



LAVERICK COTTAGE TREEHOUSE

Construction Method Statement

1044
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This method statement has been prepared to outline the indicative construction methodology of a Blue Forest treehouse.

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1.0 Introduction

DESCRIPTION OF WORKS

This Construction Method Statement (CMS) has been prepared to summarise the construction process of the proposed treehouse at land adjacent to Laverick Cottage. This construction methodology has been developed in consultation with qualified arboriculturists, ecologists, structural engineers and in compliance with British building regulations. The construction methodology outlined in this document has been employed on previous projects of a similar nature, including working in Ancient Woodland and within Listed Parkland and Registered Parks and Gardens.

This method statement should be read in conjunction with the Arboricultural Method Statements and Ecological Appraisal Reports which have been prepared for the project as part of a planning application.

Where appropriate, monitoring of works on site will be undertaken by the relevant specialist as or when necessary.

Blue Forest's treehouses are bespoke timber framed buildings with elements of steel and concrete for larger units. Construction techniques vary little from traditional timber framing methods recognised across the UK and the rest of the world. The primary structures are designed to be independent of any trees. The structure will be supported on timber posts which are founded on 'no-dig' mini screw piles.

Great care and attention is taken throughout the construction process to ensure that there is minimal impact to the trees and surrounding environment.

Sequencing of the construction phase works is summarised as follows:

- Site preparation
- Implementation of temporary site access, ground protection and the site compound
- Installation of the mini screw pile foundations
- Installation of mains services infrastructure
- Construction of deck frames and transfer platforms
- Erection of building superstructures
- Finishing works
- Landscape enhancements



2.0 Site Preparation & Access

SITE PREPARATION

Whenever possible we aim to ensure that minimal landscaping work is required when working in a woodland environment or in and around trees. Blue Forest's treehouse structures are designed to fit within a natural clearing amid the trees. The construction methodology adopted will be low impact/light touch, in order for the development to blend into the existing environment with as minimal effect on the surrounding habitat as possible.

Before works on site commence, any dead trees and shrubs or trees marked for removal will be carefully felled by a qualified arborist in line with the recommendations set out in the Arboricultural report or as part of an approved woodland management plan. Where possible, timber from the trees on site will be retained for use as part of the development or landscape enhancements.

SITE ACCESS / SOIL COMPACTION MITIGATION

Access into the woodland will be required to facilitate the installation of the treehouse.

The nature of such construction means that any risk of potential soil compaction or poaching is limited to the early stages of the project whilst the ground works are completed.

To mitigate possible ground compaction during the construction phase, designated site access routes are identified and clearly marked to ensure that site traffic (both vehicular and pedestrian) are strictly limited to approved pathways. Ground compaction and protection of tree roots along the approval access tracks is addressed in one of two ways:

1. Installation of terram, cell web and clean angular stone. (Image A)
2. Installation of temporary track way or protective ground mats on a layer of woodchip. (Image B)

Where permanent pathways are required for operational purposes, the cellweb and stone will be retained and finished with a permeable wearing course of natural self binding material such as hoggin. This offers effective, durable ground protection and ground compaction mitigation as well as providing an above ground layer in which mains services and utilities can be contained without the need for excavation within the woodland. Please refer to the architectural information for more details on the proposed service infrastructure installation. Once the ground protection works are completed, the subframe or raised deck is quickly erected and from this point onwards, the platform of the treehouses become the working area.

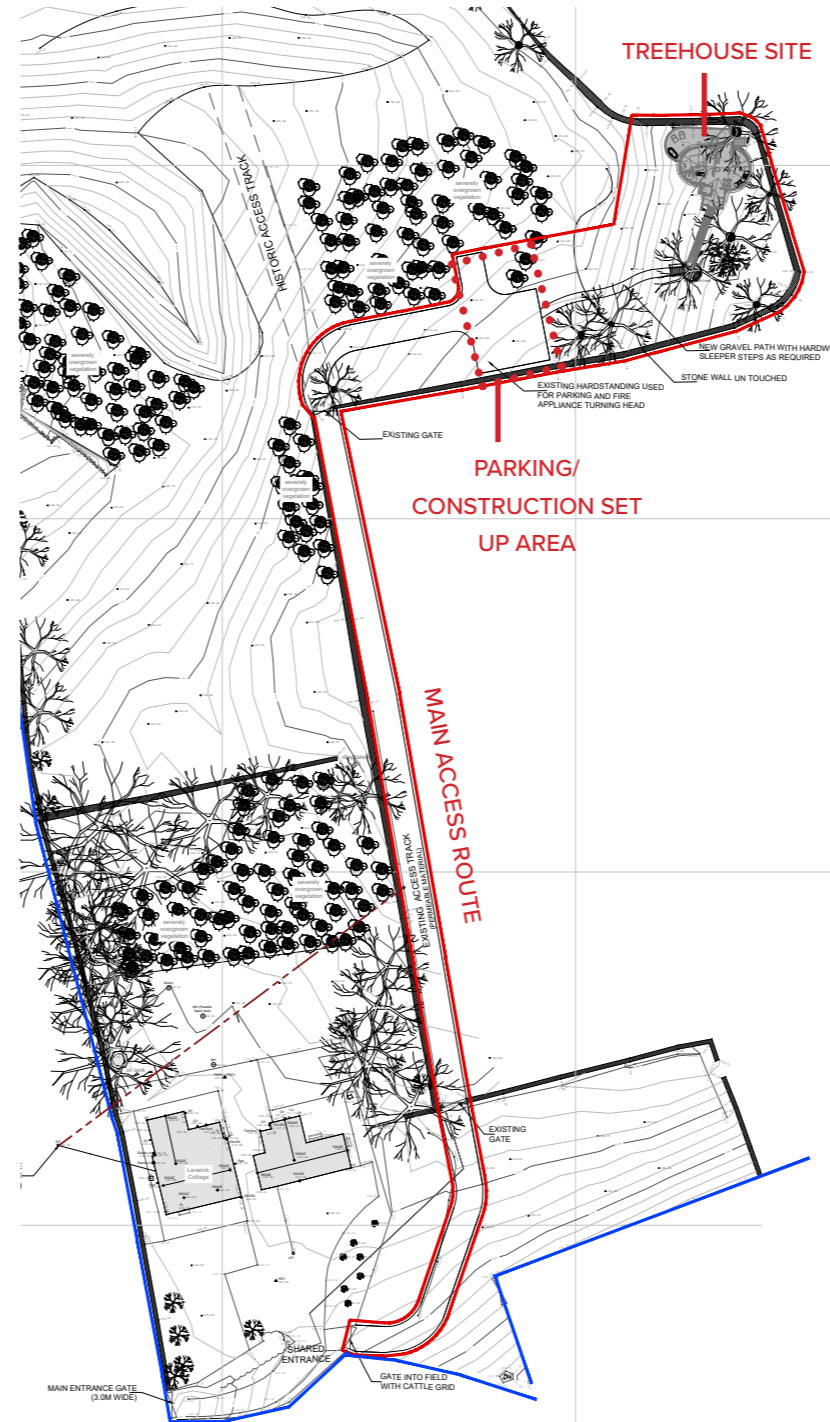


IMAGE A - CELLWEB GROUND PROTECTION



IMAGE B - TEMPORARY GROUND MATS



3.0 Tree Protection Measures

Of critical importance is the need to provide protection for the trees during the construction period due to the location within the woodland.

As with the majority of Blue Forest projects the proposed treehouse in Laverick Plantation is located within root protection areas of the host trees, hence specific measures are to be taken during construction to protect the trees and their rooting environment.

All tree works will be carried out in line with the Arboricultural Method Statement (AMS) prepared for the project. Such pruning will have no significant impact on the tree and the works fall within the bounds of normal estate management and tree care.

When considering the obstruction caused by branches the first approach is to retain the branch and temporarily support it away from harm. This can be achieved by the use of straps, for instance ratchet straps, that are broad to avoid harm to the branch. Such straps should be removed as soon as they can be following the works.

No materials, equipment or debris will be stored within any of the barrier areas and no chemicals, petrol or diesel will be allowed to spill where they may contaminate the root protection areas of retained trees.

All heavy plant, machinery, cranes and delivery vehicles shall be excluded from the areas demarcated for protection on the Tree Protection Plan and shall operate only upon areas of ground protection or existing hard surfaces.

GROUND & TREE PROTECTION

Temporary barriers will be erected as indicated on plans provided as part of the AMS. The specification for these barriers will be in accordance with the recommendations given in BS5837:2012 Trees in relation to design, demolition and construction – Recommendations Section 9.2 and will comprise 2.0m mesh barriers (Heras type panels are a simple, readily available solution) attached to a scaffold framework. Support scaffolds will be attached to the scaffold framework as necessary at an angle of 45 degrees on the side of the trees and anchored by further scaffold poles carefully firmed into the ground.

Clear signs will be attached at 6 metre intervals along the line of barriers stating 'Tree Protection Area – No Access'.

The barriers shall remain in place until soft landscape operations require its full or partial removal. No other construction activity will take place within those areas formerly protected by the fence.

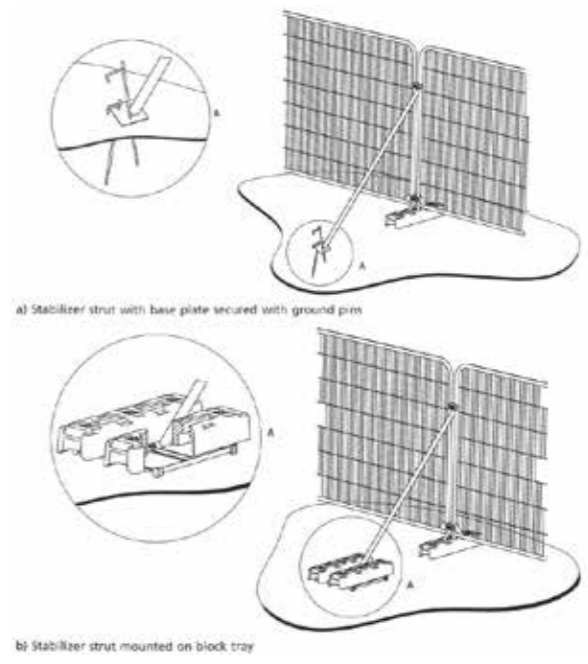
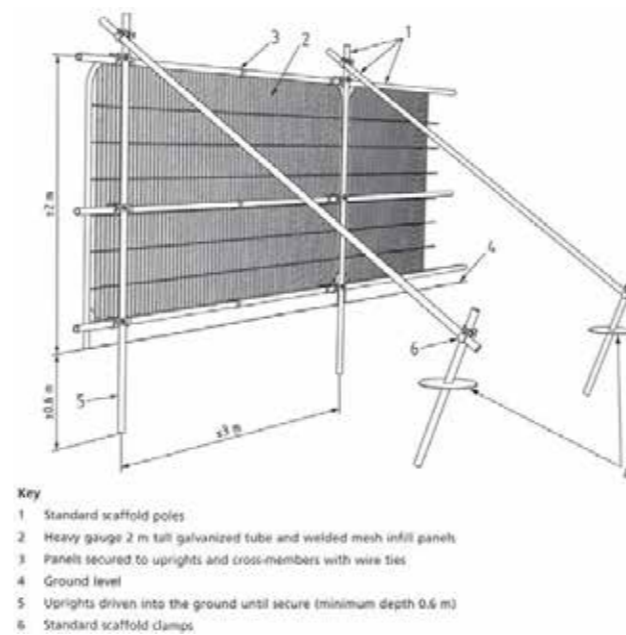
Ground protection shall remain in place throughout the construction process only to be removed to facilitate soft landscape works on completion of the construction works. Areas designated and protected with ground protection may be utilised for the storage of non-contaminating materials.

SEQUENCING OF WORKS

A logical sequence of events is to be observed as follows:

- Stage 1 Pre-construction stage, detailed design and pre-commencement meetings
- Stage 2 Undertake tree pruning in accordance with the schedule of work
- Stage 3 Erect protective barriers and lay ground protection and establish site compound
- Stage 4 Implement 'no-dig' zones
- Stage 5 Establish foundations for accommodation units (screw piles)
- Stage 6 Erect scaffolding
- Stage 7 Construct treehouse frame, platforms and ramp boardwalk access
- Stage 8 Erect treehouse wall panels and form roofs
- Stage 9 Complete all other site works
- Stage 10 Take down protective barriers, uplift ground protection and complete soft landscape works

TREE PROTECTION FENCING SPECIFICATION



PLEASE REFER TO THE ARBORICULTURAL ASSESSMENT & METHOD STATEMENT ALONGSIDE THIS METHOD STATEMENT FOR FURTHER DETAIL



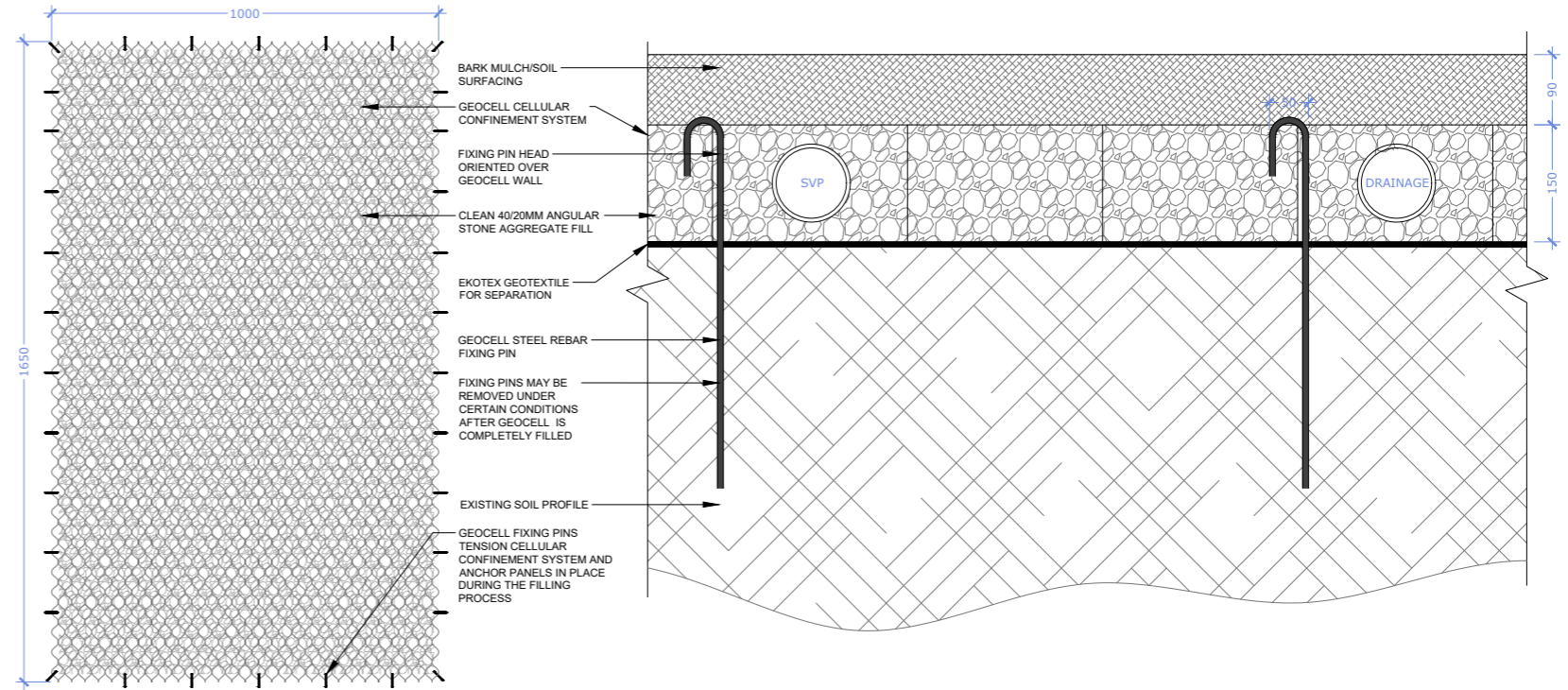
4.0 Services Infrastructure

SERVICES & INFRASTRUCTURE

The treehouse will require electrical and servicing facilities. As much as is practical, the proposed service routes follow the line of the existing paths / tracks within the landscape of the site. The proposed service infrastructure layout is detailed in the architectural information appended to the Planning Application.

Once outside the woodland and when clear of root protection zones, the services will be run underground. Trenches will be dug and filled in consecutive 10m lengths in the same day to avoid any issues regarding trapping reptiles or mammals.

Within any root zone protection areas (RPZ's) and where necessary, services will be contained within the cell web ground protection build up or laid in trenches following the guidance of the AMS and under the supervision of the tree consultant (please refer to the details to on the right).

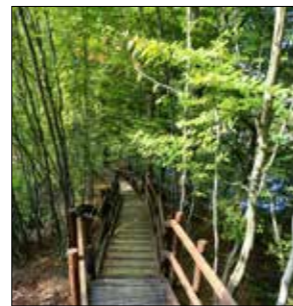


01 GEOCELL PINNING PLAN
EXTERNAL STRUCTURE 1:10

02 GEOCELL TRACK SECTION
EXTERNAL STRUCTURE 1:5



MAIN SERVICES CONTAINED IN BOARDWALK



FINISHED BOARDWALK



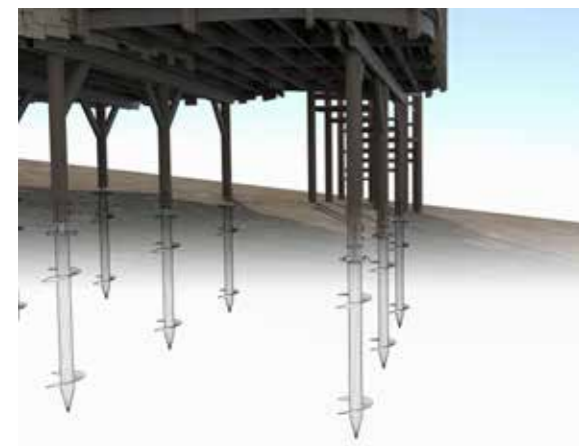
5.0 Foundations & Material Storage

MATERIAL STORAGE / WASTE

Once delivered to site, materials will be stored securely in designated areas both at the construction site and within a defined material storage area on the existing hard standing of the site as indicated on construction site plans. Ordinarily, the majority of the materials required will be delivered to the construction site in stages to avoid large amounts of materials being stored on site at any one time. Materials will be inspected each morning to identify the presence of any ecology that may have migrated overnight.

Waste materials will be stored within designated areas on the construction site and will be disposed of with the use of skips placed in the material storage area on site.

Pedestrian routes within the working site will be clearly marked and cordoned off to avoid disturbance or damage to the surrounding environment and lined with scaffold boards where necessary to avoid poaching or compaction.



SCREW PILE FOUNDATION



FOUNDATIONS

Blue Forest's treehouses are designed to be independent of any trees. The timber support posts are supported on custom designed steel post anchors which in turn attach to the top of various different piling systems.

The final piling design is dependant on the ground conditions and the results of a detailed ground investigation report. Typically Blue Forest employ one of three different piling solutions, all of which are proven to avoid any damage or negative impact on trees and tree roots.

1. Ground Screws: Also referred to as mini screw piles these are the lightest foundation solution and usually suitable for lighted loadings and use in building boardwalks and elevated platforms. Typically the piles are installed by hand, without the need for heavy machinery and range between 1.2 and 2m in length.
2. Helical Piles - These larger screw piles are capable of carrying significant loads but can require heavy machinery to install. Typically the piles are between 2.5 and 7m in length.
3. Rapid Root Piles - An alternative solution to a screw pile, the Rapid Root Piling system is based on replicating the root system of a tree spreading the loads by installing a fan of steel 'roots' held in place with a steel pile cap.



GROUND SCREW PILE



HELICAL SCREW PILE



RAPID ROOT PILE

Each foundation position shall be marked on site. Where the foundation position is within a root protection area a hand dug trial hole shall be dug to a depth of 300mm below ground level. The purpose of the trial hole is to ascertain if roots in excess of 25mm are present. If no roots of such size are encountered the pile position is considered suitable for use. If roots in excess of 25mm are encountered they shall be retained and the pile location altered if it cannot be accommodated in that position. That may have a 'knock-on' effect to alter other pile positions or alter the positioning of supporting legs for the accommodation unit.



TYPICAL ROOT PILE INSTALLATION STAGES



1. ROOT PILES SET OUT FOR INSTALLATION



2. ROOT PILES INSTALLED



3. ROOT PILE CAP DETAIL



4. ROOT PILE CAP WITH POST ANCHOR



5. BUILDING FRAME ERECTED ON PILE CAPS



6.0 Indicative Pile Installation

FOUNDATION INSTALLATION - SEQUENCE OF WORKS

1. Where the screw pile foundations fall within root zone protection areas, tree roots are carefully exposed using air spades and hand digging.
2. A pile location template is then positioned above the exposed root base and rotated until each proposed pile location falls between major roots. For more lightly loaded posts under the treehouse accommodation unit, a single pile in each location will suffice, for the heavier loaded posts, each load point will require a trio of screw piles.
3. Once the pile locations are set out, the exposed roots are covered with graded topsoil and level datums are set.
4. The screw piles are then installed in the marked locations and terminated at the correct levels. Ordinarily we would expect the pile diameter to be 60mm - 80mm installed to a depth of 4-5m.
5. Where more than one screw pile is required for the foundation point, the piles are connected with a steel grillage which forms the base plate for the treehouse posts and substructure.
6. Once all the piles have been installed, the tree house subframe and transfer platforms are installed and connected to the pile caps.

1.



4.



2.



5.



3.



6.



SUPERSTRUCTURE INSTALLATION - SEQUENCE OF WORKS

7. As site preparation works and the pile installations are being completed, the treehouse super structures (above deck level) are prefabricated off site to ensure that 'on site' works can be kept to a minimum.
8. The prefabricated sections, wall plates, roof, balustrade and external timber deck cassettes are disassembled and prepared for transport to the works compound on site. Shipping of each unit will be sequenced to ensure that minimal space is required on site prior to the treehouse being erected.
9. Once on site, the treehouse subframes and transfer platforms are erected.
10. Once the treehouse platforms are in place, these form the working platforms for the remaining construction works for the treehouses. The building superstructures will be carefully moved in panel form from the works compound to each location where they will be erected on the transfer platforms.
11. Internal finishing works are completed and incoming services connected.
12. On completion of the building works the site is broken down and any landscape enhancement works completed.

7.



10.



8.



11.



9.



12.



7.0 Lighting Strategy & Design

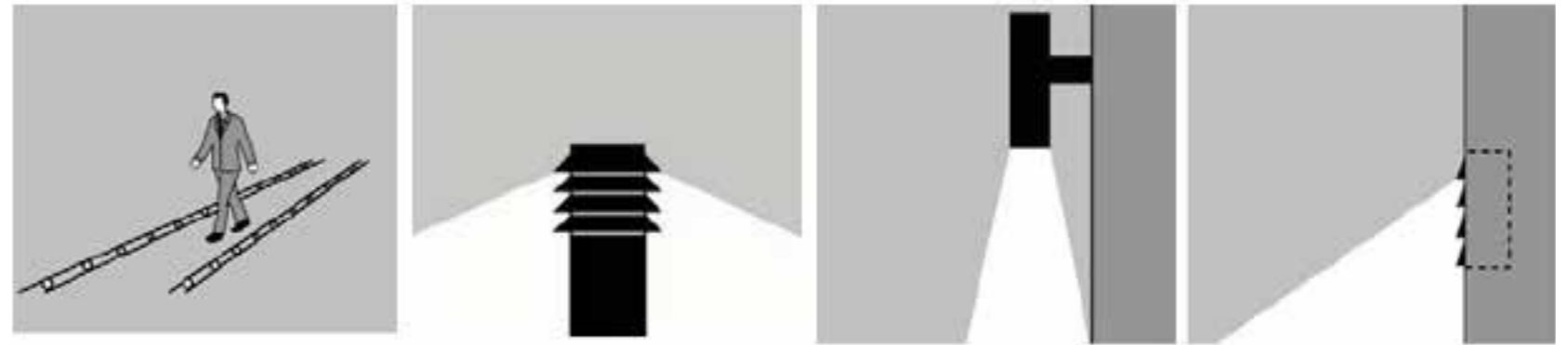
Due to the woodland nature of many of our sites, several mitigation measures have been adopted to minimise and mitigate impact upon any potential existing biodiversity and habitats. These measures will also help towards any biodiversity and habitat enhancements.

The proposal for the site will include a sensitive lighting scheme on site to ensure that opportunities for light sensitive species are maintained.

A lighting strategy and design will be implemented in accordance with light limitations, defined in the Institution of Lighting Engineers (ILE) 'Guidance Notes for the Reduction of Obtrusive Light' and will adhere to the following rationale:

1. Excessive lighting will be avoided.
2. Light spill will be minimised – this will include ensuring that there is no light spill onto or adjacent to the roost entrances and onto retained trees and habitat features on site.
3. The spread of lighting will be kept below the horizontal. PIR lighting only triggered for short periods by human sized objects will be utilised.
4. Narrow spectrum bulbs will be used to lower the range of species affected by lighting.
5. Bulbs that emit minimal UV light will be used, in particular those that avoid white and blue wavelengths. Emitted light should peak higher than 550 nm or use glass covers that filter UV wavelengths.
6. Any lighting columns should be reduced in height. Any pedestrian lighting should also be kept at a low level and preferably below 5 lux.
7. The timing of lighting should be reduced to a minimum and include unlit periods.
8. The use of reflective surfaces under lights should be avoided.

Furthermore, provision of bat boxes and bird boxes for species such as swift and house sparrow, as recommended in the Ecological Appraisal will be introduced to create roosting habitats and enhance the overall bat and bird presence within the areas in which our treehouse is located.



LIGHTING STRATEGY TO MITIGATE IMPACT UPON EXISTING HABITATS



DIRECTIONAL SHIELDED LIGHTING EXAMPLE FOR ACCESS



BAT & BIRD BOXES (SCHWEGLER 1B) WILL BE INCORPORATED TO IMPROVE EXISTING HABITAT





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