256 Gray's Inn Road

A new centre for world-leading dementia and neurology research and academic excellence

Sustainability Statement

December 2020

Issue	Date	Reason for Issue	Author
00	17/05/2019	For planning	Expedition
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Contents

0 Introduction

0.1 Description of Development

Planning permission 2019/2879/P was granted in March 2020 for the redevelopment of 256 Gray's Inn Road to provide a dementia and neurology research centre along with academic space for University College London (UCL). This Sustainability Addendum has been prepared by Expedition in connection with the planning application to amend the above permission to extend the basement of the new academic building, known as Plot 3.

The first phase of the approved development comprises the partial redevelopment of the former Royal Free Hospital (Plot 1) to deliver a world-leading medical research facility to tackle dementia and neurological diseases. Work on site is currently underway on Plot 1.

Subsequent phases of the approved development comprise the refurbishment of the grade II listed Eastman Dental Clinic (referred to as Plot 2) and the erection of a new building on the site of the Levy Wing (referred to as Plot 3) to deliver additional academic space for UCL. This academic space will complement the University's vision for creating a world class environment for education and academic research. The proposed development would also deliver a comprehensive landscaping scheme to open up new publicly accessible spaces within the site, and new public connections across it.

This planning application relates to the proposal to extend the basement of the Plot 3 building underneath the public realm area in the centre of the site to provide two lecture theatres for the academic use. UCL has identified a requirement for larger lecture theatres than would be delivered in the approved scheme. It also reflects UCL's intention to bring the delivery of the Plot 3 basement works forward at the same time as the Plot 1 basement works to deliver the development in a more efficient and less disruptive way.

This planning application also proposes small extensions to the basement of the Plot 1 building to allow for the provision of a sprinkler tank and additional plant. These are minor changes that do not have a material impact on the sustainability strategy. This updated strategy focuses on the larger amendment to the Plot 3 basement.

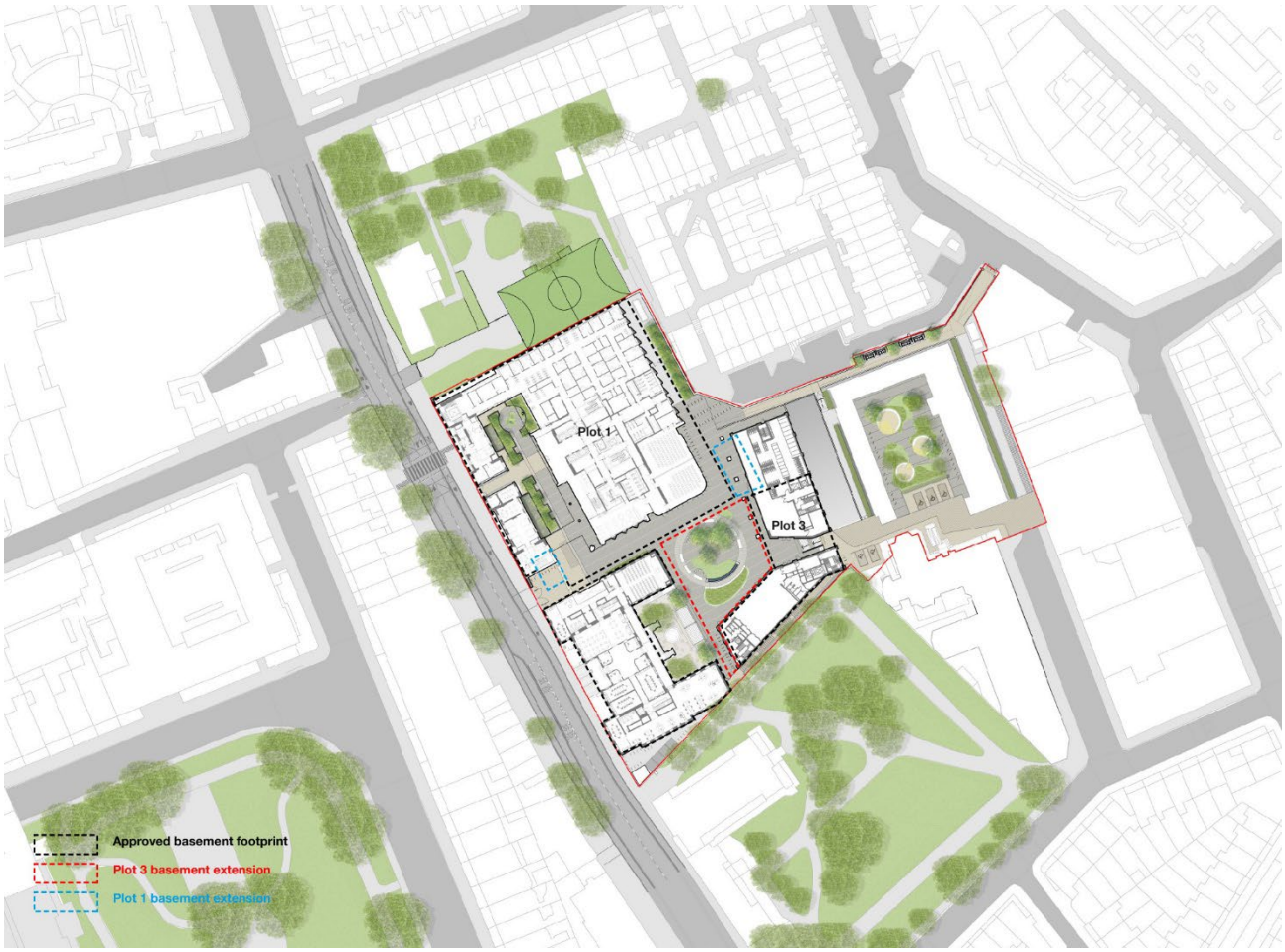


Figure 1: Site plan

0.2 Scope of this Document

This report forms an addendum to the Sustainability Statement submitted with the original planning application and sets out how the proposed amendments affect the detail and conclusions of the original report. This addendum should be read in conjunction with the original report.

The following amendments have been made to this document:

Table 1: Amendments to sustainability statement for Plot 3 application

Page(s)	Section	Amendment
3	Executive Summary	No changes
5	2. Introduction	Revised introductory paragraph to read: *Planning permission 2019/2879/P was granted in March 2020 for the redevelopment of 256 Gray's Inn Road to provide a dementia and neurology research centre along with academic space for UCL. This Sustainability Statement has been prepared as part of the pre-application discussions on a forthcoming application to amend the above permission to extend the basement of the new academic building, known as Plot 3.*

8	2.3 Supporting Documents	Addition of *Stage 3 Transport Requirements for Plot 3 prepared by Momentum* to list of supporting documents
8	2.3 Supporting Documents	Addition of *Energy Statement Plot 3 prepared by Hoare Lea* to list of supporting documents
11	3.2.1 New London Plan	Addition of paragraph: *In 2019, the GLA confirmed that they intent to publish the New London Plan. This raises its material significance for consideration in the planning process. However, we note that the project remains under assessment against the 2016 London Plan.*
12	3.3.1 Camden Climate Action	Addition of new section, 3.3.1 Camden Climate Action: *Camden have taken steps to demonstrate that they are a local authority at the forefront of climate action. In November 2019, Camden Council formally declared a Climate and Ecological Emergency. The Council held the first climate emergency citizens' assembly in the country, to listen to the priorities and ideas of people living in Camden.* *In 2020 The Council launched The Camden Climate Action Plan 2020-2025, which has a vision to achieve a net zero carbon Camden by 2030. This will require everyone living and working in Camden to play their part, but the Council will need to enable and support people to take climate action:* • *People - Everyone who lives, works, studies and visits the borough will be well informed and actively contribute to tackling the climate crisis in all aspects of their lives* • *Buildings - Camden's buildings will be energy efficient, comfortable and fit-for-purpose for a zero carbon future* • *Places - Camden's public spaces will encourage and enable healthy and sustainable travel choices and promote biodiversity* • *Organisations - All organisations in Camden will operate responsibly and embed tackling the climate crisis throughout their operations*
17	4.2 UCL's Strategic Vision	Updated text to reference new UCL document: *Change Possible: The Strategy for a Sustainable UCL 2019 - 2024*
19	5 Energy Efficiency	Clarification of reference to Energy Statement prepared by Hoare Lea (Revision 01- 03 November 2010)
20	5.4 Use Renewable Energy (Be Green)	Updated Plot 3 PV area to 235m^2 (slight reduction)
22	5.5.3 Carbon Dioxide Savings Plot 3	Updated Plot 3 carbon emission reduction to 33.5% emissions relative to current building regulations (Part L 2013 / SAP 2012), and 24.7% relative to SAP 10 to (slight improvement in performance).
22	5.5.3 Carbon Dioxide Savings Plot 3	Updated area of PV to 235m2 and annual electrical output to 35,600kWh/yr (slight reduction)
22	5.5.4 Carbon Dioxide Savings Site Wide	Updated site wide carbon emission reduction to 23% (SAP 2012) and 14.7% (SAP 10) (slight improvement in performance).
22	5.5.4 Carbon Dioxide Savings Site Wide Carbon Offset	Carbon offset figure updated to £123,400, as submitted at the S106 agreement using SAP 2012 carbon factors in line with LBC policy requirements.

23	5.5.4 Carbon Dioxide Savings	Figure 5: Site Wide Energy Hierarchy and Carbon Targets updated to reflect slight improvement in carbon emission saving.
34	10.3 Sustainable Travel	Updated number of cycle parking spaces to 378 long-stay and 326 short-stay (slight increase in number)
36	11.3 BREEAM Plot 3	BREEAM score updated to 74.48 (slight improvement)
40	Appendix C	New version of BREEAM Pre-assessment for Plot 3, dated 18th November 2020. No change to BREEAM Rating target (Excellent)

The Sustainability Statement applies to the redevelopment of 256 Gray's Inn Road, as described above. The document sets out a clear path to address key sustainability objectives, outlining appropriate strategies for: energy efficiency, sustainable water use and drainage, circular economy, biodiversity, adaptation to climate change and sustainable construction and operation. Efficient design processes are discussed alongside a suite of suitable approaches to ensure a truly sustainable scheme is developed for the whole development.

Current legislation and planning documents, specifically Building Regulations Approved Document L2A/B (Conservation of fuel and power in new/existing buildings) and Camden Planning Guidance on Sustainability, were reviewed and have guided the sustainability strategy for the redevelopment.

1 Executive Summary

This Sustainability Statement has been prepared by Expedition in connection with the proposed refurbishment and redevelopment of 256 Gray's Inn Road to deliver a new world-leading dementia and neurology research centre, as well as additional academic floorspace for University College London.

It sets out a high-level appraisal of sustainability opportunities and constraints for the proposed development. It accompanies, and should be read in conjunction with, the planning submission for the redevelopment of 256 Gray's Inn Road. Its purpose is to demonstrate how the project is addressing Camden's and relevant national requirements for sustainable development.

The development includes the partial redevelopment of Eastman Dental Hospital on Gray's Inn Road in the London Borough of Camden and is made up of a group of buildings comprising: the former Royal Free Hospital (Plot 1); the grade II listed Eastman Dental Clinic (Plot 2); and the Levy Wing (Plot 3).

The development aims to create a world leading research facility and deliver new academic space with health and wellbeing at its heart that will make a positive contribution to the environment, economy and community over the long term. This will build on UCL's long- standing commitment to achieving exemplary sustainable performance.

The following four principles have been used to set the overall project aspirations for the development; they have guided the design and development process so far and will continue to act as an overarching framework for the next stages of design, construction and operation: Low Energy and Carbon, Optimising Resource Use, Healthy and Productive Environments and Lifecycle Value. The designs and strategies that respond to these principles have been developed using an integrated systems approach, addressing energy, water, materials, waste, biodiversity and transportation in a holistic way.

The document sets out a clear path to address key sustainability objectives, outlining appropriate strategies for: energy efficiency, sustainable water use and drainage, circular economy, biodiversity, adaptation to climate change and sustainable construction and operation. Efficient design processes are discussed alongside a suite of suitable approaches to ensure a truly sustainable scheme is developed for the whole development.

Through addressing the above themes, the sustainability statement demonstrates how the redevelopment of 256 Gray's Inn Road will deliver an exemplary sustainable approach to the design process, which addresses local planning requirements.

1.1 Summary of Sustainability Approach

The development proposals respond to an overarching sustainability framework which sets a high level of ambition around sustainable development. These aspirations are delivered using an integrated systems approach, whereby multiple challenges are addressed using a suite of tailored and efficient strategies and technologies. The projects approach to sustainability is summarised below alongside Camden's key sustainable themes:

- **Energy Efficiency:** 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. Demand reduction is prioritised, efficient low NOx gas boilers and chillers provide heating and cooling and renewable energy is generated using multiple PV arrays.

- **Water Efficiency:** Water consumption will be minimised through the specification of highly water efficient fittings.
- **Flooding:** Peak surface water run-off from the site will be managed through blue/green roofs, permeable paving and a below-ground attenuation tank.
- **Sustainable Use of Materials:** Efficient use of resources, maximising recycled content of material and specification of durable materials will be prioritised to reduce whole life embodied carbon impacts.
- **Biodiversity:** Green roofs will be provided wherever possible with tree canopies in courtyards providing new habitats. Bird boxes will also to be provided.
- **Adaption to Climate Change:** Strategies for dealing with overheating and flood risk are incorporated within the design.
- **BREEAM:** BREEAM 'Excellent' and Camden's minimum standards for energy, water and materials categories are targeted.

1.2 Supporting Documents

This report forms part of the submission of the application for planning permission and listed building consent and should be read in conjunction with the following supporting documents:

a) Completed planning and listed building application form;

b) Completed Community Infrastructure Levy Form;

c) Planning Statement prepared WSP | Indigo;

d) Health Impact Assessment prepared by WSP | Indigo;

e) Economic Impact assessment prepared by WSP | Indigo;

f) Application drawings prepared by Hawkins\Brown;

g) Design and Access Statement prepared by Hawkins\Brown;

h) Feasibility Options Appraisal prepared by Hawkins\Brown;

i) Draft Phasing Strategy prepared by Hawkins\Brown;

j) Statement of Community Involvement prepared by Comm Comm UK;

k) Lighting Strategy prepared by Hoare Lea;

l) Energy Statement prepared by Hoare Lea;

m) Energy Statement Plot 3 prepared by Hoare Lea;

n) Eastman Dental Clinic Conservation Plan prepared by Alan Baxter Limited;

o) Heritage Statement prepared by Alan Baxter Limited;

p) Basement Impact Assessment prepared by Ramboll;

q) Structural Strategy Statement prepared by Ramboll;

r) Geotechnical Desk Study prepared by Ramboll;

s) Drainage Strategy prepared by Ramboll;

t) Flood Risk Assessment prepared by Ramboll;

u) Draft Construction Management Plan prepared by Blue Sky Building;

v) Site Waste Management Plan prepared by Blue Sky Building;

w) Transport Assessment prepared by Momentum;

x) Framework Travel Plan prepared by Momentum;

y) Draft Delivery and Servicing Management Plan prepared by Momentum;

z) Outline Construction Logistics Plan prepared by Momentum;

aa) Stage 3 Transport Requirements for Plot 3 prepared by Momentum;

bb) Arboricultural Report prepared by Thomson Ecology;

cc) Preliminary Ecology Appraisal prepared by Thomson Ecology;

dd) Landscaping Statement prepared by Plincke;

ee) Academic Needs Report prepared by Nicholas Hare Architects;

ff) Sustainability Statement incorporating BREEAM Assessments prepared by Expedition;

gg) Fire Strategy prepared by Buro Happold;

hh) Environmental Statement coordinated by Trium Environmental Consulting, and containing technical assessment chapters on:

a. Socio-economics prepared by WSP | Indigo;

b. Traffic and Transport prepared by Momentum;

c. Air Quality prepared by Air Quality Consultants;

d. Noise and Vibration prepared by Ramboll;

e. Wind prepared by RWDI Consulting Engineers;

f. Daylight, Sunlight, Overshadowing and Light Pollution prepared by GIA;

g. Townscape and Visual Impact Assessment prepared by Peter Stewart Consultancy;

h. Built Heritage prepared by Alan Baxter Limited; and

i. Archaeology prepared by PCA.

2 Policy and Guidance

The sustainability strategy has been developed in line with local policy and guidance. The following section summarises the main policy requirements for the sustainable development of the proposed development.

2.1 Key National Policy

2.1.1 National Planning Policy Framework (NPPF) 2018

The National Planning Policy Framework sets out the Government's planning policies for England. These apply to the preparation of local and neighbourhood plans by local authorities, to ensure sustainable development is delivered at a national level. The document defines the overarching objective of sustainable development as meeting the needs of the present without compromising the ability of future generations to meet their own needs. It covers social, environmental and economic needs.

2.1.2 Planning and Energy Act 2008

The Planning and Energy Act (2008) allows local planning authorities to set their own requirements for energy use and energy consumption in local plans as follows:

(a) a proportion of energy used in development in their area to be energy from renewable sources in the locality of the development;

(b) a proportion of energy used in development in their area to be low carbon energy from sources in the locality of the development;

(c) development in their area to comply with energy efficiency standards that exceed the energy requirements of building regulations.

2.1.3 Building Regulations Part L 2013

Approved Documents L2A/B for conservation of fuel and power in new/existing buildings other than dwellings supports the energy efficiency requirements of the Building regulations. For new buildings and in accordance with Regulation 26, the actual Building CO_2 Emission Rate (BER) must be no worse than the Target CO_2 Emission Rate (TER).

2.2 The London Plan

The London Plan is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London. Specific consideration has been given to the following policies, which are addressed in Camden's detailed planning polices set out in section 3.3.

- Policy 5.2 Minimising carbon dioxide emissions.
- Policy 5.3 Sustainable design and construction.
- Policy 5.6 Decentralised energy in development proposals.
- Policy 5.7 Renewable energy.
- Policy 5.9 Overheating and cooling.

- Policy 5.11 Green roofs.
- Policy 5.13 Sustainable drainage.
- Policy 5.18 Construction, excavation and demolition waste.
- Policy 6.9 Cycling.

2.2.1 New London Plan

The draft New London Plan is a broad plan to shape the way London develops over the next 20-25 years. The current 2016 Plan (The London Plan consolidated with alterations since 2011) is still the adopted Development Plan, but the draft London Plan is a material consideration in planning decisions.

In 2019, the GLA confirmed that they intent to publish the New London Plan. This raises its material significance for consideration in the planning process. However, we note that the project remains under assessment against the 2016 London Plan.

Alongside the adopted London Plan, key sustainability policies from the draft London Plan have been considered in developing the sustainability strategy for the proposed development; specifically, Policy SI3 which proposes a revised heating hierarchy that sees CHP demoted down the hierarchy (given decarbonisation of the Grid) and Policy SI7 which promotes more circular economy outcomes.

2.3 Local Planning Policy

2.3.1 Camden Climate Action

Camden have taken steps to demonstrate that they are a local authority at the forefront of climate action. In November 2019, Camden Council formally declared a Climate and Ecological Emergency. The Council held the first climate emergency citizens' assembly in the country, to listen to the priorities and ideas of people living in Camden.

In 2020 The Council launched The Camden Climate Action Plan 2020-2025, which has a vision to achieve a net zero carbon Camden by 2030. This will require everyone living and working in Camden to play their part, but the Council will need to enable and support people to take climate action:

- People: Everyone who lives, works, studies and visits the borough will be well informed and actively contribute to tackling the climate crisis in all aspects of their lives
- Buildings: Camden's buildings will be energy efficient, comfortable and fit-for-purpose for a zero carbon future
- Places: Camden's public spaces will encourage and enable healthy and sustainable travel choices and promote biodiversity
- Organisations: All organisations in Camden will operate responsibly and embed tackling the climate crisis throughout their operations

2.3.2 Camden Local Plan 2017

The Local Plan was adopted by the Council on 3 July 2017 and replaces the Core Strategy and Camden Development Policies documents as the basis for planning decisions and future development in the borough. It sets out the Council's planning policies, including those for sustainability and climate change. The following

policies are particularly relevant and have been considered in developing the sustainability strategy and are addressed within this sustainability statement.

Policy CC1 Climate change mitigation: All developments are required to minimise the effects of climate change and are encouraged to meet the highest feasible environmental standards that are financially viable during construction and operation.

- Promote zero carbon development and follow the energy hierarchy.
- Demonstrate how London Plan targets for carbon dioxide emissions have been meet.
- Minimise the need to travel by car and support decentralised energy networks.
- Encourage sensitive energy efficiency improvements to existing buildings.
- Demonstrate that it is not possible to retain and improve existing buildings.
- Optimise resource efficiency.

Policy CC2 Adapting to climate change: All developments are required to be resilient to climate change.

- Protect existing green spaces and promote new green infrastructure.
- Not increasing, and where possible reducing, surface water run-off.
- Incorporate green and blue roofs and green walls where appropriate.
- Reduce the impact of urban overheating.
- Achieve “Excellent” in BREEAM assessments.

Policy CC3 Water and flooding: Ensure development does not increase flood risk and reduces the risk of flooding where possible.

- Incorporate water efficiency measures.
- Avoid harm to the water environment and improve water quality.
- Consider the impact of development on risk of flooding.
- Incorporate flood resilient measures in areas prone to flooding.
- Utilise Sustainable Drainage Measures in line with drainage hierarchy.

2.3.3 Camden Planning Guidance, Energy Efficiency and Adaptation

This guidance provides information on key energy and resource issues and supports Local Plan Policies CC1 Climate change mitigation and CC2 Adapting to climate change. It was adopted in March 2019 and replaces CPG3 Sustainability July 2015, last updated March 2018. Those requirements particularly relevant to the development of the sustainability strategy are summarised below and will be addressed throughout this document.

Energy efficiency

- All development is expected to reduce carbon dioxide emissions by following the energy hierarchy in accordance with Local Plan policy CC1.
- Natural ‘passive’ measures should be prioritised over active measures to reduce energy.
- All major developments to assess the feasibility of connecting to an existing decentralised energy network, and where this is not possible establishing a new network.

- Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies.
- Energy statements are required for all developments over 500sqm of gross internal floorspace.
- Meet an overall carbon reduction target of 35% below Part L of 2013 Building Regulations.
- As a guide, at least 10% of project costs should be spent on environmental improvements in existing buildings.

Resource efficiency

- Where demolition cannot be avoided developments are expected to divert 85% of waste from landfill.

Sustainable design and construction

- All developments to address sustainable design and construction measures as per Local Plan policy CC2.
- Development is expected to reduce overheating risk through following the steps in the cooling hierarchy.
- All developments should incorporate green/blue roofs, brown roof and/or green walls where appropriate.

Sustainable Assessment tools

- Achieve an Excellent BREEAM rating, achieving 60% of all available Energy and Water credits and 40% of achievable Materials credits.

2.3.4 Camden Planning Guidance, Water and Flooding

This guidance provides information on the water environment, water efficiency and flooding, supporting Local Plan Policy CC3 Water and flooding. It was adopted in March 2019 and replaces Chapters 7 – 'Water efficiency' and 11 – 'Flooding' in CPG3 Sustainability. Those requirements particularly relevant to the development of the sustainability strategy are summarised below and will be addressed throughout this document.

Water efficiency

- All developments are to be water efficient.
- Refurbishments and other non-domestic development will be expected to meet BREEAM water efficiency credits.
- Developments over 1000 sqm to include grey water harvesting system, unless it is demonstrated that this is not feasible.

Flooding

- All developments must not increase the risk of flooding.
- Developments are required to utilise Sustainable Drainage Systems to achieve greenfield run off rates, where feasible.
- Major developments will be required to constrain runoff volumes for a 1 in 100-year, 6-hour rainfall event, where feasible.

2.3.5 Camden Planning Guidance, Biodiversity

This guidance is for planning proposals for developments proposed on sites where there is or may be biodiversity value. It supports Local Plan Policy A3 Biodiversity and was adopted in March 2018, replacing Chapter 13 – 'Biodiversity' in CPG3 Sustainability. Those requirements particularly relevant to the development of the sustainability strategy are summarised below and will be addressed throughout this document.

Biodiversity

- Demonstrate how biodiversity considerations have been incorporated into the development.
- Demonstrate how the five-point Mitigation Hierarchy has been addressed:
    - Undertake habitat assessments and/or ecological surveys;
    - Prepare plans that illustrate existing habitats and features and proposed changes;
    - Surveys and assessments prepared by a professionally qualified ecological consultant.
- Demonstrate what positive measures for enhancing biodiversity are planned.

3 Approach to Sustainability

3.1 Principles for Sustainable Development

The following four principles have been used to set the overall project aspirations for the development; they have guided the design and development process so far and will continue to act as an overarching framework for the next stages of design, construction and operation:

- **Low Energy and Carbon:** Achieve an exemplar low carbon development and make a significant contribution to the reduction of carbon emissions.
- **Optimising Resource Use:** Utilise natural resources in the most efficient and economical way possible, applying circular economy principles to minimise waste and create new business opportunities across the redevelopment site.
- **Healthy and Productive Environments:** Provide a healthy, comfortable, inclusive and safe building that supports visitors' and staff wellbeing and provides the best possible environment for world-class research.
- **Lifecycle Value:** Understand and prepare for long-term climate change impacts and scenarios that will impact the development. Build-in adaptability, flexibility and 'reconfigurability', to accommodate changes in the needs of the development over time.

Figure 3: Projects Sustainability Framework

3.2 UCL's Strategic Vision

UCL's 20-year strategy (UCL 2034) lists a sustainable estate amongst its key enablers and importantly that its estate "lives up to the world-leading status of its research and education in sustainable built environments".

UCL has a vision for its estate to perform at the highest levels of excellence and efficiency. The document Change Possible: The Strategy for a Sustainable UCL 2019 - 2024 presents UCL's vision to become a leader in the field of sustainability in all that they do, including the sustainable development and use of the estate by creating a campus which supports UCL's academic, research and enterprise activities in a sustainable way.

This will be achieved by providing a high-quality estate which contributes to UCL's reputation at the forefront of global research, enterprise and teaching, as well as enhancing the pride, morale and wellbeing of staff and students. The sustainable development and use of the estate is a very high priority for UCL and is reflected in the sustainability strategy.

3.3 Project Vision

The development aims to create a world leading research facility and deliver new academic space with health and wellbeing at its heart that will make a positive contribution to the environment, economy and community over the long term. This will build on UCL's long-standing commitment to achieving exemplary sustainable performance.

Delivering the vison will require a systematic approach and solutions that achieve multiple sustainable objectives. These objectives have been framed within the framework of the four principles for sustainable development and are illustrated in Figure 4.

To show how this approach meets the specific planning requirements of Camden, the next sections presents the key approaches and strategies for the following key areas: Energy Efficiency, Sustainable Water Use and Drainage, Materials and Waste, Biodiversity, Adaptation to Climate Change and Sustainable Construction and Operation.

Health and wellbeing

- Deliver accessible, safe, healthy, productive and comfortable internal and external environments.

Biodiversity

- Create a net positive contribution to biodiversity

Connectivity

- Promote active and sustainable travel to and from the building
- Provide effective and reliable communications infrastructure

Operational energy use

- Prioritise passive design approaches and energy efficient services

Sustainable supply

- Use zero or low carbon technologies to meet energy demand

Low embodied carbon

- Minimise embodied carbon emissions

Whole life performance

- Use whole of life value as the basis for decision making
- Ensure buildings perform in accordance with design intent

Resilience

- Reduce vulnerability to climate change and design building for future flexibility and ease of adaptation or reuse
- Design buildings so they can be easily adapted or repurposed at the end of life, in accordance with Circular Economy principles

Social Value

- Provide opportunities for the local community and be a good neighbour during construction
- Create a strong sense of place, founded on a deep understanding of the local context and heritage

Materials

- Lean design and specify reused or recycled materials
- Source materials and products from responsible sources

Waste

- Create a zero waste environment during construction and operation

Water

- Reduce water consumption in construction and operation

Figure 4: Projects Sustainability Objectives

4 Energy Efficiency

The energy strategy evaluates energy proposals in the context of the decarbonisation of grid electricity and emerging policy that reflects these wider energy shifts, in particular the draft London Plan. The Energy Assessment Guidance issued by Greater London Authority (GLA) in October 2018 has been followed, with calculations of carbon reductions using both updated SAP 10 carbon emission factors and SAP 2012 values used by current Building Regulations.

To minimise the regulated carbon dioxide emissions the design approach has followed the 'Be Lean', 'Be Clean', 'Be Green' Energy Hierarchy. The Energy Hierarchy has been adopted for each Plot and across the whole site. In agreement with Camden Planning a site wide weighted percentage reduction for Plots 1 and 3 has been calculated to assist in measuring compliance against Camden's 35% carbon target for new developments.

This section summarises and should be read in conjunction with the Energy Statement prepared by Hoare Lea (REVISION 01 – 03 NOVEMBER 2020). The key approaches are summarised below.

4.1 Use Less Energy (Be Lean)

A range of passive design and energy efficiency measures are targeted for the proposed development, including:

- Fabric insulation levels achieving improvements over the Building Regulations Part L (2013).
- High performance glazing, optimised glazing ratios to balance heat losses, heat gains and daylight ingress.
- Efficient mechanical ventilation with heat recovery.
- Fabric air permeability improvement upon Building Regulations Part L (2013) requirements.
- Highly efficient gas boilers.
- Insulated pipework and ductwork to minimise heat losses and gains.
- Demand control ventilation to spaces based on CO_2 monitoring.
- Building Management System (BMS).
- Energy efficient lighting (such as LED or compact fluorescent) with low heat output.
- Lighting controls, including daylight dimming to perimeter occupied spaces and occupancy controls.
- Variable speed pumps to minimise energy consumption for distribution of services.

4.1.1 Energy Efficiency Improvements to Existing Buildings

Fabric improvements are proposed for the retained Alexandra Wing (Plot 1), following Building Regulation Part L2B guidance. Given the external listed elements, measures such as internal insulation will be considered to improve the fabric performance.

For the refurbishment of the Eastman Dental Clinic (Plot 2) the following fabric enhancements are proposed:

- Replacing all existing windows with energy efficient windows.

- Replacing roof lights.
- Upgrading roof performance with insulation.
- Internal insulation for external walls and floor (where feasible).

These improvements along with proposals for new lighting, boiler and chiller is estimated to be more than 10% of the cost of the refurbishment.

4.2 Cooling and Overheating

Passive design measures have been proposed to reduce cooling requirements and the risk of overheating in accordance with the cooling hierarchy, including:

- High performance glazing (i.e. low g-values) and external shading to reduce solar gain.
- Use of thermal mass to help absorb excess heat.
- Low energy lighting and highly insulated hot water pipework to help minimise internal heat gains.
- High rate of fresh air and night-time cooling (delivered via mechanical ventilation).

Overheating checks, including dynamic modelling (where appropriate), has been undertaken to understand and mitigate the risk of overheating. Passive design measures, demand-controlled ventilation (based on CO_2 monitoring) and air conditioning solutions offer the most efficient solution in mitigating overheating; whilst maintaining a high level of user comfort (acoustic, thermal and air quality). The mechanical ventilation systems will incorporate high efficiency heat exchangers with a summer-bypass that will allow the systems to benefit from 'free cooling' when outside air temperatures permit.

4.3 Supply Energy Efficiently (Be Clean)

It is understood that there are no existing or potential area-wide heat networks near the proposed development for it to connect to.

Given the decarbonisation of the Grid, Combined Heat and Power (CHP), historically promoted as an efficient way of meeting low carbon policy no longer provides the carbon savings it once did. Following a review of recent SAP 10 carbon factors, CHP was identified as having limited carbon benefit in the future, and the main heating source proposed for the development are high efficiency condensing boilers.

To help future proof the development, heating infrastructure will be designed to allow for a suitable district heating network to be readily connected into the low loss header. Furthermore, given the decarbonisation of the grid, a strategy has been identified that would allow the integration of electrically generated heat sources in the future.

4.4 Use Renewable Energy (Be Green)

A site-wide low to zero carbon (LZC) feasibility study has been undertaken, identifying Photovoltaic Panels (PV) as the most suitable renewable technology. The development will aim to maximise the provision of PV and the current design includes approximately 110m^2 of PV on Plot 1, 235m^2 on Plot 3 and 235m^2 on the adjacent Frances Gardner House.

4.5 Carbon Dioxide Savings

Carbons savings for each plot and at a site wide level (i.e. Plots 1 and 3) are summarised below.

4.5.1 Plot 1

The Plot 1 building achieves a 19% reduction in CO_2 emissions relative to current building regulations (2013) and 12% reduction relative to SAP 10 figures. A 6% CO_2 emission reduction is achieved from renewable energy in the form of PV panels generating an annual electricity output of 54,950 kWh/yr. This includes approximately 110m^2 on Plot 1 building with an annual electricity output of 10,350 kWh/yr and approximately 235m^2 on Frances Gardner building with an estimated electricity output of 44,600 kWh/yr.

4.5.2 Plot 2

The Plot 2 building refurbishment design estimates a 46% reduction in CO_2 emissions against the existing building.

4.5.3 Plot 3

The Plot 3 building achieves a 33.5% reduction in CO_2 emissions relative to current building regulations (Part L 2013) (SAP 2012). The building achieves a 24.7% reduction relative to SAP 10 figures. A 20% CO_2 emission reduction is achieved from renewable energy in the form of PV panels (approximately 235m^2) generating an annual electricity output of 35,600kWh/yr.

4.5.4 Site Wide

Following the site-wide approach agreed with Camden the cumulative regulated CO_2 savings for Plots 1 and 3 are 23% compared to current Part L (SAP 2012) baseline target and 14.7% compared to the SAP 10 baseline target. The development is unable to meet the 35% on-site improvement target set out in the London Plan due to several considerations including site spatial constraints and building type user requirements; however, the development takes reasonable measures to minimise carbon emissions as set out in this strategy, and the building performs well comparative to other recent buildings of a similar nature.

Carbon Offset

As the 35% improvement in regulated carbon emissions over Part L 2013 has not been achieved, a carbon offset payment will be required. This is calculated to be £123,400 based on current Part L (2012) carbon emission factors, and will be paid into the Camden carbon offset fund. Upon completion of building works and using the as-built information, an updated calculation will be required.

Figure 5: Site Wide Energy Hierarchy and Carbon Reduction (SAP 2012) Plot 1 and 3 combined graphs.

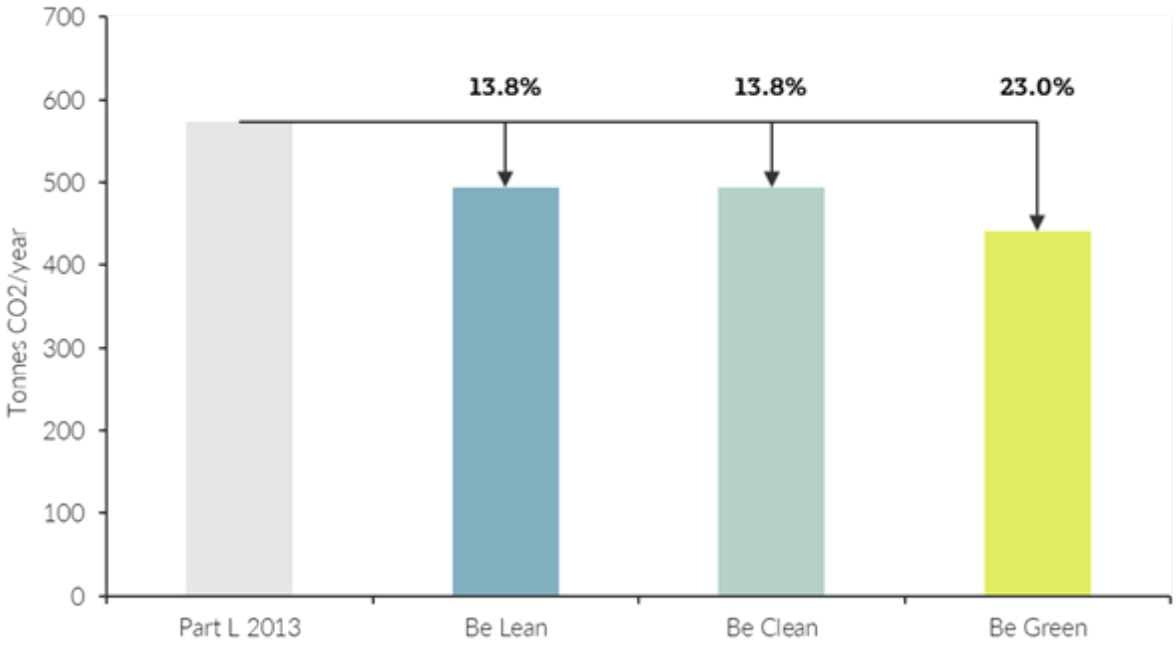


Figure 6: Site Wide Energy Hierarchy and Carbon Targets (SAP 2012) Plot 1 and 3 combined graphs.

Figure 7: Site Wide Energy Hierarchy and Carbon Reduction (SAP 2010) Plot 1 and 3 combined graphs.

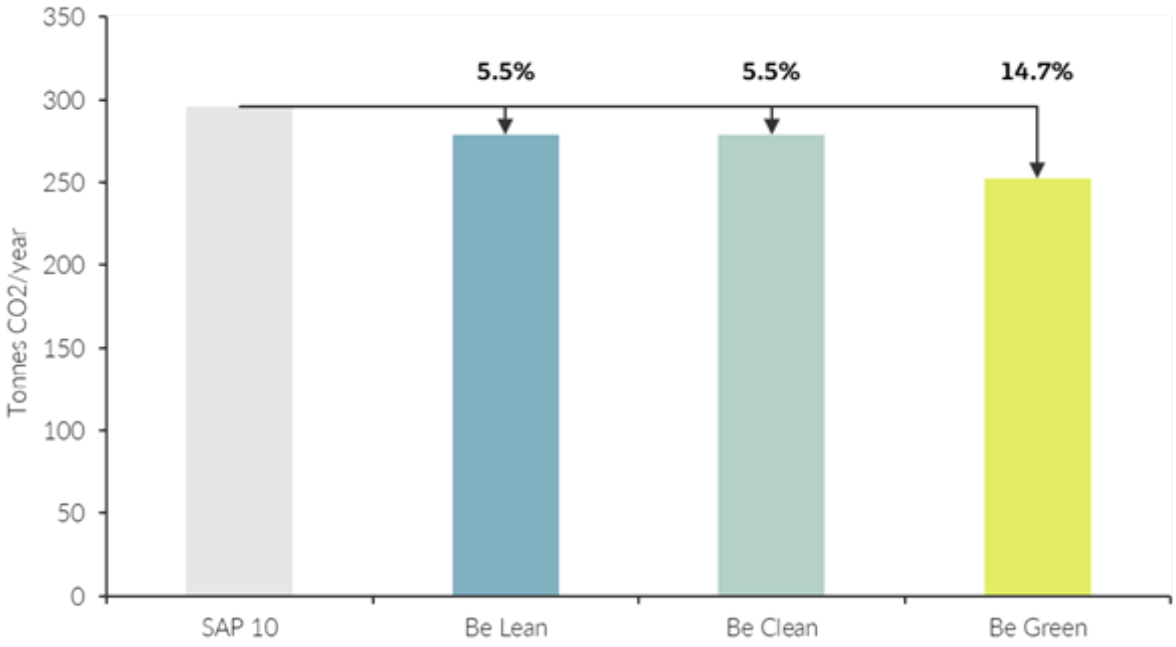
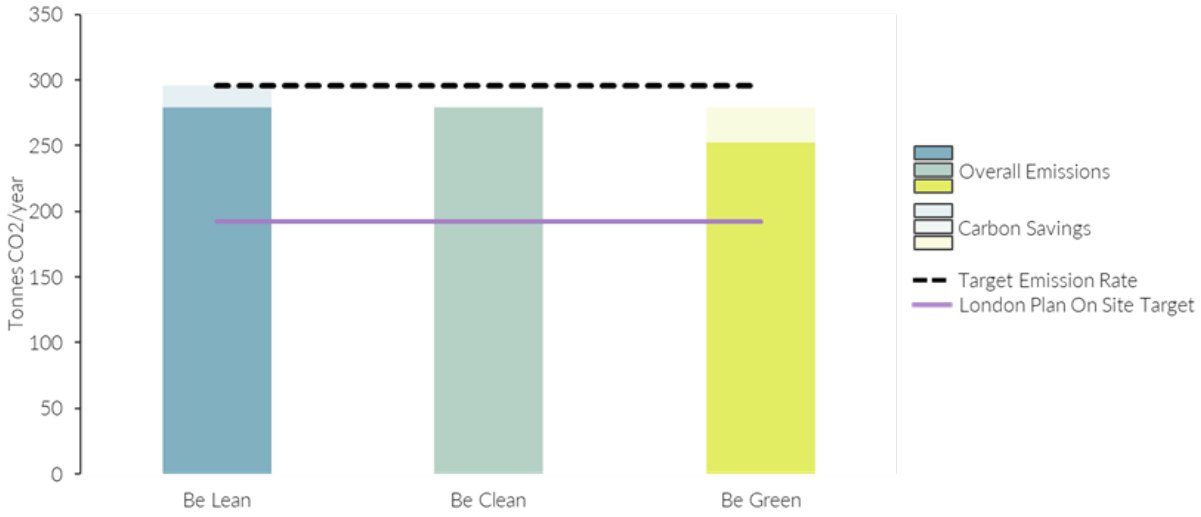


Figure 8: Site Wide Energy Hierarchy and Carbon Targets (SAP 2010) Plot 1 and 3 combined graphs.



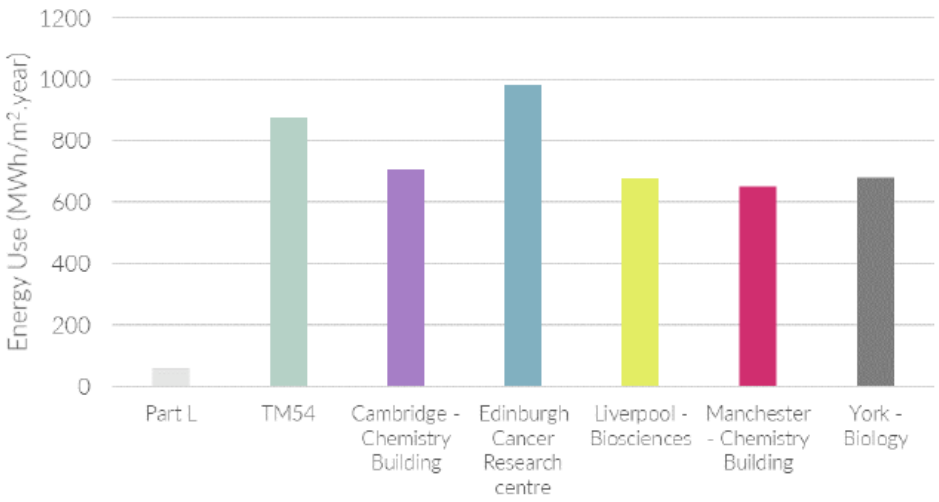
4.6 Operational energy

The current method of calculating energy use for the purposes of compliance does not take into account all the energy uses in a building or its specific operating hours and likely occupancy. As such operational energy use is often significantly higher than the design estimates used to illustrate compliance with building regulations i.e. Part L. This is especially the case for research facilities, such as Plot 1, with considerable amounts of specialist laboratory equipment.

To better understand likely operational energy consumption, more accurate estimates based on the intended use and operation of a building are needed. In 2013, CIBSE published a technical memorandum (CIBSE

TM54) for evaluating the operational energy performance of buildings at the design stage. Using this methodology, a preliminary assessment of total energy use for Plot 1 has been undertaken.

Figure 9: TM54 Estimate Comparison with Part L and Benchmark Cases (data from HEEPI, July 2011)



As expected, estimated energy use was found to be considerably higher than Part L estimations, with a significant factor being the energy consumption associated with equipment use. However, results are comparable to similar buildings, illustrated in Figure 6. The TM54 energy model will continue to be reviewed and developed with end users over the next stages, in particular to refine assumptions around the operation of equipment.

5 Sustainable Water Use and Drainage

5.1 Water Efficiency

5.1.1 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. A significant reduction in water consumption is likely to be reached through careful specification alone and Table 1 details targeted performance levels for typical components. During the next design stages, detailed specifications will be developed following engagement with the supply chain.

Table 1: Water efficient fittings specification

Component	Performance level
WC	4 litres effective flush volume
Wash hand basin taps	4.5 litres/min
Showers	6 litre/min
Urinals	1.5 litres/bowl/hour
Kitchen tap: kitchenette	5 litres/min

5.1.2 Maximising the Re-Use of Water

Recycling and rainwater harvesting are often promoted as effective ways of reducing demand for mains water. Past experiences have suggested rainwater harvesting and greywater 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 and has not been considered. Rather as detailed above highly efficient water fittings will be prioritised to reduce water usage.

5.2 Sustainable Water Management

The catchment area for the Flood Risk Assessment and Drainage Strategy encompasses the whole Eastman Dental Hospital site (Plots 1, 2 and 3). This section summarises and should be read in conjunction with the Flood Risk Assessment and Drainage Strategy prepared by Ramboll. The key approaches are summarised below.

5.2.1 Flood Risk

A Flood Risk Assessment has been undertaken for the site. The Environment Agency flood map data shows the site to be located within Flood Zone 1, indicating the site has a less than 0.1% annual probability of river

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

or sea flooding in any year. The flood risk from surface water and drainage, groundwater, reservoirs, canals and other artificial sources is considered to be low.

5.2.2 Drainage

A site-wide drainage strategy has been developed and considers the surface water run-off and attenuation requirements across all three plots.

Following consultation with Camden's drainage officer, new build areas are targeting greenfield surface water run-off rates and refurbishment areas a 50% reduction in surface water run-off. To achieve these rates the proposed surface water drainage solution maximises Sustainable Drainage Systems (SuDS) across all three plots, providing 287.4m^3 of attenuation to the site.

Blue/green roofs and permeable paving are prioritised across the site. 1,028m^2 of blue/green roofs and 260m^2 of permeable paving are currently specified, providing approximately 48.4% of total site attenuation, with 118.1m^3 and 21.0m^3 of attenuation respectively. The remaining 148.3m^3 is provided via a below-ground tank.

The strategy results in no flooding for a 1 in 100-year storm return period plus 40% climate change. Run-off volumes for a 1 in 100-year, 6-hour rainfall event are reduced as far as possible.

Green roofs and permeable paving will also meet the requirements of the pollution hazard indices set out in CIRIA guidance, providing sufficient filtration of suspended solids, metals and hydrocarbons from entering the public network.

6 Circular Economy

UCL has established a key objective for their buildings to minimise the environmental impacts of material resource using circular economy principles. The circular economy is a key element of the project's sustainability strategy.

This section focuses on materials and waste aspects of the circular economy, namely the conservation of resources and use of sustainable materials; design for longevity and flexibility; designing out waste; and managing waste sustainability.

Wherever possible existing buildings have been retained and will be refurbished rather than demolished. However, given the requirements of the world leading laboratories that will be created and changing working environments and practices, much of the existing buildings are unsuitable for conversation or reuse. The focus of the building design is on the specification of durable materials that will stand the test of time, reducing the major renovation cycle, be in keeping with the local context and be responsibly sourced.

Opportunities to use sustainable materials and reduce waste have been explored with the team and the technical and commercial feasibility of these will be investigated further in the next design phase.

6.1 Conservation of Resources and Use of Sustainable Materials

Quantities of materials will be minimised through lean design approaches, such as the optimisation and light weighting of structural design. The structural design of the proposed development will seek to realise the architectural intent and scientific requirements of the buildings with the minimum necessary structure. For example, whilst the building type and use of Plot 1 necessitates a high-performance structure, floor slabs and column loads have been critically evaluated to avoid over specifying structural element sizes. Floor thickness is largely governed by the vibration criteria for research occupancy, but column sizes have opportunity for refinement. Different column element sizes have been specified in different areas of the structure and as the building design is refined, column sizes will be reviewed and rationalised further where possible.

Across the site, there will be the opportunity to use site-won crushed material (from the demolition of existing buildings) for construction activities, for example, the working platform for piling and potentially for permanent engineered fill. There is a large net cut from site, so any aggregate and crushed material could also be exported for use on other projects subject to its composition.

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. The design team have specified cement replacement for the concrete and will continue to seek to reduce the embodied carbon of the concrete frame further.

A preliminary assessment of the embodied carbon of the concrete structure has been undertaken for Plot 1, identifying a 20% reduction in embodied carbon against a typical industry baseline (taken from Specifying Sustainable Concrete, MPA 2015). High levels of cement replacement are assumed with 65% specified for the raft foundation and 40% specified for the main structure. The study will continue to be developed and refined in later stages following consultation with the contractor and supply chain.

Where steel structural frames and reinforcement are used, high recycled content materials will be specified. Steel reinforcement is typically 99%-100% recycled. Recycled aluminium will be specified wherever possible for elements such as window frames. Furniture and fittings will also be reused throughout the three plots as occupants move in from other areas of UCL.

6.1.1 Recycled Content

With a focus on concrete and steel, the project will aim for at least 10% of the total value of materials used to be derived from recycled and reused sources. WRAP's case study evidence suggests that achieving 10% recycled content by value for the project overall, is widely achievable. Further, 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. Common WRAP 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.).

The design team will interrogate the Lifecycle Assessment and Elemental Cost plans to identify where there is potential to make the largest impacts. Opportunities to specify recycled content will be pursued during the next design phase and included as a requirement in contractor and sub-contractor documents.

6.1.2 Embodied Carbon Emissions

The embodied carbon emissions of the project are being assessed using the Hawkins\Brown Emission Reduction Tool (HBERT). HBERT is a Revit-based tool that enables design teams to quickly analyse and clearly visualise the embodied carbon emissions of different building components and construction material

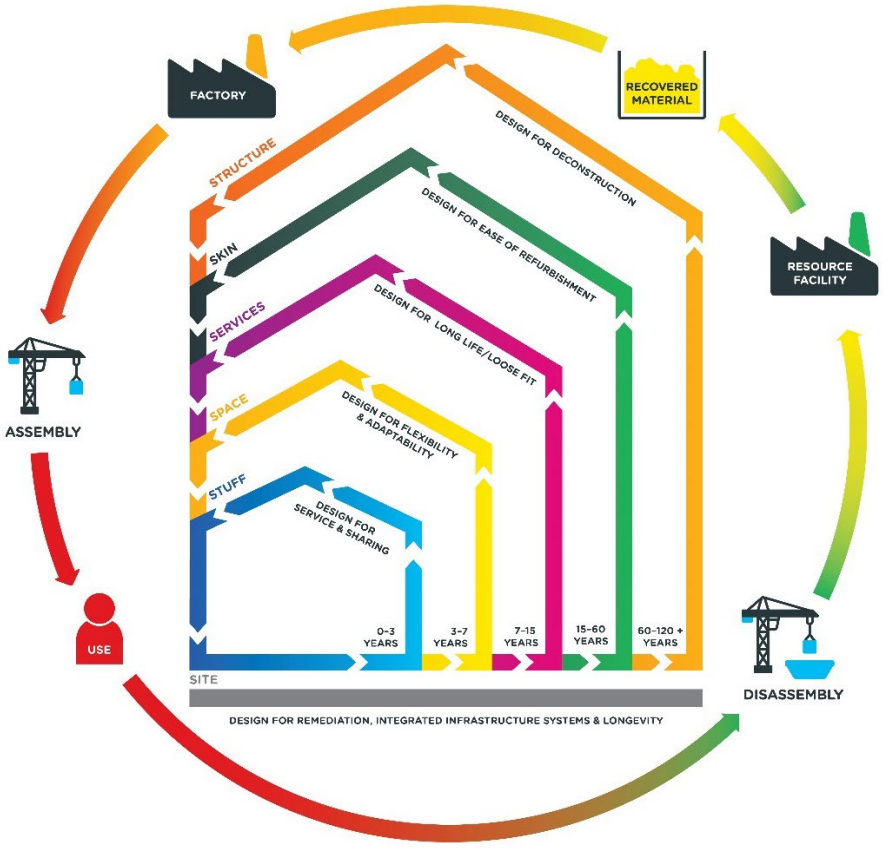
options at any time during the design process. It is also possible to output the results in a format ready to upload to the WRAP database and the design team intend to do this. The HBERT software will continue to aid the process of design optimisation for the project.

6.2 Design for Longevity, Adaptability and Flexibility

As the long-term asset owner, UCL has a vested interest in ensuring the development is designed for longevity, with reconfigurable internal spaces and ease of maintenance and upgrade of individual elements over time.

In line with circular economy principles, the design team are taking a layered approach to the design of the building. Each layer of the building will be designed to be as independent as possible, to enable elements to be refurbished, upgraded or replaced as required without damaging the adjacent layers. This will deliver buildings that are simpler to maintain and adapt and allows the components to be more readily reclaimed at end-of-life. It should also reduce maintenance costs and minimise disruption to staff and students. The design team will specify materials that can be reused and recycled at end-of-life or returned to the manufacturer for re-processing, where possible.

Figure 10: Optimising material use in accordance with the lifecycle of different building layers



usefulprojects

Based on Brand, S. (1994). How Buildings Learn.

The projects strategic approach to avoiding waste for each layer of the building can be summarised as:

- **Site (public realm and infrastructure):** Design for longevity and flexibility. Excavation waste will be minimised by balancing cut and fill on-site.
- **Substructure:** Design for longevity (50+ year design life).

- **Superstructure:** Design for longevity (50+ year design life), whilst enabling adaptability in response to cultural, demographic, environmental and technical change. The structural grid laid out in regular, repeating patterns. The project will use common, standard shapes and connections; minimise the number of different member sizes; and will fasten precast members together with durable, removable mechanical fasteners. Adhesives will be avoided.
- **Shell/skin:** Design for longevity, using brick facades (that have a lifespan of 200+years) and can be reclaimed and recycled at end of life. Cement mortar will be avoided.
- **Services:** Design mechanical and electrical systems to minimise replacement cycles and support easy removal and replacement, reconditioning, upgrading or high value recycling.
- **Space:** The internal spaces will be flexible to allow for change to internal layout to accommodate changes in needs. Internal non-structural walls will be designed so they can be moved fairly easily. UCL will aim to minimise replacement cycles of windows, doors, ceilings by emphasising importance of whole life costs.
- **Stuff:** Robust flooring will be specified that can be maintained or returned to the supplier for reprocessing or recycled at end of life.

6.3 Design out Construction, Demolition, Excavation Waste

Where possible the design team have tried to avoid complete demolition and rebuild. During the feasibility stage of the project, a detailed options study was carried out by the design team to ensure the brief for the new research facility and academic space was being delivered in a way that minimised the extent of demolition, and in particular maximised the use of the site and protected the most significant heritage assets. Further details are provided in the Feasibility Options Appraisal submitted with the application.

The full elevation along Gray's Inn Road and Alexandra Wing are to be retained, and along with the refurbishment of the Grade 2 listed, Eastman Dental Clinic Building, help the project reduce demolition waste and materials use. The opportunity to reuse the demolition waste from existing structures on-site is significant and will be considered further in consultation with demolition contractors.

Where possible off-site construction will be used to minimise waste and lorry movements. Combining off-site and on-site construction has been considered for the Plot 1, by using precast lattice floor panels to minimise/eliminate the necessity for temporary formwork and will be explored further in the next design phase.

In line with the waste hierarchy, reducing, reusing and recycling waste is a priority for the project. Additional designing out waste principles that will be adopted include:

- 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.

These principles are exemplified in Figures 8 and 9. All actions taken to minimise waste will be included in the Site Waste Management Plan.

Figure 11: Opportunities to design out waste at design stage

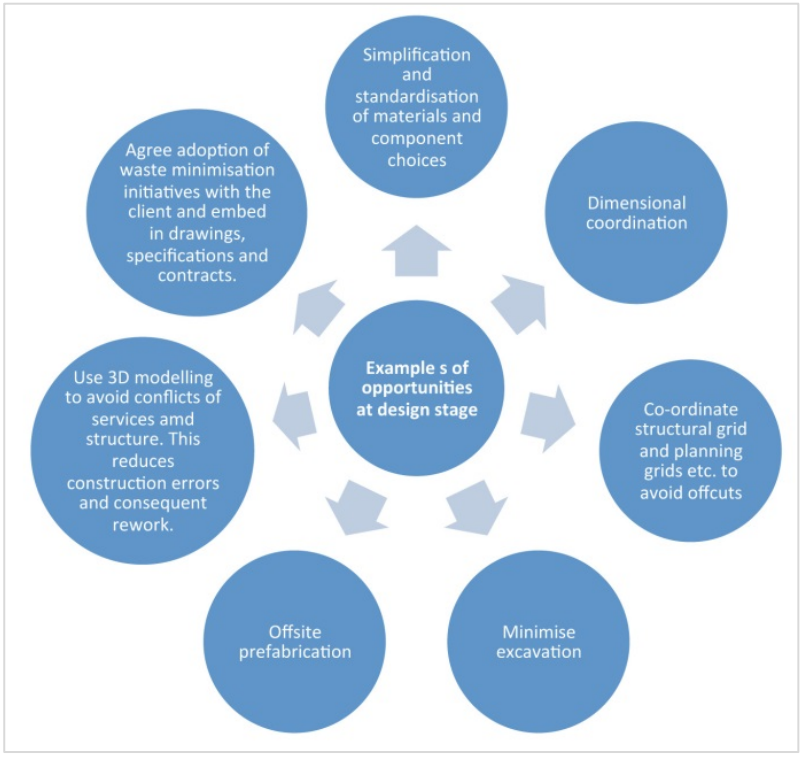


Figure 12: Opportunities to design out waste at procurement and construction stage

6.4 Manage Waste Sustainably and at the Highest Value

This section focuses on how waste arising from demolition, excavation and construction will be managed in accordance with the waste hierarchy; optimising the amount reused and recycled to retain the value and quality of materials for as long as possible.

6.4.1 Demolition Waste

Early identification of materials for potential reuse, refurbishment or recycling through pre-demolition audits will help to maximise the value of materials recovered from the demolition process and minimise the transportation of waste for off-site processing or disposal. Minimising the number of HGV movements associated with off-site waste disposal and subsequent material import will deliver quantifiable, socio-economic benefits. As a minimum, demolition contractors will endeavour to salvage natural stone, bricks, good quality items of furniture, timber and topsoil. Plasterboard, carpets, vinyl flooring, concrete, asphalt and mixed masonry will all be carefully segregated to maximise recycling potential.

6.4.2 Excavation waste

Arisings from bulk excavation and pilling to be segregated and re-used as fill or as landscaping on site and other sites.

6.4.3 Construction waste

An outline Site Waste Management Plan (SWMP) has been produced setting out how the contractor will implement, manage and monitor all waste associated product arisings throughout the project. A target for a 95% diversion of construction and demolition waste from landfill has been included. The principle contractor will refine and develop the SWMP (at least one month prior to starting on site), detailing actions and initiatives to reduce construction waste and ensure the legal disposal of waste. Potential space for storage of reusable materials will be identified and appropriate space allocated to allow extensive segregation of waste materials.

7 Biodiversity

7.1 Landscape

Appropriate landscaping has been chosen to reflect the nature of use. Courtyards are expected be active places with heavy use by staff, students and visitors. In these areas, hard paving has been specified with tree canopies. Access is also required for emergency services and ground level landscaping is provided wherever possible. The Arboricultural Impact Assessment and Method Statement provide details on how neighbouring green spaces and trees within and adjacent to the site will be protected from the impact of construction according to the recommendations in the Ecologist's report.

Green and blue roofs have been specified wherever possible. Where existing structures are retained, their structural strength will be assessed and sedum roofs or other more lightweight biodiverse roofs will be specified, if necessary. Landscaping in courtyards includes a variety of trees to provide additional habitat and aid in retention of stormwater onsite. The current landscape design is summarised below, and further details can be found in the Landscaping Statement prepared by Plincke:

- 531 sqm of ornamental mix planting.
- 84 sqm of grassed area with bulbs.
- 106 sqm of intensive roof planting mix.
- 758 sqm of extensive green roofs.
- 73 sqm of extensive green / sedum roof to bike stores.

7.2 Ecology

A Preliminary Ecological Appraisal (PEA) and Preliminary Roost Assessment (PRA) for Bats has been undertaken for the red-line boundary of the development, by Thomson Ecology and are submitted as part of this application. Recommendations to protect and enhance ecology are summarised below and are included within the current design.

- Temporary Heras fencing with dust sheeting erected around site boundary during construction phase to minimise impact of dust to St Andrews Gardens and Calthorpe Community Garden.
- Any works that impact the suitable habitat for breeding birds timed to avoid bird breeding season.
- Installation of at least four bird boxes on mature trees or buildings.
- Frances Gardner House and the three trees along the southern boundary of the site to be protected from proposed works.
- Temporary Heras fencing with dust sheeting erected between demolition site and Frances Gardner House and three trees along the southern boundary of the site to prevent dust impacting bats.
- Lights should be directional and facing away from Frances Gardner House and the three trees along the southern boundary of the site.
- Works to stop before dusk so lighting is not required during emergence times for bats.
- On-site compounds located at least 5m away from Frances Gardner House and three trees along southern boundary of the site to avoid potential disturbance to bats.

8 Adaptation to Climate Change

From the outset, sustainability and climate change resilience have been a priority for the design of the proposed development. Each of the sections presented in this sustainability statement demonstrate how the development will contribute towards climate change mitigation.

It is anticipated that climate change will lead to a greater incidence of extreme weather events, such as heavy rain, heatwaves and longer periods of drought. The impact of this on the built environment will include:

- growing risk of overheating;
- increased risk of flooding from surface water runoff following storm events; and
- increased irrigation requirements for native species of flora.

Additional details are provided below, with reference to relevant sections in this document and supporting documents.

8.1 Overheating

Passive design measures have been prioritised to reduce the risk of overheating. Overheating checks, including dynamic modelling (where appropriate), has been undertaken to understand and mitigate the risk of overheating. In accordance with their use, buildings are to be actively cooled to mitigate the risk of overheating and have been designed to reduce their cooling demand and make use of free-cooling strategies where possible.

These approaches will also mitigate the risk of the urban heat island effect, by reducing the amount of heat introduced to the surrounding environment. Additional measures to reduce any potential impact include the use of light-coloured construction materials and the landscape design which includes green roofs and tree planting in courtyards to provide areas of shade.

Refer to section 5.2 Cooling and Overheating and the Energy Statement submitted as part of this application for further information.

8.2 Flood Risk

The development has been designed to intercept and manage all events up to the 1 in100-year storm return period plus 40% for climate change.

Refer to section 6.2 Sustainable Water Management and the Flood Risk Assessment and Drainage Strategy submitted as part of this application for further information.

8.3 Irrigation

Green roof specifications will consider appropriate drought resistant planting to ensure that they can survive hot summers with minimal maintenance.

8.4 Changing Ground Conditions

The structure is piled and deep and is unlikely to be affected by changes in the ground conditions.

9 Construction and Operation

9.1 Construction Impacts

A Draft Construction Management Plan has been produced and submitted with the planning application. 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 7.

The use of consolidated vehicles deliveries will be explored to further reduce environmental impacts and congestion around the site. Refer to the Outline Construction Logistics Plan submitted as part of this application, which discusses the management of construction traffic management in more detail.

9.2 Sustainable Operations

The building has been designed to support sustainable operations for many years to come and has been developed in close coordination with future users and UCL's facilities and management team.

A Soft Landings approach aligned with the BSRIA Soft Landings Framework has been adopted for the project, helping to ensure the way buildings will be used, managed and maintained is integrated into the design process. By fostering a greater involvement of designers and contractors with building users a deeper understanding of how the buildings are actually used will be developed, helping to reduce the "performance-gap" often experienced between design and in-use operation.

Energy and water meters coupled with a Building Management System (BMS) will enable monitoring and reporting of energy use and generation (from PV) and water use during operation.

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

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

9.3 Sustainable Travel

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.

The development is well connected being close to good public transport links. Sustainable modes of travel will be prioritised, with the development providing 378 long-stay and 326 short-stay cycle parking spaces and 4 external electric vehicle charging points. Additionally, a space within the service yard area will be reserved for UCL owned electric vehicles.

Refer to the Transport Assessment and Travel Plan submitted as part of this application for further information.

10 BREEAM

All plots are targeting a BREEAM rating of Excellent and Camden's minimum standards for Energy (60%), Water (60%) and Materials (40%) categories. This is in line with the requirements of Policy CC2 in the Camden Local Plan. Within each assessment potential credits have also been identified to help further performance. These credits will be subject to whole life value assessments and will remain under review during the next design stages. The following summaries the current BREEAM scores.

10.1 Plot 1

Plot 1 is being assessed under BREEAM New Construction 2014. The project has started the Design Stage assessment and is a targeting a score of 82.54 (Excellent) with a current score of 10.51. BREEAM 'Excellent' with 80% of Energy, 77.7% of Water and 78.6% of Materials credits are currently targeted. The full BREEAM assessment can be found in the Appendix A.

10.2 Plot 2

Plot 2 is being assessed under BREEAM Refurbishment and Fit-out (RFO) 2014. A pre-assessment has been carried out with the design team and a target score of 74.37 (Excellent) has been agreed. BREEAM 'Excellent' with 61.5% of Energy, 77.7% of Water and 61.5% of Materials credits are currently targeted. The full BREEAM assessment can be found in the Appendix B.

10.3 Plot 3

Plot 3 is being assessed under BREEAM New Construction 2018. A pre-assessment has been carried out with the design team and a target score of 74.48 (Excellent) has been agreed. BREEAM 'Excellent' with 78.3% of Energy, 77.8% of Water and 42.3% of Materials credits are currently targeted. The full BREEAM assessment can be found in the Appendix C.

11 Conclusion

The document sets out a clear path to address key sustainability objectives, outlining appropriate strategies for: energy efficiency, sustainable water use and drainage, circular economy, biodiversity, adaptation to climate change and sustainable construction and operation. Efficient design processes are discussed alongside a suite of suitable approaches to ensure a truly sustainable scheme is developed for the project.

Through addressing the above themes, the sustainability statement demonstrates how the proposed development will deliver an exemplary sustainable approach to the design process, which addresses local planning requirements. The projects approach to sustainability is summarised below alongside Camden's key sustainable themes:

- **Energy Efficiency:** 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. Demand reduction is prioritised, efficient low NOx gas boilers and chillers provide heating and cooling and renewable energy is generated using multiple PV arrays.
- **Water Efficiency:** Water consumption will be minimised through the specification of highly water efficient fittings.
- **Flooding:** Peak surface water run-off from the site will be managed through blue/green roofs, permeable paving and a below-ground attenuation tank.
- **Sustainable Use of Materials:** Efficient use of resources, maximising recycled content of material and specification of durable materials will be prioritised to reduce whole life embodied carbon impacts.
- **Biodiversity:** Green roofs will be provided wherever possible with tree canopies in courtyards providing new habitats. Bird boxes will also to be provided.
- **Adaption to Climate Change:** Strategies for dealing with overheating and flood risk are incorporated within the design.
- **BREEAM:** BREEAM 'Excellent' and Camden's minimum standards for energy, water and materials categories are targeted.

Appendix A: Plot 1 BREEAM Credit Tracker Design Stage

SOUTHFACING

256 Grays Inn Road Plot 1

BREEAM Credit Tracker

Design Stage

Uncontrolled revision

15 May 2019

Southfacing Services Ltd

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London
N1 2SF

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1.0 Introduction

This report is intended as a summary of progress against the targeted credits for the following BREEAM assessment:

Project Name	256 Grays Inn Road Plot 1
BREEAM Version	BREEAM 2014 NC
Assessment Stage	Design Stage
Lead Assessor	Lucy Harris
Targeted Score	82.54
Target Rating	Excellent (70%)
Current Score	10.51
Current Rating	Unclassified
Downloaded By	Daniel Raymond
Download Date	15/05/19
Download Time	14:22:31 (BST)

Please note that this is an uncontrolled copy and is for information only. Formal progress reports will be issued by your licensed assessor at key stages of the project. 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.

Within the report the progress against each credit will be marked as follows:

Red	Not yet started	No information received
Amber	Ongoing	Partial information received OR full credits no longer achievable.
Green	Achieved	All required information received and credit awarded.
Grey	Not targeted	Not targeted.

Minimum Standards

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

Issue	Awarded	Maximum Rating	Met
Man 03 - Responsible construction practices	0	Very Good	✗
Man 04 - Commissioning and handover	0	Outstanding	✓
Man 05 - Aftercare	0	Very Good	✗
Ene 01 - Reduction of energy use and carbon emissions	0	Very Good	✗
Ene 02 - Energy Monitoring	0	Good	✗
Wat 01 - Water Consumption	0	Pass	✗
Wat 02 - Water Monitoring	0	Pass	✗
Mat 03 - Responsible Sourcing of Materials	0	Unclassified	✗
Wst 01 - Construction Waste Management	0	Excellent	✓
Wst 03 - Operational Waste	0	Very Good	✗
LE 03 - Minimising impact on existing site ecology	0	Good	✗

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

2.0 - Credit Summary

		Available	Targeted	Potential	Awarded	Responsibility
Management						
Man 01	Project brief and design	4	4	4	1	Contractor, Project Manager, BREEAM AP, Architect
Man 02	Life cycle cost and service life planning	4	4	4	3	Cost Consultant
Man 03	Responsible construction practices	6	6	6	0	Contractor, BREEAM AP
Man 04	Commissioning and handover	4	4	4	0	Services Engineer, Contractor
Man 05	Aftercare	3	3	3	0	Client, Contractor, Services Engineer
		21	21	21	4	
Health & Wellbeing						
Hea 01	Visual Comfort	5	2	3	0	Architect, Services Engineer
Hea 02	Indoor Air Quality	5	3	4	0	Services Engineer, Architect, Contractor
Hea 03	Safe containment in laboratories	2	2	2	0	Client, Services Engineer
Hea 04	Thermal comfort	3	3	3	0	Services Engineer
Hea 05	Acoustic Performance	3	3	3	0	Acoustician, Contractor
Hea 06	Safety and Security	2	1	2	1	Architect, Project Manager, Client, Transport Consultant
		20	14	17	1	
Energy						
Ene 01	Reduction of energy use and carbon emissions	12	8	10	0	Services Engineer
Ene 02	Energy Monitoring	2	2	2	0	Services Engineer
Ene 03	External Lighting	1	1	1	0	Services Engineer
Ene 04	Low carbon design	3	2	3	1	Services Engineer
Ene 05	Energy Efficient Cold Storage	2	2	2	0	Services Engineer, Client
Ene 06	Energy Efficient Transportation Systems	3	3	3	0	Services Engineer, Lift Engineer
Ene 07	Energy Efficient Laboratory Systems	5	4	5	0	Client, Services Engineer
Ene 08	Energy Efficient Equipment	2	2	2	0	Services Engineer, Client
		30	24	28	1	
Transport						
Tra 01	Public Transport Accessibility	5	5	5	5	Assessor
Tra 02	Proximity to amenities	1	1	1	1	Transport Consultant
Tra 03	Cyclist facilities	2	2	2	0	Transport Consultant, Architect
Tra 04	Maximum Car Parking Capacity	2	2	2	0	Transport Consultant
Tra 05	Travel Plan	1	1	1	0	Transport Consultant, Architect
		11	11	11	6	
Water						
Wat 01	Water Consumption	5	3	5	0	Architect
Wat 02	Water Monitoring	1	1	1	0	Services Engineer
Wat 03	Leak Detection	2	2	2	0	Services Engineer
Wat 04	Water Efficient Equipment	1	1	1	0	Landscape Architect, Architect
		9	7	9	0	

Materials						
Mat 01	Life Cycle Impacts	6	4	6	0	Architect
Mat 02	Hard Landscaping and Boundary Protection	1	1	1	0	Landscape Architect, Architect
Mat 03	Responsible Sourcing of Materials	4	3	4	0	Contractor
Mat 04	Insulation	1	1	1	0	Architect, Services Engineer, Contractor
Mat 05	Designing for durability and resilience	1	1	1	0	Architect
Mat 06	Material efficiency	1	1	1	0	Architect
		14	11	14	0	
Waste						
Wst 01	Construction Waste Management	4	2	3	0	Contractor
Wst 02	Recycled Aggregates	1	1	1	0	Structural Engineer
Wst 03	Operational Waste	1	1	1	0	Architect
Wst 05	Adaptation to climate change	1	1	1	1	Architect, Services Engineer
Wst 06	Functional adaptability	1	1	1	0	Services Engineer, Architect
		8	6	7	1	
Land Use & Ecology						
LE 01	Site Selection	2	2	2	0	Architect, Structural Engineer
LE 02	Protection of Ecological Features	2	2	2	1	Landscape Architect, Ecologist, Contractor, Architect
LE 03	Minimising impact on existing site ecology	2	2	2	0	Ecologist, Contractor, Architect, Landscape Architect
LE 04	Enhancing site ecology	2	1	2	0	Ecologist, Contractor, Architect, Landscape Architect
LE 05	Long Term Impact on Biodiversity	2	2	2	0	Ecologist, Contractor
		10	9	10	1	
Pollution						
Pol 01	Impact of Refrigerants	3	0	1	0	Services Engineer
Pol 02	NOx emissions	3	0	3	0	Services Engineer
Pol 03	Surface Water Run Off	5	4	5	0	Structural Engineer
Pol 04	Reduction of Night Time Light Pollution	1	1	1	0	Services Engineer
Pol 05	Noise Attenuation	1	1	1	0	Acoustician, Services Engineer
		13	6	11	0	
Innovation						
Man 03	Responsible construction practices	1	1	1	0	Contractor
Man 05	Aftercare	1	1	1	0	Client
Hea 01	Visual Comfort	1	0	0	0	
Hea 02	Indoor Air Quality	2	0	0	0	
Ene 01	Reduction of energy use and carbon emissions	5	0	0	0	
Wat 01	Water Consumption	1	0	0	0	
Mat 01	Life Cycle Impacts	3	0	0	0	
Mat 03	Responsible Sourcing of Materials	1	0	0	0	
Wst 01	Construction Waste Management	1	0	0	0	
Wst 02	Recycled Aggregates	1	0	1	0	Structural Engineer

Wst 05	Adaptation to climate change	1	1	1	0	Assessor
AI	Approved Innovation	1	0	0	0	Architect, Client
		19	3	4	0	

3.0 - Credit Progress Log

		Available	Targeted	Achieved	Action	Status	Information Outstanding / Comments
Management							
Man 01	Project brief and design	4	4	1	Contractor, Project Manager, BREEAM AP, Architect		**Credit 2:** Stakeholder consultation (third party) **Outstanding Requirements:** 4, 5, 6, 7. **Credit 3:** Sustainability Champion (design) **Outstanding Requirement:** 9. **Credit 4:** Sustainability Champion (monitoring progress) **Outstanding Requirement:** 12. **Comments:** **All Targeted:** **Credit 1 (Project Brief and Roles)**: Awarded **Credit 2 (Consultation)**: One credit where relevant parties have been consulted in the preparation of the building brief, a consultation plan produced, consultation undertaken and feedback provided using an demonstrably independent third party. ***Responsibility: Indigo Planning/HB (external)*** *Notes: Amendments still required as per email to Benjamin 28/02/19 of external stakeholders meeting minutes confirming these headings have been covered.* **Credit 3 (BREEAM AP from RIBA Stage 1)**: Complete pending achievement of BREEAM Excellent at Design Stage. **Credit 4 (BREEAM AP to RIBA Stage 4)**: A further credit for the appointment of a BREEAM AP to monitor and regularly review project performance against BREEAM performance targets between RIBA stages 2 and 4. ***Responsibility: Expedition*** *18/02/19: Pending meeting minutes and reports at Stage 4 and achievement of BREEAM Excellent at Design Stage.*
Man 02	Life cycle cost and service life planning	4	4	3	Cost Consultant		**Comments:** **All Targeted:** **Credit 1 (worth 2) (Elemental LCC):** One credit where an outline, entire asset elemental life cycle cost (LCC) plan has been carried out at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008. ***Responsibility: Arcadis Cost Manager*** *Notes: Received from Naomi. Awarded.* **Credit 2 (Component Level LCC):** A further credit for a component level LCC option appraisal has been developed by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008 covering envelope, services, finishes and external spaces. ***Responsibility: Arcadis Cost Manager*** ***Credit 3 (Capital Cost Reporting):*** The capital cost in £k/sqm is reported to the BRE. ***Responsibility: Arcadis Cost Manager*** *Notes: Received from Naomi in LCC Model. Awarded.*

Man 03	Responsible construction practices	6	6	0	Contractor, BREEAM AP		**Credit 0:** Pre-Requisite **Outstanding Requirement:** 1. **Credit 1:** Environmental management **Outstanding Requirements:** 2, 3. **Credit 2:** Sustainability Champion (construction) **Outstanding Requirements:** 4, 5, 6. **Credit 3:** Considerate construction **Outstanding Requirement:** 7. **Credit 4:** Monitoring of construction site impacts - Utility consumption **Outstanding Requirements:** 8, 9, 10, 11, 12, 13, 14. **Credit 5:** Monitoring of construction site impacts - Transport of construction materials & waste **Outstanding Requirements:** 15, 16, 17. **Comments:** **All Targeted:** **Credit 1 (Construction Site Management)**: One credit where the contractor will be certified under an EMS (such as ISO 14001) and commit to implement Environment Agency best practice pollution prevention practices on site. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 1 (Site Energy Consumption)**: 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. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 2 (Sustainability Champion to Close Out):** A Sustainability Champion is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target(s), during the Construction, Handover and Close Out stages (as defined by the RIBA Plan of Works 2013, Stages 5 and 6). ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents (and Expedition client side).*** **Credit 3 & 4 (CCS):** 2 credits 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. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 5 (Utilities)**: One credit for appointing a nominated individual to monitor, record and report data on water and energy consumption relating to site activities and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 6 (Transport CO_2 Emissions)**: 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. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents. Review closely as risk item.*** **Credit 4 (Site Timber Procurement)**: One credit for sourcing all timber used for temporary site uses in accordance with the Government's Timber Procurement Policy. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** *Potential Innovation credit where UCL ask for the above as part of enabling and demolition works in addition to construction works.*

Man 04	Commissioning and handover	4	4	0	Services Engineer, Contractor		**Credit 0:** Pre-Requisite (Excellent & Outstanding only) **Outstanding Requirement:** 0. **Credit 1:** Commissioning and testing schedule and responsibilities **Outstanding Requirements:** 1, 2, 3, 4. **Credit 2:** Commissioning building services **Outstanding Requirements:** 5, 6. **Credit 3:** Testing and inspecting building fabric **Outstanding Requirements:** 7, 8, 9. **Credit 4:** Handover **Outstanding Requirements:** 10, 11. **Comments:** **All Targeted:** **Credit 1 (Commissioning)**: 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. ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 2 (Complex Systems):** One credit where complex systems are specified, a specialist commissioning manager (specialist contractor rather than general sub-contractor; the installation and commissioning needs to be carried out independently by different parties, but can both be from the contractor organisation) should be appointed during the design stage to monitor commissioning until project completion. ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 3 (Building Fabric Testing)**: One credit where there will be a commitment to carry out air tightness testing and 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. Identified as a risk credit due to leakage in existing building (more difficult to mitigate). **Targeted.** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **Credit 4 (Building Users Guide)**: One credit for producing a Building User Guide appropriate to all users of the building and where this is made available to all users. ***Responsibility: Expedition/UCL*/Arcadis Project Manager (to be included as requirements in contract documents).**

Man 05	Aftercare	3	3	0	Client, Contractor, Services Engineer		**Credit 1:** Aftercare support **Outstanding Requirements:** 1, 2. **Credit 2:** Seasonal commissioning **Outstanding Requirement:** 3. **Credit 3:** Post occupancy evaluation **Outstanding Requirements:** 4, 5. **Comments:** **All Targeted:** **Credit 1 (Aftercare Support)**: 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. ***Responsibility: UCL/Hoare Lea (data collection)/Arcadis Project Manager (aftercare support). To be included as requirements in contract documents.*** **Credit 2 (Seasonal Commissioning)**: One credit where a specialist commissioning agent (specialist contractor rather than general sub-contractor) will be appointed to undertake seasonal commissioning in the first 12 months after building occupation. ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 3 (Post Occupancy Evaluation)**: 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. ***Responsibility: UCL (David Stevens)***
Management score		21	21	4			
Health & Wellbeing							

Hea 01	Visual Comfort	5	2	0	Architect, Services Engineer		**Credit 1:** Glare control **Outstanding Requirements:** 1, 2. **Credit 4:** Internal and external lighting levels, zoning and control **Outstanding Requirements:** 7, 8, 9, 10, 11, 12, 13. **Comments:** **Pre-requisite:** HFBs on all fluorescent lighting. *Mandatory requirement, must be achieved.* ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **Credit 1 (Glare Control):** One credit where all occupied areas where glare is an issue will have user controlled glare control (eg blinds). **Targeted.** ***Responsibility: HB*** **Credit 2 (worth 2) (Daylighting) :** 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). *Review required but thought that 60% might be achievable (first credit, 80% occupied areas for two credits). HB to check area of occupied spaces with access to daylight, considering those that could be excluded due to specialist requirements.* **Potential.** ***Responsibility: HB/Hoare Lea*** *Notes: Hoare Lea to circulate daylighting report.* **Credit 3 (View Out):** One credit where all occupied areas where work stations are provided will have a view out (no internal rooms). **Not Targeted.** *Note: HB have reviewed and this credit does not appear possible (see email from Bejamin Newcomb 15/10/18).* **Credit 4 (Internal & External Lighting):** One credit where internal & external lighting will be designed and specified in accordance with relevant CIBSE & BS best practice guidance. **Targeted.** ***Responsibility: Hoare Lea***

Hea 02	Indoor Air Quality	5	3	0	Services Engineer, Architect, Contractor		**Credit 1:** Indoor air quality (IAQ) plan **Outstanding Requirement:** 1. **Credit 3:** Volatile organic compound (VOC) emission levels (products) **Outstanding Requirements:** 6, 7. **Credit 4:** Volatile organic compound (VOC) emission levels (post construction) **Outstanding Requirements:** 8, 9, 10, 11, 12. **Comments:** **Credit 1 (Indoor Air Quality)**: 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. **Targeted** ***Responsibility: Hoare Lea*** **Credit 2 (Ventilation):** Intakes and exhausts are over 10m apart, HVAC systems have appropriate filtration, CO2 or air quality sensors are provided. *Review required.* **Potential.** ***Responsibility: Hoare Lea*** **Credit 3 (VOCs)**: One credit where paints / varnishes and the majority of finish materials will be specified as low VOC in accordance with best practice testing. **Targeted.** ***Responsibility: HB*** **Credit 4 (VOC Testing)**: One credit where post completion VOC testing will be carried out in accordance with best practice standards and any non-compliance rectified. **Targeted.** ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 5 (Natural Ventilation):** One credit where all occupied building areas will be naturally ventilated in accordance with best practice standards. **Not targeted**.
Hea 03	Safe containment in laboratories	2	2	0	Client, Services Engineer		**Credit 1:** Laboratory containment devices and containment are... **Outstanding Requirements:** 1, 2, 3. **Credit 2:** Buildings with containment level 2 and 3 laboratory facilities **Outstanding Requirements:** 4, 5. **Comments:** **All Targeted:** **Credit 1 (Risk Assessment)**: An objective risk assessment of the proposed laboratory facilities has been carried out prior to completion of the Developed Design (RIBA Stage 3 or equivalent) to ensure potential risks are considered in the design of the laboratory against relevant standards. ***Responsibility: Hoare Lea and UCL (Martin Farley* - Sustainable Laboratory Advisor*)*** **Credit 2 (Cat 2 & 3 additional)**: Where containment level 2 and 3 laboratory facilities are specified they must meet best practice safety and performance criteria and objectives. Ventilation systems are designed in compliance with the best practice guidance set out in 'DRAFT HSE Biological Agents and Genetically Modified Organisms (Contained Use) Regulations 2010' and filters for all areas designated as containment level 2 and 3 are located outside the main laboratory space for ease of cleaning/replacement and the filters are easily accessible by maintenance staff or technicians. The design team also demonstrate that the individual fume cupboard location and stack heights have been considered in accordance with HMIP Technical Guidance Note (Dispersion) D1. ***Responsibility: UCL (Martin Farley* - Sustainable Laboratory Advisor*)***

Hea 04	Thermal comfort	3	3	0	Services Engineer		**Credit 1:** Thermal modelling **Outstanding Requirements:** 1, 2, 3, 4. **Credit 2:** Adaptability - for a projected climate change scenario **Outstanding Requirements:** 5, 6, 7, 8. **Credit 3:** Thermal zoning and controls **Outstanding Requirements:** 9, 10, 11. **Comments:** **All Targeted:** **Credit 1 & 2 (Thermal Modelling)**: One credit where thermal modelling will be carried out in accordance with best practice CIBSE guidance & to ensure appropriate thermal comfort levels are met and the second credit where modelling is undertaken in climate change scenarios. ***Responsibility: Hoare Lea*** **Credit 2 (Thermal Zoning & Control)**: A further credit where appropriate thermal zoning & control systems will be specified. ***Responsibility: Hoare Lea***
Hea 05	Acoustic Performance	3	3	0	Acoustician, Contractor		**Credit 1:** Acoustic performance **Outstanding Requirement:** 1. **Comments:** **All Targeted:** **Credit 1 (Internal Noise Levels):** One credit for a commitment to design occupied areas to meet best practice (BB93 & BS8233) internal noise levels. ***Responsibility:*** **Ramboll** **Credit 2 (Rain Noise)**: Internal indoor ambient noise levels are achieved in line with Section 2 of APS for all room types. ***Responsibility:*** **Ramboll** **Credit 2 (Reverberation Times):** One credit for a commitment to design relevant building areas to meet best practice (BB93) reverberation times. ***Responsibility:*** **Ramboll**
Hea 06	Safety and Security	2	1	1	Architect, Project Manager, Client, Transport Consultant		**Comments:** **All Targeted:** **Credit 1 (Safe Access):** One credit where the site will be designed to have safe cyclist, pedestrian & delivery access. *(There will be no car parking provision)*. ***Responsibility: UCL/Momentum/HB/Plincke Landscape Architect*** *Notes: On discussion with Momentum reviewing current plans (Sept 2018) there is not currently facility to separate pedestrians, cyclists, cars and deliveries in the two main routes to the building. Credit dropped.* **Credit 2 (Security):** Awarded
Health & Wellbeing score		20	14	1			
Energy							
Ene 01	Reduction of energy use and carbon emissions	12	8	0	Services Engineer		**Credit 1:** Energy performance **Outstanding Requirement:** 1. **Comments:** **Up to 12 credits** where the building's energy performance exceeds that required under Part L 2010. For a rating of Outstanding there is a minimum requirement of achieving 8 credits. ***Responsibility: Hoare Lea (with input from HB)*** *Notes: HL Stage 2 report confirms 8 credits will be targeted as a minimum.*

Ene 02	Energy Monitoring	2	2	0	Services Engineer		**Credit 1:** Sub-metering of major energy consuming systems **Outstanding Requirements:** 1, 2, 3, 4. **Credit 2:** Sub-metering of high energy load and tenancy areas **Outstanding Requirement:** 5. **Comments:** **All Targeted:** **Credit 1 (End Use Meters):** One credit where all major energy consuming systems within the building will be sub-metered and all sub-meters / outputs appropriately labelled. ***Responsibility: Hoare Lea*** **Credit 2 (Functional Areas Meters):** One credit where all tenanted (or major function areas) will be individually sub-metered or monitored through a BEMS. ***Responsibility: Hoare Lea***
Ene 03	External Lighting	1	1	0	Services Engineer		**Credit 1:** External lighting **Outstanding Requirements:** 1, 2, 3. **Comments:** **One credit** where all external lighting will be specified to meet best practice efficacy, colour rendering and control requirements. ***Responsibility: Hoare Lea***
Ene 04	Low carbon design	3	2	1	Services Engineer		**Comments:** **Credit 1 (Passive Design Analysis):** Still require Hea4 first credit to be awarded. Passive Design Analysis received**.** **Credit 2 (Free Cooling):** One credit where some form of free cooling instead of active cooling. Active cooling can still be provided in small areas e.g. small IT rooms, kitchenettes and toilets. *Review required and query with BRE whether labs will need to comply.* **Potential.** ***Responsibility: Hoare Lea*** *Notes: HB have sent a plan showing 8% of floor area can be naturally ventilated. Still need further information from Hoare Lea on passive cooling measures.* **Credit 3 (LZC Feasibility Study):** One credit where feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent). Report received, credit awarded. ***Responsibility: Hoare Lea***
Ene 05	Energy Efficient Cold Storage	2	2	0	Services Engineer, Client		**Credit 1:** Refrigeration energy consumption **Outstanding Requirements:** 1, 2. **Credit 2:** Indirect greenhouse gas emissions **Outstanding Requirements:** 3, 4. **Comments:** **All Targeted:** **Credit 1 (Robust Selection):** The refrigeration system, its controls and components have been designed, installed and commissioned in accordance with the Code of Conduct for carbon reduction in the refrigeration retail sector and BS EN 378-2 and using robust and tested refrigeration systems/components. ***Responsibility: Hoare Lea/HB/UCL*** **Credit 2 (Greenhouse Gas Emissions):** The installed refrigeration system demonstrates a saving in indirect greenhouse gas emissions (CO_2 eq.) over the course of its operational life. ***Responsibility: Hoare Lea/HB/UCL***

Ene 06	Energy Efficient Transportation Systems	3	3	0	Services Engineer, Lift Engineer		**Credit 1:** Energy consumption **Outstanding Requirement:** 1. **Credit 2:** Energy efficient features **Outstanding Requirements:** 2, 3, 4, 5, 6. **Comments:** **All Targeted:** **Credit 1 (Transport Analysis):** 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. ***Responsibility: Cook Associates*** *Notes: Early engagement to ensure all points covered in initial lift analysis.* **Credit 2 & 3 (Energy Efficiency):** A further two credits where lifts & escalators will be fitted with energy saving measures such as variable speed drives, load sensors and stand-by mode. ***Responsibility: Hoare Lea/Cook Associates***
Ene 07	Energy Efficient Laboratory Systems	5	4	0	Client, Services Engineer		**Credit 0:** Pre-Requisite **Outstanding Requirement:** 1. **Credit 1:** Design specification **Outstanding Requirements:** 2, 3, 4, 5. **Credit 2:** Best practice energy efficient measures **Outstanding Requirements:** 6, 7, 8, 9. **Comments:** **Credit 1: (Analysis):** Safe Containment Risk Assessment as per Hea3 has been achieved, plus, client engagement is sought through consultation during the preparation of the initial project brief (RIBA Stage 1 or equivalent) to determine occupant requirements and define laboratory performance criteria. Performance criteria should include, but not be limited to the following aspects: 1. Description of purpose 2. Occupant/process activities 3. Containment requirements and standards 4. Air change rate requirements 5. Ventilation system performance and efficiencies 6. Heating and cooling requirements 7. Interaction between systems 8. Flexibility/adaptability of laboratory facilities. Also, fume cupboard air flow needs to be reduced to 0.16m3/linear metre (width) of fume cupboard space, if reasonable. **Targeted.** ***Responsibility: Hoare Lea (items 4-6)/UCL (rest) (Martin Farley* - Sustainable Laboratory Advisor*)*** *Notes: Risk item, Safe Containment risk Assesment needs to be drawn together by Hoare Lea and Martin Farley. Needs to have been carried out by RIBA Stage 1. Chased HL 23/07/18 and 01/08/18.* **Credit 2 - 5 (Energy Efficient Measures):** Achieving the required energy efficient measures as detailed in the Guidance to achieve a maximum of 4 credits (plus the additional one above) based on >25% floor are are labs (e.g. best practice fan powers, reduced volume rates, grouping of vents, energy recovery, grouping of cooling loads, free cooling, load responsiveness, clean rooms, diversity of central plant sizing, reducing air change rates.). **3 credits currently targeted, with the fourth as a potential.** ***Responsibility: Hoare Lea/UCL (Martin Farley* - Sustainable Laboratory Advisor*)***

Ene 08	Energy Efficient Equipment	2	2	0	Services Engineer, Client		**Credit 1:** Energy efficient equipment **Outstanding Requirements:** 1, 2, 3. **Comments:** **Two credits** where energy efficient equipment (IT equipment, white goods etc) is specified for the development. **Targeted.** ***Responsibility: UCL/IT Specialist***
Energy score		30	24	1			
Transport							
Tra 01	Public Transport Accessibility	5	5	5	Assessor		**Comments:** **Awarded.**
Tra 02	Proximity to amenities	1	1	1	Transport Consultant		**Comments:** **Awarded.**
Tra 03	Cyclist facilities	2	2	0	Transport Consultant, Architect		**Credit 1:** Cycle storage **Outstanding Requirement:** 1. **Credit 2:** Cyclist facilities **Outstanding Requirements:** 2, 3. **Comments:** **All Targeted:** **Credit 1 (Cycle Storage):** One credit where 1 cycle space is provided per 10 staff/students (for HE calculation) or 1 per 10 staff and 1 per consulting rooms or 10 beds (whichever is the larger). The cycle storage is secure and covered (sliding scale, and reduction due to Tra1 can be applied). As an example, based on 600 standard occupancy for the HE calculation, this would equate to the following on a sliding scale: 1. 1-200 = (1 per 10 users) 20 spaces plus 2. 200-300 = (1 per 15 users) 7 spaces plus 3. 300-400 = (1 per 20 users) 5 spaces plus 4. 400-600 = (1 per 25 users) 8 spaces 5. Total = 40. But halved due to good Accessibility Index, so **20 covered and secure cycle spaces.** Further discussion required to adopt the best approach. ***Responsibility: UCL/HB/Momentum*** ***Requirements:*** *Plan showing numbers and locations of secure and covered cycle spaces as above.* **Credit 2 (Cyclist Facilities):** A further credit where compliant cyclist facilities (eg showers, changing space, lockers & drying space) will also be provided. Based on the above, facilities need to include at least 2 of the following types: 1. 2 showers (one male, one female, or mixed use) 2. 20 lockers 3. Adequate changing facilities 4. Drying space Further discussion required to adopt the best approach. ***Responsibility: UCL/HB/Momentum*** *Notes: 174 long stay cycle spaces anticipated for planning, with 174 lockers and 18 showers.*

Tra 04	Maximum Car Parking Capacity	2	2	0	Transport Consultant		**Credit 1:** Maximum car parking capacity **Outstanding Requirement:** 1. **Comments:** **All Targeted:** **Two credits** where parking provision is limited to 1 space for 30 occupants. *Both credits will be achievable by default since there is likely to be no or limited (disabled) car parking provision associated with this building.* ***Responsibility: UCL/Momentum***
Tra 05	Travel Plan	1	1	0	Transport Consultant, Architect		**Credit 1:** Travel plan **Outstanding Requirements:** 1, 2, 3, 4. **Comments:** **One credit** where a compliant travel plan will be produced for the development and measures for future users are incorporated. **Targeted.** ***Responsibility:UCL/Momentum***
Transport score		11	11	6			
Water							
Wat 01	Water Consumption	5	3	0	Architect		**Credit 1:** Water consumption **Outstanding Requirements:** 1, 2, 3, 4, 5, 6. **Comments:** **Up to 5 credits** can be awarded based on energy efficient water fittings. *Three currently targeted. All five credits have been targeted on other UCL developments through the use of highly efficient water fittings (no rainwater harvesting planned). Suitability of similar specifications to be reviewed in line with building area types.* ***Responsibility: Hoare Lea/HB*** *Notes: Hoare Lea and HB to liaise to maximise these credits using the Wat1 calculator as a guide (need accommodation schedule of areas and specifications of water fittings). Expedition to circulate Wat1 calculator for UCL New Student Centre. HB happy with these. Need further input from Hoare Lea on labs water use.*
Wat 02	Water Monitoring	1	1	0	Services Engineer		**Credit 0:** Pre-requisite (Good to Outstanding ONLY) **Outstanding Requirement:** 1. **Credit 1:** Water monitoring **Outstanding Requirements:** 1, 2, 3, 4. **Comments:** **Pre-requisite:** Installation of pulsed output water meter. ***Mandatory requirement, must be achieved.*** ***Responsibility: Hoare Lea*** **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). **Targeted.** ***Responsibility: Hoare Lea***

Wat 03	Leak Detection	2	2	0	Services Engineer		**Credit 1:** Leak detection system **Outstanding Requirement:** 1. **Credit 2:** Flow control devices **Outstanding Requirement:** 2. **Comments:** **Credit 1 (Major Leak Detection):** One credit where a water leak detection system will be installed to the building. **Targeted.** ***Responsibility: Hoare Lea*** **Credit 2 (Sanitary Supply Shut Off):** One credit where sanitary supply shut off will be specified to the cold water supply to WCs in all toilet areas. **Targeted.** ***Responsibility: Hoare Lea***
Wat 04	Water Efficient Equipment	1	1	0	Landscape Architect, Architect		**Credit 1:** Water efficient equipment **Outstanding Requirements:** 1, 2. **Comments:** **One Credit** where any external planting only requires watering from precipitation and/or strategies are implemented to reduce external water use. **Targeted.** ***Responsibility: HB*** *Notes: No vehicle wash down areas.*
Water score		9	7	0			
Materials							
Mat 01	Life Cycle Impacts	6	4	0	Architect		**Credit 1:** Life cycle impacts **Outstanding Requirements:** 1, 2, 3. **Comments:** **Up to 6 Credits and 1 Innovation Credit:** where materials are used which have an A or A+ rating. HB to review as part of Revit model and give some high level suggestions at this stage for gaining maximum credits. **4 credits targeted.** ***Responsibility: HB*** *Notes: HB using their own IMPACT compliant software tool for life-cycle assessments.*
Mat 02	Hard Landscaping and Boundary Protection	1	1	0	Landscape Architect, Architect		**Credit 1:** Hard landscaping and boundary protection **Outstanding Requirement:** 1. **Comments:** **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. Any asphalt or gravel requires recycled sub-base. Highlighted as risk from other UCL developments with large amount of hard landscaping as part of the project. Review required, only a small area of hard landscaping. ***Responsibility: HB***

Mat 03	Responsible Sourcing of Materials	4	3	0	Contractor		**Credit 0:** Pre-requisite **Outstanding Requirement:** 1. **Credit 1:** Sustainable Procurement Plan **Outstanding Requirement:** 2. **Credit 2:** Responsible sourcing of materials (RSM) **Outstanding Requirement:** 3. **Comments:** **Pre-requisite:** Responsibly sourced timber. ***Mandatory requirement, must be achieved.*** **Credit 1 (Sustainable Procurement Plan)**: The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan. **Targeted.** ***Responsibility: HB/Arcadis Project Manager. To be included as requirements in contract documents.*** **Credits 2-4 (Responsible Sourcing):** Available for the specification of responsibly sourced (eg ISO14001, BES6001 or certified timber) materials. **2 credits targeted with one further as potential.** ***Responsibility: HB/Arcadis Project Manager. To be included as requirements in contract documents.***
Mat 04	Insulation	1	1	0	Architect, Services Engineer, Contractor		**Credit 1:** Embodied impact **Outstanding Requirements:** 1, 2. **Comments:** **Credit 1 (Embodied Impact)**: Where the insulation index is greater than 2.5 for external walls, ground floor, roof and building services, calculated from volume, conductivity and Green Guide rating. **Targeted.** ***Responsibility: HB/Arcadis Project Manager. To be included as requirements in contract documents.***
Mat 05	Designing for durability and resilience	1	1	0	Architect		**Credit 1:** Protecting vulnerable parts of the building from damage & protecting exposed parts of the building from material degradation **Outstanding Requirements:** 1, 2. **Comments:** **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 and relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors. **Targeted.** ***Responsibility: HB***
Mat 06	Material efficiency	1	1	0	Architect		**Credit 1:** Material efficiency **Outstanding Requirements:** 1, 2. **Comments:** **One Credit** where opportunities have been identified, and appropriate measures investigated and implemented (e.g through use of BIM), to optimise the use of materials in building design, procurement, construction, maintenance and end of life, from Preparation and Brief to Construction stages. Early attention required by architect. **Targeted.** ***Responsibility: HB/UCL (with input from Hoare Lea and Ramboll)*** *Notes: Pending amendments to HB report emailed 23/07/18.*
Materials score		14	11	0			
Waste							

Wst 01	Construction Waste Management	4	2	0	Contractor		**Credit 1:** Construction resource efficiency **Outstanding Requirements:** 1, 2, 3. **Credit 2:** Diversion of resources from landfill **Outstanding Requirements:** 4, 5. **Comments:** **Credit 1 (worth 3) (Waste Generated):** Three credits where a pre-demoltion audit and SWMP is produced and site waste will be limited to 3.4m^3 or 3.2 tonnes per 100m^2 GIA. *One out of four targeted. This credit has been difficult for a number of UCL developments. Opportunities for greater savings to be reviewed.* **One credit targeted.** **Credit 2 (Diversion):** 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. **Targeted.** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.***
Wst 02	Recycled Aggregates	1	1	0	Structural Engineer		**Credit 1:** Recycled aggregates **Outstanding Requirements:** 1, 2, 3. **Comments:** **Credit 1 (Recycled Aggregate):** where a significant proportion (approximately 25%) of high grade aggregate demand on site will be met through the use of recycled aggregate **or** secondary aggregate. Note: the distance component of this credit is only now measured for the Innovation credit. **Targeted.** ***Responsibility: Ramboll/Arcadis PM* (to be included as a requirement in contract documents.)**
Wst 03	Operational Waste	1	1	0	Architect		**Credit 1:** Operational waste **Outstanding Requirements:** 1, 2, 3, 4, 5, 6, 7. **Comments:** **Credit 1 (Operational Waste):** 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. *Will need careful review, likely provision on a site wide basis, but is a requirement for BREEAM Excellent and Outstanding.* **Targeted.** ***Responsibility: UCL***
Wst 05	Adaptation to climate change	1	1	1	Architect, Services Engineer		**Comments:** **Awarded**
Wst 06	Functional adaptability	1	1	0	Services Engineer, Architect		**Credit 1:** Functional adaptability **Outstanding Requirement:** 2. **Comments:** **Credit 1 (Functional Adaptability):** where a building-specific functional adaptation strategy study has been undertaken by the client and design team by Concept Design (RIBA Stage 2 or equivalent), which includes recommendations for measures to be incorporated to facilitate future adaptation and these measures are incorporated where feasible. **Targeted.** ***Responsibility: HB (with input from Hoare Lea)*** *Notes: Pending confirmation that this report has been incorporated into designs (Stage 4). Any omissions have been justified.*
Waste score		8	6	1			
Land Use & Ecology							

LE 01	Site Selection	2	2	0	Architect, Structural Engineer		**Credit 1:** Previously occupied land **Outstanding Requirement:** 1. **Credit 2:** Contaminated land **Outstanding Requirements:** 2, 3. **Comments:** **Credit 1 (Previously Developed Land):** Where at least 75% of the development footprint is on previously developed land. **Targeted.** ***Responsibility: UCL/HB*** **Credit 2 (Contaminated Land):** Where the development is on a site considered to be seriously contaminated. **Targeted.** ***Responsibility: Ramboll*** *Notes: Contamination report and remedial works required due from Ramboll end August 2018.*
LE 02	Protection of Ecological Features	2	2	1	Landscape Architect, Ecologist, Contractor, Architect		**Credit 2:** Protection of ecological features **Outstanding Requirements:** 2, 3. **Comments:** **Credit 1 (Ecological Value of the Site)** where the site is deemed of low ecological value. ***Awarded.*** **Credit 2 (Protection of Ecological Features)** where the construction zone is of low ecological value and all remaining ecological features on site will be adequately protected during construction. **Targeted.** ***Responsibility:*** **Thomson Ecology/Arcadis PM, to be included as requirements in contract documents.**
LE 03	Minimising impact on existing site ecology	2	2	0	Ecologist, Contractor, Architect, Landscape Architect		**Credit 1:** Change in ecological value **Outstanding Requirements:** 1, 2. **Comments:** **Up to 2 Credits (Mitigating Ecological Impact):** where there is no negative ecological impact on the pre-existing site by the new development. ***Responsibility: Thomson Ecology/HB*** *Notes: Ecology Report currently suggests only one credit available, HB believe two credits should be achievable. Both parties to discuss pending review of landscape plan.*
LE 04	Enhancing site ecology	2	1	0	Ecologist, Contractor, Architect, Landscape Architect		**Credit 1:** Ecologist's report and recommendations **Outstanding Requirements:** 2, 3. **Comments:** **Credit 1 (Ecologist's Report and Recommendations)**: where an ecologist provides a BREEAM compliant report with recommendations.*Thomson Ecology appointed as Suitably Qualified Ecologist. Demonstrate the protection of site ecology during construction works. Include further surveys for bats and implementation of necessary mitigation and enhancement measures.* **Targeted.** ***Responsibility: Thomson Ecology/HB*** **Credit 2 (Enhancing Site Ecology)**: where employment of an ecologist allows an improvement in biodiversity of greater than 6 plant species. *Unlikely to be achieved based on amount of planting required to achieve a positive increase in ecological value. Review in line with Eastman Dental Hospital site wide ecology plan/appraisal.* ***Potential.*** ***Responsibility: Thomson Ecology/HB*** *Notes: Ecology Report currently suggests only one credit available, HB believe two credits should be achievable. Both parties to discuss pending review of landscape plan.*

LE 05	Long Term Impact on Biodiversity	2	2	0	Ecologist, Contractor		**Credit 1:** Long term impact on biodiversity **Outstanding Requirements:** 1, 2, 3. **Comments:** **Credit 1 (worth 2) (Long Term Impact on Biodiversity):** 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. The appointed contractor will need to confirm compliance with the relevant legislation and meet certain site practices that promote protection of biodiversity. These include nomination of a Biodiversity Champion, workforce ecology training, recording and monitoring of biodiversity actions and minimising disturbance to wildlife. ***Responsibility:*** **Thomson Ecology/Arcadis PM, to be included as requirements in contract documents.**
Land Use & Ecology score		10	9	1			
Pollution							
Pol 01	Impact of Refrigerants	3	0	0	Services Engineer		**Comments:** **Credit 1 (worth 3) (Impact of Refrigerants):** **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 and **one credit** where appropriate leak detection is in place (possible to achieve on it's own or by default with a charge of less than 6kg). *Review required.* **Potential** ***Responsibility: Hoare Lea*** *Notes: In order to get to Outstanding, the leak detection credit will need to be targeted and is included in this score.*
Pol 02	NOx emissions	3	0	0	Services Engineer		**Comments:** **Credit 1 (worth 3) (NOx Emissions):** where the NOx emissions of space heating & cooling systems will be limited to less than 40mg/kWh. *A calculation of NOx emissions against loads is required. Heat pumps may mean these credits are unachievable under BREEAM 2014.* **Potential.** ***Responsibility: Hoare Lea*** *Notes: Stage 2 report implies use of gas boilers, with CHP and ASHP.*
Pol 03	Surface Water Run Off	5	4	0	Structural Engineer		**Credit 1:** Flood resilience **Outstanding Requirements:** 1, 2, 3. **Credit 2:** Surface water run-off **Outstanding Requirements:** 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14. **Comments:** **Credits 1 (worth 2) (Flood Risk):** 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. *Note from Ramboll: Currently the EA maps show the site to be in a Low Flood Risk zone for all sources.* **Targeted.** ***Responsibility: Ramboll*** **Credit 2 (worth 2) (Surface Water Run-off):** One credit where an appropriate consultant is appointed to demonstrate that surface water run-off post development is limited to that prior to development. *Note from Ramboll: The site is almost completely impermeable at present therefore the run-off will likely remain the same (We will be required to reduce the downstream flood risk through attenuation and a reduction in the peak rate leaving our site).* A further credit where it can be demonstrated that flooding of the building will not occur in the event of local drainage system failure. *Note from Ramboll: As above there will be no change to the total volume of run-off generated. The building will be designed to protect the internal spaces from local flood, but review is required.* **Targeted.** ***Responsibility: Ramboll*** **Credit 3 (Minimising Water Course Pollution):** One credit where the potential for watercourse pollution is prevented by the specification of petrol interceptors / oil interceptors. Also specific confirmation that there will be no discharge from the developed site for rainfall up to 5mm. *This credit has been difficult for a number of UCL developments, due to requirement of no rainfall run-off less than 5mm. Detailed surface water modelling required.* **Not Targeted.** ***Responsibility: Ramboll***

Pol 04	Reduction of Night Time Light Pollution	1	1	0	Services Engineer		**Credit 1:** Reduction of night time light pollution **Outstanding Requirements:** 1, 2, 3, 4, 5. **Comments:** **Credit 1 (Reduction of Night Time Light Pollution):** where external lighting (levels, reflectance and controls) has been designed in accordance with the ILE guidance on prevention of night time light pollution. **Targeted.** ***Responsibility: Hoare Lea***
Pol 05	Noise Attenuation	1	1	0	Acoustician, Services Engineer		**Credit 1:** Reduction of noise pollution **Outstanding Requirements:** 1, 2, 3, 4, 5. **Comments:** **Credit 1 (Noise Attenuation):** where actual building plant is specified to ensure that external noise levels do not increase by more than 5dB (day) and 3dB (night) as a result of development / compliant with BS 7445:1991 with the help of an acoustician. ***Responsibility:*** **Ramboll/Hoare Lea**
Pollution score		13	6	0			
Innovation							
Man 03	Responsible construction practices	1	1	0	Contractor		**Credit 1:** Considerate Construction: Exemplary performance **Outstanding Requirement:** 18. **Comments:** **Credit 1 (CCS):** Where the Contractor exceeds 40+ points under the CCS. **Targeted.** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.***
Man 05	Aftercare	1	1	0	Client		**Credit 1:** Aftercare / monitoring: 3 years **Outstanding Requirement:** 5. **Comments:** **Credit 1 (3 years Building Performance Review):** Where at quarterly intervals in the first three years of building occupation there will be: 1. Collection of occupant satisfaction, energy and water consumption data. 2. Analysis of data and adjustments made 3. Setting targets for reducing energy and water consumption 4. Feedback any lessons learned to the Design Team for future projects 5. Provide data at 1 to the BRE. **Targeted.** ***Responsibility: UCL***
Hea 01	Visual Comfort	1	0	0			**Comments:**
Hea 02	Indoor Air Quality	2	0	0			**Comments:**
Ene 01	Reduction of energy use and carbon emissions	5	0	0			**Comments:**
Wat 01	Water Consumption	1	0	0			**Comments:**
Mat 01	Life Cycle Impacts	3	0	0			**Comments:**
Mat 03	Responsible Sourcing of Materials	1	0	0			**Comments:**
Wst 01	Construction Waste Management	1	0	0			**Comments:**

Wst 02	Recycled Aggregates	1	0	0	Structural Engineer		**Comments:** **Further Innovation credit** available where 35% of high grade aggregates come from a recycled/secondary aggregate source within 30km from site. **Potential.** ***Responsibility: Ramboll/Arcadis Project Manager***
Wst 05	Adaptation to climate change	1	1	0	Assessor		**Credit 1:** Responding to adaptation to climate change **Outstanding Requirement:** 2. **Comments:** **Credit 1 (Adaptation to Climate Change):** where a number of credit criteria have been achieved throughout the assessment: **Hea4** (climate change thermal modelling), **Ene1** (at least 8 credits), **Ene4** (Passive Design Analysis), **Wat1** (at least 3 credits), **Mat5** (Material Degradation), **Wst5** (Adaptability Report), **Pol3** (1 flood risk credit, both surface water run-off credits). **Responsibility: Arcadis Project Manager (to co-ordinate)**
AI	Approved Innovation	1	0	0	Architect, Client		**Comments:** Design team to monitor this ongoing. **One credit** where any new technology, design, construction, operation, maintenance or demolition method or process that can be shown to improve the sustainability performance of a building and is of demonstrable benefit to the wider industry in a manner that is not covered elsewhere in BREEAM. In addition the innovation has been approved by BRE Global in accordance with its published BREEAM Innovation credit procedures. *To be explored by Design Team. Possible examples for this project: BIM innovative modelling; waste generation and recycling monitored by contractor (demolition & enabling), additional credits from BREEAM NC 2018 such as provision of outside space for building users, additional energy modelling to determine actual energy consumption figures (including risk assessment), public transport/network enhancements, detailed materials LCA analysis or EPD review.*
Innovation score		19	3	0			

Appendix B: Plot 2 BREEAM Pre-Assessment Summary Report

SOUTHFACING

256 Grays Inn Road Plot 2

BREEAM Pre-Assessment Summary Report

Pre-assessment

Uncontrolled revision

15 May 2019

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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	256 Grays Inn Road Plot 2
BREEAM Version	BREEAM 2014 Non-Dom RFO
Assessment Stage	Pre-Assessment Stage
Lead Assessor	Lucy Harris
Target Rating	Excellent (70%)
Downloaded By	Daniel Raymond
Download Date	15/05/19
Download Time	14:22:52 (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;

- Targeted - Credits currently targeted to deliver a rating of Excellent.
- Potential - Additional credits that might be achievable, subject to review.
- - .

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

Scenario	Score	BREEAM Rating
Targeted	74.37	Excellent
Potential	87.75	Excellent

2.1 Minimum Standards

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

Issue	Targeted	Potential
Man 03 - Responsible construction practices	✔	✔
Man 04 - Commissioning and handover	✔	✔
Man 05 - Aftercare	✔	✔
Ene 01 - Reduction of energy use and carbon emissions	✔	✔
Ene 02 - Energy Monitoring	✔	✔
Wat 01 - Water Consumption	✔	✔
Wat 02 - Water Monitoring	✔	✔
Mat 03 - Responsible Sourcing of Materials	✔	✔
Wst 01 - Construction Waste Management	✔	✔
Wst 03 - Operational Waste	✔	✔

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	Targeted	Potential	Comments
Management					
Man 01	Project brief and design	4	4	4	**All Targeted:** **Credit 1 Stakeholder consultation (project delivery):** One credit for involving key stakeholders in the project brief & design from RIBA Stage 2 (or equivalent) onwards. In addition, a schedule of roles & responsibilities should be produced for key stakeholders (as relevant) considering key BREEAM headings. Where the contractor is not appointed earlier on, appointment of someone with contracting experience (i.e. suitably experienced person with substantial contractor experience in similar projects) to be involved RIBA Stage 2 onwards would still allow this credit. ***Responsibility: Arcadis Project Manager*** **Credit 2 Stakeholder consultation (third party):** One credit where relevant parties have been consulted on the relevant minimum consultation content in the preparation of the building brief prior to end of Concept Design, a consultation plan produced, consultation undertaken and feedback provided using a demonstrably independent third party by end of Technical Design. ***Responsibility: Indigo Planning/HB(external)*** **Credit 3 (BREEAM AP from RIBA Stage 1):** One credit for the appointment of a BREEAM AP & setting of BREEAM performance targets by the end of RIBA Stage 2 (or equivalent). ***Responsibility: Expedition*** **Credit 4 (BREEAM AP to RIBA Stage 4):** A further credit for the appointment of a BREEAM AP to monitor and regularly review project performance against BREEAM performance targets between RIBA stages 2 and 4. ***Responsibility: Expedition***
Man 02	Life cycle cost and service life planning	4	4	4	**All Targeted:** **Credit 1 & 2 (Elemental LCC):** Two credits where an outline, entire asset elemental life cycle cost (LCC) plan has been carried out at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008. ***Responsibility: Arcadis Cost Manager*** **Credit 3 (Component Level LCC):** A further credit for a component level LCC option appraisal has been developed by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008 covering envelope, services, finishes and external spaces. ***Responsibility: Arcadis Cost Manager*** **Credit 4 (Capital Cost Reporting):** The capital cost in £k/sqm is reported to the BRE. ***Responsibility: Arcadis Cost Manager***

Man 03	Responsible construction practices	6	6	6	**All Targeted:** **Pre-requisite (Site Timber):** All timber and timber-based products used during the construction process of the project are 'legally harvested and traded timber'. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 1 (Environmental Management):** One credit where the contractor will be certified under an EMS (such as ISO 14001) and commit to implement Environment Agency best practice pollution prevention practices on site. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 2 (Sustainability Champion - Construction):** A Sustainability Champion is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target(s), during the Construction, Handover and Close Out stages (as defined by the RIBA Plan of Works 2013, Stages 5 and 6). ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 3 & 4 (CCS):** Two credits 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. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 5 (Monitoring Impacts - Utilities):** One credit for appointing a nominated individual to monitor, record and report data on water and energy consumption relating to site activities and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 6 (Monitoring Impacts - Transport CO2 Emissions):** One credit for appointing a nominated individual to monitor, record and report data on transport (fuel consumption & CO2 emissions) relating to site activities (waste & materials) and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Exemplary Credit (CCS):** Exemplary credit where there is a commitment to achieve a score of 40 points under the Considerate Constructors Scheme. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.***
Man 04	Commissioning and handover	4	3	4	**Credit 1 (Commissioning - Testing Schedule and Responsibilities):** 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. **Targeted** ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 2 (Commissioning - Building Services):** One credit where during the design stage, the client or the principal contractor appoints an appropriate project team member (provided they are not involved in the general installation works), to undertake design reviews and give advice on suitability for ease of commissioning, providing commissioning management input to construction programming and during installation stages and management of commissioning, performance testing and handover or post-handover stages. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager. **Targeted** ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 3 (Building Fabric Testing):** One credit where there will be a commitment to carry out air tightness testing and 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. **Potential** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **Credit 4 (Building Users Guide):** A Building User Guide is developed or (where present) an existing Building User Guide is updated, prior to handover for distribution to the building occupiers and premises managers, with a draft copy developed and discussed with users first. Further, a training schedule is prepared for the premises manager covering design intent, services, commissioning and maintenance. **Targeted** ***Responsibility: Arcadis Project Manager/UCL. To be included as requirements in contract documents.***

Man 05	Aftercare	3	3	3	**All Targeted:** **Credit 1 (Aftercare Support)**: One credit where there is a commitment to provide aftercare support to all building occupiers in the first 12 months of occupation and where mechanisms will be put in place to collect & report on energy & water consumption data. ***Responsibility: UCL/Hoare Lea (data collection)/Arcadis Project Manager (aftercare support). To be included as requirements in contract documents.*** **Credit 2 (Seasonal Commissioning)**: One credit where a specialist commissioning agent (specialist contractor rather than general sub-contractor) will be appointed to undertake seasonal commissioning in the first 12 months after building occupation. ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 3 (Post Occupancy Evaluation)**: 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. ***Responsibility: UCL*** **Exemplary Credit (Aftercare Support):** One credit for collection of customer satisfaction, energy and water consumption over the first three years of occupation, setting of targets and reporting. ***Responsibility: UCL***
	Management Totals: (+exemplary)	**21 (+2)**	**20 (+2)**	**21 (+2)**	
	Management score totals:	**13.533**	**14.888**	**15.533**	
Health & Wellbeing					
Hea 01	Visual Comfort	7	2	4	**Credit 1 (Glare Control):** One credit where a glare assessment has been carried out and all occupied areas where glare is an issue will have user controlled glare control (eg blinds). **Targeted** ***Responsibility: HB*** **Credit 2 (Daylighting):** Up to three credits available where best practice daylight factors are achieved, or a minimum of 15% improvement in daylight after refurbishment for one credit and 30% improvement for two credits can be demonstrated. Further review required. **Potential (1 Credit)** ***Responsibility: HL*** **Credit 3 (View Out):** Two credits where 95% of occupied areas with work stations are within 7m of a view out, the window opening being 20% or more of the surrounding wall (relevant areas with no windows will not allow this credit). 80% of occupied areas within 7m will allow one credit. **Potential (1 Credit)** ***Responsibility: HB*** **Credit 4 (Internal & External Lighting):** One credit where internal & external lighting will be designed and specified in accordance with relevant CIBSE & BS best practice guidance. **Targeted** ***Responsibility: Hoare Lea***

Hea 02	Indoor Air Quality	5	3	5	**Credit 1 (Indoor Air Quality)**: One credit where an indoor air quality plan will be produced. **Targeted** ***Responsibility: Hoare Lea (input from HB where required)*** **Credit 2 (Ventilation):** Intakes and exhausts are over 10m apart, HVAC systems have appropriate filtration, CO2 or air quality sensors are provided, achieve relevant fresh air rates. Review required. **Potential** ***Responsibility: Hoare Lea*** **Credit 3 (VOCs):** One credit where paints / varnishes and the majority of finish materials will be specified as low VOC in accordance with best practice testing. **Targeted** ***Responsibility: HB*** **Credit 4 (Post Construction VOC Testing):** One credit where post completion VOC testing will be carried out in accordance with best practice standards and any non-compliance rectified. **Targeted** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **Credit 5 (Potential for Natural Ventilation):** At least two levels of user control are implemented on the supply of fresh air. **Potential** ***Responsibility: Hoare Lea (mechanical ventilation)/HB (openable windows)***
Hea 04	Thermal comfort	3	3	3	**All Targeted:** **Credit 1 & 2 (Thermal Modelling):** One credit where thermal modelling will be carried out in accordance with best practice CIBSE AM11 guidance & to ensure appropriate thermal comfort levels are met and the second credit where modelling is undertaken in climate change scenarios. ***Responsibility: Hoare Lea*** **Credit 3 (Thermal Zoning & Control):** A further credit where appropriate thermal zoning & control systems will be specified. ***Responsibility: Hoare Lea***
Hea 05	Acoustic Performance	3	3	3	**All Targeted:** **Credit 1 (Sound Insulation):** Achieve performance standards (BB93) relating to airborne sound insulation between spaces and impact sound insulation of floors. ***Responsibility: Ramboll*** **Credit 2 (Internal Indoor Ambient Noise Levels):** Internal indoor ambient noise levels are achieved in line with BB93 for all room types, including for rain noise. ***Responsibility: Ramboll*** **Credit 3 (Reverberation Times):** Achieve requirements relating to reverberation time of BB93. ***Responsibility: Ramboll***
Hea 06	Safety and Security	1	1	1	**Targeted:** **Credit 1 (Security):** One credit where a suitably qualified security consultant (ALO or other specialist with 3 years experience, and relevant qualifications/membership) will be consulted from RIBA Stage 2 (or equivalent) and their comments incorporated within the building design. ***Responsibility: Hoare Lea***
Health & Wellbeing Totals: (+exemplary)		**19 (+3)**	**12**	**16**	
Health & Wellbeing score totals:		**14.609**	**9.227**	**12.302**	
Energy					

Ene 01	Reduction of energy use and carbon emissions	15	6	6	**Targeted:** **Up to 15 credits (Energy Performance):** The Whole Building Energy Model (Option 1) requires the calculation of an Energy Performance Ratio using a National Calculation Methodology compliant software. Dependent on the scope of works the Elemental Energy Score (Option 2) is calculated using the BREEAM refurbishment and fit-out energy model, which considers the performance of individual end use energy components (thermal conductance of fabric, heating, cooling, ventilation, hot water, lighting and local services as applicable). 6 credits are required (and targeted) as a minimum to achieve an Excellent rating, under Option 1 (modelling required to confirm this). ***Responsibility: Hoare Lea (with input from HB)***
Ene 02	Energy Monitoring	2	2	2	**All Targeted:** **Credit 1 (End Use Meters):** One credit where all major energy consuming systems within the building will be sub-metered and all sub-meters / outputs appropriately labelled. ***Responsibility: Hoare Lea*** **Credit 2 (Functional Areas Meters):** One credit where all tenanted (or major function areas) will be individually sub-metered or monitored through a BEMS. ***Responsibility: Hoare Lea***
Ene 03	External Lighting	1	1	1	**Targeted:** **One credit** where all external lighting will be specified to meet best practice efficacy (>60 lumens/cw), colour rendering and control requirements. ***Responsibility: Hoare Lea***
Ene 04	Low carbon design	3	2	3	**Credit 1 (Passive Design):** One credit has been achieved at Hea1 and the project team carries out an analysis of the proposed building design/development to influence decisions made during Concept Design stage (RIBA Stage 2 or equivalent) and identify opportunities for the implementation of passive design solutions that reduce demands for energy consuming building services. **Targeted** ***Responsibility: Hoare Lea*** **Credit 2 (Free Cooling)**: The passive design analysis includes an analysis of free cooling and the building uses a free cooling strategy to reduce cooling demand i.e. night-time cooling. **Targeted** ***Responsibility: Hoare Lea*** **Credit 3 (LZC Technology):** One credit where a feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent) by an energy specialist (see Relevant definitions) to establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy source(s) for the building/development. **Potential** ***Responsibility: Hoare Lea***
Ene 06	Energy Efficient Transportation Systems	3	3	3	**All Targeted:** **Credit 1 (Transport Analysis):** Lift transport analysis and energy consumption is calculated in accordance with BS EN ISO 25745 Part 2 or Part 3 for different lift types, and the most energy efficient is specified (new lifts only). ***Responsibility: Cook Associates*** **Credits 2-3 (Specification):** Lifts are specified with a standby condition for off-peak periods; lift car lighting and display lighting provides an average lamp efficacy across all fittings in the car of > 55 lamp lumens/circuit Watt; and the use of a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. (All 3 energy efficient features for new lifts. At least 2 for existing lifts). Where the use of regenerative drives is demonstrated to save energy, they are specified. ***Responsibility: Cook Associates***

Ene 08	Energy Efficient Equipment	2	2	2	**Targeted:** **Two credits** where a meaningful reduction in total unregulated energy consumption is demonstrated. Specify energy efficient equipment (IT equipment, white goods etc) ***Responsibility: UCL***
Energy Totals: (+exemplary)		**26 (+5)**	**16**	**17**	
Energy score totals:		**16.882**	**10.389**	**11.038**	
Transport					
Tra 01	Public Transport Accessibility	5	5	5	**Targeted:** **Credit 1 (Accessibility):** The public transport Accessibility index (AI) for the building is 34.21 therefore 5 credits can be awarded. ***Responsibility: Southfacing***
Tra 02	Proximity to amenities	1	1	1	**Targeted:** **Credit 1 (Amenities):** Food outlet, cash machine and recreation area within 500m walking distance. ***Responsibility: Momentum***
Tra 03	Cyclist facilities	2	2	2	**All Targeted:** **Credit 1 (Cycle Storage):** One credit where 1 cycle space is provided per 10 staff/students. The cycle storage is secure and covered (sliding scale, and reduction due to Tra1 can be applied). As an example, based on 600 standard occupancy site wide for the HE calculation, this would equate to the following on a sliding scale: 1. 1-200 = (1 per 10 users) 20 spaces plus 2. 200-300 = (1 per 15 users) 7 spaces plus 3. 300-400 = (1 per 20 users) 5 spaces plus 4. 400-600 = (1 per 25 users) 8 spaces 5. Total = 40. But halved due to good Accessibility Index, so **20 covered and secure cycle spaces.** ***Responsibility: HB/Momentum*** **Credit 2 (Cyclist Facilities):** A further credit where compliant cyclist facilities (eg showers, changing space, lockers & drying space) will also be provided. Based on the above, facilities need to include at least 2 of the following types: 1. 2 showers (one male, one female, or mixed use) 2. 20 lockers 3. Adequate changing facilities 4. Drying space ***Responsibility: HB/Momentum***
Tra 05	Travel Plan	1	1	1	**Targeted:** **One credit** where a compliant travel plan will be produced for the development and measures for future users are incorporated. ***Responsibility: Momentum***
Transport Totals: (+exemplary)		**9**	**9**	**9**	
Transport score totals:		**6.766**	**6.766**	**6.766**	
Water					

Wat 01	Water Consumption	5	3	5	**Targeted:** **Up to 5 credits** can be awarded based on new water efficient fittings and measures specified to retrofit existing devices. Three currently targeted. UCL specifications to be reviewed in line with building area types. ***Responsibility: Hoare Lea/HB***
Wat 02	Water Monitoring	1	1	1	**Targeted:** **Pre-requisite:** Installation of pulsed output water meter. ***Responsibility: Hoare Lea*** **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). ***Responsibility: Hoare Lea***
Wat 03	Leak Detection	2	2	2	**All Targeted:** **Credit 1 (Major Leak Detection):** One credit where a water leak detection system will be installed to the building. ***Responsibility: Hoare Lea*** **Credit 2 (Sanitary Supply Shut Off):** One credit where sanitary supply shut off will be specified to the cold water supply to WCs in all toilet areas. ***Responsibility: Hoare Lea***
Wat 04	Water Efficient Equipment	1	1	1	**Targeted:** **One Credit** where unregulated water demand is reduced and a meaningful reduction in total water demand is demonstrated. Any external planting only requiring watering from precipitation and/or strategies are implemented to reduce external water use, with an estimated saving demonstrated. ***Responsibility: HB***
Water Totals: (+exemplary)		**9 (+1)**	**7**	**9**	
Water score totals:		**6.766**	**5.263**	**6.766**	
Materials					
Mat 01	Life Cycle Impacts	6	4	6	**Targeted:** **Up to 6 Credits:** where an LCA has been carried out and 80% has been achieved in the Mat01 calculator. Less credits available on a sliding scale. Alternatively, up to four credits can be achieved where robust environmental performance information can be provided on new materials and retained materials are re-used in situ. ***Responsibility: HB***
Mat 03	Responsible Sourcing of Materials	4	2	2	**Pre-requisite:** All timber is legally and sustainably sourced. ***Responsibility: HB/Arcadis Project Manager. To be included as requirements in contract documents.*** **Credit 1 (Sustainable Procurement Plan):** The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan. **Targeted** ***Responsibility: HB/Arcadis Project Manager. To be included as requirements in contract documents.*** **Credits 2-4 (Responsible Sourcing):** Up to three credits available for the specification of responsibly sourced (eg ISO14001, BES6001 or certified timber) materials. **Targeted (1 Credit)** ***Responsibility: HB/Arcadis Project Manager. To be included as requirements in contract documents.***
Mat 04	Insulation	1	1	1	**Targeted:** **Credit 1 (Embodied Impact)**: Where the insulation index is greater than 2.5 for external walls, ground floor, roof and building services, calculated from volume, conductivity and Green Guide rating. ***Responsibility: HB***

Mat 05	Designing for durability and resilience	1	1	1	**Targeted:** **<u>One credit</u>** 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 and relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors. ***Responsibility: HB***
Mat 06	Material efficiency	1	0	0	**Not Targeted:** **<u>One credit</u>** where material use has been optimised in building design, procurement, construction, maintenance and end of life demonstrated for <u>EVERY</u> RIBA stage including 0.
Materials Totals: (+exemplary)		**13 (+2)**	**8**	**10**	
Materials score totals:		**14.097**	**8.675**	**10.843**	
Waste					
Wst 01	Construction Waste Management	7	4	4	**<u>Credit 1 (Pre-refurbishment Audit):</u>** A pre-refurbishment audit will be undertaken by a competent person and by Concept Design Stage (RIBA Stage 2) covering existing buildings, structure and hard surfaces to evaluate material re-use and set waste management targets for the contractor. **Targeted** ***Responsibility: UCL/Arcadis Project Manager*** **<u>Credit 2 (Reuse and Direct Recycling of Materials):</u>** Up to two credits where waste is either directly re-used on-site or off-site or are sent back to the manufacturer for closed loop recycling. Using a BREEAM Wst 01 calculator, one credit is achieved where 50% of the total available points are attained and two credits achieved for 75%. One credit targeted. **Targeted (1 Credit)** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **<u>Credit 3 (Resource Efficiency):</u>** Up to 3 credits where efforts have been made to reduce the construction waste created. One credit targeted where no more than 11.3m3/100sqm floor area has been generated. **Targeted (1 Credit)** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **<u>Credit 5 (Diversion from Landfill)</u>**: One credit where 85% volume of construction waste and 90% of demolition waste has been diverted from landfill. **Targeted** ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.***
Wst 03	Operational Waste	1	1	1	**Targeted:** **<u>One credit</u>** where dedicated space in line with The Metric Handbook 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. Will need careful review, likely provision on a site wide basis, but is a requirement for BREEAM Excellent and BREEAM Outstanding. ***Responsibility: HB/UCL***

Wst 05	Adaptation to climate change	1	1	1	**<u>One credit (Climate Change Adaptation Strategy):</u>** for carrying out a systematic (structural and fabric resilience specific) risk assessment by RIBA Stage 2 to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages 1. Hazard assessment 2. Risk estimation 3. Risk evaluation 4. Risk management **Targeted** ***Responsibility: HB/Ramboll*** **<u>Exemplary Credit:</u>** Can be awarded where the below are all achieved: Hea 04 Thermal comfort credit 2 Ene 01 Reduction of energy use and carbon emissions at least 8 credits (not current) Ene 04 Low carbon design credit 1 Wat 01 Water consumption at least 3 credits Mat 05 Designing for durability and resilience Pol 03 Flood risk management and reducing surface water run-off - credit 1, 3 and 4. **Potential** **Responsibility: Southfacing to oversee**
Wst 06	Functional adaptability	1	1	1	**Targeted:** **<u>Credit 1 (Functional Adaptability):</u>** Undertake a building specific functional adaptation study by Concept Design and adopt functional adaptation measures by Technical Design (RIBA Stage 4). ***Responsibility: HB (with input from Hoare Lea)***
Waste Totals: (+exemplary)		**10 (+2)**	**7**	**7 (+1)**	
Waste score totals:		**7.048**	**4.934**	**5.934**	
Land Use & Ecology					
LE 02	Protection of Ecological Features	1	1	1	**Targeted:** **<u>Credit 1 (Protection of Ecological Features):</u>** Where all ecological features are protected during the clearance, site preparation and refurbishment or fit-out. ***Responsibility: Thomson Ecology/Arcadis PM (to be included as requirements in contract documents).***
LE 04	Enhancing site ecology	1	1	1	**Targeted:** **<u>Credit 1 (Ecologist's Report & Recommendations):</u>** Where a Suitably Qualified Ecologist (SQE) is appointed by the end of Preparation & Brief Stage (RIBA Stage 1) and carries out a site survey at Concept Design (RIBA Stage 2). Commitment to implement the SQE's recommendations. ***Responsibility: Thomson Ecology/HB/Plincke***
LE 05	Long Term Impact on Biodiversity	2	2	2	**Targeted:** **<u>2 Credits (Long term impact on biodiversity):</u>** Two credits are available where a Suitably Qualified Ecologist (SQE) is appointed prior to commencement on site to ensure all works are carried out in accordance with UK/EU legislation. A landscape management plan will be produced to cover at least 5 years after occupation and the contractor commits to at least 4 additional measures as listed in the credit requirements. ***Responsibility: Thomson Ecology/Arcadis PM (to be included as requirements in contract documents).***
Land Use & Ecology Totals: (+exemplary)		**4**	**4**	**4**	

Land Use & Ecology score totals:		9.022	9.022	9.022	
Pollution					
Pol 01	Impact of Refrigerants	3	0	1	**Pre-requisite**: All systems (with electric compressors) must comply with the requirements of BS EN 378:2008 (parts 2 and 3) and where refrigeration systems containing ammonia are installed, the Institute of Refrigeration Ammonia Refrigeration Systems Code of Practice. **Credit 1 (Impact of Refrigerant) (Up to 2 Credits):** One credit where the refrigerants specified within building services systems will have a Direct Life Cycle CO2 equivalent of less than 1000 or two credits where the refrigerants specified within building services systems will have a Direct Life Cycle CO2 equivalent of less than 100 or a Global Warming Potential of less than 10. Review required. **Not Targeted** **Credit 2 (Leak Detection):** Where systems using refrigerants have a permanent automated refrigerant leak detection system installed; OR where an inbuilt automated diagnostic procedure for detecting leakage is installed. In all instances a robust and tested refrigerant leak detection system must be installed and must be capable of continuously monitoring for leaks and isolating the remaining charge. **Potential** ***Responsibility: Hoare Lea***
Pol 02	NOx emissions	3	0	3	**Potential:** **Up to 3 credits** achievable based on NOx emissions of heating / hot water system. 3 credits for <40mg/kWh. Review required. ***Responsibility: Hoare Lea***
Pol 03	Surface Water Run Off	5	4	5	**Credits 1 & 2 (Flood Risk):** 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. Note from Ramboll: Currently the EA maps show the site to be in a low flood risk zone for all sources. **Targeted** ***Responsibility: Ramboll*** **Credit 3 (Surface Water Run-off):** One credit where an appropriate consultant is appointed to demonstrate that surface water run-off post development is limited to that prior to development. Note from Ramboll: The site is almost completely impermeable at present therefore the run-off will likely remain the same (We will be required to reduce the downstream flood risk through attenuation and a reduction in the peak rate leaving our site). **Targeted** ***Responsibility: Ramboll*** **Credit 4 (Surface Water Run-off):** A further credit where it can be demonstrated that flooding of the building will not occur in the event of local drainage system failure. Note from Ramboll: As above there will be no change to the total volume of run-off generated. The building will be designed to protect the internal spaces from local flood, but review is required. **Targeted** ***Responsibility: Ramboll*** **Credit 5 (Minimising Water Course Pollution):** One credit where the potential for watercourse pollution is prevented by the specification of petrol interceptors / oil interceptors. Also specific confirmation that there will be no discharge from the developed site for rainfall up to 5mm. This credit has been difficult for a number of UCL developments, due to requirement of no rainfall run-off less than 5mm. Detailed surface water modelling required. **Potential** ***Responsibility: Ramboll***
Pol 04	Reduction of Night Time Light Pollution	1	1	1	**Targeted:** **One credit** where external lighting (levels, reflectance and controls) has been designed in accordance with the ILE guidance 2011 on prevention of night time light pollution. ***Responsibility: Hoare Lea***
Pol 05	Noise Attenuation	1	1	1	**Targeted:** **One credit** where existing or new plant is specified to ensure that external noise levels do not increase by more than 5dB during day and 3dB at night as a result of development. Compliant with BS 7445. Noise impact assessment undertaken by a suitably qualified acoustic consultant. **Targeted** ***Responsibility: Hoare Lea/Ramboll***

Pollution Totals: (+exemplary)		**13 (+1)**	**6**	**11**	
Pollution score totals:		**11.277**	**5.205**	**9.542**	
Innovation					
AI	Approved Innovation	1	0	0	
Innovation Totals: (+exemplary)		**1**	**0**	**0**	
Innovation score totals:		**1**	**0**	**0**	
OVERALL SCORE TOTALS:		**101**	**74.37**	**87.75**	

Appendix C: Plot 3 BREEAM Pre-Assessment Summary Report

SOUTHFACING

256 Grays Inn Road Plot 3

BREEAM Pre-Assessment Summary Report

Pre-assessment

Uncontrolled revision

18 Nov 2020

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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	256 Grays Inn Road Plot 3
BREEAM Version	BREEAM 2018 NC
Assessment Stage	Pre-Assessment Stage
Lead Assessor	Lucy Harris
Target Rating	Excellent (70%)
Downloaded By	Lucy Harris
Download Date	18/11/20
Download Time	8:00:49 (GMT)

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;

- - .
- Targeted - Credits needed to achieve Excellent.
- Potential - Targeted plus extra potential credits.

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

Scenario	Score	BREEAM Rating
Targeted	74.48	Excellent
Potential	84.66	Excellent

2.1 Minimum Standards

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

Issue	Targeted	Potential
Man 03 - Responsible construction practices	✔	✔
Man 04 - Commissioning and handover	✔	✔
Man 04 - Commissioning and handover	✔	✔
Man 05 - Aftercare	✔	✔
Ene 01 - Reduction of energy use and carbon emissions	✔	✔
Ene 02 - Energy monitoring	✔	✔
Wat 01 - Water consumption	✔	✔
Wat 02 - Water monitoring	✔	✔
Mat 03 - Responsible sourcing of construction products	✔	✔
Wst 01 - Construction waste management	✔	✔
Wst 03 - Operational waste	✔	✔

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	Targeted	Potential	Comments
Management					
Man 01	Project brief and design	4	4	4	**All Targeted:** **Credit 1 (Project Brief and Roles):** One credit for involving key stakeholders in the project brief & design from RIBA Stage 2 (or equivalent) onwards. In addition, a schedule of roles, responsibilities & training should be produced for key stakeholders (as relevant). Where the contractor is not appointed earlier on, appointment of someone with contracting experience ('suitably experienced person with substantial contractor experience in similar projects) to be involved RIBA Stage 2 onwards would still allow this credit. ***Responsibility: Arcadis Project Manager/HB*** **Credit 2 (Consultation):** One credit where relevant parties have been consulted in the preparation of the building brief prior to end of Concept Design, a consultation plan produced, consultation undertaken and feedback provided using a demonstrably independent third party by end of Technical Design. ***Responsibility: Indigo Planning/HB (external)*** **Credit 3 (BREEAM AP from RIBA Stage 1):** One credit for the appointment of a BREEAM AP & setting of BREEAM performance targets by the end of RIBA Stage 2 (or equivalent). ***Responsibility: Expedition*** **Credit 4 (BREEAM AP to RIBA Stage 4):** A further credit for the appointment of a BREEAM AP to monitor and regularly review project performance against BREEAM performance targets between RIBA stages 2 and 4. ***Responsibility: Expedition***
Man 02	Life cycle cost and service planning	4	4	4	**All Targeted:** **Credit 1 & 2 (Elemental LCC):** One credit where an outline, entire asset elemental life cycle cost (LCC) plan has been carried out at Process Stage 2 (equivalent to Concept Design - RIBA Stage 2) in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008. ***Responsibility: Arcadis Cost Manager*** **Credit 3 (Component Level LCC):** A further credit for a component level LCC option appraisal has been developed by the end of Process Stage 4 (equivalent to Technical Design – RIBA Stage 4) in line with PD 156865:2008 covering envelope, services, finishes and external spaces. ***Responsibility: Arcadis Cost Manager*** **Credit 4 (Capital Cost Reporting):** The capital cost in £k/sqm is reported to the BRE. ***Responsibility: Arcadis Cost Manager***

Man 03	Responsible construction practices	6 (+1)	6	6 (+1)	**All Targeted:** **Pre-requisite (Site Timber):** All timber and timber-based products used during the construction process of the project are 'legally harvested and traded timber'. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents***. **Credit 1 (Construction Site Management):** One credit where the contractor will be certified under an EMS (such as ISO 14001) and commit to implement Environment Agency best practice pollution prevention practices on site. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents***. **Credit 2 (Sustainability Champion to Close Out):** A Sustainability Champion is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target(s), during the Construction, Handover and Close Out stages (as defined by the RIBA Plan of Works 2013, Stages 5 and 6). ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 3 & 4 (CCS):** 2 credits 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. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 5 (Utilities):** One credit for appointing a nominated individual to monitor, record and report data on water and energy consumption relating to site activities and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. ***Responsibility: Arcadis Project Manager, to be included as requirements in contract documents.*** **Credit 6 (Transport CO2 Emissions):** One credit for appointing a nominated individual to monitor, record and report data on transport (fuel consumption & CO2 emissions) relating to site activities (waste & materials) and providing this data to the BREEAM assessor for entry into the BREEAM reporting tool. ***Responsibility: UCL/Arcadis Project Manager, to be included as requirements in contract documents.***
Man 04	Commissioning and handover	4	4	4	**All Targeted:** **Credit 1 (Commissioning - testing schedule and responsibilities):** 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. ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 2 (Commissioning - Design and Preparation):** One credit where during the design stage, the client or the principal contractor appoints an appropriate project team member (provided they are not involved in the general installation works), to undertake design reviews and give advice on suitability for ease of commissioning, providing commissioning management input to construction programming and during installation stages and management of commissioning, performance testing and handover or post-handover stages. For buildings with complex building services and systems, this role needs to be carried out by a specialist commissioning manager. ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 3 (Building Fabric Testing):** One credit where there will be a commitment to carry out air tightness testing and 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. ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **Credit 4 (Building Users Guide):** One credit for developing two building user guides for a) a non-technical user guide for distribution to the building occupiers and b) a technical user guide for the premises facilities managers. Also prepare two training schedules timed appropriately around handover and proposed occupation plans for the building occupier and facilities manager. ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.***

Man 05	Aftercare	3	3	3	**All Targeted:** **Credit 1 (Aftercare Support):** 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. ***Responsibility: UCL/Hoare Lea (data collection)/Arcadis Project Manager (aftercare support). To be included as requirements in contract documents.*** **Credit 2 (Seasonal Commissioning):** One credit where a specialist commissioning agent (specialist contractor rather than general sub-contractor) will be appointed to undertake seasonal commissioning in the first 12 months after building occupation. ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.*** **Credit 3 (Post Occupancy Evaluation):** 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. ***Responsibility: UCL***
Management Totals: (+exemplary)		**21 (+1)**	**21**	**21 (+1)**	
	Management score totals:	**11**	**11**	**12**	
Health & Wellbeing					
Hea 01	Visual comfort	5 (+2)	2	4	**Credit 1 (Glare Control):** One credit where a glare assessment has beeen carried out and all occupied areas where glare is an issue will have user controlled glare control (eg blinds). **Targeted.** ***Responsibility: HB*** **Credit 2 & 3 (Daylighting):** 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). Review required but thought that 60% might be achievable (first credit, 80% occupied areas for two credits). **Potential.** ***Responsibility: HB*** **Credit 4 (View Out):** One credit where all occupied areas where work stations are provided will have a view out (no internal rooms allowable). **Potential.** ***Responsibility: HB*** **Credit 5 (Internal & External Lighting):** One credit where internal & external lighting will be designed and specified in accordance with relevant CIBSE & BS best practice guidance. **Targeted.** ***Responsibility: Hoare Lea***
Hea 02	Indoor air quality	4 (+1)	3	4	**Pre-requisite (Indoor Air Quality)**: One credit where an indoor air quality plan will be produced. **Targeted** ***Responsibility: Hoare Lea*** **Credit 2 (Ventilation):** Intakes and exhausts are over 10m apart, HVAC systems have appropriate filtration, CO2 or air quality sensors are provided, achieve relevant fresh air rates. Review required. **Potential.** ***Responsibility: Hoare Lea*** **Credit 3 (VOCs):** One credit where paints / varnishes and the majority of finish materials will be specified as low VOC in accordance with best practice testing. **Targeted.** ***Responsibility: HB*** **Credit 4 (Post Construction VOC Testing):** One credit where post completion VOC testing will be carried out in accordance with best practice standards and any non-compliance rectified. **Targeted.** ***Responsibility: Arcadis Project Manager/Hoare Lea. To be included as requirements in contract documents.***

Hea 04	Thermal comfort	3	3	3	**All Targeted:** **Credit 1 & 2 (Thermal Modelling):** One credit where thermal modelling will be carried out in accordance with best practice CIBSE guidance & to ensure appropriate thermal comfort levels are met and the second credit where modelling is undertaken in climate change scenarios. ***Responsibility: Hoare Lea*** **Credit 3 (Thermal Zoning & Control):** A further credit where appropriate thermal zoning & control systems will be specified. ***Responsibility: Hoare Lea***
Hea 05	Acoustic performance	3	3	3	**All Targeted:** **Credit 1 (Internal Noise Levels):** One credit for a commitment to design occupied areas to meet best practice (BB93 & BS8233) internal noise levels. ***Responsibility: Ramboll*** **Credit 2 (Rain Noise):** Internal indoor ambient noise levels are achieved in line with Section 2 of APS for all room types. ***Responsibility: Ramboll*** **Credit 2 (Reverberation Times):** One credit for a commitment to design relevant building areas to meet best practice (BB93) reverberation times. ***Responsibility: Ramboll***
Hea 06	Security	1 (+1)	1	1	**Targeted:** **Credit 1 (Security):** One credit where a suitably qualified security consultant (ALO or other specialist with 3 years experience, and relevant qualifications/membership) will be consulted from RIBA Stage 2 (or equivalent) and their comments incorporated within the building design. ***Responsibility: Hoare Lea***
Hea 07	Safe and healthy surroundings	2	2	2	**All Targeted:** **Credit 1 (Safe Access):** One credit where the site will be designed to have safe cyclist, pedestrian & delivery access. (There will be no car parking provision). **Credit 2 (Open Space):** There is an accessible open space. ***Responsibility: UCL/Momentum/HB***
Health & Wellbeing Totals: (+exemplary)		**18 (+4)**	**14**	**17**	
Health & Wellbeing score totals:		**14**	**10.889**	**13.222**	
Energy					
Ene 01	Reduction of energy use and carbon emissions	13 (+5)	9	9	**Up to 9 credits (Energy Performance):** where the building's energy performance exceeds that required under Part L 2010, 2013 Edition with 2016 amendment. For a rating of Excellent, 4 credits required, for a rating of Outstanding there is a minimum requirements of achieving 8 credits. 5 + 4 credits targeted. ***Responsibility: Hoare Lea (with input from HB)*** **4 Credits (Prediction of Operational Energy Consumption):** Carry out an energy design workshop, and modelling to predict energy consumption and identify risks that are monitored through the process. ***Responsibility: Hoare Lea (with input from HB)***
Ene 02	Energy monitoring	2	2	2	**All Targeted:** **Credit 1 (End Use Meters):** One credit where all major energy consuming systems within the building will be sub-metered and all sub-meters / outputs appropriately labelled. ***Responsibility: Hoare Lea*** **Credit 2 (Functional Areas Meters):** One credit where all tenanted (or major function areas) will be individually sub-metered or monitored through a BEMS. ***Responsibility: Hoare Lea***

Ene 03	External Lighting	1	1	1	**Targeted** **<u>One credit</u>** where all external lighting will be specified to meet best practice efficacy (>70 lumens/cw), colour rendering and control requirements. ***Responsibility: Hoare Lea***
Ene 04	Low carbon design	3	2	3	**<u>Credit 1 (Passive Design Analysis):</u>** One credit has been achieved at Hea1 and the project team carries out an analysis of the proposed building design/development to influence decisions made during Concept Design stage (RIBA Stage 2 or equivalent) and identify opportunities for the implementation of passive design solutions that reduce demands for energy consuming building services. **Targeted.** ***Responsibility: Hoare Lea*** **<u>Credit 2 (Free Cooling):</u>** One credit where some form of free cooling instead of active cooling. Active cooling can still be provided in small areas e.g. small IT rooms, kitchenettes and toilets. Review required. **Potential.** ***Responsibility: Hoare Lea*** **<u>Credit 3 (LZC Feasibility Study):</u>** One credit where feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent) by an energy specialist (see Relevant definitions) to establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy source(s) for the building/development. **Targeted.** ***Responsibility: Hoare Lea***
Ene 06	Energy efficient transportation systems	2	2	2	**Targeted:** **<u>Credit 1 (Transport Analysis):</u>** Lift transport analysis and energy consumption is calculated in accordance with BS EN ISO 25745 Part 2 or Part 3 for different lift types, and the most energy efficient is specified. ***Responsibility: Cook Asscociates*** **<u>Credit 2 (Specification):</u>** Lifts are specified with a standby condition for off-peak periods; lift car lighting and display lighting provides an average luminous efficacy across all fittings in the car of > 70 luminaire lumens per circuit Watt; and the use of a drive controller capable of variable speed, variable-voltage, and variable-frequency (VVVF) control of the drive motor. ***Responsibility: Cook Asscociates***
Ene 08	Energy efficient equipment	2	2	2	**<u>Two credits</u>** where energy efficient equipment (IT equipment, white goods etc) is specified for the development. **Targeted**. ***Responsibility: UCL***
Energy Totals: (+exemplary)		**23 (+5)**	**18**	**19**	
Energy score totals:		**16**	**12.522**	**13.217**	
Transport					
Tra 01	Transport assessment and travel plan	2	2	2	**Targeted:** **<u>Two credits</u>** were a travel assessment has been carried out before end of Concept Design and will be incorporated in the design, providing proposals to improve sustainable travel, and involve the client in its creation with a travel plan (for long term management) as an output. It should include as a minimum: a. Existing travel patterns and opinions of existing building or site users towards cycling and walking, identifying constraints and opportunities, if relevant. b. Travel patterns and transport impact of future building users. c. Current local environment for walkers and cyclists (accounting for visitors who may be accompanied by young children). d. Reporting of the number and type of existing accessible amenities within 500m of the site. e. Disabled access (accounting for varying levels of disability and visual impairment). f. Calculation of the existing public transport Accessibility Index (AI). g. Current facilities for cyclists. ***Responsibility:UCL/Momentum***

Tra 02	Sustainable transport measures	10	6	6	**Targeted:** Pre-requisite: Achieve Tra 01. AI informs the number of measures which need to be incorporated in the building. **6 credits** likely for the following items to be included - Travel Information System, Cycle spaces (1 cycle space per 10 staff/students for BREEAM, likely to be exceeded by London Plan requirements), 3 existing amenities within 500m. ***Responsibility: Momentum***
Transport Totals: (+exemplary)		**12**	**8**	**8**	
Transport score totals:		**10**	**6.667**	**6.667**	
Water					
Wat 01	Water consumption	5 (+1)	3	3	**Up to 5 credits** can be awarded based on energy efficient water fittings. Three currently targeted. All five credits have been targeted on other UCL developments through the use of highly efficient water fittings (no rainwater harvesting planned). Suitability of similar specifications to be reviewed in line with building area types. ***Responsibility: Hoare Lea/HB***
Wat 02	Water monitoring	1	1	1	**Pre-requisite:** Installation of pulsed output water meter. Mandatory requirement, must be achieved. ***Responsibility: Hoare Lea*** **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). **Targeted.** ***Responsibility: Hoare Lea***
Wat 03	Water leak detection	2	2	2	**All Targeted** **Credit 1 (Major Leak Detection):** One credit where a water leak detection system will be installed to the building. ***Responsibility: Hoare Lea*** **Credit 2 (Sanitary Supply Shut Off):** One credit where sanitary supply shut off will be specified to the cold water supply to WCs in all toilet areas. ***Responsibility: Hoare Lea***
Wat 04	Water efficient equipment	1	1	1	**One Credit** where any external planting only requires watering from precipitation and/or strategies are implemented to reduce external water use. **Targeted.** ***Responsibility: HB***
Water Totals: (+exemplary)		**9 (+1)**	**7**	**7**	
Water score totals:		**7**	**5.444**	**5.444**	
Materials					
Mat 01	Environmental impacts from construction products - Building life cycle assessment (LCA)	7 (+3)	3	5	**Targeted:** **Credit 1:** (6 credits available) for a simplified life cycle analysis of superstructure materials. LCA analysis carried out at Concept Design already. More credits are awarded if a full LCA is carried out. 2 credits targeted. **Credit 2:** As above, for substructure and hard landscaping. Initial comparison to the BREEAM benchmarks and options appraisal needs to be demonstrated at Concept Design and again at Technical Design. Potential to achieve more credits if a full LCA is carried out. ***Responsibility: HB***

Mat 02	Mat 02 Environmental impacts from construction products - Environmental Product Declarations (EPD)	1	0	1	**Credit 1:** Materials in Mat 01 are provided with EPDs. To be investigated further as may be challenging to achieve. **Potential.**
Mat 03	Responsible sourcing of construction products	4 (+1)	2	2	**Credit 1 (Sustainable Procurement Plan):** The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan developed before end of Concept Design. **Targeted.** ***Responsibility: HB*** **Credits 2-4 (Responsible Sourcing):** Available for the specification of responsibly sourced (eg ISO14001, BES6001 or certified timber) materials. **1 credit targeted.** ***Responsibility: HB/Arcadis Project Manager. To be included as requirements in contract documents.***
Mat 05	Designing for durability and resilience	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 and relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors. **Targeted.** ***Responsibility: HB***
Mat 06	Material efficiency	1	0	0	**Not Targeted:** **One credit** where material use has been optimised in building design, procurement, construction, maintenance and end of life demonstrated for EVERY RIBA stage. No evidence for stages 0 and 1 so cannot be achieved.
Materials Totals: (+exemplary)		**14 (+4)**	**6**	**9**	
Materials score totals:		**15**	**6.429**	**9.643**	
Waste					
Wst 01	Construction waste management	5 (+1)	3	3	**Targeted:** **Credit 1 (Pre-demolition Audit):** 1 credit where a pre-demolition audit is provided to identify opportunitites for the demolition materials by end of Concept Design stage. This has been provided. ***Responsibility: HB*** **Credit 2 (Construction Resource Efficiency) (3 credits available):** 1 credit likely, where construction waste totals less than 13.3m3 per 100m2 GIA and SWMP is produced. ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.*** **Credit 3 (Diversion from Landfill):** Diversion of waste from landfill is 70% volume or 80% tonnage. ***Responsibility: Arcadis Project Manager. To be included as requirements in contract documents.***
Wst 02	Use of recycled and sustainably sourced aggregates	1 (+1)	0	1	**One credit:** where secondary aggregates are used and sourced locally. If there is demolition, then a pre-demolition audit as Wst1 is required. **Potential.**
Wst 03	Operational waste	1	1	1	**One credit** where dedicated space in line with The Metric Handbook 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. Will need careful review, likely provision on a site wide basis, but is a requirement for BREEAM Excellent and Outstanding. **Targeted.** ***Responsibility: UCL***

Wst 05	Adaptation to climate change	1 (+1)	1 (+1)	1 (+1)	**<u>One credit (Climate Change Adaptation Strategy):</u>** for carrying out a systematic (structural and fabric resilience specific) risk assessment by RIBA Stage 2 to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages 1. Hazard assessment 2. Risk estimation 3. Risk evaluation 4. Risk management ***Responsibility: HB/Ramboll***
Wst 06	Design for disassembly and adaptability	2	2	2	**Targeted:** **<u>Credit 1 (Functional Adaptability Recommendations):</u>** The building has been designed for efficient future disassembly and/or adaptation to changes in function of the building and evidenced by way of a study at Concept Design. ***Responsibility: HB (with input from Hoare Lea)*** **<u>Credit 2 (Functional Adaptability Implementation):</u>** An update at Technical Design demostrating suggestions incorporated is provided along with a disassembly guide. ***Responsibility: HB (with input from Hoare Lea)***
	Waste Totals: (+exemplary)	**10 (+3)**	**7 (+1)**	**8 (+1)**	
	Waste score totals:	**6**	**5.2**	**5.8**	
Land Use & Ecology					
LE 01	Site selection	2	2	2	**<u>Credit 1 (Previously Developed Land):</u>** Where at least 75% of the development footprint is on previously developed land. **Targeted.** ***Responsibility: UCL/HB*** **<u>Credit 2 (Contaminated Land):</u>** Where the development is on a site considered to be seriously contaminated. Ramboll confirm there is asbestos in the ground. **Targeted.** ***Responsibility: Ramboll***
LE 02	Identifying and understanding the risks and opportunities for the site	2 (+1)	2	2	**Targeted:** 1 credit available for Route 1, 2 credits for Route 2. **Pre-requisite:** All relevant EU and UK legislation relating to wildlife is adhered to. **<u>Credit 1 (Survey and Evaluation/Determining Outcomes) (2 credits available):</u>** Ecological value of the land is determined. 2 credits are achieved with the appointment of an ecologist providing a BREEAM compliant report surveying current ecological value, assessing risks and offering opportunities, by end of Preparation and Brief Stage. Design Team required to engage in optimising outcomes by end of Concept Design. Ecology Report (May 2019) confirms two credits can be targeted. ***Responsibility: Thomson Ecology/HB***
LE 03	Managing negative impacts on ecology	3	3	3	**Targeted:** Ecology Report (May 2019) confirms three credits can be targeted. **Pre-requisite:** LE 02 must be achieved. **<u>Credit 1 (Planning and Implementation):</u>** Roles assigned to prevent negative impact on ecology items by end of Concept Design. Construction works planned early to minimise disturbance, and stakeholders consulted. ***Responsibility: HB/Arcadis*** **<u>Credit 2 (Minimising Negative Impact) (2 credits available):</u>** No overall loss of site ecology as a result of works. 2 credits are achieved with the appointment of an ecologist providing a BREEAM compliant report. ***Responsibility: Thomson Ecology/Arcadis PM (to be included as requirements in contract documents).***

LE 04	Change and enhancement of ecological value	4 (+1)	2	3	**Targeted:** Ecology Report (May 2019) confirms two credits can be targeted. **Pre-requisite:** Le03 must be achieved. **Credit 1 (Change and Enhancement) (3 credits available):** 2 credits for a small positive change in ecological value of the site (percentage score of 95-104). Ecologist will need to provide a BREEAM compliant report and recommendations to achieve this incorporated into the design and on site. ***Responsibility: Thomson Ecology/HB/Arcadis PM (to be included as requirements in contract documents).*** **Credit 2 (Liaison, Implementation, Data Collection):** Project team have liaised with relevant stakeholders to taking into consideration data collated and shared, and have implemented the solutions and measures selected in a way that enhances ecological value. Data collated is provided to the local environmental records centres nearest to, or relevant for, the site. ***Responsibility: Thomson Ecology/HB/Arcadis PM (to be included as requirements in contract documents).***
LE 05	Long term management and maintenance	2	2	2	**Targeted:** Pre-requisite: Le04 must be achieved. **Credit 1:** Maintenance and ongoing monitoring of ecological outcomes during the project. As part of the tenant or building owner information supplied, include a section on Ecology and Biodiversity to inform the owner or occupant of local ecological features, value and biodiversity on or near the site. **Credit 2:** A Landscape and Ecology Management Plan is produced by the ecologist for the first 5 years after occupation, in line with BS 42020:2013. Ecology Report (May 2019) confirms two credits can be targeted. ***Responsibility: Thomson Ecology/Arcadis PM (to be included as requirements in contract documents).***
Land Use & Ecology Totals: (+exemplary)		**13 (+2)**	**11**	**12**	
Land Use & Ecology score totals:		**13**	**11**	**12**	
Pollution					
Pol 01	Impact of refrigerants	3	0	1	**One credit** where the refrigerants specified within building services systems will have a Direct Life Cycle CO2 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 and **one credit** where appropriate leak detection is in place (possible to achieve on it's own or by default with a charge of less than 6kg), or three credits where the building will not use any refrigerants in building services systems. Review required. **Potential** ***Responsibility: Hoare Lea***
Pol 02	Local air quality	2	2	2	**Targeted:** **Two credits** where all heating and hot water is supplied by non-combustion systems OR Emissions from all installed combustion plant that provide space heating and domestic hot water are calculated and credits awarded accordingly. ***Responsibility: Hoare Lea***

Pol 03	Flood and surface water management	5	4	5	**Credits 1 & 2 (Flood Risk):** 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. Note from Ramboll: Currently the EA maps show the site to be in a Low Flood Risk zone for all sources. **Targeted.** ***Responsibility: Ramboll*** **Credit 3 (Surface Water Run-off):** One credit where an appropriate consultant is appointed to demonstrate that surface water run-off post development is limited to that prior to development. Note from Ramboll: The site is almost completely impermeable at present therefore the run-off will likely remain the same (We will be required to reduce the downstream flood risk through attenuation and a reduction in the peak rate leaving our site). **Targeted.** ***Responsibility: Ramboll*** **Credit 4 (Surface Water Run-off):** A further credit where it can be demonstrated that flooding of the building will not occur in the event of local drainage system failure. Note from Ramboll: As above there will be no change to the total volume of run-off generated. The building will be designed to protect the internal spaces from local flood, but review is required. **Targeted.** ***Responsibility: Ramboll*** **Credit 5 (Minimising Water Course Pollution):** One credit where the potential for watercourse pollution is prevented by the specification of petrol interceptors / oil interceptors. Also specific confirmation that there will be no discharge from the developed site for rainfall up to 5mm. This credit has been difficult for a number of UCL developments, due to requirement of no rainfall run-off less than 5mm. Detailed surface water modelling required. **Potential.** ***Responsibility: Ramboll***
Pol 04	Reduction of night time light pollution	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. **Targeted.** ***Responsibility: Hoare Lea***
Pol 05	Reduction of noise pollution	1	1	1	**One credit** where actual building plant is specified to ensure that external noise levels do not increase by more than 5dB (day and night) as a result of development / compliant with BS 4142:2014 with the help of an acoustician. **Targeted.** ***Responsibility: Ramboll***
Pollution Totals: (+exemplary)		**12**	**8**	**10**	
Pollution score totals:		**8**	**5.333**	**6.667**	
Innovation					
AI	Approved Innovation	1	0	0	
Innovation Totals: (+exemplary)		**1**	**0**	**0**	
Innovation score totals:		**1**	**0**	**0**	
OVERALL SCORE TOTALS:		**101**	**74.48**	**84.66**	

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