UCL

New Student Centre

Sustainability Statement

June 2015

expedition

Revision Schedule

Revision	Date	Comments	By	Checked	Approved
00	01/06/15	Sustainability Statement to accompany the planning application for the UCL New Student Centre	DR	JS	JS

Contents

0.0 Executive Summary

UCL has set a clear vision and ambitious targets for delivering sustainability on the Bloomsbury Campus. The development and refurbishment of existing buildings will play a key role in UCL's ability to meet those targets, particularly in the reduction of carbon emissions.

The New Student Centre (NSC) will be a flagship building for the UCL campus. The vision for the building is to create a space for students that will foster learning and provide support through the student services function.

The design of the building will: support the wellbeing of building users; be high performing, including in terms of resource impacts; and be adaptable to changing climates and future demands.

Our approach to sustainability for the New Student Centre is summarised below, alongside Camden's key sustainable themes.

- **Energy Efficiency:** A highly energy efficient building, connected to the UCL District Heat Network, cooled by a ground source system and with renewable energy generation from roof mounted photovoltaics.
- **Water Efficiency:** Minimising water consumption through the specification of water efficient fittings.
- **Sustainable Use of Materials:** Durable materials with a simple open structure, where finishes are minimised and hence whole life material impacts are reduced.
- **Biodiversity:** A biodiverse roof will be provided and enhancement of the planting in the Japanese Garden will also be undertaken. Bird and bat boxes are also to be provided.
- **Flooding:** Peak runoff from the site will be managed through attenuation in the biodiverse roof and a basement level attenuation tank.
- **Adaption to Climate Change:** Methods for dealing with overheating are incorporated within the design. Surface water drainage systems accommodate likely impacts of climate change.
- **BREEAM:** BREEAM 'Excellent' and Camden's minimum standards for energy, water and materials are targeted.

1.0 Introduction

This document has been prepared to accompany the planning application for development of the New Student Centre. It sets out the sustainability strategy for the new building including an overview of the energy strategy for the proposed scheme.

The energy strategy has been prepared in accordance with the principles of the energy hierarchy and will help to deliver a 'Lean', 'Clean' and 'Green' building.

The document sets out a clear path to meet all wider sustainability objectives, outlining appropriate strategies for: water; materials and waste; and biodiversity. Efficient design processes are discussed alongside a suite of suitable technologies to ensure a truly sustainable scheme is developed for the New Student Centre.

Current legislation and planning documents, specifically Approved Document L2A and Camden Planning Guidance on Sustainability, were reviewed and have guided the sustainability strategy for the New Student Centre.

1.1 Scheme Details

The New Student Centre will be constructed on a vacant brownfield site adjacent to the Bloomsbury Theatre on Gordon Street. The development includes the demolition of staircase structure and plant rooms, erection of a part 4, part 5 storey (plus two below ground floors) new build academic building (Use Class D1); the re-landscaping of the existing Japanese Garden to the rear; the provision of cycle parking; new vehicular and pedestrian access and associated works.

2.0 Policy & Guidance

The design of the New Student Centre will be subject to a number of policy requirements which are summarised here.

Building Regulations Part L 2013

The development of the New Student Centre will be subject to Approved Document L2A. In accordance with Regulation 26 the actual Building CO2 Emission rate (BER) must be no greater than the Target CO2 Emission Rate (TER).

Greater London Authority

As outlined in the Sustainable, Design and Construction SPG, since 6 April 2014 the Mayor has applied a 35 per cent carbon reduction target beyond Part L 2013 of the Building Regulations.

Local Policy

Camden Planning Guidance on Sustainability (CPG 3) sets out the following targets:

- Carbon dioxide reduction target for new developments to make a 35 per cent improvement on the current 2013 Building Regulations, (following the recommendation of the GLA).
- Where feasible and viable developments will be required to connect to a decentralised energy network or include CHP.
- Developments are to target a 20 per cent reduction in carbon dioxide emissions from on-site renewable energy technologies.
- Developments over 1000 square meters to include grey water harvesting system, unless it is demonstrated that this is not feasible.
- All developments should aim for at least 10 per cent of the total value of materials used to be derived from recycled and reused sources.
- BREEAM target of 'Excellent' with 60, 60 and 40 per cent of Energy, Water and Materials credits achieved, respectively.
- All developments to incorporate brown roofs, green roofs and green walls, unless it is demonstrated this is not possible or appropriate.
- As a minimum, surface water run-off rates should be reduced by 50 per cent across the development.
- All developments are expected to consider the impact of climate change and be designed to cope with the anticipated conditions.

BREEAM

The New Student Centre is to be assessed under BREEAM Education 2011.

3.0 Energy Efficiency

3.1 Energy Strategy

The energy strategy has been prepared in accordance with the principles of the energy hierarchy and will deliver a 'Lean', 'Clean' and 'Green' building. The New Student Centre has been designed with the following key principles:

- Minimise the demand for energy by enhancing fabric efficiency and promoting passive design.
- Utilise the thermal mass of the building to help control internal heat gains.
- Use of mechanical ventilation with heat recovery to recover ventilation heat loss during the winter.
- Provide heating through a connection to UCL's District Heat Network.
- Prevent spaces from overheating by using natural ventilation or mechanical ventilation (heat recovery element by-passed), with CO2/temperature sensing and optimiser to increase the fresh air rate for comfort purposes.
- Connect the building to a 'free' source of cooling via an open loop ground source borehole system which feeds cooling pipes embedded in the underside of the floor slabs.
- Maximise the use of photovoltaic panels to generate renewable energy.

3.2 Carbon Dioxide Savings

The New Student Centre will meet Camden Council and the Greater London Authority (GLA) requirement for a 35% carbon dioxide reduction on Part L 2013. Camden Council's renewable target for a 20% reduction in regulated carbon dioxide emissions is also met from on-site renewable energy technologies.

The results from the Part L 2013 calculation in relation to the energy hierarchy are summarised below and have been presented in line with Greater London Authority guidance

	Carbon dioxide emissions (Tonnes CO2 per annum)	
	Regulated	**Unregulated**
Baseline: Building Regulations Part L 2013 Compliant Building	99.45	84.97
After energy demand reduction ('Be Lean')	87.23	84.97
After efficient energy supply ('Be Clean')	85.79	84.97
After renewable energy ('Be Green')	64.26	84.97

Table 0.1: Carbon dioxide emissions at each stage of the Energy Hierarchy

	Regulated Carbon dioxide savings	
	(Tonnes CO2 per annum)	**(%)**
Savings from energy demand reduction ('Be Lean')	12.22	12%
Savings from efficient energy supply ('Be Clean')	1.43	1%
Saving from renewable energy ('Be Green')	21.53	22%
Total Cumulative Savings	35.19	35%
Total Target Savings	34.81	35%
Annual Surplus	0.38	-

Table 0.2: Regulated carbon dioxide savings from each stage of the Energy Hierarchy

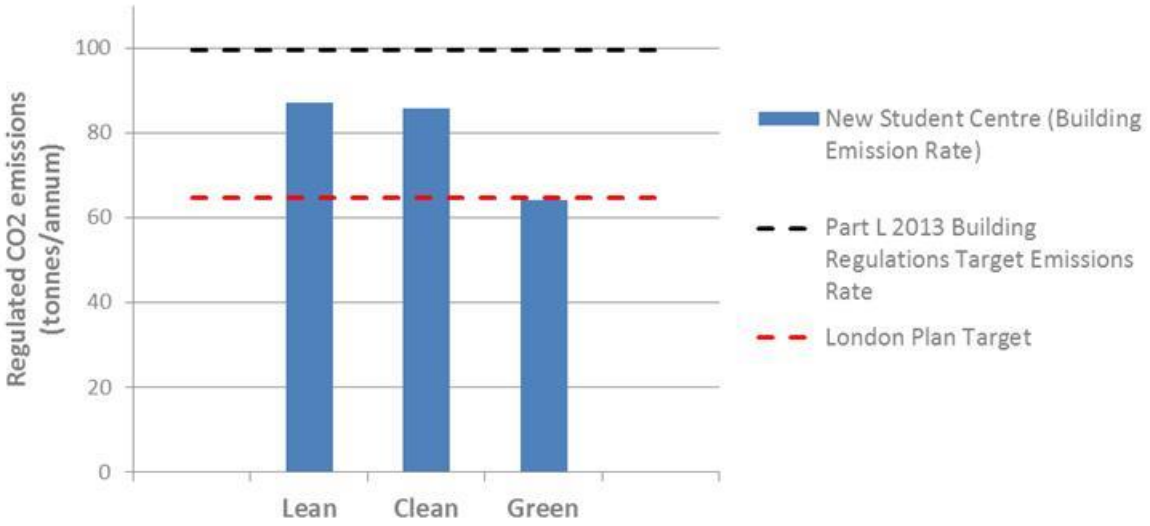

Figure 0.1: The energy hierarchy

The strategy for achieving this, following the energy hierarchy, is summarised below. For more detail, please refer to the "New Student Centre Energy Strategy".

3.3 Use Less Energy ('Be Lean')

The design of the New Student Centre optimises passive measures to limit the energy demands for space heating, cooling and lighting in the following ways:

- The design will optimise the thermal performance of the envelope with respect to heat loss (annual energy consumption) and build cost. U-Values and an air permeability exceeding the current Part L 2013 Building Regulations will be applied throughout the development.
- The building has a high thermal mass to help control internal gains.
- Facades designed to minimise the amount of solar gain whilst maintaining high levels of usable daylight.
- Areas of glazing, depths of reveals and overhangs respond to the sun path, working together to reduce the amount of solar gain entering the building.
- Natural daylight will be optimised and a light palette of colours will be applied to the interior, improving daylight penetration and the quality of space.
- A central atrium helps to bring light deep into the building.
- Lighting will be selected to provide the highest level of energy efficiency whilst balancing capital costs and operational needs, and lighting sensors and controls will be installed.
- Highly efficient mechanical ventilation with heat recovery will be specified.
- Mixed-mode ventilation strategy will use natural ventilation for 'free cooling'.
- Intelligent building and energy management controls to optimise and monitor energy consumption within the building.

3.4 Supply Energy Efficiently ('Be Clean')

The New Student Centre will be connected to UCL's Bloomsbury Campus District Heat Scheme. This will provide space heating and domestic hot water to the building. Due to system inefficiencies carbon savings from the inclusion of district heating will not provide the carbon savings expected of such a system.

An open loop ground source borehole will provide 'free' cooling to the building; both to the ventilation system, through connection to the Air Handling Unit and space cooling through embedded coils within the floor slabs.

3.4 Use Renewable Energy ('Be Green')

Roof mounted photovoltaics will also be incorporated into the scheme to meet the 35% carbon reduction target against Part L 2013. Currently an option is proposed to generate approximately 41.4MWh of electricity, save approximately 21.5 tonnes of CO2.

4.0 Water Efficiency

4.1 Minimising Water Use

Minimising water consumption will be achieved through the specification of water efficient fittings, such as dual flush toilets and low flow taps. In our experience a significant reduction of current water consumption is likely to be reached through careful specification alone. A number of 'efficient' water fittings are available on the market. They are seen as an 'easy win' and broadly neutral on capital cost.

Other products aim to push the boundaries, such as waterless urinals or very low flush WC's. These products could be considered 'ultra-efficient' fittings. They are less readily available on the market and have generally been less tested in real-life situations. They also operate differently from standard fittings, require specific maintenance and can be misused more easily, which could potentially lead to a number of issues.

During the next phase of design, the team will engage with the supply chain to identify technologies, seek references of systems in use and develop appropriate specifications. Table 4.1 summarises 'efficient' and 'ultra-efficient' specifications alongside BREEAM performance levels. Metering and leak detection systems will also be provided.

Fitting Type	BREEAM Performance Levels			Recommended Specification	
	Baseline	3 Credits	5 Credits	'Efficient'	'Ultra-efficient'
WC's	6 l/flush	4 l/flush (effective flush volume)	3 l/flush (effective flush volume)	4 l/flush (Single siphon flush with delayed action inlet valve)	Male: 4 l/flush (Single siphon flush with delayed action inlet valve) (If urinals used as well, otherwise dual flush as female) Female: 4/2.6 l/flush (Dual siphon flush with delayed action inlet valve)
Urinals	10 l/bowl/hr	1.5 l/bowl/hr	Waterless	1.5 l/bowl/hr	Fan assisted waterless urinals
Hand basin taps	12 l/min	4.5 l/min	3 l/min	4 l/min (Push tap or PIR sensor)	3.5 l/min (PIR sensor)
Showers	14 l/min	6 l/min	3.5 l/min	7 l/min	6 l/min
Kitchen taps	12 l/min	5 l/min	5 l/min	5 l/min	5 l/min

Table 4.1: Water efficient fittings specification

4.2 Maximising the Re-Use of Water

Recycling and rainwater harvesting are promoted by BREEAM and local planning policy as ways of reducing demand for mains water. Our past experience suggests rainwater harvesting and grey water recycling are generally not a cost-effective way of meeting non-potable demand in buildings and has only a marginal environmental benefit, and often creates a maintenance burden. This analysis is in line with the Environmental Agency Report SC090018[1] on the limitations of rainwater and greywater recycling systems. The costs of installing decentralised water systems and the additional space that would be required mean that neither technology is deemed to be an effective solution for the New Student Centre.

[1] Environment Agency, Evidence, Energy and carbon implications of rainwater harvesting and greywater recycling, Report: SC090018

5.0 Sustainable Use of Materials and Waste Minimisation

Sustainable materials use and waste minimisation are core objectives of this project. A workshop has been held with the design team to identify opportunities to use sustainable materials and reduce waste. The technical and commercial feasibility of these will be investigated further in the next design phase.

Being a largely vacant site, there is minimal waste expected from demolition. However the key material and waste impacts are associated with the removal of excavated material for the basement and landscape works, and the construction of the concrete frame. Our approaches to mitigating these impacts are highlighted below.

5.1 Waste Minimisation and Diversion from Landfill

In line with the waste hierarchy, reducing, reusing and recycling waste is our priority. The biggest impact, from a waste perspective, is likely to be the arising's from the removal of materials from the Japanese Garden and the basement excavation. It is proposed to work with the contractor and UCL's central logistics team to ensure that excavated materials are removed safely with minimum disruption to neighbours, and that a secondary use is identified.

Additional design out waste principles that will be adopted include:

- Incorporating materials with recycled content e.g. concrete, steel, plasterboard.
- Designing out finishes through use of exposed surfaces.
- Building Information Modelling (BIM) to: improve collaboration and prevent design clashes; drive resource efficiency during design; improve accuracy of fabrication; assist with accurate ordering; and optimise logistics planning and coordination – all reducing waste.
- Waste efficient procurement and engagement with suppliers to reduce waste, such as packaging waste.
- Specification of durable materials.

The design team will pursue a number of quick wins to increase recycled content and reduce waste, particularly for:

- Concrete;
- Steel;
- Plasterboard;
- Insulation; and
- Floor coverings.

These opportunities will be taken forward where technically and commercially feasible.

A Site Waste Management Plan will be produced. The project will optimise reuse and recycling of excavated material, targeting current good practice of non-hazardous waste diversion from landfill by weight. For construction waste, diversion from landfill will be targeted, in line with current good practice.

These principles are exemplified in Figures 5.1 and 5.2.

Figure 5.1: Opportunities to design out waste at design stage

Figure 5.2: Opportunities to design out waste at procurement and construction stage

The design team will record actions taken at design stage to minimise waste, and will liaise with the appointed contractor to include these in the Site Waste Management Plan.

5.2 Sustainable Materials

The focus of the building design is on the specification of durable materials that will stand the test of time, reduce the major renovation cycle, be in keeping with the local context and be responsibly sourced.

Major building elements (roof, external walls, floor finishes, internal partitions, windows and fit-out elements) will be carefully evaluated to balance traditional criteria such as aesthetics, technical performance and cost alongside environmental and social criteria. The design team will seek to minimise whole life impacts of materials, and will specify healthy, responsibly sourced materials. Durable materials consistent with the design life of the building will be specified. The BRE Green Guide to Specification and Environmental Product Declarations (EPD's) will be used to inform decision making where data is available.

Research and early engagement with the supply chain to identify innovative materials and products has already started, and will continue through detailed design and specification.

By far the biggest material impact will be the concrete frame. As such, a key focus of the detailed design phase will be to work with the contractor and supply chain to minimise the embodied impact of concrete.

5.3 Recycled Content

We know from WRAP's case study evidence that achieving 10% recycled content by value for the project overall is widely achievable even without explicitly trying to increase recycled content. By adopting the most significant opportunities to increase recycled content through the use of cost competitive, readily available products, levels exceeding 20% are common.

Most of the potential to increase recycled content can be achieved by identifying the top 5 to 10 'Quick Wins'.

The common quick wins for recycled content are:

- bulk aggregates (sub-base, pipe bedding, fill, etc.);
- ready-mix concrete (foundations, floor slabs, etc.);
- asphalt;
- drainage products/pipes;
- pre-cast concrete products (paving, slabs);
- concrete tiles and reconstituted slate tiles;
- dense blocks;
- lightweight blocks;
- clay facing bricks;
- plasterboard;
- ceiling tiles;
- chipboard and other wood-based boards;
- insulation (floor, wall and roof); and
- floor coverings (carpet, underlay, etc.).

Opportunities to specify recycled content will be pursued during RIBA Stage 4. The requirement to achieve 20% recycled content will be included in the procurement documentation and contract for the contractor appointment.

6.0 Biodiversity

An ecological survey of the New Student Centre site has been undertaken and is included within Appendix A. The existing site was found to be of low ecological value and the ecologist has made specific recommendations to enhance the ecology of the site.

Environmental enhancement will be achieved through 190m^2 of biodiverse roof mix and planting in the Japanese Garden.

The biodiverse roof will include a mix of brown roof substrates, loose natural elements such as logs or padlestones to provide invertebrate habitats and native plug planting.

The current landscaping proposals result in a positive increase in the ecological value of the site as outlined in the ecology survey.

Two bird and bat boxes ae also to be located on the building, in an integrated way, in line with the recommendations from the ecology survey.

7.0 Flooding and Surface Water Management

7.1 Flood risk

The site has not been identified as being at risk of fluvial flooding. The impact of potential flooding from local sources such as a burst water main has been assessed to ensure that threshold levels are set to protect property and people during this event.

7.2 Sustainable Water Management

Surface water collected from the site will be discharged to the public sewer system via a connection at basement level.

In accordance with sustainable design principles, surface water will be managed to ensure pollutants are removed at source, peak discharges are appropriately attenuated and where feasible, opportunities are sought to integrate surface water with ecological enhancement strategies.

For this project, the biodiverse roof provides a level of cleansing and attenuation at roof level. Additional attenuation will be provided by a tank within the basement to achieve a minimum 50% reduction in peak runoff.

The pre-development run-off has been calculated based on a footprint of 935m^2, comprising 437m^2 impervious areas and 498m^2 semi-pervious areas. For a critical storm of duration 5 minutes, the following flow rates were calculated for varying return periods:

2 yr RP	13.3 l/s
30 yr RP	24.0 l/s
100 yr RP	30.3 l/s

The London Plan and Camden Council require a minimum 50% attenuation of the undeveloped site's surface water runoff at peak times, with 100% attenuation preferred. To achieve a minimum 50% reduction in peak flow rates a 20m^3 attenuation tank will be required. During detailed design, opportunities will be sought to optimise the size of the tank in the context of operational space constraints.

8.0 Adaption to Climate Change

In general, according to UK Climate Projections (UKCP09), warmer and wetter conditions are expected in the coming years. The impact of this has been taken into consideration in the development of the energy strategy, the surface water drainage system and external microclimate control.

8.1 Building Energy Systems

Warmer winters will generally have a positive effect on buildings, minimising demand for space heating. However, warmer summers will represent a significant challenge in maintaining the thermal comfort of buildings.

Appropriate fabric and passive design measures (i.e. solar shading) are crucial. Typically strategies for reducing winter heat losses such as superinsulation and good airtightness also help to reduce summer heat gains and work well in minimising overheating, providing there is adequate solar shading.

Designing for natural (and night-time) ventilation has been considered, alongside methods for dealing with the cause of overheating. Solar shading, improved glazing performance (g-values) and reduced areas of glazing will all reduce solar gain significantly, before it even enters a building.

All equipment (i.e. PC's) and lighting contribute to heating a building. These internal gains must be minimised to mitigate the risk of overheating. Energy efficient equipment and low energy lighting are specified.

Efficient methods of cooling the New Student Centre have also been included within the design, which will ensure thermal comfort is maintained and inefficient systems are not retrofitted on an ad-hoc basis as temperatures rise.

8.2 Surface Water Drainage

The drainage system has been designed for a 1 in 100 year event and has been sized to take account of climate change.

8.3 Microclimate Control

The planting strategy and approach to materials selection in the Japanese Garden has been driven in part to mitigate heat island impacts. Similarly the roof level planting and reflective elements will provide a natural cooling effect.

9.0 Sustainable Travel

The New Student Centre site is well connected being close to good public transport links. To promote cycling, the student centre will include cycle racks and showers within the building. The current proposal is to provide 54 bike spaces and 6 showers.

10.0 Sustainable construction

An Environmental Management Plan will be produced and construction site impacts to land, air, water and noise will be monitored and managed throughout the construction period, as will energy and water consumption. Waste will be managed sustainability as described in Section 5.

The use of consolidated delivery vehicles to reduce congestion and environmental impacts is being explored with UCL.

Please refer to the Transport Statement prepared by Iceni which discusses construction management in more detail.

11.0 Sustainable operations

The building has been designed to support sustainable operations for many years to come and has been developed working closely with UCLs maintenance team.

A Soft Landings approach will be adopted to ensure that the building systems operations are understood. Energy and water meters coupled with a Building Management System will enable monitoring and reporting of energy and water use during operation. The soft landings approach will also ensure that the targets developed in design inform the operational management plan.

The specification of high quality and durable materials for the building will ensure that maintenance and replacement requirements are reduced.

The site benefits from excellent public transport links and a Travel Plan will be implemented to encourage sustainable travel for staff, students, visitors and guests.

Segregation of waste at source will be encouraged and specific areas for waste segregation will be provided.

12.0 Sustainable Assessment Tools – BREEAM

A BREEAM pre-assessment has been carried out with the design team and a target score of 81 has been agreed. The project is also targeting 93, 78 and 77 per cent of available energy, water and materials credits. In line with Camden's requirements BREEAM 'Excellent' and the minimum standards for energy, water and materials are achieved. Please refer to Appendix B for the full pre-assessment report.

A number of further potentially achievable credits have also been identified. These credits will remain under review during the next stages of design. Achieving a number of these credits will depend on the contractor's management systems and processes on site. The design team will work with UCL to ensure that the requirements on the contractor are embedded in the tender process.

The following summarises the current BREEAM pre-assessment alongside Camden's specific targets.

Management

The design team are targeting all available credits. The requirements will be written into pre-qualification documentation for potential contractors to ensure that these are achieved. The project team has engaged extensively with different stakeholders to develop the designs including students, Library Services and UCL's maintenance team.

Health and Wellbeing

The scheme is currently targeting 10 out of 15 available credits in this section. The deep plan of the building and basement areas means that it is difficult to achieve the Visual Comfort Criteria. To mitigate this, the building has been designed with a central atrium and reflective surfaces to bounce light into the heart of the building. For the basement areas, lighting systems that mimic natural daylight are being explored. Basement spaces will be used for activities that lend themselves to this environment including showers and the quiet contemplation areas.

Since the building is not naturally ventilated all year round, the scheme does not achieve all the credits under Indoor Air Quality. The ventilation system has been designed to minimise energy consumption through a mixed mode operation. For much of the year, the building will be naturally ventilated, however the building will be mechanically ventilated in peak seasons, providing cool air in summer and minimising heat loss in winter. The ventilation system will have a filtered fresh air intake. Coupled with the use of CO2 monitors and good rates of air change, the NSC will arguably have better air quality than a naturally ventilated building given the external air quality in this location.

Energy

The project is on track to achieve 25 of the 27 available targets, 93 per cent of all available in line with Camden Council planning conditions. The credits will depend on the final efficiencies of mechanical and electrical systems for example, the performance of the ground source cooling system and the carbon intensity of the UCL heat network.

Transport

The design team are targeting all available credits in this section. The New Student Centre site is well connected, being close to good public transport links. To promote cycling, the student centre will include cycle racks and showers within the building. The current proposal is to provide 50 bike spaces and 6 showers within the basement of the New Student Centre.

Water

Water consumption has been minimised through efficient fittings coupled with active water monitoring and leak detection systems. Alternative water supplies such as rainwater harvesting and grey water recycling have not been investigated as a result of concerns over maintenance of these types of systems and their whole life environmental impact. Hence 7 out of the 9 credits are achieved in this section. At 78 per cent of available credits, this is consistent with Camden's specific requirements.

Materials

The team are currently targeting 10 of the available 13 credits, 77 per cent of available material credits, which meet Camden Council planning conditions. Materials will be chosen with consideration of their environmental impact. Requirements for material sourcing will be written into pre-qualification documentation for potential contractors to ensure all possible credits are achieved in this section.

Waste

The scheme is currently on track to achieve at least 3, and potentially 5 out of 6 available credits. The potential for use of recycled or secondary aggregate will be investigated further with the appointed contractor.

Land Use and Ecology

An area of biodiverse green roof will be provided; including at least 15 different native species of plants with known benefit to wildlife. The Japanese gardens also provide an opportunity to enhance site ecology and green space provision. Bird and bat boxes will be located on the building, in an integrated way. The measures will ensure that 8 of 10 credits will be achieved.

Pollution

The NSC is anticipated to achieve 9 out of the 13 available points under this section. The principal area of investigation is to minimise pollutants associated with energy systems, and in particular refrigerants.

Innovation

A further 2 credits have been highlighted under innovation for sustainable procurement and responsible construction practices.

Appendices

Appendix A Ecological Survey

thomson ecology



University College London, Bloomsbury Campus, London

Ecological Survey to inform BREEAM – New Construction 2011 Assessment (LE2 to LE5)

For

Expedition

Project No.: RSFS101 / 003 / 002

June 2015

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Project Number	Report No.	Revision No.	Date of Issue
RSFS101	001	001	28/05/2015
RSFS101	001	002	03/06/2015

Revision 1	Name	Signature	Position
Author	Felicity Andruszko		Assistant Ecologist
Checker	Lynette Pearce		Senior Ecologist
Approved By	Gabrielle Graham		Principal Ecologist

Revision 2	Name	Signature	Position
Minor amendments	Gabrielle Graham		Principal Ecologist

Disclaimer:

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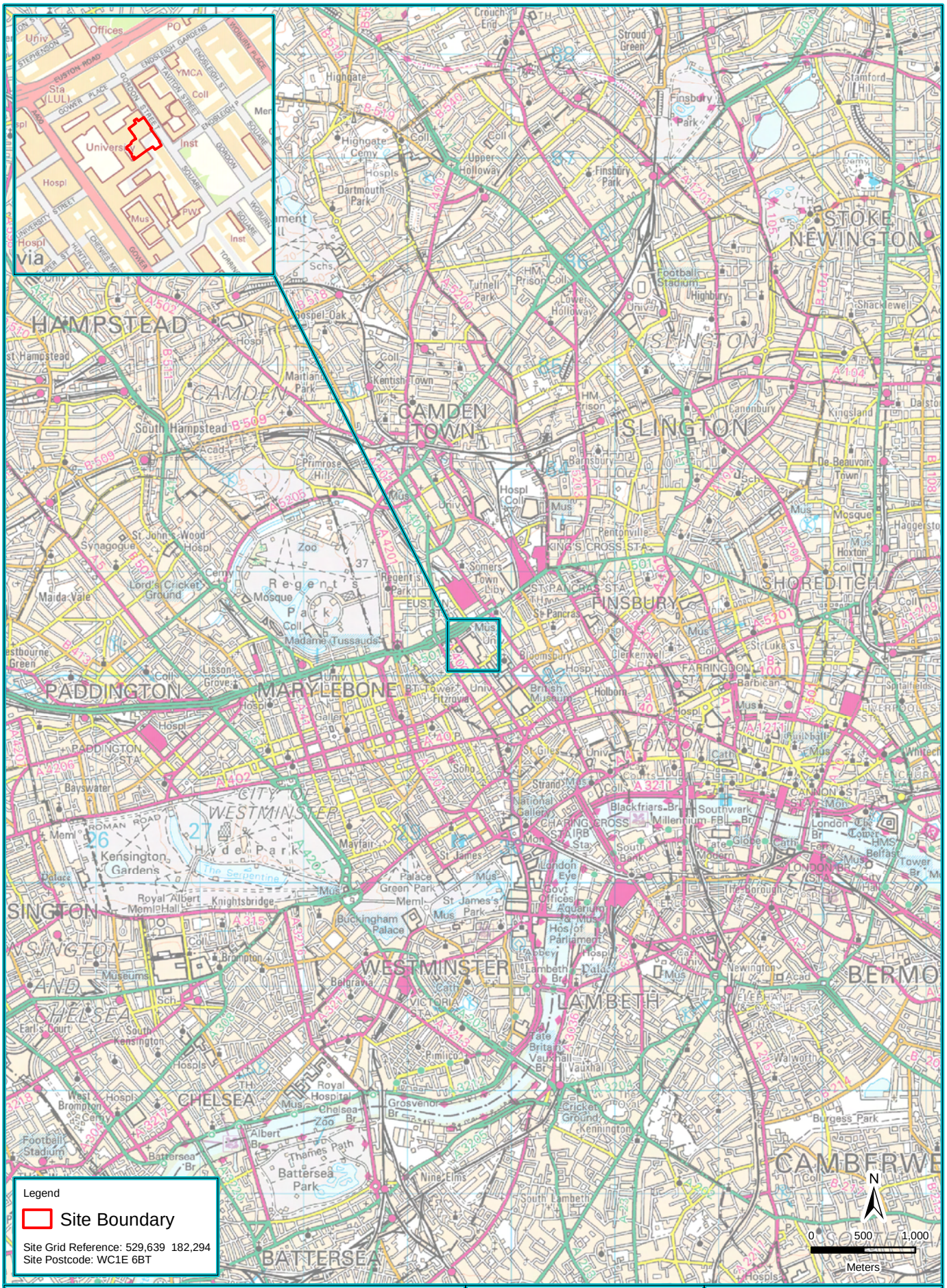

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Figure Title: Site Location		Drawn: NS	Checked: KM
		Date: 22/05/2015	Date: 22/05/2015

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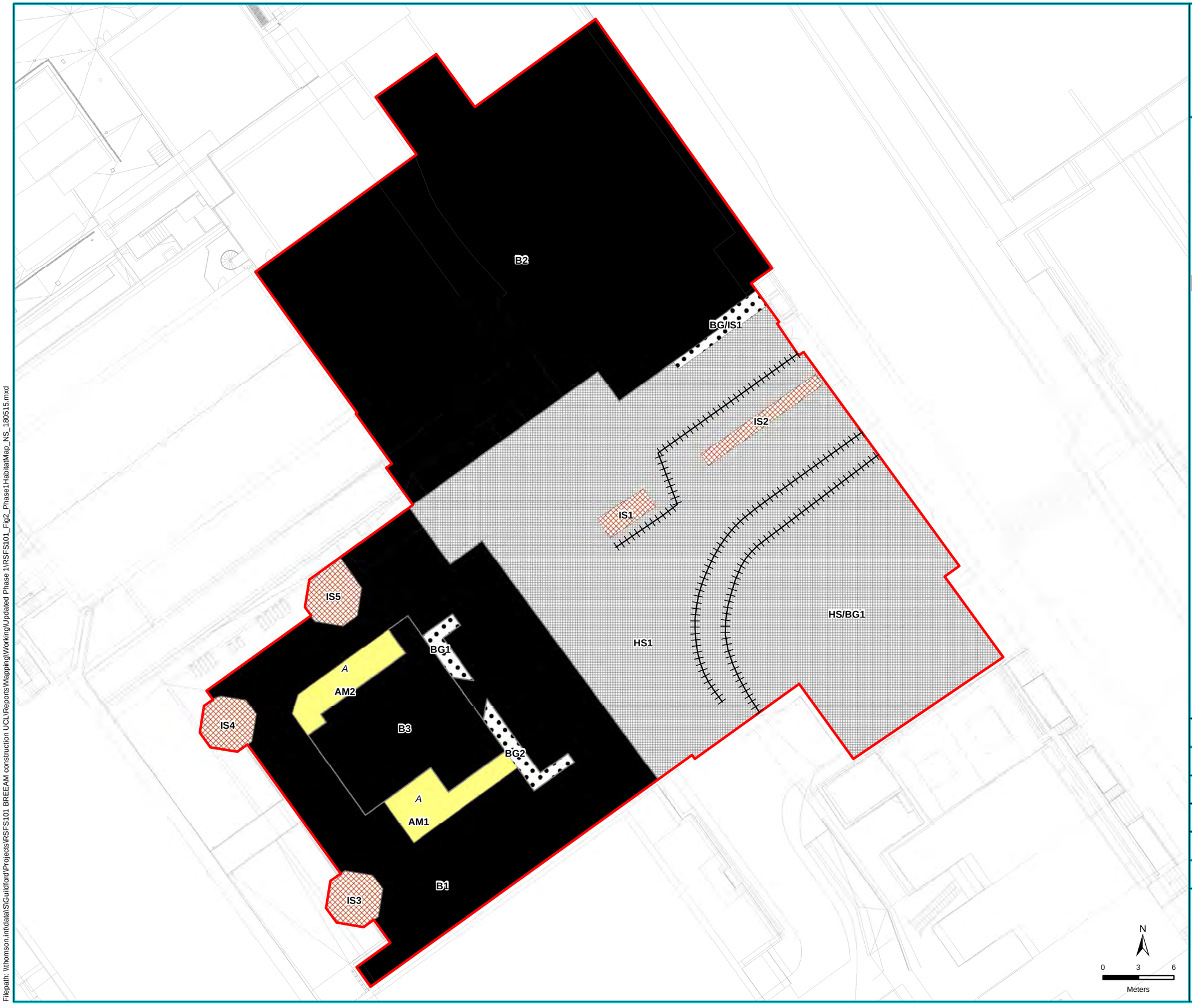

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Legend

- Fence
- Amenity Grassland (*A*)
- Introduced Shrub
- Building
- Bare Ground
- Hard Standing
- Site Boundary

Site Grid Reference: 529,639 182,307
Site Postcode: WC1E 6BT

This map has been drawn at a sufficient level of accuracy to fulfil the requirements of a Phase 1 baseline habitat survey. The level of accuracy depends on both the size of the area involved and the base mapping. Every effort has been made to create a map that is as accurate as possible. However, this map is not intended to represent a scaled landscape survey so should not be used to pin-point accurate engineering work or as a basis for detailed site planning.

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Date: 22/05/2015	Date: 22/05/2015
Client	Expedition
Figure Number	2
Figure Title	Extended Phase 1Habitat Survey Results

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Photograph 1:
Amenity grassland AM1 and AM2 in the roof garden of building B1, and the temporary building B3.

Photograph 2:
Raised planter with introduced shrub IS3 in the roof garden of B1.

Photograph 3:
Bare ground and introduced shrub BG/IS1 adjacent to building B2.

Photograph 4:
Areas of bare ground BG1 and BG2 which have previously been used as raised planters between the temporary building B3 and the first storey section of B1.

Photograph 5:
Introduced shrub IS1 and IS2 and hard standing. Buiding B1 in the background.

Photograph 6:
Area of bare ground and hard standing BG/HS1 being used as a site for temporary building compound units.

Client: Expedition	Drawing Ref: RSFS101/18666/1		thomson ecology
Figure Number: 3	Scale at A4: Not applicable		
Figure Title: Photographs of the Site	Drawn: NS	Checked: KM	www.thomsonecology.com enquiries@thomsonecology.com
	Date: 26/05/2015	Date: 26/05/2015	

1. Summary

1.1 Background

1.1.1 University College London (UCL) proposes the construction of a new Student Centre on a 2830m^2 site within the grounds of the UCL Bloomsbury Campus on Gordon Street, London.

1.1.2 The site is to be assessed using the BREEAM – New Construction Assessment 2011 (BRE, 2011) for education buildings, which considers whether a proposal will enhance or damage the ecological value of a site. Expedition commissioned Thomson Ecology on 11th May 2015 to undertake a preliminary ecological assessment of the site to inform this process. The final assessment will be made by a registered BRE assessor.

1.2 Likely Credit Rating

Section	Maximum Credits Available	Likely Credit Rating for Development*	Justification/Requirements
LE2	1	**1**	The site can be classified as being of low ecological value.
LE3	2	**2**	The development should result in no negative change to ecological value of the site and consequently the maximum number of credit points should be available.
LE4	3	**2**	Two credit points should be available provided an ecologist is appointed, all recommendations followed and a positive increase in the ecological value of the site of up to (but not including) six species is achieved.
LE5	2	**2**	Two credit points should be available provided all mandatory requirements and at least four additional requirements are implemented.
Total	8	**7**	

*Likely credit rating based on our assessment – to be confirmed by BRE Assessor

1.2.1 A total of seven credit points could be achieved from a maximum available of eight, provided that the recommendations in this report are followed.

1.2.2 Our justification for the likely credit rating given above is discussed in the main body of the report.

2. Introduction

2.1 Development Background

2.1.1 UCL proposes to construct a new Student Centre on land within the Bloomsbury Campus. The site is located on Gordon Street, London (see Figure 1).

2.1.2 The total development area occupies approximately 2830m^2. There are currently two main buildings on site, still in use as part of UCL, with an additional temporary building in use as a café situated on the roof of one of the buildings. The majority of the remainder of the site is dominated by hard standing. Following development, most of the site will consist of a single building, with areas of hard standing for access.

2.1.3 The site is to be assessed using the BREEAM – New Construction Assessment 2011 (BRE, 2011) for education buildings, which considers whether a proposal will enhance or damage the ecological value of a site.

2.1.4 Expedition commissioned Thomson Ecology on 11th May 2015 to undertake an ecological assessment and habitat survey of the site to inform LE2 to LE5 of the BREEAM – New Construction Assessment 2011.

2.2 General Approach and BREEAM Assessment

2.2.1 Conducting an ecological walkover survey following extended Phase 1 survey methodology (JNCC, 2010) is a standard technique for assessing the ecological value of development sites.

2.2.2 Following the BREEAM - New Construction Assessment 2011 guidelines, a site visit carried out by a suitably qualified ecologist allows an informed assessment of the ecological value of a site to be made. The ecologist can then give advice on ecological enhancement, determine how any identified features of ecological value can be retained and protected and to what degree the ecological value of the site may be changed.

2.2.3 The full BREEAM assessment will be carried out by a registered assessor and the information in this report is intended to assist with the BREEAM assessment by giving the likely credit rating. In addition, advice or recommendations are given as to how a higher credit rating could be achieved for this development.

2.3 Suitably Qualified Ecologist (SQE)

2.3.1 The field survey and report has been undertaken by Felicity Andruszko MSc BSc (Hons).

2.3.2 Following the BREEAM guidelines (2011), a suitably qualified ecologist is defined as an individual who:

- Holds a degree or equivalent qualification in ecology or a related subject;
- Is a practicing ecologist with a minimum of three years experience (within the last five years); and
- Is covered by a professional code of conduct and is subject to peer review.

2.3.3 This survey and report has been signed off by Gabrielle Graham MSc BSc (Hons) MCIEEM, whom meets the criteria for a suitably qualified ecologist (SQE) by holding a degree in Zoology, being a practicing ecologist for nine years and being a full member of CIEEM.

3. LE2 – Ecological Value of Site and Protection of Ecological Features

3.1 Background

3.1.1 One credit point is available where evidence is provided that the construction zone is defined as land of low ecological value and all existing features of ecological value will be fully protected from damage during site preparation and construction works. The aim of LE2 is to encourage development on land that already has limited value to wildlife and to protect existing features from substantial damage during site preparation and construction works.

3.1.2 A site visit was carried out by Thomson Ecology on 15th May 2015 to determine the ecological value of the site. The methodologies used for the field survey and evaluation are given in Appendix 1. The results of the site visit are given below.

3.2 Field Survey

Habitats and Flora

3.2.1 The following Phase 1 habitats (JNCC, 2010) were recorded on site:

- Amenity grassland;
- Introduced shrub;
- Fence;
- Building;
- Bare ground;
- Bare ground/introduced shrub mosaic
- Hard standing; and
- Hard standing/bare ground mosaic

3.2.2 These habitats are described below. A map showing the main features and distribution of habitats on the site is given on Figure 2. Photographs of the site are given in Figure 3.

Habitat Name	Amenity grassland	**Code**	AM1 and AM2	**Area (m^2)**	59
Description: Two parcels of amenity grassland dominated by perennial rye-grass (*Lolium perenne*) form areas of living roof on top of Building B1 (see Photograph 1 on Figure 3). Other species include frequent red fescue (*Festuca rubra*) and annual meadow grass (*Poa annua*) and daisy (*Bellis perennis*), dandelion (*Taraxacum* agg.) and ribwort plantain (*Plantago lanceolata*) occurring rarely.					
Key Species: Perennial rye-grass, red fescue, annual meadow grass					

Habitat Name	Introduced shrub	Code	IS1 and IS2	Area (m^2)	23
Description: Two raised beds of introduced shrub are located in the north of the site surrounded by hard standing (HS1). The raised beds contain mostly non-native shrubs including: hebe species. (*Hebe* sp.), New-Zealand Flax (*Phormium* sp.), box-leaf honeysuckle (*Lonicera nitida*) and elaegnus sp. (*Elaegnus* sp.)					
Key Species: Hebe and daisy					

Habitat Name	Introduced shrub	Code	IS3-IS5	Area (m^2)	55
Description: A further three raised beds of introduced shrub occur on the roof of Building B1. They mostly contain non-native shrubs and herbs such as rose (*Rosa* sp.) and an aloe (*Aloe* sp.). IS4 and IS5 contain wall cotoneaster (*Cotoneaster horizontalis*).					
Key Species: Wall cotoneaster.					

Habitat Name	Bare ground	Code	BG1, BG2	Area (m^2)	22
Description: Two raised areas of bare ground located in the roof garden of B1, behind B3 which have previously been planted.					
Key Species: N/A					

Habitat Name	Bare ground/Introduced Shrub	Code	BG/IS1	Area (m^2)	11
Description: An area of bare ground with some introduced shrub located between B2 and HS1. Introduced shrub species present include sycamore (*Acer pseudoplatanus*), willowherb species (*Epilobium*) and butterfly-bush *(Buddleja davidii*) approximately 10% of the area is vegetated. See Photograph 3 on Figure 3.					
Key Species: Sycamore, willowherb, butterfly-bush.					

Habitat Name	Fence	Code	F	Area (m^2)	n/a
Description: Steel fencing (1m in height) and temporary wooden construction fencing (3m in height) are found in the north-east of the site.					
Key Species: N/A					

Habitat Name	Building	Code	B1, B2, B3	Area (m^2)	1609
Description: A building (B1 on Figure 2 and Photograph 4 and 5 on Figure 3) forms the south-western section of the site. Areas of introduced shrub (IS3-IS5) and amenity grassland (AM1 and AM2) form areas of living roof on the first floor. There is a second storey section in the north-east of the building (see Photograph 3 on Figure 3). A temporary building (B3) currently used as a café is located on part of the roof space of B1. B2 is located in the north-west of the site and is currently used as the Bloomsbury Theatre.					
Key Species: N/A.					

Habitat Name	Hard standing	Code	HS1	Area (m^2)	704
Description: Road and pavement form an area of hard standing (HS1) in the east of the site (see HS1 on Figure 2 and Photograph 5 on Figure 3).					
Key Species: N/A					

Habitat Name	Hard standing/Bare ground mosaic	Code	HS/BG1	Area (m^2)	347
Description: An area of hard standing and bare ground in the east of the site currently being used as a site for temporary building compound units (see HS/BG1 on Figure 2 and Photograph 6 on Figure 3)					
Key Species: N/A					

Fauna

3.2.3 The following species of fauna were recorded during the survey:

- Blackbird (*Turdus merula*)
- Magpie (*Pica pica*)

3.3 Assessment of Ecological Value and Protection of Ecological Features

3.3.1 The site is considered to have low ecological value as it does not support any semi-natural habitats and has negligible potential for protected species. It is highly modified and is located in the densely urban setting of central London.

3.4 Conclusion

3.4.1 The site can be classified as being of low ecological value and **one credit point** can therefore be awarded under LE2.

4. LE3 – Mitigating Ecological Impact

4.1 Background

4.1.1 Under LE3, credits are awarded if steps are taken to minimise reductions or increase the ecological value of the site. In this case, ecological value is based on the number of plant species per hectare (counting native species or those with a known value to local wildlife only). This is worked out using numbers of native species for the various landscape types on site, both before and after development. Credit points are available as listed in the table below.

Credits available under LE3 – Mitigating Ecological Impact

Credit Points	Criteria
1	Where evidence provided demonstrates that the change in the site's existing ecological value, as a result of development, is minimal.
2	Where evidence provided demonstrates that there is no negative change in the site's existing ecological value as a result of development.

4.1.2 A minimal change is defined as a change of ecological value of between less than zero and equal to, or greater than, minus nine species. No negative change of ecological value is defined as equal to, or greater than zero species.

4.2 Guidance

Species before Development

4.2.1 A total of seven types of habitat (with defined areas) were identified on site. The number of species identified in each habitat type is summarised in the following table. As plant species were only found on approximately 5% of the total area of the bare ground/introduced shrub (BG/IS1) the calculations have been adjusted to reflect this. This can then be used to calculate the average number of species before development.

Plot Type (Habitat)	Area on Site (m^2)	Number of Native Species *		Species x Area of Plot Type
Amenity grassland†	59	6		354
Introduced shrub†	78	11		858
Building	1620	0		0
Bare ground/Introduced Shrub mosaic (vegetated)**	0.55	3		1.65
Hard standing	704	0		0
Bare ground†	22	0		0
Hard standing/Bare ground mosaic	347	0		0
Total site area =	**2830**		**Total =**	**1214**
Species before development = **(Total species x area of plot type/Total site area)**				**0.43**

* Or species with a known value to wildlife, this includes species listed on RHS plants for bees, bats and butterflies.
†The amenity grassland, introduced shrub parcels IS3-IS5 and bare ground overlap the footprint of the building, and therefore the area of the building has been reduced accordingly..
**Only 5% of the bare ground/introduced shrub area is vegetated, therefore the area 'on site' has been reduced to 5% of the actual area.

Species after Development

4.2.2 Following development, the site will be largely comprised of a single building. Landscaping plans have been produced which include a Japanese Garden with areas of formal planting and a living roof. The planting schedule for the Japanese Garden was based on drawings supplied to Thomson Ecology by Expedition (drawing number L-1363-PPP-02)

4.2.3 By multiplying the number of native species, or species with a known value to wildlife, proposed within each planting scheme by the area of each landscaping type, the average number of species after development can be calculated. The calculation is shown in the following table.

Plot Type (Habitat)	Area on Site (m^2)	Number of Native Species*		Species x Area of Plot Type
Building	2634	0		0
Living roof (planted area)**	96.5	10		965
Japanese Garden (planted area)**	100	21		2100
Total site area =	**2830**		**Total =**	**3065**
Species after development = **(Total species x area of plot type/Total site area)**				**1.08**

* Or species with a known value to wildlife, this includes species listed on RHS plants for bees, bats and butterflies.
**The living roof overlaps the building area footprint, and so the living roof area is not included in the total site area calculation.

Change in Ecological Value

Total No. Species After Development		Total No. Species Before Development		Total Change in Species
1.08	-	0.43	=	0.65

4.3 Conclusion

4.3.1 Therefore under the current landscaping proposals, it should be possible to achieve **two credits** as there will be no negative change in the ecological value of the site.

5. LE4 – Enhancing Site Ecology

5.1 Background

5.1.1 A maximum of three credit points are available in this section if steps are taken to protect and enhance the ecological value of the site following development.

5.1.2 One point is available if a suitably qualified ecologist is appointed to advise and report on enhancing and protecting the ecological value of the site, and the ecologist's recommendations for general enhancement and protection of site ecology are implemented.

5.1.3 A progressive increase in credit points is available for a positive increase in the ecological value of the site, provided the first credit point has been achieved. This is shown in the table below.

Increase in credits available under LE4 – Enhancing Site Ecology

Total Credit Points	Criteria (assuming first credit point has already been achieved)
2	For a positive increase in the ecological value of the site up to (but not including) six species.
3	For a positive increase in the ecological value of the site of six species or greater.

5.2 Appointed Professional Ecologist

5.2.1 Thomson Ecology has been appointed as professional ecologists to advise the client on ecological enhancement and protection of ecological features. Gabrielle Graham is the suitably qualified ecologist in this case, as indicated in the introduction of this report (see Section 2.3).

5.3 Recommendations

5.3.1 As no features of ecological value have been recorded, recommendations are not required for protection of ecological features on site. Recommendations for ecological enhancement are as follows:

- Installation of a living roof using native species or species of known benefit to wildlife on the new building.
- Inclusion of at least two bird bricks (*e.g.* Schwegler 1HE) or bird boxes (*e.g.* Cedarwood house sparrow box) for house sparrow (*Passer domesticus*). House sparrow is on the UK red list for birds and is a Species of Principal Importance under the NERC Act and London Local BAP priority species.
- Inclusion of at least two bat bricks or bat boxes on the new building. These should face in a southerly direction (*i.e.* south-west to south-east). A large variety of designs are available, including the Schwegler 1FF and 2FN bat boxes, which are self-cleaning. Bat bricks that can be custom made to match the construction of the new building (see Alana Ecology website

for more information). The site is located adjacent to Gordon Square and Tavistock Square Gardens, which may provide suitable foraging habitat for bats. Six bat species, including three frequently found in the London area, are Species of Principal Importance under the NERC Act. All bats are London BAP priority species.

- Any external new lighting on site should be directional and must ensure control of light spillage to prevent any negative impacts to the recommended bird and bat boxes.

5.4 Further Increase in Ecological Value of the Site

5.4.1 Further credit points are available under LE4 providing the first credit point is achieved, as described in 5.1.2, and evidence is provided to demonstrate a positive increase in the ecological value of the site of up to (but not including) six species and an increase of six species or above.

5.4.2 Under the current, proposed planting scheme there will be an increase of 0.65 species, resulting in two credit points being awarded.

5.4.3 As this is an area based calculation, in order to receive a positive change in the number of species of at least six, it would be necessary to greatly increase the area of the site available for planting. This would only be likely to be achieved by incorporating an additional large area (760m^2) of species-rich grassland with 20 native species (or species of known benefit to wildlife) into the development plan.

5.4.4 Therefore, three credit points are unlikely to be achieved under LE4 unless significantly large areas of the site are made available for planting, or unrealistic numbers of plant species are incorporated into the landscaping design.

5.5 Conclusion

5.5.1 One credit should be awarded due to an ecologist being appointed. An additional credit should be achieved if current landscaping proposals are followed. Therefore a total of **two credits** should be achieved under LE4.

5.5.2 Three credits would only be likely to be achievable if a significantly larger area of living roof is incorporated into the proposals. This is likely to be unrealistic (see Section 5.4.3) and therefore it is unlikely that any more than two credit points will be gained under LE4.

6. LE5 - Long Term Impact on Biodiversity

6.1 Background

6.1.1 One credit point is available if all mandatory requirements and at least two additional requirements under the BREEAM – New Construction (2011) Assessment guidelines are committed to.

6.1.2 A second credit point is available if all the mandatory requirements and at least four additional requirements are carried out.

6.2 Mandatory Requirements

6.2.1 Mandatory requirements are that:

- A suitably qualified ecologist (SQE) has been appointed prior to commencement of activities on site;
- The SQE has confirmed that all relevant UK and EU legislation relating to protection and enhancement of ecology has, or will be, complied with during the design and construction process; and
- An appropriate landscape and habitat management plan is produced covering at least the first five years after project completion.

Suitably Qualified Ecologist

6.2.2 Gabrielle Graham from Thomson Ecology Ltd is the SQE in this case as indicated in the introduction to this report (see Section 2.3). Thomson Ecology Ltd has been appointed prior to commencement of activities on site.

Protection and Enhancement

6.2.3 The wall cotoneaster present in introduced shrub areas IS4 and IS5 is an invasive species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). As such, it should be removed and destroyed on site if possible, preferably by burning, in order to prevent its further spread into the wild. We would also recommend removal of butterfly-bush by burning.

Habitat Management Plan

6.2.4 Given the site is located in an urban environment and dominated solely by a building requiring little management other than that outlined below, a management plan is not considered to be required. However the following points should be considered:

- Where bird boxes are installed on the new building, these should be cleaned out outside of the bird breeding season (*i.e.* they should be cleaned out between September to February inclusive) each year. If the boxes are damaged or broken, they should be replaced with a similar box.
- Bat boxes can only be opened by licensed bat workers. These will require no maintenance.

- Any planted shrubs should be pruned where necessary (to control spread) and watered, particularly during the first year of planting and during dry periods. This should be undertaken outside of breeding bird season (March - August) or following a check by an ecologist.

6.3 Additional Requirements

6.3.1 Additional requirements that could be implemented by the contractor under LE5 (in addition to the mandatory requirements) in order to gain one or two credit points include the following:

1. The contractor nominates a 'Biodiversity Champion' to influence site activities and to ensure that detrimental impacts on biodiversity are minimised in line with the recommendations of a SQE;
2. The contractor trains the work force on the protection of site ecology during the project;
3. The contractor records actions taken to protect biodiversity and monitor their effectiveness throughout key stages of construction (these records must be made publicly available upon request);
4. A new ecologically valuable habitat appropriate to the local area is created. This includes habitat that supports nationally, regionally or locally important biodiversity and/or which is nationally, regionally or locally important itself (e.g. a UK Biodiversity Action Plan (BAP) priority habitat, habitat listed in the Local BAP or habitat type occurring within designated sites identified in local plans);and
5. The contractor has programmed site works to minimise disturbance to wildlife.
6. BREEAM – New Construction (2011) contains an extra additional requirement available for Education buildings. This requires that a partnership is set up with a local wildlife organisation *e.g.* the local Wildlife Trust or a similar body, and the group has:
   - Provided advice early in the design process regarding protecting and/or providing habitat for species of local importance on the site;
   - Provided advice based on their local knowledge regarding the development's relationship with the local ecological environment; and
   - Committed to provide ongoing support for the long-term management and maintenance of the outdoor space.

6.3.2 By nominating an individual who is made aware of the ecological issues on site, namely the recommendations with respect to the removal of wall cotoneaster and clearance of habitat suitable for breeding birds, Point 1 should be covered. Points 2 and 3 should be awarded by default as no features of significant ecological value are present on site.

6.3.3 By undertaking works outside of the breeding bird season or following a check by an ecologist, achieving point 5 should be achievable.

6.4 Conclusion

6.4.1 It should be possible to implement all mandatory requirements and at least four of the additional requirements, therefore **two credits** should be available under LE5.

7. References

7.1.1 Building Research Establishment Ltd (2011). *BREEAM New Construction Assessment: Non Domestic Buildings, Technical Manual SD5073- 2.0:2011*. BRE, Watford.

7.1.2 Department for Environment, Food and Rural Affairs (DEFRA) (2005). *Helping to prevent the spread of invasive non-native species: Horticultural Code of Practice*. DEFRA, London.

7.1.3 JNCC (2010). *Handbook for Phase 1 habitat survey: A technique for environmental audit*. Joint Nature Conservancy Committee, Peterborough.

7.1.4 London Biodiversity Partnership. *London's BAP priority habitats*. www.lbp.org.uk

7.1.5 Royal Horticultural Society. *Plants to attract bats* www.rhs.org.uk/advice/pdfs/plants-for-bats

7.1.6 Royal Horticultural Society. Plants to attract bees www.rhs.org.uk/Media/PDFs/Advice/Plants-for-bees

7.1.7 Royal Horticultural Society. *Plants to attract butterflies* www.rhs.org.uk/Media/PDFs/Advice/Plants-for-butterflies

7.1.8 Stace C (2010). *New Flora of the British Isles* (third edition). Cambridge University Press, Cambridge.

8. Appendix 1 – Methods Used

8.1 Field Survey

8.1.1 A survey area was defined that encompassed the entire site proposed for development.

8.1.2 An extended Phase 1 survey (JNCC, 2010; IEA, 1995) was conducted throughout the survey area. This is a standard technique for obtaining baseline ecological information for areas of land and can be used to inform the BREEAM assessment process.

8.1.3 The Phase 1 methodology is primarily a mapping technique and uses a standard set of habitat definitions for classifying areas of land on the basis of the vegetation present. For this survey, the technique was modified (or extended) to provide more detail over a smaller area, and give further consideration to fauna.

8.1.4 Incidental records of fauna were also made during the survey and the habitats identified were evaluated for their potential to support protected species and other species of conservation concern, including Biodiversity Action Plan Priority species. No specific faunal surveys were undertaken.

8.1.5 A full plant species list was compiled for each of the Phase 1 habitat types identified. Plant species nomenclature follows Stace (2010).

8.2 Ecological Value of the Site

8.2.1 The evaluation is based on standard criteria for assessing nature conservation value. The site is evaluated against ten different criteria as summarised in the following table:

Criteria	Description / Comments
Size	The value of a site usually increases with size. Smaller sites are therefore often of low ecological value.
Diversity	The variety of both species and communities. Sites with a low diversity are generally of low ecological value.
Naturalness	Degree of modification by man. Highly modified sites often have low ecological value.
Rarity	The presence of rare or local species or communities on site. Common and widespread species and communities are often of low ecological value.

Criteria	Description / Comments
Fragility	Degree of sensitivity of species, communities and habitats to environmental change. Recently established ephemeral or 'artificial' habitats are often of lower ecological value than long established habitats with slow colonising species as they are more readily recreated.
Typicalness	Sites that represent a 'typical' example of a particular ecosystem may have value as well as the best examples of particular ecosystems.
Recorded history	Value of the site for previous scientific study and research. Important sites may be designated for their scientific interest.
Position in an ecological/ geographical unit	Relationship of site to adjacent areas of conservation value. Sites that have no function as wildlife corridors or refuges within similar surroundings often have low ecological value.
Potential value	Potential of site to support species of conservation concern or to develop greater conservation interest through management or natural change. Sites with no or minimal potential are generally of low conservation value.
Intrinsic appeal	Popular species or groups of species (e.g. birds or orchids) may have a greater intrinsic value than others. Sites that support a low diversity of popular species are likely to be perceived as having low ecological value.

9. Appendix 2 – Species Lists

9.1.1 Amenity grassland (AM1 and AM2)

Vernacular name	Scientific name	Abundance (DAFOR)
Perennial Rye-grass	*Lolium perenne*	D
Annual Meadow-grass	*Poa annua*	O
Red fescue	*Festuca rubra*	O
Daisy	*Bellis perennis*	R
Dandelion	*Taraxacum agg.*	R
Ribwort plantain	*Plantago lanceolata*	R

9.1.2 Introduced shrub (IS1)

Vernacular name	Scientific name	Abundance (DAFOR)
Hebe species	*Hebe* sp.	D

9.1.3 Introduced shrub (IS2)

Vernacular name	Scientific name	Abundance (DAFOR)
Box-leaf honeysuckle	*Lonicera nitida*	O
New-Zealand Flax	*Phormium sp.*	O
Spotted Laurel	*Aucuba japonica*	O

9.1.4 Introduced shrub (IS3-5)

Vernacular name	Scientific name	Abundance (DAFOR)
Barberry	*Berberis* sp.	F
Geranium	*Geranium* sp.	F
Lavender	*Lavandula sp.*	F
Rosemary	*Rosmarinus* sp.	F
Bay	*Laurus* sp.	O
Box	*Buxus* sp.	O
Hebe	*Hebe* sp.	O
New-Zealand Flax	*Phormium* sp.	O
Rose	*Rosa* sp.	O
Wall cotoneaster	*Cotoneaster horizontalis*	O
Aloe	*Aloe sp.*	R
Caster oil plant	*Fatsia japonica*	R

9.1.5 Introduced Shrub/Bare ground mosaic BG/IS1

Vernacular name	Scientific name	Abundance (DAFOR)
Sycamore	*Acer pseudoplantus*	R
Willowherb	*Epilobium* sp.	R
Butterfly-bush	*Buddleja davidii*	R

Appendix B BREEAM Pre-Assessment

UCL Student Centre

BREEAM Pre-Assessment Summary Report

Pre-assessment

Uncontrolled revision

21 May 2015

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1.0 Introduction

This report is intended as a summary of the BREEAM pre-assessment review for the following project:

Project Name	UCL Student Centre
BREEAM Version	BREEAM 2011 NC v2 - Education
Assessment Stage	Pre-Assessment Stage
Lead Assessor	Ben Cartmell
Target Rating	Excellent (70%)
Downloaded By	Ben Cartmell
Download Date	21/05/15
Download Time	22:34:47 (BST)

Please note that this is an uncontrolled copy and is for information only and a more detailed, formal pre-assessment report may be issued by your appointed assessor. If you have any queries on the content of this report or the award of any of the credits please contact your licensed assessor as noted above.

2.0 Scoring scenarios

It should be noted that the pre-assessment scores have been based on the following scoring scenarios;

- Current - The credits which are currently being targeted to deliver a rating of Excellent.
- To Outstanding - Current plus further credits which could be targeted to deliver a rating of Outstanding.
- Further potential - Further potential credits in addition to those identified for Outstanding which provide further options.

On this basis, the following scores are considered achievable under each scenario;

Scenario	Score	BREEAM Rating
Current	81	Excellent
To Outstanding	89.41	Outstanding
Further potential	90.41	Outstanding

2.1 Minimum Standards

In addition performance against the minimum standards (required for the specified target rating) under each scenario is summarised below;

Issue	Current	To Outstanding	Further potential
Man 01 - Sustainable Procurement	✓	✓	✓
Man 02 - Responsible Construction Practices	✓	✓	✓
Man 04 - Stakeholder Participation	✓	✓	✓
Hea 01 - Visual Comfort	✓	✓	✓
Hea 04 - Water Quality	✓	✓	✓
Ene 01 - Reduction of CO2 Emissions	✓	✓	✓
Ene 02 - Energy Monitoring	✓	✓	✓
Ene 04 - Low and Zero Carbon Technologies	✓	✓	✓
Wat 01 - Water Consumption	✓	✓	✓
Wat 02 - Water Monitoring	✓	✓	✓
Mat 03 - Responsible Sourcing of Materials	✓	✓	✓
Wst 01 - Construction Waste Management	✓	✓	✓
Wst 03 - Operational Waste	✓	✓	✓
LE 03 - Mitigating Ecological Impact	✓	✓	✓

If the required minimum standards are not met then the target rating will not be achieved regardless of overall score.

3.0 - Credits and Comments Table

		Available	Current	To Outstanding	Further potential	Comments
Management						
Man 01	Sustainable Procurement	8	8	8	8	**Credit 1:** One credit for involving key stakeholders in the project brief & design from RIBA Stage B (or equivalent) onwards. In addition, a schedule of roles, responsibilities & training should be produced for key stakeholders (as relevant). *This is expected to be available from UCL and Mace.* **Credit 2:** One credit for the appointment of a BREEAM AP & setting of BREEAM performance targets by the end of RIBA Stage B (or equivalent). *To be delivered by Expedition / Southfacing.* **Credit 3:** A further credit for the appointment of a BREEAM AP to monitor and regularly review project performance against BREEAM performance targets between RIBA stages B and E. *To be delivered by Expedition / Southfacing.* **Credit 4:** A further credit for the appointment of a BREEAM AP to monitor and regularly review project performance against BREEAM performance targets from pre-construction through to RIBA Stage L (or equivalent). *To be delivered by Expedition / Southfacing.* **Credit 5: One credit** where there will be a commitment to carry out thermographic testing once the building is complete to identify the continuity of insulation / avoidance of thermal bridging. This survey should be included in the programme of works and there should be a commitment to rectify any defects identified. **Credit 6:** One credit where there will be a commitment to appoint a project team member to monitor commissioning on behalf of the client, where best practice (CIBSE / BSRIA) commissioning codes will be complied with & commissioning will be accounted for in the programme of works. In addition, where complex systems are specified, a specialist commissioning manager should be appointed during the design stage to monitor commissioning until project completion. **Credit 7:** One credit where a specialist commissioning agent will be appointed to undertake seasonal commissioning in the first 12 months after building occupation. *To be included as requirements in the contract documents.* **Credit 8:** A further credit where mechanisms will be put in place to collect & report on energy & water consumption data and there is a commitment to provide aftercare support to all building occupiers in the first 12 months of occupation. *It will be the responsibility of UCL Estates to make this commitment.*
Man 02	Responsible Construction Practices	2	2	2	2	**Credit 1:** One credit for a commitment to achieve certification under the Considerate Constructors Scheme. **Credit 2:** A further credit where there is a commitment to achieve a minimum score of 35 points under the Considerate Constructors Scheme with a score of at least 7 in each section.

Man 03	Construction Site Impacts	5	5	5	5	**Credit 1:** One credit for appointing a nominated individual to monitor, record and report data on energy consumption relating to site activities and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. **Credit 2:** One credit for appointing a nominated individual to monitor, record and report data on water consumption relating to site activities and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. **Credit 3:** One credit for appointing a nominated individual to monitor, record and report data on transport (fuel consumption & CO_2 emissions) relating to site activities (waste & materials) and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. **Credit 4:** One credit for sourcing all timber used for temporary site uses in accordance with the Government's Timber Procurement Policy. **Credit 5:** One credit where the contractor will certified under an EMS (such as ISO 14001) and commit to implement Environment Agency best practice pollution prevention practices on site.
Man 04	Stakeholder Participation	4	3	4	4	**Credit 1:** One credit where relevant parties have been consulted in the preparation of the building brief, a consultation plan produced, consultation undertaken and feedback provided. *Southfacing will meet with Nicholas Hare to discuss the role of the third party consultation coordinator. The credit has been identified as being required to achieve Outstanding.* **Credit 2:** One credit for producing an access statement in accordance with CABE recommendations and providing shared facilities that can be accessed by the community in a secure manner (without gaining uncontrolled access to the building). *It has been advised by Nicholas Hare Architects that a CABE compliant Design & Access Statement will be produced.* **Credit 3:** One credit for producing a Building User Guide appropriate to all users of the building and where this is made available to all users. **Credit 4:** One credit where there will be a commitment by the client to undertake Post Occupancy Evaluation & to disseminate information on this through a suitable case study. *It will be the responsibility of UCL Estates to make this commitment.*
Man 05	Life Cycle Cost and Service Life Planning	3	3	3	3	**Credit 1:** One credit where a Life Cycle Cost (LCC) model will be carried out at RIBA Stage C/D (or equivalent) in accordance with PD156865 and a critical appraisal completed at feasibility stage on Service Life Planning in accordance with ISO 15686. *AECOM have begun the LCC model with BREEAM requirements incorporated.* **Credit 2:** A further credit where the analysis will cover at least 2 key building elements (envelope, services, finishes or external spaces) and be used to select the options with the lowest discounted LCC. *As above.* **Credit 3:** A further credit where the model carried out at RIBA Stage C/D will be updated during Stage D/E, the results implemented in the final specification and a maintenance strategy developed based on the LCC analysis. *As above.*
Management Totals:		**22**	**21**	**22**	**22**	
Management score totals:		**12**	**11.455**	**12**	**12**	
Health & Wellbeing						

Hea 01	Visual Comfort	4	1	1	1	**Pre-requisite:** HFBs on all fluorescent lighting. *Mandatory requirement, must be achieved.* **Credit 1:** One credit where at least 60% of occupied areas will have a daylight factor of 2% and a uniformity ratio of 0.4 (or view of sky and room depth criterion). *It is assumed with a number of deeper spaces that these criteria will not be achievable. This credit is not targeted however the daylight levels for the new design will be checked.* **Credit 2:** One credit where at least 80% of occupied areas will have a daylight factor of 2% and a uniformity ratio of 0.4 (or view of sky and room depth criterion). *It is assumed with a number of deeper spaces that these criteria will not be achievable. This credit is not targeted.* **Credit 3:** One credit where all occupied areas will have user controlled glare control (eg blinds) and an adequate view out. *Assumed to not be achievable due to deeper spaces and the view out criteria. This credit is not targeted.* **Credit 4:** One credit where internal & external lighting will be designed and specified in accordance with relevant CIBSE & BS best practice guidance. *Credit targeted.*
Hea 02	Indoor Air Quality	4	2	2	2	**Credit 1:** One credit where an indoor air quality plan will be produced, where air intakes / extracts are appropriately located to avoid air pollution & ventilation rates specified in accordance with best practice standards. *The credit requirements have been reviewed by the team and it has been decided that these are not achievable.* **Credit 2:** One credit where paints / varnishes and the majority of finish materials will be specified as low VOC in accordance with best practice testing. *Credit targeted.* **Credit 3:** One credit where post completion VOC testing will be carried out in accordance with best practice standards and any non-compliance rectified. *Credit targeted.* **Credit 4:** One credit where all occupied building areas will be naturally ventilated in accordance with best practice standards. *The credit requirements have been reviewed by the team and it has been decided that these are not achievable.*
Hea 03	Thermal Comfort	2	2	2	2	**Credit 1:** One credit where thermal modelling will be carried out in accordance with best practice CIBSE guidance & to ensure appropriate thermal comfort levels are met. *To be included in the BDP Specifications. Credit targeted.* **Credit 2:** A further credit where appropriate thermal zoning & control systems will be specified. *As the design develops BDP to advise if there will be any impact on meeting the credit requirements. Credit targeted until advised otherwise.*
Hea 04	Water Quality	1	1	1	1	**Pre-requisite** for compliance with HSE ACoP. *Mandatory requirement, must be achieved.* **Credit 1:** One credit where all water systems will be designed to HSE ACoP on prevention of legionella and failsafe (eg steam) humidification is specified (or no humidification present). In addition chilled drinking water dispensers should be provided in all relevant building areas. *Credit targeted.*
Hea 05	Acoustic Performance	2	2	2	2	**Credit 1:** One credit for a commitment to design occupied areas to meet best practice (BB93 & BS8233) internal noise levels. *Credit targeted. Assumed achievable on basis of input from the appointed acoustician.* **Credit 2:** One credit for a commitment to design relevant building areas to meet best practice (BB93) reverberation times. *Credit targeted. Assumed achievable on basis of input from the appointed acoustician.*
Hea 06	Safety and Security	2	2	2	2	**Credit 1:** One credit where the site will be designed to have safe cyclist, pedestrian & delivery access. *Credit targeted.* **Credit 2:** One credit where a suitable security consultant (ALO or CPDA) will be consulted from RIBA Stage C (or equivalent) and their comments incorporated within the building design to ensure that it will comply with the principles of Secured by Design. *An ALO was consulted during the early stages of the initial design. The person has been re-engaged to review and advise on the latest scheme.*
Health & Wellbeing Totals:		**15**	**10**	**10**	**10**	

Health & Wellbeing score totals:		**15**	**10**	**10**	**10**	
Energy						
Ene 01	Reduction of CO2 Emissions	15	14	14	14	**Up to 15 credits** where the building's energy performance exceeds that required under Part L 2010. For a rating of Excellent there is a minimum requirements of achieving 6 credits with a minimum of 10 credits required for a rating of Outstanding. *Expedition have undertaken preminary Part L calculations based on the current design and specification proposing that 14 credits could be achieved.*
Ene 02	Energy Monitoring	2	2	2	2	**Credit 1:** One credit where all major energy consuming systems within the building will be sub-metered and all sub-meters / outputs appropriately labelled. *Credit targeted.* **Credit 2:** One credit where all tenanted (or major function areas) will be individually sub-metered or monitored through a BEMS. *Credit targeted.*
Ene 03	External Lighting	1	1	1	1	**One credit** where all external lighting will be specified to meet best practice efficacy, colour rendering and control requirements. *Credit targeted.*
Ene 04	Low and Zero Carbon Technologies	5	4	5	5	**Credit 1:** One credit where a feasibility study will be carried out to establish appropriate forms of low & zero carbon energy for the development. *Expedition will be producing a compliant feasibility study. Credit targeted.* **Credit 2:** A further credit where the study will also cover a Life Cycle Assessment of the carbon impact of the chosen LZC technology. *Expedition will be producing a compliant feasibility study. Credit targeted.* **Credit 3:** One further credit where an LZC technology will be specified and will result in a reduction in CO_2 emissions of at least 10% **OR** two further credits where an LZC technology will be specified and will result in a reduction in CO_2 emissions of at least 20%. *One credit has been included under the Current design and two credits have been identified as being required in order to achieve a rating of Outstanding.* **Credit 4:** One credit where the building will achieve the comfort conditions set out in Hea 03 and free cooling strategies will be specified. *It is understood that free cooling is now incorporated into the energy strategy so the credit is targeted.*
Ene 06	Energy Efficient Transportation Systems	2	2	2	2	**Credit 1:** One credit where lifts & escalators will be specified based on an analysis of transport demand & energy consumption and selection of the lowest energy consumption option. *Credit targeted.* **Credit 2:** A further credit where lifts & escalators will be fitted with energy saving measures such as variable speed drives, load sensors and stand-by mode. *Credit targeted.*
Ene 08	Energy Efficient Equipment	2	2	2	2	**Two credits** where energy efficient equipment (IT equipment, white goods etc) is specified for the development. *UCL Estates will be responsible for this credit.*
	Energy Totals:	**27**	**25**	**26**	**26**	
	Energy score totals:	**19**	**17.593**	**18.296**	**18.296**	
Transport						
Tra 01	Public Transport Accessibility	5	5	5	5	Up to **5 credits** for provision of public transport based on a PTAL / Accessibility Index (AI) rating. *The AI has already been calculated for the site using the TfL PTAL calculator. This AI have been included in the BREEAM Tra 01 calculator and this has confirmed that all five credits can be claimed.*
Tra 02	Proximity to Amenities	1	1	1	1	**One credit** where the building is located within 500m (by safe walking route) to key amenities such as grocery shop, post box & cash machine. *Credit targeted.*
Tra 03	Cyclist Facilities	2	2	2	2	**Credit 1:** One credit where secure, covered cycle storage facilities will be provided for building users. *Credit targeted.* **Credit 2:** A further credit where compliant cyclist facilities (eg showers, changing space, lockers & drying space) will also be provided. *Credit targeted.*

Tra 04	Maximum Car Parking Capacity	2	2	2	2	**One credit** where parking provision is limited to 1 space for 25 occupants. **Two credits** where parking provision is limited to 1 space for 30 occupants. *Both credits will be achievable by default as there will be no car parking provision associated with this building.*
Tra 05	Travel Plan	1	1	1	1	**One credit** where a compliant travel plan will be produced for the development, the findings of which will be used to influence the building design. *Credit targeted.*
	Transport Totals:	**11**	**11**	**11**	**11**	
	Transport score totals:	**8**	**8**	**8**	**8**	
Water						
Wat 01	Water Consumption	5	3	3	3	**Up to 5 credits** are achievable based on specification of water efficient fittings and/or water recycling. *3 credits have been targeted based on water efficient fixtures and fittings being specified.*
Wat 02	Water Monitoring	1	1	1	1	**Pre-requisite:** Installation of pulsed output water meter. *Mandatory requirement, must be achieved.* **Credit 1:** One credit where a pulsed output water meter will be specified to the mains supply to the building(s). In addition, any water consuming plant or areas which account for more than 10% of water demand must be separately sub-metered and all meters connected to the BMS (where specified). *Credit targeted.*
Wat 03	Leak Detection	2	2	2	2	**Credit 1:** One credit where a water leak detection system will be installed to the building. *Credit targeted.* **Credit 2:** One credit where sanitary supply shut off will be specified to the cold water supply to WCs in all toilet areas. *Credit targeted.*
Wat 04	Water Efficient Equipment	1	1	1	1	**One credit** where water efficient irrigation will be specified to the building and external landscaping. *Credit targeted.*
	Water Totals:	**9**	**7**	**7**	**7**	
	Water score totals:	**6**	**4.667**	**4.667**	**4.667**	
Materials						
Mat 01	Life Cycle Impacts	6	4	6	6	**Up to 6 credits** are available for the specification of materials for key building elements. *Six credits have been identified as being required to achieve Outstanding. The materials specification needs to consider Green Guide ratings from an early stage and reviewed throughout design development.*
Mat 02	Hard Landscaping and Boundary Protection	1	1	1	1	**One credit** where at least 80% (by area) of external hard landscaping & boundary protection will be specified to have an A or A+ rating under the Green Guide to Specification. *Given the limited amount of hard landscaping and no boundary protection, this credit should be easily achievable.*
Mat 03	Responsible Sourcing of Materials	3	2	3	3	**Pre-requisite:** Responsibly sourced timber *Mandatory requirement, must be achieved.* **Up to 3 credits** are available for the specification of responsibly sourced (eg ISO14001, BES6001 or certified timber) materials. *Assumed that at least two credits will be achievable within the current materials specification. In order to achieve a rating of Outstanding the 3rd credit will also be required.*
Mat 04	Insulation	2	2	2	2	**Credit 1:** One credit where all insulation (fabric, services & acoustic) is specified to have a low environmental impact (under the Green Guide to Specification) and good thermal insulation properties. *Credit targeted.* **Credit 2:** A further credit where insulation (fabric, services & acoustic) is responsibility sourced from manufacturers having appropriate environmental certification (eg ISO 14001, BES6001 or similar). *Credit targeted.*
Mat 05	Designing for Robustness	1	1	1	1	**One credit** where the building design will incorporate suitable durability measures in areas of high vehicular & pedestrian traffic to prevent damage to vulnerable parts of the building. *Credit targeted.*
	Materials Totals:	**13**	**10**	**13**	**13**	

	Materials score totals:	**12.5**	**9.615**	**12.5**	**12.5**	
Waste						
Wst 01	Construction Waste Management	4	2	3	3	**Credit 1:** One credit where a SWMP is produced and site waste will be limited to 13.3m^3 or 11.1 tonnes per 100m^2 GIA. *Credit targeted.* **Credit 2:** Two credits where a SWMP is produced and site waste will be limited to 7.5m^3 or 6.5 tonnes per 100m^2 GIA. *Credit targeted for Outstanding.* **Credit 3:** Three credits where a SWMP is produced and site waste will be limited to 3.4m^3 or 3.2 tonnes per 100m^2 GIA. *Credit unlikely to be achievable. To be confirmed by the appointed contractor.* **Credit 4:** A further credit where at least 70% by volume (or 80% by weight) of non-hazardous site waste will be diverted from landfill through reuse or recycling. *Credit targeted.*
Wst 02	Recycled Aggregates	1	0	1	1	**One credit** where a significant proportion (approximately 25%) of high grade aggregate demand on site will be met through the use of locally sourced (within 30km) recycled aggregate **or** secondary aggregate. *Credit targeted to achieve a rating of Outstanding.*
Wst 03	Operational Waste	1	1	1	1	**One credit** where dedicated space will be provided on site to cater for the segregation / storage of operational recyclable waste and the space will be clearly labelled for use. In addition, buildings likely to generate significant volumes of recyclable waste should provide a suitable waste compactor / baler. *The storage space may be located on the campus but close to the building. Nicholas Hare Architects will coordinate the provision. Credit targeted.*
	Waste Totals:	**6**	**3**	**5**	**5**	
	Waste score totals:	**7.5**	**3.75**	**6.25**	**6.25**	
Land Use & Ecology						
LE 01	Site Selection	2	1	1	1	**Credit 1:** One credit where at least 75% of the development footprint is on previously developed land. *Credit targeted.* **Credit 2:** One credit where the development is on a site considered to be seriously contaminated. It is understood that this site is not contaminated and therefore this credit is not available.
LE 02	Ecological Value of Site and Protection of Ecological Features	1	1	1	1	**One credit** where the site is deemed of low ecological value or where the construction zone is of low ecological value and all remaining ecological features on site will be adequately protected during construction. *It has been assumed that the site is of low ecological value and that there are no ecological features which will require protection. Credit targeted.*
LE 03	Mitigating Ecological Impact	2	2	2	2	**One credit** where the ecological impact of development will result in a change of less than -9 species or **two credits** where the ecological impact of development will be species neutral. *It has been assumed that there will be a likely positive increase in the ecological value of the site so two credits should be achieved.*
LE 04	Enhancing Site Ecology	3	2	2	3	**Credit 1:** One credit where a suitably qualified ecologist will be appointed to produce an ecological report on the site prior to development commencing and the client commits to implement their general recommendations. *Credit targeted based on advice given by Thomson Ecology.* **Credit 2:** One further credit where ecological enhancements will be specified to the site which will result in a species increase of up to 6. *Credit targeted based on advice given by Thomson Ecology.* **Credit 3:** An additional credit where ecological enhancements will be specified to the site which will result in a species increase of more than 6. *Thomson Ecology advised that this credit was unlikely to be achieved based on their first survey and report. To be reviewed.*

LE 05	Long Term Impact on Biodiversity	2	2	2	2	**One credit** where a suitably qualified ecologist will be appointed prior to works commencing to ensure that all relevant EU/UK legislation is complied with, a landscape management plan is produced and 2 of the additional BREEAM LE 05 requirements met or **two credits** where a suitably qualified ecologist will be appointed prior to works commencing to ensure that all relevant EU/UK legislation is complied with, a landscape management plan is produced and 4 of the additional BREEAM LE 05 requirements met. *Two credits should be easily achievable as Thomson Ecology have already been appointed but the appointed contractor will need to confirm compliance with the relevant legislation and meet certain site practices that promote protection of biodiversity.*
Land Use & Ecology Totals:		**10**	**8**	**8**	**9**	
Land Use & Ecology score totals:		**10**	**8**	**8**	**9**	
Pollution						
Pol 01	Impact of Refrigerants	3	0	1	1	**One credit** where the refrigerants specified within building services systems will have a Direct Life Cycle CO_2 equivalent of less than 1000 or **two credits** where the refrigerants specified within building services systems will have a Direct Life Cycle CO_2 equivalent of less than 100 or a Global Warming Potential of less than 10 or **three credits** where the building will not use any refrigerants in building services systems. *One credit should be targeted to achieve a rating of Outstanding.*
Pol 02	NOx Emissions	3	2	2	2	**One credit** where the Nox emissions of space heating & cooling systems will be limited to less than 100mg/kWh or **two credits** where the Nox emissions of space heating & cooling systems will be limited to less than 70mg/kWh or **three credits** where the NOx emissions of space heating & cooling systems will be limited to less than 40mg/kWh*. Two credits should be targeted to achieve Excellent.* **Note**: It is understood that information is being sought on the NOx emissions associated with the district heating system.
Pol 03	Surface Water Run Off	5	5	5	5	**Credits 1 & 2:** Two credits where a site specific flood risk assessment will be carried out and the site is found to be in an area considered to be of low risk of flooding. *Two credits are targeted.* **Credit 3:** One credit where an appropriate consultant is appointed to demonstrate that surface water run-off post development is limited to that prior to development. *Credit targeted.* **Credit 4:** A further credit where it can be demonstrated that flooding of the building will not occur in the event of local drainage system failure. *Credit targeted.* **Credit 5:** One credit where the potential for watercourse pollution is prevented by the specification of petrol interceptors / oil interceptors. *Credit targeted.*
Pol 04	Reduction of Night Time Light Pollution	1	1	1	1	**One credit** where external lighting (levels, reflectance and controls) has been designed in accordance with the ILE guidance on prevention of night time light pollution. *Credit targeted.*
Pol 05	Noise Attenuation	1	1	1	1	**One credit** where building plant is specified to ensure that external noise levels do not increase by more than 5dB as a result of development / compliant with BS 7445:1991. *Credit targeted.*
Pollution Totals:		**13**	**9**	**10**	**10**	
Pollution score totals:		**10**	**6.923**	**7.692**	**7.692**	
Innovation						
Man 01	Sustainable Procurement	1	0	1	1	**Credit 1: Exemplary Performance.** For extension of energy and water monitoring activities as described in Man 1 (Credit 8) to three years. *Credit targeted to achieve a rating of Outstanding. This will be the responsibility of UCL Estates.*

Man 02	Responsible Construction Practices	1	1	1	1	**Credit 1: Exemplary Performance.** A further credit associated with Man 2 where there is a commitment to achieve a minimum score of 40 points under the Considerate Constructors Scheme with a score of at least 7 in each section. *Credit targeted.*
Hea 01	Visual Comfort	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Ene 01	Reduction of CO2 Emissions	5	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Ene 04	Low or Zero Carbon Technologies	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Ene 05	Cold Storage	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Wat 01	Water Consumption	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Mat 01	Life Cycle Impacts	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Mat 03	Responsible Sourcing of Materials	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Wst 01	Construction Waste Management	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
Wst 02	Recycled Aggregates	1	0	0	0	Credit for Exemplary Performance. *Not targeted.*
AI	Approved Innovation	1	0	0	0	-
	Innovation Totals:	**16**	**1**	**2**	**2**	
	Innovation score totals:	**16**	**1**	**2**	**2**	
	OVERALL SCORE TOTALS:	**116**	**81.003**	**89.405**	**90.405**	