife Site (LWS)	655m west	A section of the River Kennet and the Kennet and Avon Canal from near Burghfield Bridge, south-east of Reading, to Waterloo Meadows adjacent to Edgar Road near the centre of Reading. The River Kennet is one of the best examples of a chalk river nationally, and is a UK BAP Priority Habitat. The Kennet & Avon Canal section is also fed by water from the River Kennet and is also calcareous in nature.
Holy Brook LWS	663m west	This site was originally designated as a number of separate sites which have now been combined. The Holy Brook is a stream that carries water from and emptying back into the River Kennet, a chalk river. Alder and willows line the banks and a variety of wetland species are found along the banks with stands of reed sweet-grass, hemlock water-dropwort and occasional water dock. Water-crowfoots (*Ranunculus aquatilis/ fluitans*) were recorded in the Brook in 1987 and 1994. A number of notable invertebrates have been recorded in Holy Brook and water vole has been recorded in the central and western sections.
Whitley Park Farm/St Patrick's Hall LWS	870m south	A diverse site based in the grounds of the Reading University Student Village, but squeezed between accommodation blocks, housing estate and a public open space. This LWS Site is important in holding mixed broadleaved semi-natural woodland and a range of associated habitats, including two ponds, both very different in character – one open and one enclosed. The woodland has some mature oak and ash although with abundant suckering elm, some of which is now quite tall. Sycamore is establishing in abundance in places and some exotic species have been planted in some areas. Willows are found along the outflow of the pond. The site is important however, for its bird fauna holding a number of species listed on both the red and amber lists as "birds of conservation concern", although the date of most of these records are unknown.

Birds	TVERC returned 91 records for four species of bird within 1km of the site boundary: • Swift *Apus apus* • Dunnock *Prunella modularis* • House sparrow *Passer domesticus* • Kingfisher *Alcedo atthis* Species returned included those listed on Schedule 1 of the Wildlife and Countryside Act 1981, Section 41 of the NERC Act and birds listed on the Red and Amber lists of Birds of Conservation Concern 4. The closest record was for 10 adult swifts 75m west of the site in 2011.
Bats	TVERC returned 93 records for at least five species of bat within 1 km of the site boundary. Those listed include: • Noctule bat *Nyctalus noctule* • Nathusius' Pipistrelle *Pipistrellus nathusii* • Soprano Pipistrelle Pipistrellus pygmaeus • Common pipistrelle Pipis*trellus pipistrellus* • Serotine *Epitesicus serotinus* Records also included those unclassified to such a high level such as unidentified bat species, unidentified Myotis bat species and unidentified Pipistrelle bat species. The closest record was for a common pipistrelle 226m north of the site at the University of Reading, London Road Campus in 2014.
Reptiles	TVERC returned no records for reptiles within 1km of the site boundary.
Great crested newt	TVERC returned no for great crested newt within 1km of the site boundary. There were however three records for smooth newt *Lissotriton vulgaris* within this radius, with the two closest recordings having been taken at the same location, 905m south of the site, both in 2016.
Hazel dormouse	TVERC returned no records for hazel dormouse *Muscardinus avellanarius* within 1km of the site boundary.
Eurasian Badger	TVERC returned four records for Eurasian badger *Meles meles* within 1km of the site boundary. The closest of these was for badger hair 365m east of the site in 2015.
Otter, water vole and white clawed crayfish	TVERC returned no records for European otter *Lutra lutra*, water vole *Arvicola amphibious* or white clawed crayfish *Austropotamobius pallipes* within 1km of the site boundary. MAGIC and Ordnance survey maps were used to identify that no watercourses are found within 500m of the site. Subsequently, these species are not discussed again in this report.

Other mammals	TVERC returned two records for West European hedgehog *Erinaceus europaeus* within 1km of the site boundary. The closest record was 900m west of the site in 2010. The Big Hedgehog Map, (www.bighedgehogmap.org), a feature launched through the Hedgehog Street campaign, a national conservation project by People's Trust for Endangered Species (PTES) and the British Hedgehog Preservation Society (BHPS) aimed at Britain's declining hedgehogs, illustrates the presence of West European Hedgehog throughout Reading. The closest record on the Big Hedgehog Map, was for a live individual, in the amenity grassland area in the rear of The Museum of English Rural Life, approximately 50m east of the site.
Invertebrates	TVERC returned 42 records for stag beetle *Lucanus cervus* within 1km of the site boundary. The closest of these was 69m north west of the site in 2015.
Flora	TVERC returned one record for corn mint *Mentha arvensis*, 943m south west of the site in 2015.
Invasive species	TVERC returned seven records for non-native species within 1km of the site boundary. These were for Indian balsam and Japanese knotweed, with the closest records being 693m west in 2013 and 890m west in 2014 respectively.

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Phase 1 Survey Results
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Site description	The site currently comprises the existing Abbey Senior School buildings and sports courts. The site is located in Reading, Berkshire, within an urban setting. The site is bounded by Crown Place to the north, University of Reading London Road Campus to the north and east, Kendrick Road to the west and Reading School Morgan Road Playing Fields and residential properties to the south. The site covers approximately 14,527m^2 in total, and the National Grid Reference for the centre of the site is SU 72191 72680. Please refer to the Appendix B for a Phase 1 Habitat Plan showing existing habitats on site.
Buildings	The Abbey Senior School is a multi-storey building of brick façades with several interconnected sections and two inner courtyards. The western most courtyard includes a small rose garden, magnolia tree and amenity grassland whilst the eastern courtyard, where the new dining room is to be constructed, is predominantly hardstanding with central planters. All sections appear to be in good condition with limited features to accommodate roosting bats. Features present are listed in the Bat Building and Tree Assessment Results on Page 16.
Hardstanding	Hardstanding is present between and around the school buildings as well as in the parking area and on the tennis courts. This habitat has negligible ecological value.
Amenity grassland	Amenity grassland is present both within the site boundary, in the school rose garden western courtyard, and in the zone of influence adjacent to the south of the site in the Reading School Morgan Road Playing Fields. In these areas, the grass is cut relatively short, and is likely subject to a regular mowing regime. Amenity grassland affords little ecological value for protected species.
Introduced shrub	Introduced shrub is present in small areas throughout the site. These include in the car park on the west of the site, as a rose garden in the western courtyard and in planters in the eastern courtyard.
Scattered trees	There are few trees within the site boundary. Within the car park on the west of the site there are three young trees in a small parcel of amenity grassland within the carpark. There is also a magnolia *Magnolia sp.* tree within the western courtyard of B1, adjacent to the rose garden and four trees on the southern boundary of the site proposed to be removed, adjacent to the Reading School Morgan Road Playing Fields. Outside the site boundary, there is a line of mature sycamore *Acer pseudoplatanus* trees adjacent to the west of the site, along Kendrick Road and various trees, adjacent to the eastern boundary of the site in the grounds of the Museum of English Rural Live. Within Reading School Morgan Road Playing Fields, there are various trees, including oak *Quercus sp.*, sycamore and silver birch *Betula pendula* scattered around the boundary.

Fauna	During the Phase 1 Habitat Survey wood pigeons *Columba palumbus* were identified flying out of the tree cluster at TN13 on the Phase 1 Habitat Plan in Appendix B. Garden birds were identified in the north eastern corner of the Reading School Morgan Road Playing Fields near Building 2 (B2) on the Phase 1 Habitat Plan in Appendix B. Two bird nests were identified within the cluster of four trees on the southern boundary of the site, adjacent to the Reading School Morgan Road Playing Fields (TN6 on the Phase 1 Habitat Plan in Appendix B) Potential mammal holes were identified in three places on the Reading School Morgan Road Playing Fields. These are identified by TN7, TN11 and TN12 on the Phase 1 Habitat Plan in Appendix B. At TN7 there was a gap under the mesh fence adjacent to a hole and holes which did not lead anywhere in the soil were identified at TN11 and TN12. There were holes identified within the structure of the building within the site boundary. These are referenced to in the Bat Building and Tree Assessment Results on Page 16.

Site Evaluation	The site is deemed to have low ecological value. The existing buildings' walls and roofs were inspected where possible for protected species such as birds and bats. There were features present on the site suitable for nesting birds and roosting bats, and within the zone of influence, on Reading School Morgan Road Paying Fields, for reptiles. However, as the planned work is expected to be of relatively small scale and maintained within the boundary of the site, it is unlikely to have a significant effect on the ecological value of the Reading School Morgan Road Playing Fields.
Drinking Water Safeguard Zones	The site falls witih a Drinking Water Safeguard Zone designated as at risk from Benzo-A-Pyrene, Nitrite, 2-4 D, Carbetamide, Chlorthal, Chlorotoluron, Glyphosate, MCPA, Mecoprop, Metaldehyde, Metazachlor, Propyzamide and Quinmerac. It is assumed that standard pollution prevention measures will be implemented during construction. These include measures that follow the Environment Agency Pollution Prevention Guidelines/Guidance on Pollution Prevention and the Construction Industry Research and Information Association (CIRIA) guidance on the control of water pollution from construction sites.
Impacts on designated sites	There are no statutory sites within 1km of the development site – it is therefore unlikely that any will be affected as part of the works. The site does within an SSSI Impact Zone. However, the proposed work does not fall into any of the at-risk categories for this SSSI Impact Zone. As such, it is unlikely that Natural England need to be contacted regarding likely impacts on SSSIs. There are three non-statutory designated sites within 1km of the site. However, all of these are over 650m from the site. Given the small scale of the works and physical separation of the site from these non-statutory designated sites, it is believed that there will be a negligible effect on non-statutory designated sites as a result of the development. Whilst the site is within an urban setting, there are areas of greenspace nearby, mostly consisting of amenity grassland habitat. These include playing fields at Reading School Main School Site, 395m east, and small areas of amenity grassland within University of Reading London Road Campus such as adjacent to the east of the site and Reading School Morgan Road Playing Fields adjacent to the south east of the site. Given the small scale of the works and (with exception Reading School Morgan Road Playing Fields) physical separation of the site from these green spaces, it is believed that there will be a negligible effect on these areas as a result of the development.

Reptiles	The Reading School Morgan Road Playing Fields contains two small areas of unmanaged scrub which provide small pockets of suitable habitat for reptiles (TN8 and TN9 in the Phase 1 Habitat Plan in Appendix B). However, there is limited connectivity with similar habitats in the surrounding areas to this area site and the site itself is made up predominantly of buildings and hardstanding. It is subsequently unlikely that reptiles will be negatively impacted by the planned work on the site.
Nesting birds	Suitable bird nesting habitat was present in the form of scattered trees and introduced shrub both within the boundary of the site and within the Reading School Morgan Road Playing Fields in the Zone of Influence. Of note, two bird nests were identified within the cluster of four trees proposed to be removed on the southern boundary of the site, adjacent to the Reading School Morgan Road Playing Fields (TN6 on the Phase 1 Habitat Plan in Appendix B). Recommendations: It is recommended that demolition and vegetation clearance work are undertaken outside of the bird nesting season (March–August). If works are scheduled to take place within the bird nesting season, an ecologist should visit to inspect the site within 24 hours prior to clearance to confirm the presence/absence of nesting birds. If birds are found to be nesting, then works in the area around the nest must be delayed until after the young have fledged.

Bat Building and Tree Assessment Results

Bats are likely to use green spaces, such as the Reading School Morgan Road Playing Fields, in the area for foraging.

There was one building (B1 on the Phase 1 Habitat Plan in Appendix B, the main school building) within the site boundary and one small metal storage container on the Reading School Morgan Road Playing Fields (B2 on the Phase 1 Habitat Plan in Appendix B), within the Zone of Influence.

The main school building, B1, was generally in a good state of repair. However, three holes were identified in the brick work of the building. The first two of these were in the western courtyard, next to an entrance to the building (TN3 on the Phase 1 Habitat Plan in Appendix B). Whilst the first, lower positioned, of these was superficial and categorised as providing negligible potential to support roosting bats, it was not possible to see the higher positioned one clearly enough to categorise it as negligible with certainty. However, there is no construction work planned for this area of the site. It is subsequently unlikely that any potential bat roosting features in this position would be negatively affected by the current proposals.

The Third hole in the brickwork was on the south eastern end of the building (TN5 on the Phase 1 Habitat Plan in Appendix B). This hole was very low down and unlikely to support roosting bats, subsequently being classed as providing negligible potential to support roosting bats.

The small metal storage container, B2, on the Reading School Morgan Road Playing Fields was inspected and found to be well sealed, offering no cracks or crevices suitable for the entry of bats. B2 was subsequently categorised as providing negligible potential to support roosting bats.

The cluster of four trees proposed to be removed on the southern boundary of the site, adjacent to the Reading School Morgan Road Playing Fields (TN6 on the Phase 1 Habitat Plan in Appendix B) had dense ivy cover. Whilst this is not a feature in itself, it can mask features underneath which may provide potential to support roosting bats. Of these four trees, the westernmost was the largest, with the densest ivy cover, and can be categorised as providing low potential to support roosting bats.

Bat Building and Tree Assessment Results (continued)

A tree cluster with dense ivy coverage, of predominantly silver birch tree species, is located on the south eastern corner of the Reading School Morgan Road Fields, outside the site boundary but within the Zone of Influence (TN13 on the Phase 1 Habitat Plan in Appendix B). Due to the distance of these trees from the site and the small scale and localised nature of the proposed works, it is not anticipated that these trees, or their potential to support roosting bats, will be affected by any of the proposed development at the Abbey Senior School.

Recommendations:

Following BCT survey guidelines, it is recommended that a minimum of one dusk emergence survey to identify whether any of the four trees on the southern boundary of the site are being used by bats. This survey should be carried out in good weather between the months of May and August. Two ecologists equipped with recordable detectors should survey and record the number, species and direction of flight of any bats observed emerging from or entering the trees. On a precautionary basis it is recommended that if these trees are felled, they should be subject to a soft felling exercise undertaken by a suitably qualified contractor. This would involve the stepwise and careful removal of limbs in a methodical manner. In the very unlikely event that a bat is encountered, all works should cease, and advice sought from a suitably qualified ecologist.

However, is advised that night-time work, using artificial lighting, is avoided. Where this is not possible, construction lighting should be minimised and directed away from trees, shrubs and other natural habitats, to minimise disturbance to notable species, such as bats, which may be using habitats within or adjacent to the site.

Recommendations for Ecological Enhancement

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Ecological Enhancements

To ensure the proposed development improves the current ecological value of the site, the proposals should include a number of ecological enhancements. This is to ensure the ecological value found on the existing site is mitigated against, and the development contributes to the greening of the borough and an increase in biodiversity, whilst contributing to the requirements set out in Reading Borough Council local biodiversity policies.

Recommendations include:

- Incorporation of a Biodiverse Green Roof
- Installation of at least three bird nesting boxes on the site
- Installation of at least two bat boxes on the site
- External lighting in line with BCT guidelines
- Incorporation of native or fruiting and flowering plant species
- Incorporation of a stag beetle loggery/reptile habitat feature
- Hedgehog corridors

Biodiverse Green Roof

In line with the current proposed plans for the development, it is recommended that an extensive biodiverse roof with an area of 492m^2 is installed. A light weight pre-grown 'wildflower blanket' will be installed over a substrate base with a depth of around 80mm, with a species diversity of over 20 species.

The wildflowers and herbs incorporated into the blanket will provide a viable and vibrant plant community in blanket format for instant greening of a biodiverse green roof. Native UK species will be used, to suit the green spaces to local populations of invertebrates.

The substrate depth of the roof should vary between 80–150mm to create varying microclimates across the roof. If possible, areas of bare shingle or bare sand should be incorporated into the green roof's landscaping in order to provide habitat for burrowing invertebrates and foraging birds. Crushed brick and other non-contaminated aggregates can also be placed in small piles on the roof to create a mosaic of habitats across the roof.

The installation of this green roof is in line with Reading's biodiversity policy and its aims to increase the amount of green infrastructure across the borough. The green roof will attract a diversity of invertebrates, and other fauna such as foraging bat and bird species, would be attracted to a roof featuring an abundance of wildflowers.

Bird boxes

It is recommended that at least three bird boxes are installed on the site. These should contain a mix of 26mm hole boxes for tits and robins and open-fronted boxes for larger birds such as thrushes.

Boxes should be fixed two to four metres on a tree or facade, out of the reach of predators such as domestic cats. Unless there are trees or buildings, which give permanent shelter, it is best facing between north and east.

Bat boxes

To support local bat populations, it is recommended that at least two bat boxes or bricks are installed on the façades of the building.

The boxes should be made from untreated wood or 'woodcrete' (a mixture of wood shavings and cement). Schwegler 1FF or Schwegler 2F bat boxes are recommended as they are likely to be of interest to a wide range of species and they typically have longer lifespans than wooden boxes (example images are given below). Bat boxes should be placed at a minimum of 4m, preferably 5-6m, off the ground.

Alternatively, a bat brick can provide internal roost space, and can be incorporated into the fabric of a building as it is built or renovated. A variety of facings can be fitted to suit any existing brick, wood, stonework, or rendered finish, rendering the box unobtrusive.

External lighting in line with the BCT guidelines

Bats are likely to use green spaces in the area for foraging such as the Reading School Morgan Road Playing Fields, in the area for foraging.

It advised that night-time construction work, using artificial lighting, is avoided. Where this is not possible, construction lighting should be minimised and directed away from trees, shrubs and other natural habitats, to minimise disturbance to notable species, such as bats, which may be using habitats within or adjacent to the site. To reduce the impact on bats of any new external lighting that will be installed on the site for post construction uses, the building's external lighting should be designed in line with the Bat Conservation Trust's "Bats and Lighting in the UK" guideline, to reduce the impact the development has on bat populations. These guidelines have been summarised in Appendix C of this report.

Native plants	Where new planting is installed, this should include native species or species of benefit to wildlife. Planting should include a diverse mix of species, including a variety of fruiting and flowering species, grasses and herbaceous plants to provide a nectar source and overwintering habitat for invertebrates and in turn a foraging habitat for birds. The planting should be biased towards (and preferably exclusively) wildlife-friendly species, such as the following: Beech Fagus sylvatica, box *Buxus sempervirens*, lavender *Lavendula angustifolia*, hazel *Corylus avellana*, common dogwood *Cornus sanguinea*, wild privet *Ligustrum vulgare*, holly *Ilex aquifolium*, blackthorn *Prunus spinosa*, ivy *Hedera helix*, hawthorn *Crataegus monogyna*, guelder rose *Viburnum opulus*, honeysuckle *Lonicera periclymenum*, dog rose *Rosa canina*, heather *Calluna vulgaris*, viper's burgloss *Echium vulgare*, primrose *Primula vulgaris*, daffodil *Narcissus pseudonarcissus*, wood anemone *Anemone nemorosa*. Night scented plants may also be beneficial to attract insects and in turn bats. Species such as evening-primrose *Oenathera biennis*, night-scented stock *Mattiola bicornia*, lemon balm *Melissa officinalis*, borage *Borago officinalis*, may be appropriate for this purpose.
Stag beetle loggery/ Reptile habitat feature	Stag beetles are known to be found in Berkshire, and records within close vicinity of the site were returned by TVERC. These are a priority species in the UK BAP. Stag beetles rely on decaying wood that is in contact with the soil, both to feed on as larvae and in which to lay their eggs. A log pile could be incorporated into the site. This feature can also act as refugia for reptiles such as slow worms and common lizard. Hardwoods such as oak, beech, sycamore or ash are recommended with the bark still attached and should be piled up and left to decay naturally. Alternatively, logs from any trees that are being removed from the site could be retained and used for this purpose. The feature should be left in a quiet area of the site, ideally within or near dense vegetation.
Hedgehog corridors	Hedgehogs can roam an average distance of 2km on a single night, therefore maintaining corridors and connectivity is of benefit to the hedgehog population. Creation of a hedgehog holes, a 13cm square gap in the boundary fence or wall at the garden will enable hedgehogs to pass through the Site and provide increased connectivity of the habitat. A part of the redeveloped site could be less formally managed and left 'overgrown' to provide potential nesting and hibernation areas for hedgehogs.

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BREEAM 2018 Ecology Credit Assessment

Preliminary Ecological Appraisal

The Abbey Senior School

Introduction

The assessment of the BREEAM 2018 Land Use and Ecology criteria via Route 2 has been selected by the design team and a Suitably Qualified Ecologist has undertaken an ecological survey of the site and identified ecological constraints and opportunities.

The BREEAM 2018 Land Use and Ecology criteria have been reviewed. Advice and recommendations have been provided in regard to the following: protection of the features, enhancing site ecology and long-term impact on biodiversity.

The anticipated BREEAM 2018 New Construction credits can be summarised as follows:

LE 02 – Identifying and understanding the risks and opportunities for the project

Two out of two credits to be awarded

LE 03 – Managing Negative Impacts on Ecology

Three out of three credits to be awarded

LE 04 – Change and enhancement of ecological value

Three out of four credits to be awarded and an exemplary credit (where the ecologist's recommendations are adopted).

LE 05 – Long Term Ecology Management and Maintenance

Two out of two credits to be awarded (where the building manager commits to maintain the site's proposed ecological features)

Pre-requisite criteria	
Assessment route selection	The BREEAM Guidance Note GN34 BREEAM Ecological Risk Evaluation Checklist was consulted by the design team and ecologist. The assessment of the BREEAM 2018 Land Use and Ecology criteria under Route 2 has been selected, i.e., a Suitably Qualified Ecologist has undertaken an assessment of the site and identified ecological constraints and opportunities for the site. The GN34 BREEAM Ecological Risk Evaluation Checklist therefore does not need to be completed for this assessment. This pre-requisite for the Land Use and Ecology credits has been met.
Compliance with legislation	To gain Land Use and Ecology credits, the client or contractor is required to confirm that compliance will be monitored against all relevant UK and EU or international legislation relating to the ecology of the site. The site has been assessed potential for protected species such as bats and nesting birds, and invasive species such as Japanese knotweed. There are features on the site that could accommodate nesting birds and roosting bats and relevant legislation has been provided to the client within this report. This pre-requisite for the Land Use and Ecology credits has been met.
LE 02 – Identifying and understanding the risks and opportunities for the project	
Survey and evaluation	A Suitably Qualified Ecologist was appointed at the early design stage of the project (RIBA Stage 2), in order to identify the ecological constraints and opportunities for the site. A Phase 1 habitat survey and protected species assessment was carried out to determine the ecological baseline of the site and its 'zone of influence'. The zone of influence is defined as areas of land or water bodies impacted by the site undergoing assessment – these areas can be adjacent to the site or can be areas that are dependent on the site but not physically linked, including areas downstream from a site. Areas within the zone of influence can be negatively affected by changes on an assessment site but they also provide further opportunity to maximise enhancement activities. Results of the survey can be found in the 'Survey Results' section above.

Survey and evaluation

The following information was determined and considered when deciding the ecological outcomes for the site.

Survey

Criteria	Comments
Zone of influence.	Site boundary + 10m radius (due to the potential increased noise/pollution during construction). Includes roads, vegetation and buildings adjacent to the site.
Current flora, fauna (including permanent and transient species) and habitat characteristics.	Site dominated by building and hardstanding habitat.
Habitat extent, quality, connectivity and fragmentation.	Buildings in good state of repair with limited potential to support protected species.
Recent and historic site condition.	N/A
Existing management and maintenance levels and arrangements.	The site is in a very good state of repair, suggesting it is well managed.
Existing ecological initiatives within the zone of influence.	N/A – no ecological initiatives present within site or zone of influence
Identification of, and consultation with, relevant stakeholders impacted or affected by the site.	N/A
Local knowledge or sources of information.	Desktop study data from TVERC, Reading Biodiversity Action Plan, The Natural Environment in Berkshire – Biodiversity Strategy 2014 – 2020, Reading Borough Local Development Framework – Core Strategy, MAGIC

Survey and evaluation (continued)

Evaluation

Criteria	Comments
Current value/condition of features including habitats, species, food sources and connectivity.	Poor – limited flora and no fauna present within the site boundary
Current value/condition of broader biodiversity and ecosystem services benefits or opportunities.	The Reading School Morgan Road Playing Fields provide suitable habitat for both bats and birds.
Direct/indirect risks to current ecological value.	N/A – currently low ecological value.
Capacity and feasibility to enhance the ecological value.	Moderate – can create artificial roosting spaces, green infrastructure e.g. green roof.
Habitat restoration and creation potential.	Moderate – can create artificial roosting spaces, green infrastructure e.g. green roof.
Impact of the proposed design, construction works and operations on site.	Negligible impact on ecology.

An ecologist has visited the site and evaluated the constraints and opportunities for the site, feeding back to the design team. One credit can be awarded for LE 02.

Determining ecological outcomes for the site

The ecological information for the site was analysed, and the following action plan was created to give the best ecological outcomes for the site;

Action	Comments
Avoidance	N/A – no ecological features requiring avoidance present.
Protection	N/A – no ecological features requiring protection present.
Reduction or limitation of negative impacts	N/A – no ecological features requiring reduced/limited impacts present.
On site compensation	N/A – no ecological features requiring protection present.
Enhancement	Artificial nesting sites and green infrastructure to be implemented.

The ecological outcome for the site has been determined in accordance with the BRE's Strategic Ecological Framework's hierarchy of action. One further credit can be awarded for LE 02

LE 03 Managing Negative Impacts on Ecology

Planning, liaison and implementation

The ecologist has had discussions with the design team to ensure that features of ecological value within the site and zone of influence are protected. The potential impact of site preparation and construction works on ecology were identified at an early project stage to optimise benefits and outputs.

There are no features of significant ecological value present on the site. A cluster of four trees on the southern boundary of the site, proposed to be removed, have been assessed by an arboriculturalist.

Consultation with the design team and other stakeholders has occurred. One credit can be awarded for LE 03.

Managing negative impacts of the site / project

The site and zone of influence has been deemed to have low ecological value – there is potential for both nesting birds and roosting bats within the site boundary. Negative impacts from site preparation and construction works are to be managed according to the hierarchy set out within LE 02. No net loss of ecological value will occur on the site and zone of influence.

No net loss of ecological value will occur on the site. Two further credits for LE 03 can therefore be awarded.

LE 04 Change and enhancement of ecological value	
Liaison, implementation and data	The ecologist and design team have discussed and decided on a number of ecological enhancements for the site. The enhancements are to benefit local wildlife populations, in line with Reading's biodiversity policies and Biodiversity Action Plan. These recommendations include; • Incorporation of a Biodiverse Green Roof • Installation of at least three bird nesting boxes on the site • Installation of at least two bat boxes on the site • External lighting in line with BCT guidelines • Incorporation of native or fruiting and flowering plant species • Incorporation of a stag beetle loggery • Hedgehog corridors No priority species were recorded on the site; therefore data has not been fed back to the local environmental records centre (TVERC). Locally relevant ecological enhancements have been incorporated into the site. *One credit can be awarded for LE 04.*
Change and enhancement of ecology	Up to three credits can be awarded based on the calculation of the change in ecological value occurring as a result of the project. This must be calculated in accordance with the process set out in GN36 – BREEAM, CEEQUAL and HQM Ecology Calculation Methodology – Route 2. The calculation assesses the site's existing and proposed ecological value as biodiversity units, and accounts for linear and area-based habitats separately. Please see Appendix G for full details of the calculation methodology. The changes in the site's habitats are the following; Installation of 492m^2 extensive green roof on the proposed new dining room building's roof. Using the BREEAM, CEEQUAL and HQM Ecology Calculation Methodology, an increase in ecological value has been achieved on the site (366%) – two further credits can therefore be awarded.

LE 05 Long Term Ecology Management and Maintenance

Planning, liaison, data, monitoring and review management and maintenance	The design team are committed to monitoring and reviewing the effectiveness with which the plans for LE 03 & LE 04 are implemented. The end user of the building will be responsible for carrying out maintenance actions on the scheme. If the landscape and ecology management plan is accurately followed, and the maintenance actions are performed correctly, the features will continue to provide considerable ecological value and support local wildlife populations. The features will link to the area's ecosystem services, such as pollination, climate regulation, and flood control. A section on ecology and biodiversity will be included within the tenant or building owner information pack, to inform of local ecological features, value and biodiversity on or near the site. This information pack should include the following content: • Details of the ecological value within the property boundary (e.g. public and private gardens, green roofs), common areas (e.g. communal garden), and the surrounding area (e.g. public recreational space). • The benefits of the ecological value to the occupants and the broader community. • Highlight relevant actions that can be taken to enhance value within the property that is owned or occupied to help ensure its ongoing management and maintenance. • Contact details for those responsible for the management and maintenance of the local ecology and sources of local information on biodiversity and ecological management including management companies and local wildlife trusts. The site's ecological features will be managed and maintained throughout the course of the building's lifetime. One credit can be achieved for LE 05.
Landscape and ecology management plan	A landscape and ecology management plan has been produced in accordance with BS 42020:2013 Section 11.1, which contains the following: • Actions and responsibilities, prior to handover, to give to relevant individuals • The ecological value and condition of the site over the development life. • Identification of opportunities for ongoing alignment with activities external to the development project and which supports the aims of BREEAM's Strategic Ecology Framework • Identification and guidance to trigger appropriate remedial actions to address previously unforeseen impacts • Clearly defined and allocated roles and responsibilities. The landscape and management plan should be updated as appropriate to support maintenance of the ecological value of the site. A landscape and ecology management plan has been produced for the site. A further credit can be achieved for LE 05.

Conclusions
Preliminary Ecological Appraisal
The Abbey Senior School

Conclusions

A site survey was undertaken at The Abbey Senior School in Reading, Berkshire, to review the ecology of the site and undertake a Phase 1 habitat survey and bat building and tree assessment to inform the site's planning application in addition to Ecology credit allocation within a BREEAM 2018 New Construction assessment.

The site was found to have some limited ecological value in the form of nesting habitat for birds, and roosting habitat for bats. However, more suitable habitat for both nesting birds and roosting, foraging and commuting bats is available in the adjacent Reading School Morgan Road Playing Fields. As the planned work is expected to be of relatively small scale and maintained within the boundary of the site, it is unlikely to have a significant effect on this area. The development is expected to have little impact on statutory sites near to the development. Reading Borough Council Local Policy and compliance with EU & UK legislation for protected species is also reviewed and discussed.

The BREEAM 2018 Assessment Land Use and Ecology credits section, details the BREEAM guidelines for each credit (New Construction: LE 02 – LE 05) and demonstrates compliance using information gathered at the site visit. This covers aspects of ecological value of land and protection of ecological features, mitigating ecological impact, enhancing site ecology and providing long-term impact on biodiversity.

Recommendations have been made to mitigate any impact from the development and ensure that the site is enhanced for wildlife and a gain for biodiversity in line with national and local policy.

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Validation & Document References

Preliminary Ecological Appraisal

The Abbey Senior School

Site survey and report produced by Gemma Golding:	
Ecologist's Qualifications:	MSc – Ecology and Evolutionary Biology BSc – Zoology
Evidence of practicing Ecologist	Eight Associates, Ecologist and Sustainability Consultant, conducting habitat and protected species surveys (2019 to present date); Atkins, Assistant Ecologist. habitat and protected species surveys (2018 – 2019); Jacobs, Seasonal Ecologist, protected species surveys (2018).

Site survey and report verified by Stacey Cougill:	
Ecologist's Qualifications:	BSc – Environmental Science MSc – Conservation Biology UCert – Species Identification and Biological Recording
Evidence of practicing Ecologist	Eight Associates, Sustainability Consultant specialising in Ecology (2011 to present date), Open University, iSpot, Biodiversity Mentor (2009 – 2012) and Westminster City Council, Biodiversity Project Manager (2007–2010).
Professional Code of Conduct	I am a full member of the Chartered Institute of Ecology and Environmental Management.

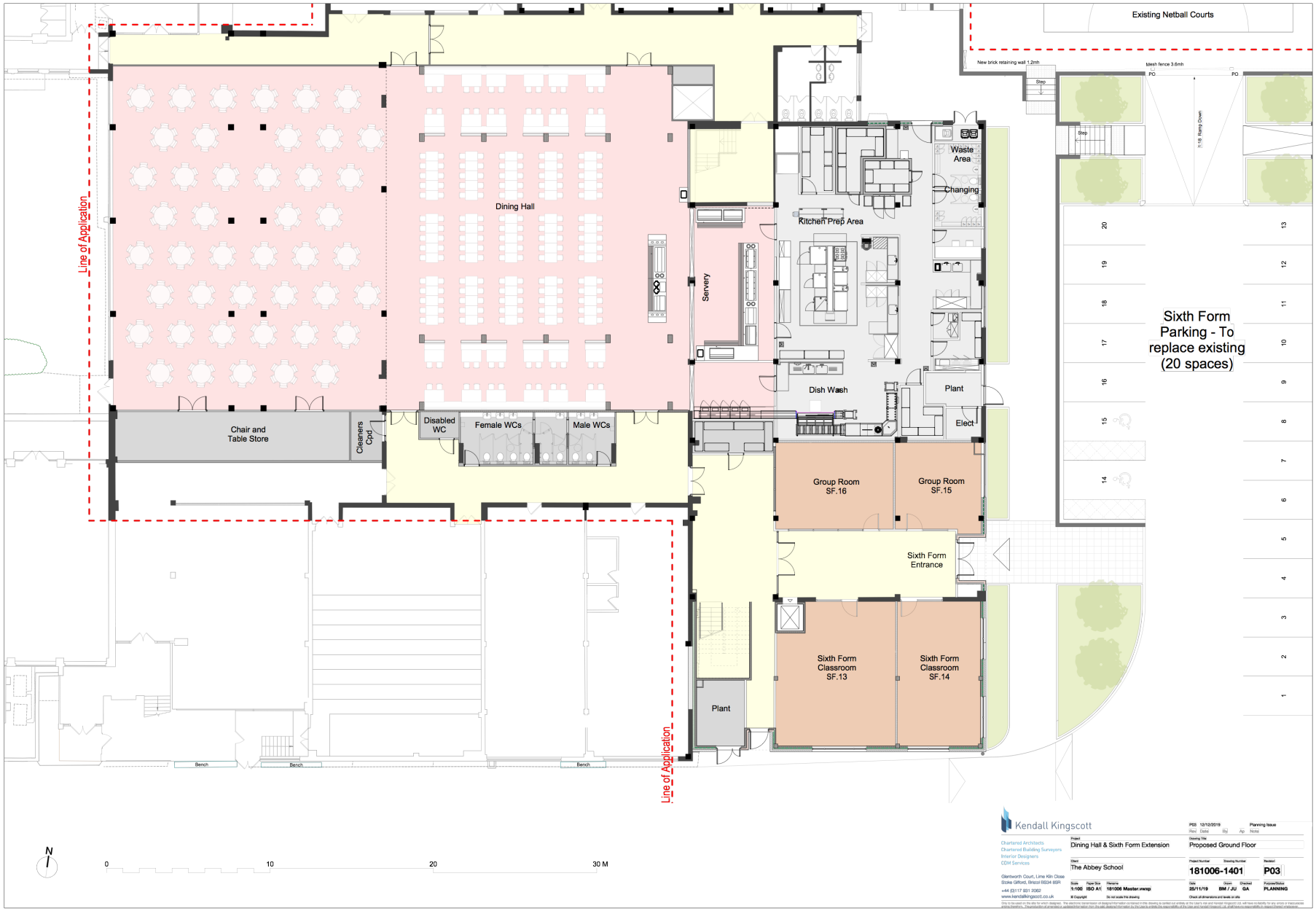
Validation	
I confirm the information provided in this document is truthful and accurate at the time of completion.	
Suitably Qualified Ecologist	Stacey Cougill
Signature of Ecologist	SC
Date	18/12/2019

Document	Reference
Photos taken by Gemma Golding during the site survey	19th November 2019
Phase 1 Habitat Plan	Created by Gemma Golding using QGIS 3.8. Base map: OpenStreetMap, November 2019

Appendix A: Site Plans

Preliminary Ecological Appraisal

The Abbey Senior School


Existing Netball Courts
New brick retaining wall 1.2mh
Mesh fence 3.6mh
PO
PO
Step
Step
1:15 Ramp Down
Line of Application
Dining Hall
Servery
Kitchen Prep Area
Waste Area
Changing
Dish Wash
Plant
Elect
Chair and Table Store
Cleaners Cpd
Disabled WC
Female WCs
Male WCs
Group Room SF.16
Group Room SF.15
Sixth Form Entrance
Sixth Form Classroom SF.13
Sixth Form Classroom SF.14
Plant
Line of Application
Sixth Form Parking - To replace existing (20 spaces)
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
1
Bench
Bench
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30 M
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Interior Designers
CDM Services
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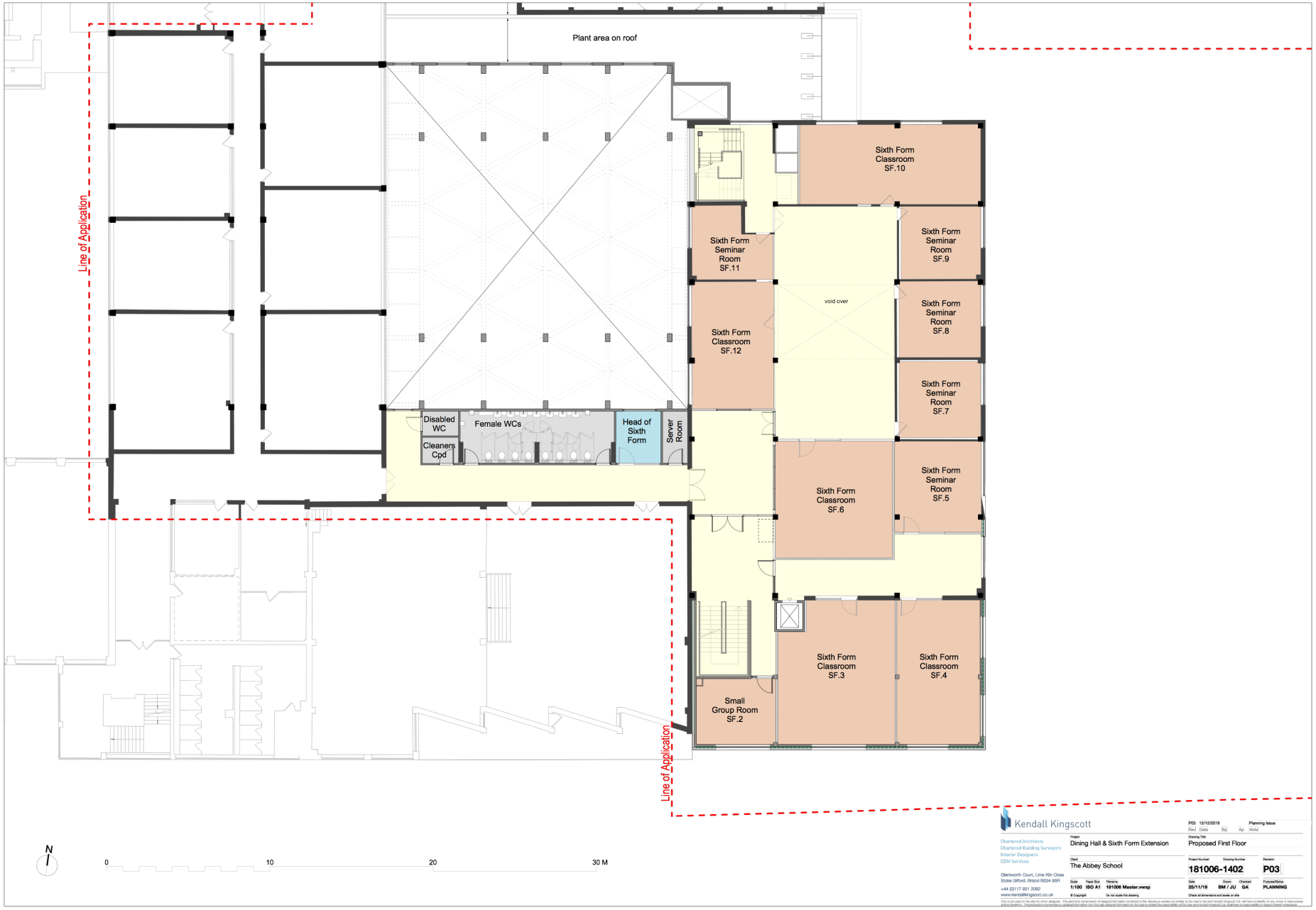
P03 12/12/2019 Planning Issue
Rev Date By Ap Note
Project
Dining Hall & Sixth Form Extension
Drawing Title
Proposed Ground Floor
Client
The Abbey School
Project Number
181006-1401
Drawing Number
Revision
P03
Scale
1:100
Paper Size
ISO A1
Filename
181006 Master.vwxp
Date
25/11/19
Drawn
BM / JU
Checked
GA
Purpose/Status
PLANNING
© Copyright
Do not scale this drawing
Check all dimensions and levels on site


Plant area on roof
Line of Application
Sixth Form Classroom SF.10
Sixth Form Seminar Room SF.11
Sixth Form Seminar Room SF.9
void over
Sixth Form Seminar Room SF.8
Sixth Form Classroom SF.12
Sixth Form Seminar Room SF.7
Disabled WC
Female WCs
Head of Sixth Form
Server Room
Cleaners Cpd
Sixth Form Classroom SF.6
Sixth Form Seminar Room SF.5
Sixth Form Classroom SF.3
Sixth Form Classroom SF.4
Small Group Room SF.2
Line of Application
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30 M
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CDM Services
Glentworth Court, Lime Kiln Close
Stoke Gifford, Bristol BS34 8SR
+44 (0)117 931 2062
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P03 12/12/2019 Planning Issue
Rev Date By Ap Note
Project: Dining Hall & Sixth Form Extension
Drawing Title: Proposed First Floor
Client: The Abbey School
Project Number: 181006-1402
Drawing Number: P03
Revision:
Scale: 1:100
Paper Size: ISO A1
Filename: 181006 Master.vwxp
Date: 25/11/19
Drawn: BM / JU
Checked: GA
Purpose/Status: PLANNING
© Copyright
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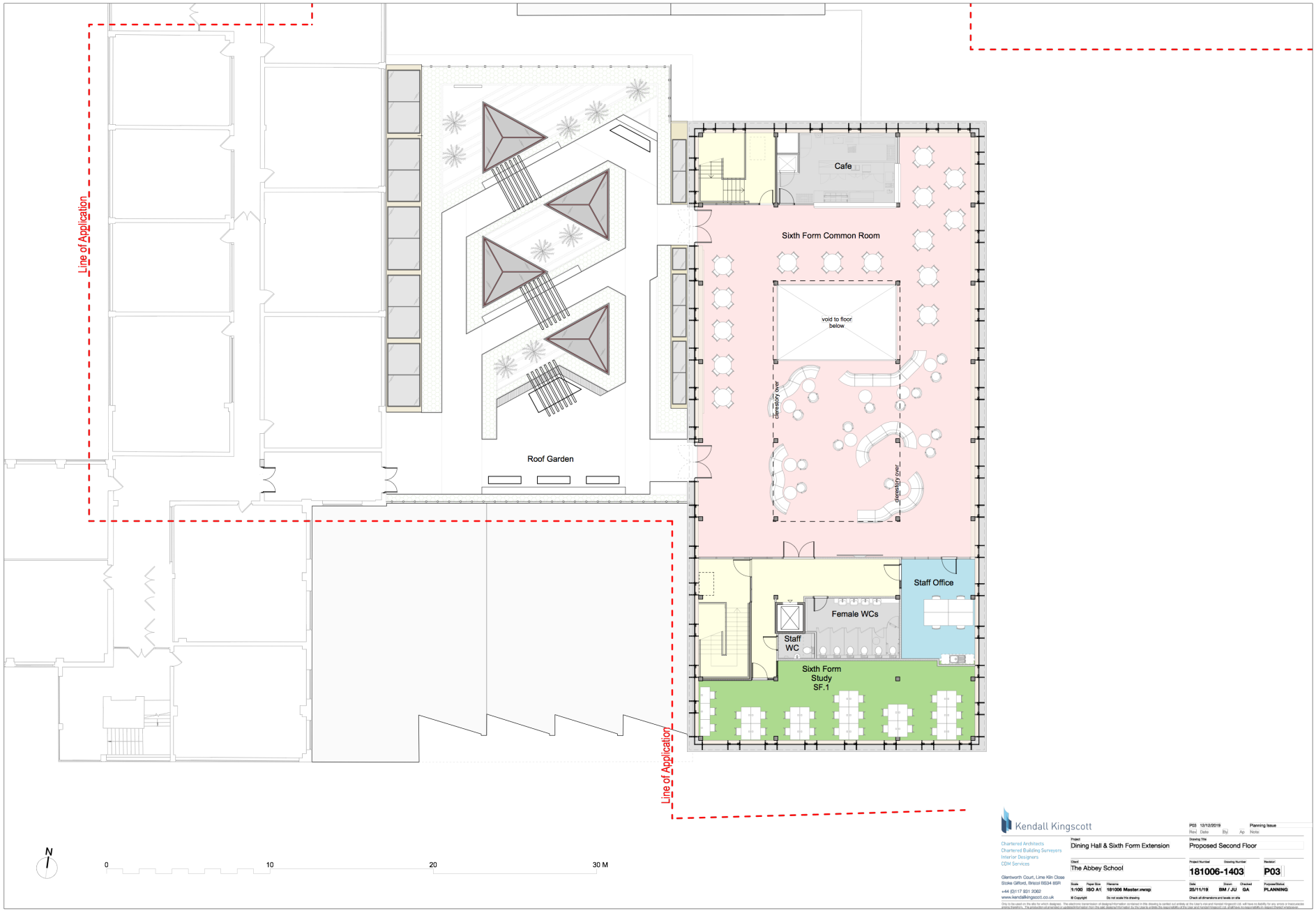
Check all dimensions and levels on site



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Rev	Date	By	Ap	Note
P03	12/12/2019			Planning Issue

Project: Dining Hall & Sixth Form Extension

Drawing Title: Proposed Second Floor

Client: The Abbey School

Project Number: 181006-1403

Drawing Number: P03

Revision:

Scale	Paper Size	Filename	Date	Drawn	Checked	Purpose/Status
1:100	ISO A1	181006 Master.vwxp	25/11/19	BM / JU	GA	PLANNING

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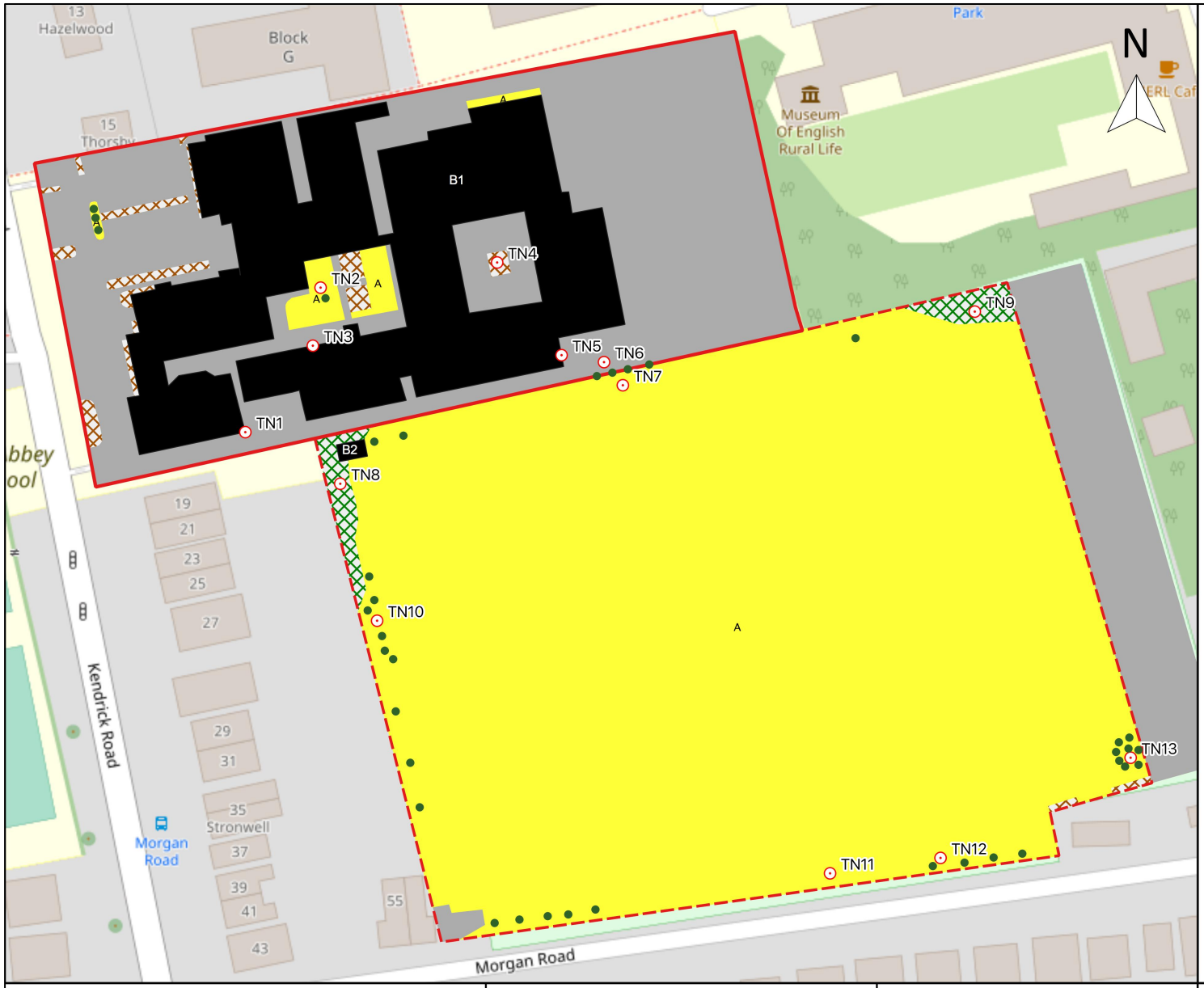
Appendix B: Phase 1 Habitat Plan

Preliminary Ecological Appraisal

The Abbey Senior School



Legend

- Site Boundary
- Zone of Influence
- Target notes
- Buildings
- Hardstanding
- Dense Scrub
- Introduced Shrub
- Amenity Grassland
- Trees

Basemap: OpenStreetMap

0 25 50 m

Contains OS data © Crown Copyright [OS Open Map - Local] (2019)

Title: Phase 1 Habitat Plan	Prepared by: Gemma Golding	Date: 26/11/2019
Project: The Abbey School	Quality Assured by: Stacey Cougill	Scale: 1:1500

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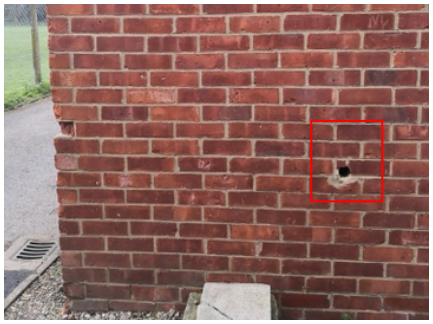
Appendix B: Phase 1 Habitat Plan

Preliminary Ecological Appraisal

The Abbey Senior School

Target notes (TN) were used to illustrate ecological features on the Phase 1 Habitat Plan. Below a description and images of each TN is provided.

Target Note	Description	Photograph
TN1	A gap in the southern façade of the main school building, B1. Whilst this gap could provide potential for roosting bats, it is far enough away from the planned works to be considered unlikely to be affected by the work. However, if this area is used as an access point to where the work will be carried out, it is advised that night-time work, using artificial lighting, is avoided.	
TN2	A magnolia *Magnolia sp.* Tree, categorised as providing negligible potential to support roosting bats, is located within the western courtyard within B1, adjacent to the rose garden.	
TN3	Two holes are located next to an entrance to the building within the western courtyard of B1 (TN3 on the Phase 1 Habitat Plan in Appendix B). Whilst the first, lower positioned, of these was superficial and classified as providing negligible potential to support roosting bats, it was not possible to see the higher positioned one clearly enough to classify it as negligible with certainty. However, work is not planned in this area of the school and any possible features here are unlikely to be negatively affected by the work.	

Target Note	Description	Photograph
TN4	The eastern courtyard within B1 comprises predominantly of hardstanding, with a central planter containing introduced shrub. This is where the proposed new dining hall will be located, with green roof above.	
TN5	There was a hole in the brickwork on the south eastern façade of the building (TN5 on the Phase 1 Habitat Plan in Appendix B). This hole was very low down and unlikely to support roosting bats, subsequently being classed as providing negligible potential to support roosting bats.	
TN6	There are four trees proposed to be removed on the southern boundary of the site, adjacent to the Reading School Morgan Road Playing Fields. Images a) – d) in the right hand column illustrate these; a) A photo taken of the four trees from within the Reading School Morgan Road Playing Fields, south of the boundary.	 a)

Target Note	Description	Photograph
TN6 (continued)	b) The two central trees in this cluster contain old bird nests. c) A photo taken of the trees from within the site boundary, with the western most tree closest to the camera. The dense ivy cover present on this tree cluster is visible in this image. Whilst this is not a feature in itself, it can mask features underneath which may provide potential to support roosting bats. Of these four trees, the westernmost was the largest with the densest ivy cover and can be classifies as providing low potential to support roosting bats d) A photo of the four trees from within the site boundary facing west. This image shows how close the building which is undergoing an extension is to the tree cluster.	 b) c) d)

Target Note	Description	Photograph
TN7	A potential mammal hole was identified on the southern boundary of the site. No further evidence was recorded here, and the spoil did not appear to lead anywhere further.	
TN8	An area of dense scrub was recorded in the north west corner of the Reading School Morgan Road Playing Fields, outside the site boundary but within the Zone of Influence. This parcel of habitat provides a small pocket of suitable habitat for reptiles.	
TN9	An area of dense scrub was recorded in the north east corner of the Reading School Morgan Road Playing Fields, outside the site boundary but within the Zone of Influence. This parcel of habitat provides a small pocket of suitable habitat for reptiles.	

Target Note	Description	Photograph
TN10	A cluster of immature silver birch trees on the western boundary of the Reading School Morgan Road Playing Fields.	
TN11	A potential mammal hole was identified near the southern boundary of the Reading School Morgan Road Playing Fields, outside the site boundary but within the Zone of Influence. No further evidence was recorded here, and the spoil did not appear to lead anywhere.	
TN12	A potential mammal hole was identified near the southern boundary of the Reading School Morgan Road Playing Fields, outside the site boundary but within the Zone of Influence. No further evidence was recorded here, and the dug soil did not appear to lead anywhere.	

Target Note	Description	Photograph
TN13	A tree cluster with dense ivy coverage, of predominantly silver birch tree species, was located on the south eastern corner of the Reading School Morgan Road Fields, outside the site boundary but within the Zone of Influence. Wood pigeons *Columba palumbus* were identified flying out of this tree cluster during the Phase 1 Habitat Survey.	

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Appendix C: Site Photos
Preliminary Ecological Appraisal
The Abbey Senior School

General site and building photos are included below:

Photo 1 Front entrance of the main school building, B1, on the east of the site

Photo 2 Car park with introduced shrub on the east of the site.

Photo 3 Eastern boundary of the site with mature Sycamores along Kendrick Road visible

Photo 4 Western courtyard within B1, with central magnolia tree, rose garden and amenity grassland area.

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Appendix C: Site Photos
Preliminary Ecological Appraisal
The Abbey Senior School

Photo 5 Eastern courtyard within B1, predominantly hardstanding with an area of planters containing introduced shrub in the central area.

Photo 6 Area south of B1, adjacent to the northern boundary of Reading School Morgan Road Playing Fields.

Photo 7 A small metal storage container, B2, outside of the site boundary but within the Zone of Influence, on the Reading School Morgan Road Playing Fields. The southern façade of B1 can be seen on the right hand side of the image.

Photo 8 The south eastern corner of B1 where the classroom extension is planned. An area on the eastern facade is circled, where a hole in the brickwork is located (TN5 in the Phase 1 Habitat Plan in Appendix B)

Appendix C: Site Photos
Preliminary Ecological Appraisal
The Abbey Senior School

Photo 9 Hardstanding area consisting of old tennis court east of the amenity grassland at Reading School Morgan Road Playing Fields.

Photo 10 Amenity grassland sports pitches at Reading School Morgan Road Playing Fields, in the Zone of Influence, south of the site.

Appendix D: Relevant Legislation

Preliminary Ecological Appraisal

The Abbey Senior School

Wild Birds

The Wildlife & Countryside Act 1981 (as amended) is domestic legislation for Great Britain. The Act includes the UK's domestic implementation of the species protection of the European Directive on the Conservation of Wild Birds (79/409).

Under the Wildlife and Countryside Act 1981 all birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions to intentionally:

- Kill, injure or take any wild bird.
- Take, damage or destroy the nest of any wild bird while it is in use or being built.
- Take or destroy the egg of any wild bird.
- Have in one's possession or control any wild bird (dead or alive) or any part of a wild bird that has been taken in contravention of the Act or the Protection of Birds Act 1954.
- Have in one's possession or control any egg or part of an egg that has been taken in contravention to the Act. This includes items taken or killed before the passing of the Act.
- Have in one's possession or control any live bird of prey of any species in the world (with the exception of vultures and condors) unless it is registered and ringed in accordance with the Secretary of State's regulations.
- Have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered (and in some cases ringed) in accordance with the Secretary of State's regulations.
- Disturb any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or disturb the dependent young of such a bird.

Bats

All species of bat are fully protected under the Conservation of Habitats and Species Regulations 2010. It is illegal to injure, kill, capture or disturb a bat. It is also illegal to damage, destroy or obstruct trees, buildings or other places used for roosting, even if bats are not present.

Most development and maintenance work affecting bats and / or roosts e.g. bridge / tree maintenance works, demolition, barn conversions etc., therefore require a Habitats Regulations License for work to take place legally.

All bat species are also protected under the Wildlife and Countryside Act 1981 (as amended). This means they are additionally protected from intentional or reckless disturbance, intentional or reckless obstruction of access to any place of shelter or protection; and/or, selling, offering or exposing for sale, possession or transporting for purpose of sale.

Appendix E: Artificial Lighting for Bats

Preliminary Ecological Appraisal

The Abbey Senior School

Bats and artificial lighting

Illuminating a bat roost can cause disturbance (Downs et al 2003) and this may result in the bats deserting the roost or even becoming entombed within it (Packman et al 2015). Light falling on a roost access point will at least delay bats from emerging and this shortens the amount of time available to them for foraging (Boldogh et al 2007). In addition, the associated flightpath to and from the access point is just as valuable and vulnerable as the roost itself. Severing a key flightpath some distance from the roost could cause desertion in its own right. In addition to causing disturbance to bats at the roost, artificial lighting can also affect the feeding behaviour of bats. There are two aspects to this. One is the attraction that light from certain types of light sources has to a range of insects; the other is the presence of lit conditions posing a barrier to movement.

Sources of lighting which can disturb bats are not limited to roadside or external security lighting, but can also include light spill via windows, permanent but sporadically operated lighting such as sports floodlighting, and in some cases car headlights. Additionally, glare (extremely high contrast between a source of light and the surrounding darkness – linked to the intensity of a luminaire) may affect bats over a greater distance than the target area directly illuminated by a luminaire and must also be considered on your site. Luminaires come in different styles, applications and specifications. The following should be considered when choosing luminaires.

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability
- A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012)
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- The use of specialist bollard or low-level downward directional luminaires to retain darkness above can be considered. However, this often comes at a cost of unacceptable glare, poor illumination efficiency, a high upward light component and poor facial recognition, and their use should only be as directed by the lighting professional
- Column heights should be carefully considered to minimise light spill
- Only luminaires with an upward light ratio of 0% and with good optical control should be used – See ILP Guidance for the Reduction of Obtrusive Light
- Luminaires should always be mounted on the horizontal, i.e. no upward tilt
- Any external security lighting should be set on motion-sensors and short (1min) timers
- As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

For further information on designing artificial lighting for bats, please see the Bat Conservation Trust and Institution of Lighting Professionals' Guidance Note 08/18.

Appendix F: Local Biodiversity Policy

Preliminary Ecological Appraisal

The Abbey Senior School

Reading Borough Local Development Framework – Core Strategy (Adopted 2008)

This document sets out the Reading Borough Council's adopted planning strategy for the Borough. It sets out how planning and development will achieve the Reading 2020 Vision for the town. Relevant Policies are listed below.

CS28: Loss of Open Space

Development proposals that will result in the loss of open space or jeopardise its use or enjoyment by the public will not be permitted. In exceptional circumstances, development may be permitted where it is clearly demonstrated that replacement open space, to a similar standard, can be provided at an accessible location close by, or that improvements to recreational facilities on remaining open space can be provided to a level sufficient to outweigh the loss of the open space. The quality of existing open space should not be eroded by insensitive development on adjoining land.

CS36: Biodiversity and Geology

a) Development should retain, protect and incorporate features of biodiversity or geological interest (including protected species and their habitats) found within the application site into their schemes. On sites with recognised biodiversity or geological value, development will not be permitted where there would be a direct or indirect adverse impact on the site, unless clearly demonstrated that: –
    i. The need for development clearly outweighs the need to protect the value of the site; and
    ii. Appropriate compensation, impact minimisation, mitigation and compensation are provided.
b) Local Nature Reserves and Wildlife Heritage Sites will be safeguarded and where possible, enhanced. Permission will not be granted for any development that would adversely affect a designated nature reserve or Wildlife Heritage Site.
c) Any development that would sever or threaten the integrity of an established wildlife link, as indicated on an adopted proposals map, will not be permitted. Where applicable, developments should be designed to protect, consolidate, extend and enhance the network of wildlife links and corridors in and adjoining the Borough, working with neighbouring authorities where appropriate.

CS37: Major Landscape Features and Strategic Open Space

Planning permission will not be granted for any development that would detract from the character or appearance of areas designated as a Major Landscape Feature:

- The Thames Valley;
- The Kennet and Holy Brook Meadows;
- The West Reading wooded ridgeline;
- The East Reading wooded ridgeline; and
- The North Reading dry valleys.

CS38: Trees, Hedges and Woodlands

Individual trees, groups of trees, hedges and woodlands will be protected from damage or removal, and the Borough's vegetation cover will be extended.

Appendix F: Local Biodiversity Policy

Preliminary Ecological Appraisal

The Abbey Senior School

The Natural Environment in Berkshire – Biodiversity Strategy 2014 – 2020

This report provides a statement of the current state of nature in Berkshire and a strategy for
protecting and enhancing the natural environment in Berkshire. Relevant National Outcomes hoped for as part of the strategy include:

Outcome 1 – Habitats and ecosystems on land (including freshwater habitats)

a) Better wildlife habitats with 90% of priority habitats in favourable or recovering condition and at least 50% of SSSIs in favourable condition, while maintaining at least 95% in favourable or recovering condition.
b) More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by 2020
c) At least 17% of land and inland water, especially areas of particular importance for biodiversity and ecosystems services, conserved through effective, integrated and joined up approaches to safeguard biodiversity and ecosystem services including through management of our existing systems of protected areas and the establishment of nature improvement areas;
d) Restoring at least 15% of degraded ecosystems as a contribution to climate change mitigation and adaption.

Outcome 3 – Species

We will see an overall improvement of the status of our wildlife and we will have prevented further human-induced extinctions of known threatened species.

Outcome 4 – People

Significantly more people will be engaged in biodiversity issues, aware of its value and taking positive action.

Indicators for the above outcomes have been defined nationally and are published by the Department for Environment, Food and Rural Affairs (Defra) on the gov.uk website.

Appendix F: Local Biodiversity Policy

Preliminary Ecological Appraisal

The Abbey Senior School

Reading Biodiversity Action Plan

Whilst Reading Biodiversity Action Plan was valid from 2005 – 2015, it still provides an idea of priority habitats and species within the borough. These are listed below.

Priority Habitats

- Man-made sites and structures
- Gardens, parks and similar sites
- Natural Grassland
- Parkland and veteran trees
- Ancient and/ or species-rich hedgerows
- Broad-leaved woodland (including ancient semi-natural woodland)
- Ponds (standing open water) and reedbeds
- Rivers

Species

- Black poplar
- Loddon lily
- Glow worm
- Stag beetle
- Bats
- Water vole
- Black redstart
- House Sparrow
- Sand martin
- Great crested newt
- Slow worm

Other long list species

- Bluebell
- Cowslip
- Moschatel
- Ragged robin
- Snakes head fritillary
- Wild service-tree
- Buttoned snout
- Heart moth
- Marbled white
- Stripped lychnis
- Otter
- Barn owl
- Bittern
- Bull finch
- House martins
- Kestrel
- Kingfisher
- Lapwing
- Linnet
- Little ring plover
- Nightingale
- Reed bunting
- Skylark
- Snipe
- Song thrush
- Swift
- Grass snake

eight associates

Appendix G: BREEAM Ecology Calculation

Preliminary Ecological Appraisal

The Abbey Senior School

Area based habitat:

Pre-Development Habitat	Distinctiveness	Condition	Area	Pre-D Area Biodiversity Units
Buildings and Hard Standing	Buildings and Hard Standing	Buildings and Hard Standing	13,810.00	0
Amenity Grassland	Low	Poor	364	728
Introduced Shrub	Low	Poor	353	706
Total Pre-D Area Biodiversity Units: 1,434				

Pre-Development Habitat	Distinctiveness	Condition	Area	Post-D Area Biodiversity Units
Buildings and Hard Standing	Buildings and Hard Standing	Buildings and Hard Standing	285	0
Total Post-D Area Biodiversity Units Lost: 285				

Post-development Habitat	Distinctiveness	Target Condition	Area	Risks			Pre-D Area Biodiversity Units
				Delivery	Temporal	Spatial	
Intensive Green Roof	High	Poor	195	Medium	2	Within 500m	718.15
Feature Planting (Scattered Scrub)	Medium	Poor	90	Low	5	Within 500m	302.40
Total Post-D Area Biodiversity Units Created: 1020.55							

Linear (foliage) habitat:

Linear (Foliage) Based Habitat Created or Enhanced			
Parcel Number	Habitat Type	Length (m)	Biodiversity Units
1 – Car Park	Low Evergreen Hedge (species-poor hedge)	50	50

Percentage Change Area Biodiversity Units	
(Total Post-D Area Based Biodiversity Units ÷ Total Pre-D Area Based Biodiversity Units) x 100 =	171%