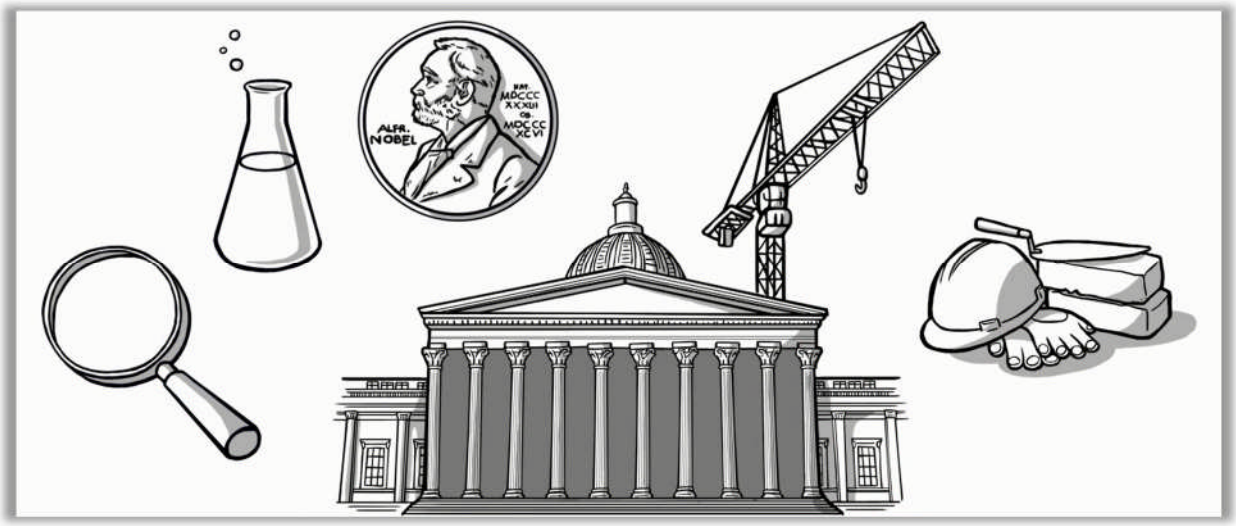
UCL Estates

Sustainability

UCL Sustainable Building Standard

A standard for the sustainable design, construction and operation of building, engineering, maintenance and infrastructure works at UCL



Version Control

Date	Version	Change	Reason	Author	Authorised
16/11/2016	1.8	For publication	Update	B. Stubbs	R. Jackson

Contents

Relationship with other UCL documents and procedures

This Sustainable Building Standard replaces the previous 'Sustainable Design Specification' most recently updated in September 2013. It also combines the requirements of the separate 'Project Sustainability Assessment Procedure' (covered in Part 2 of this document) which previously set out requirements for BREEAM/ Ska assessments etc.

However, this document is also designed to complement other UCL procedures, specifications, guidance and templates. The contents and requirements will therefore be increasingly reflected and embedded throughout Estates documentation. The following UCL documents, available via the UCL Estates website, are of particular relevance:

- EHS rules for contractors
- MEP Design Guidance (Updated version in draft at time of writing. Please contact UCL Sustainability Team - green-ucl@ucl.ac.uk)
- Construction Management Plan
- Biodiversity Action Plan and Strategy
- UCL Noise and Vibration Standard (In draft at time of writing. Please contact UCL Sustainability Team - green-ucl@ucl.ac.uk)

Introduction

UCL recognises the importance of delivering a sustainable estate in support of its academic mission. As such, this is identified as one of a few key enablers within our 20-year institutional strategy - *UCL 2034*.

In order to achieve our aims, sustainability needs to be standard practice within UCL Estates – not a 'nice to have'. It needs to be championed by the Estates teams and embedded throughout all Estates processes and procedures. In driving our sustainability performance forward, UCL seeks to be regarded as a leader across the HE sector.

This Sustainable Building Standard (SBS) details UCL's ambitious requirements for the delivery of a sustainable built environment, including the minimum standards and targets required for all new build, refurbishment, fit-out and minor works projects. Its main aim is to ensure that everyone we work with is increasingly familiar with our aims, values and requirements, and how they relate to their particular roles.

In order to meet our stretching long-term targets, it is essential that we push for continuous improvement. We need to account for developing regulatory obligations and best practice, as well as the rising expectations of our staff, students and other stakeholders. To increase buy-in, this must also be underpinned by the potential for measurable, value-driven outcomes.

We have an unprecedented pipeline of building projects, including the creation of a new campus on the Queen Elizabeth Olympic Park. On major projects such as these, our expectation is that design and construction teams will challenge best practice – delivering sustainable buildings which are sector-leading, and address some of our most pressing issues such as adaptability, flexibility, wellbeing and productivity.

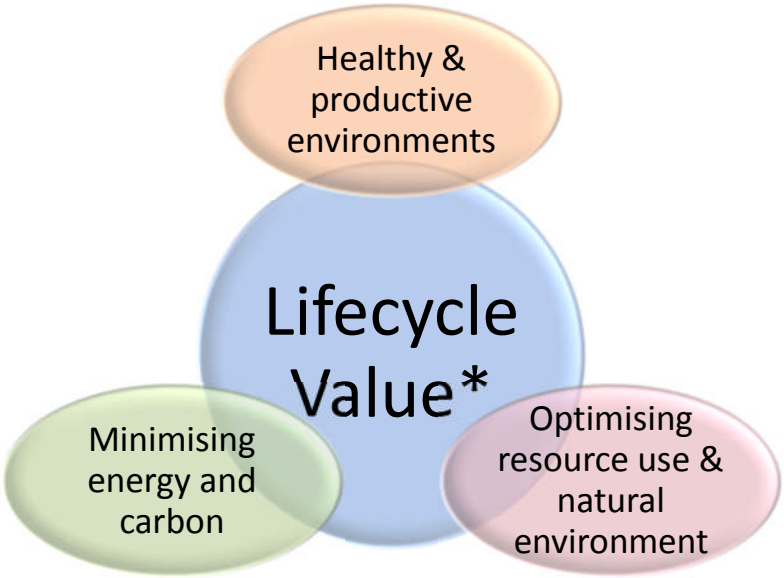
'Living Lab'

UCL is seeking to utilise parts of its estate to support research activity - referred to as our 'Living Lab'. This concept works to unlock UCL's expertise and tackle sustainability challenges by bringing people together and using the campus as a test bed for new ideas. Examples include trialling management processes and monitoring their effectiveness, or perhaps technologies to improve data capture, such as sensors embedded within the building.

As part of the SBS implementation, we would expect design teams to consider ways in which the project could be part of UCL's research and teaching activities - its Living Lab.

Part 1: UCL's Vision for Sustainable Buildings

In order to achieve our '2034' strategy objectives, our vision is for the UCL estate to perform at the highest levels of excellence and efficiency. This will support of our aim to be sector leaders in sustainability of the built environment and beyond. For UCL, this means addressing the following core principles in all our projects:



*By value, we don't just mean financial factors. It's essential that we account for the wider environmental, social and community impacts of our buildings.

Maximising value throughout the building life cycle

Our interest in the buildings we occupy often spans decades, and even centuries. We need to future-proof our built assets, ensuring that they are robust and flexible to stand the test of time, taking into account the potential for climate change adaptation.

Life cycle costing	All our projects will explore solutions which prioritise long term value as well as the initial budget. In addition to financial benefits, project teams must account for the less tangible value of sustainable buildings including environmental and social aspects.
Carbon appraisal	UCL has clear targets and obligations to measure, monitor, report and reduce our carbon emissions, as set out in the UCL Carbon Management Plan. All projects which have an impact on energy consumption are required to use our Cost & Carbon Tool with a view to investing in design options which result in lower carbon emissions and costs throughout the building lifecycle.
Life cycle design	Future-proofing our built assets requires careful design decisions to ensure that we can provide: • Robust and durable buildings which are easy to maintain and cost effective; • Facilities that can be easily reconfigured to allow for changes in functional requirements or user profiles; and

	• Buildings which can continue to operate efficiently in a changing climate, with particular emphasis on projected temperature and rainfall patterns.
Consultation, handover and aftercare	We believe that involving the right stakeholders at all stages of the project and through into the operational phase is fundamental to minimising running costs, resource consumption and increasing user satisfaction. This will range from technical specialists through to those who occupy and run the buildings.

Minimising energy use and carbon emissions

Cutting our carbon emissions and energy use helps minimise our environmental impacts whilst also reducing our operational costs. It also helps us to deliver against challenging international, national and sector-led targets. We intend to reduce these impacts to the lowest possible level with an ultimate aim of carbon neutrality for our new buildings.

Energy modelling and performance	Energy modelling must go beyond Building Regulations requirements to account for energy consumption not only from major systems but also specialist and 'plug in' equipment. Due regard should also be given to embodied carbon associated with materials choices.
Passive design	We require all our project teams to adopt a 'passive first' approach to building design which seeks to minimise reliance on mechanical and electrical services as far as possible.
Efficient systems	Where required, all of our plant and equipment should be planned and designed to reduce operational energy consumption and carbon emissions to a minimum, including the use of low/ zero carbon technologies.
Monitoring and management	It is vital that we can measure and understand our energy consumption at the level of individual systems and functional areas to identify opportunities for improved energy management and efficiencies.

Ensuring healthy and productive environments

Early planning of simple design measures can have a major impact on user satisfaction and productivity, whilst also influencing positive behaviour change. The comfort and wellbeing of building users must be considered alongside functional and technical requirements.

Internal environment	The design of internal spaces must be approached with a view to improving health, productivity and inclusivity for all building users with due regard to lighting, air quality and thermal comfort levels in particular.
External environment	External environments must be planned to optimise personal safety and accessibility, as well as enhancing site ecology and the public realm, for the benefit of both UCL and surrounding communities.

Sustainable travel arrangements	Facilities should be provided to minimise the need for motorised transport including the provision of remote working/ conferencing technology and enhancing the environment for pedestrians and cyclists.
Construction site management	Contractors are expected to implement best practice site management procedures to reduce their impact on staff and students, as well as our neighbours and the wider environment.

Optimising resource use & natural environment

Resource efficient design can result in significant cost savings whilst also minimising environmental impacts. We will follow circular economy[1] principles, using material and water resources as efficiently as possible, whilst also conserving natural capital.

Design for material resource efficiency	We require our design teams and contractors to plan for the most efficient use of material resources, avoiding or minimising the need for new products and materials as far as possible, or through specification of reused or recycled alternatives.
Minimising construction waste	We require all of our contractors to provide detailed plans to manage and minimise construction and demolition waste to the lowest possible level, whilst also targeting zero waste to landfill.
Operational waste	We will provide appropriate facilities and adopt management strategies which facilitate operational waste minimisation and maximise our recycling rates.
Materials with low environmental impacts	The materials used in our buildings should have the lowest possible impact on the environment. This requires pursuit of circular economy principles, as well as responsible and sustainable procurement.
Reducing water consumption	We expect to reduce water consumption associated with our buildings and facilities through the use of efficient equipment, careful management and, where practical, the use of rainwater harvesting.
Pollution	We require all projects to demonstrate how they have minimised pollution to air, land and water – as well as light and noise pollution. This should encompass design, construction and operational phases.

The business case for a sustainable estate

One of the common challenges when making the case for sustainable buildings and infrastructure is communicating the value benefits to key decision makers including budget holders, particularly when that value is accrued over a long period or where it is less tangible.

For many of our stakeholders, the drivers for developing a more sustainable estate are clear and compelling, including reduced energy consumption; lower carbon footprint; more efficient use of

[1] A **circular economy** is an alternative to a traditional **linear economy** (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life.

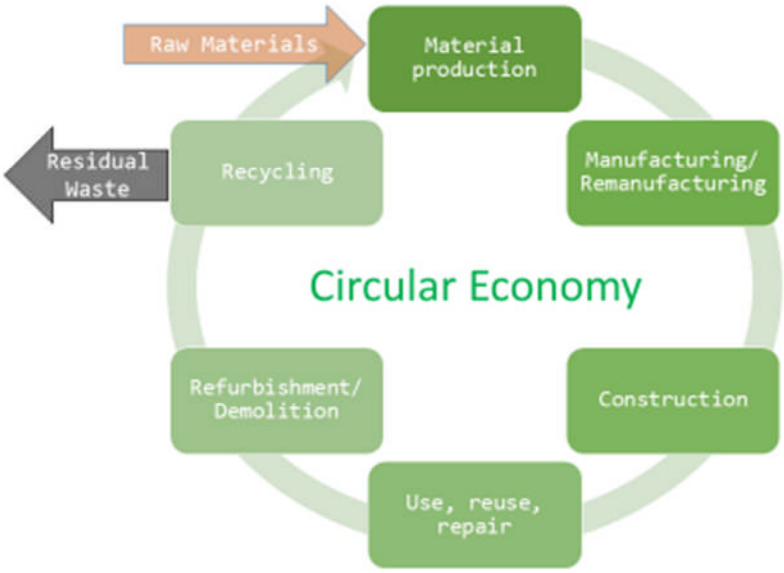
material and water resources; simplified maintenance; and adaptability. Indeed many of our academic colleagues are directly involved in making the case through research in precisely these areas.

However, not all of the benefits are immediately evident. As well as the more obvious cost savings, the business case for sustainability must also account for value which is more difficult to quantify, including the health and productivity of occupants, and broader community value.

In particular, a sustainable UCL aspires to a built environment which is based on a 'whole life' approach to design and planning, including the ability for our buildings to endure and adapt to both changing user requirements and the effects of climate change.

Delivering the vision – key targets and commitments

- Ensure that our buildings help to support staff and student health, well-being and work-life balance
- Achieve a BREEAM[2] rating of at least 'Excellent' for new build and major refurbishment projects, with the aim of 'Outstanding' wherever practical
- Smaller refurbishment and fit out projects must meet the Ska 'Gold' standard
- Achieve a 40% improvement in building carbon emissions, for new build/ part new build projects, relative to current Building Regulations (2013)
- Major refurbishment projects are required to develop a strategy in accordance with the energy hierarchy, and to achieve the minimum level for an 'Excellent' BREEAM rating
- Minimise the environmental impacts of material resource using 'circular economy' principles
- Aim to achieve zero construction waste to landfill
- Enhance biodiversity and improve ecological connectivity within the urban landscape



[2] Building Research Establishment Environmental Assessment Method

Part 2: Managing Sustainable Projects

This section of the UCL Sustainable Building Standard is specifically aimed at those who are involved in the day-to-day management of our projects – University Project Officers and external project managers in particular. It is designed to ensure that sustainability requirements are incorporated in an efficient and straightforward manner from the earliest project stages, helping to minimise administrative burden and avoiding the necessity for corrective action later in the process. In particular, it will help to maximise the value that can be achieved from the most appropriate measures and interventions.

Key Requirements

1. **Project Brief/ Business Case**: Confirm sustainability and carbon targets no later than Stage 1 and ensure they are included in the project brief. Opportunities to maximise the most beneficial and cost-effective measures start to decline after this stage.
2. **Environmental Assessment:** Identify the correct assessment method (e.g. BREEAM, Ska, Mini-Ska) at Stage 1 in conjunction with the UCL Sustainability Team. Early input from specialist consultants may be required.
3. **Carbon Appraisal**: All projects which have an impact on building energy consumption must use the UCL Cost & Carbon Tool to determine carbon emission and cost savings associated with different design/ specification options as part of business case development.
4. **Energy Modelling:** Commission energy modelling which goes beyond regulatory minimum compliance to predict more accurate and holistic building energy use.
5. **Life Cycle Costing**: All construction projects must balance capital expenditure with ongoing operational and maintenance costs. Larger projects must carry out a formal life cycle costing exercise starting no later than Stage 2 with an update during detailed design.
6. **Soft Landings**: The 'Soft Landings' process must be used to inform project planning and to ensure that buildings are set up to perform at optimum levels from handover stage and throughout their lifetime. This needs to be planned from the start of Stage 2.
7. **Specifications, Tender and Contract Documents:** Embed specific, measurable sustainability targets and requirements in tender & contract documents.

Project Sustainability Assessment Procedure

UCL is committed to the use of robust and auditable environmental assessment procedures for all our building projects. In general, we use recognised industry standards to provide a framework for implementing environmental and broader sustainability best practice, as outlined below. However, we do not use these tools in isolation and project sustainability considerations should include the widest possible range of appropriate measures. We do not preclude the use of complementary or innovative methods where they can be demonstrated to result in an equal or improved level of performance (e.g. Passivhaus; WELL Building Standard).

The principal standards we use are as follows:

Project Category	Description	Method	Minimum Rating
New build/ part new build	New construction as well as significant extensions to existing buildings	BREEAM	Excellent*
Major refurbishment	Work involving the remodelling of the building envelope (e.g. glazing, roof or wall sections) **and/or** remodelling the core mechanical, electrical heating or ventilation systems.	BREEAM	Excellent
Fit-Out/ Minor refurbishment	Larger scale fit-out works within a building, confined within the building envelope and with minimal or no impact on core building services or envelope (e.g. lab refurbishment, space reconfiguration)	Ska HE	Gold
Minor works/ Lab fit-out	Small scale engineering, maintenance or repair works such as a toilet refurbishment, painting a corridor, new lighting etc. Separate requirements for labs.	Mini-Ska/ Ska Labs	Comply with all relevant measures
Smaller new build/ refurb	New build or refurbishment projects <1000m^2	Consult UCL Sustainability team	
Infrastructure	Civil engineering, infrastructure and landscaping projects	Consult UCL Sustainability team	

* Project teams for all major new build projects must demonstrate an approach to achieving a potential 'Outstanding' rating.

Project category and hence method/rating needs to be stated in the consultants' invitation to tender. Where there is any doubt about which methodology should be used, this should be confirmed with the UCL Sustainability Team.

Leadership and Responsibilities

A meeting should take place between the Sustainability Team, Strategy Manager and Project Manager upon project initiation to confirm the methodology applied, project targets and key responsibilities which are summarised below:

Role	Responsibility
Estates Leadership Team	• Sets tone, approves strategy, reviews project team progress and agrees major derogations/ appropriate mitigation in conjunction with the UCL Sustainability Manager • Overall responsibility for compliance and audit
UCL/ Sustainability Team	• Sets overarching requirements/ agrees any variations • Provides steer and assurance • Oversees assessment and audit process/ monitors progress • Agrees derogations where appropriate • Requires provision of performance data for reporting purposes
University Project Officer/ External Project Manager	• Must be familiar with the requirements of the *Sustainable Building Standard* and *Sustainable Project Planner* • Ensures that project sustainability requirements are included in all relevant project documentation – from brief/ business case through to tender and contract documents • Ensures that the correct assessment methodologies are applied to the project, including carbon appraisal • Appoints Sustainability and Energy Consultants; BREEAM/ Ska assessor; and specialist consultants, as required (confirm with Sustainability Team) • Ensures that the project design and implementation teams are fully aware of their responsibilities with regard to meeting the required standards, and providing appropriate evidence. • Arranges sustainability meetings/ workshops at regular intervals during the project lifecycle.
Sustainability Consultant/ BREEAM or Ska Assessor	• **Must be appointed no later than RIBA 1 for new build and major refurbishment projects** • Ensures that the project is delivered in accordance with the UCL SBS • Facilitates sustainability workshops; assigns team responsibilities; sends team reminders; and provides regular written updates. • Provides advice and guidance on the sustainability objectives and assessment process to the design and implementation teams • Challenges the project team to optimise sustainable design and construction • Reviews and manages documentary evidence to confirm implementation of sustainable design measures • Manages formal certification process (BREEAM/ Ska) • Identifies additional opportunities for exemplar practice/ innovation
Project Design Team	• Reviews relevant sections of the SBS to confirm that all requirements can be met; raise derogations where necessary

Role	Responsibility
	• Supports the project manager and sustainability consultant in identifying relevant sustainability criteria to target on the project • Reviews discipline-specific requirements of the sustainability assessment (BREEAM/ Ska) and highlights compliance risks and additional opportunities • Ensures that requirements are incorporated clearly into design and specification documentation • Attends sustainability review meetings • Where necessary, prepares additional evidence documents to support the formal assessment process
Project Implementation Team (contractor)	• Reviews targeted sustainability criteria, specification and contract documents to ensure requirements can be met in practice • Raises risks and additional/ alternative opportunities as early as possible • Ensures that targeted criteria are met in the event of product substitutions or design changes • Organises regular sustainability review sessions • Provides evidence of compliance to the sustainability consultant
Energy Consultant (where appointed, otherwise MEP)	• For new build/ major refurbishment projects - should be appointed at same time/ alongside MEP consultant • Provides advice and guidance to the design team on sustainable energy solutions, including opportunities for innovative solutions to minimise operational carbon emissions • Completes/ updates UCL Cost and Carbon Tool. • Undertakes initial energy modelling as part of the energy strategy development for the project • Carries out additional modelling (e.g. daylighting, overheating) as required/appropriate • Provides energy consumption data to cost consultant for LCC analysis • Reviews MEP specifications to ensure energy efficiency is achieved in practice, highlighting any risks. • Identifies additional opportunities for exemplar practice/ innovation • Uploads data onto Carbon Buzz
Cost Consultant	• Ensures budgeting and value engineering exercises account for the life cycle benefits of investing in sustainability initiatives • Account for value of existing building materials • Where required, carry out formal life cycle costing analysis (with input from Energy Consultant) • Provide necessary information to support completion of the Cost and Carbon Tool (carried out by energy consultant); i.e. CapEx data for options to allow payback/NPV to be estimated
Specialist disciplines	• Depending on the scope of the project, additional specialist inputs may be required to meet the requirements of the SBS and sustainability assessments. This may include: ecologist, acoustician, security consultant, transport consultant etc.

Please note that a more detailed breakdown of the detailed responsibilities relating to each separate discipline is provided in Section 3: Sustainable Design Requirements

UCL Portfolio Services

The UCL Portfolio Services Office (PSO) supports project and programme management teams in the delivery of the Estates portfolio of projects, programmes and activities. This includes capturing and reporting on all aspect of projects and programmes to provide assurance and increase visibility across the estates portfolio.

This responsibility extends to UCL sustainability requirements as set out in this Sustainable Building Standard. Our internal and external projects managers are required to provide basic sustainability performance data in monthly reports throughout the duration of a project (i.e. BREEAM/ Ska progress; carbon data; relevant risks).

In support of the above, members of the UCL Sustainability Team provide assurance and oversight for the implementation of sustainability measures on a project-by-project basis, providing additional support as required. They are also responsible for reporting on progress to Capital Projects & Estates Strategy Board and the Strategic Maintenance Project Board, as well as signing off Stage Gate approvals at relevant project stages.

Project Brief/ Business Case

Input required: UPO/ External PM
RIBA Stage: 0 onwards

The effective implementation of the SBS and associated environmental assessments requires defined procedures and actions from the project inception stage.

In the first instance, it is the responsibility of University Project Officers (UPO's) and/ or external project managers to familiarise themselves with the requirements of the SBS, and to ensure that **ALL** relevant requirements are accounted for. They will then need to cascade the initial responsibilities and actions to their project teams, as required.

The UCL Sustainability Team should be consulted and will provide an assurance role at these early stages to ensure that the project brief includes all relevant sustainability objectives.

This SBS should also be provided to all framework consultants during the tender process for new appointments/ projects. Consultant teams are required to adhere to the requirements outlined in this document and to provide the relevant information to contractors on a project-by-project basis. The UCL project manager will be required to ensure that all members of the project team are meeting the requirements of the SBS. The UCL Sustainability Team will provide assurance to the project manager in relation to this requirement.

Actions & Responsibilities

1. **Account for all relevant requirements in the SBS**
2. **Set overall project sustainability targets**
3. **Identify correct assessment method (e.g. BREEAM, Ska)**
4. **Confirm benchmark energy and carbon data using UCL Cost & Carbon Tool**
5. **Justify any likely areas of risk/ non-conformance (where known)**
6. **Highlight opportunities for innovative or best practice sustainability interventions**

Environmental Assessment (BREEAM & Ska)

Input Required: Sustainability Consultant
RIBA Stage: 1 onwards

The BREEAM and Ska assessment methodologies are the main frameworks which are used by UCL to implement sustainability on a project-by-project basis. Even where a formal assessment is not required, a review of measures in the relevant standard will highlight opportunities to improve building performance in relation to environmental impact; user satisfaction; and life cycle value.

Overall responsibility for BREEAM and Ska Assessments lies with the University Project Officer (UPO) or external project manager, as relevant to the project.

Assessments are divided into the following stages:

<table>
<tr><th rowspan="2">RIBA Stage</th><th>BREEAM</th><th>Ska</th><th>Mini-Ska</th></tr>
<tr><td>New build, including extensions, and major refurbishments</td><td>Fit-out works, with minimal or no impact on core building services or envelope</td><td>Smaller projects (e.g. room/ corridor refurbishment)</td></tr>
<tr><td>0</td><td colspan="3">Complete Project Brief/ determine environmental assessment method</td></tr>
<tr><td>1</td><td>PRE-ASSESSMENT
Appoint BREEAM AP; hold pre-assessment workshop; identify early actions and responsibilities</td><td>SCOPING
Initial scoping, and pre-assessment exercise</td><td>SCOPING
UPO/PM to identify relevant measures using Mini-Ska template</td></tr>
<tr><td>2</td><td rowspan="3">DESIGN STAGE ASSESSMENT
Design team reviews; prepare evidence; include BREEAM requirements in tender docs; interim certification</td><td rowspan="3">DESIGN STAGE ASSESSMENT
Appoint assessor (if required); design team reviews; prepare evidence; include Ska in tender docs</td><td rowspan="4">SELF-ASSESSMENT
Ensure that ALL relevant measures are translated into design specification and complete Mini-Ska tool to confirm implementation</td></tr>
<tr><td>3</td></tr>
<tr><td>4</td></tr>
<tr><td>5</td><td>CONSTRUCTION STAGE
Contractor reviews; site audits; prepare and collate project performance data</td><td>CONSTRUCTION STAGE
Contractor reviews; site audits; prepare and collate project performance data</td></tr>
<tr><td>6</td><td rowspan="2">POST-CONSTRUCTION ASSESSMENT
Finalise project performance data and provide 'as built' evidence; final certification</td><td rowspan="2">HANDOVER STAGE ASSESSMENT
Finalise project performance data and provide 'as built' evidence</td><td rowspan="2">AUDIT
Confirm final compliance
Update Mini-Ska tool
Audits carried out by UCL Sustainability Team</td></tr>
<tr><td>7</td></tr>
</table>

BREEAM Assessments

The Building Research Establishment Environmental Assessment Method (BREEAM) is the most widely used tool for assessing building sustainability in the UK and is recognised throughout the construction industry.

The BREEAM assessment process will be managed by the project manager in conjunction with the BREEAM Advisory Professional (AP)/ Assessor. It is UCL's strong preference that assessments are managed using online tracker software in order to facilitate guidance and provide updates to the project team; set clear responsibilities and deadlines; and provide effective progress monitoring.

The BREEAM assessor will be expected to facilitate an initial BREEAM workshop involving relevant members of the project team, and to attend regular progress update meetings. He/ she will be required to provide all relevant project stakeholders with guidance on the assessment in an easily accessible format, including the following as a minimum:

- Detailed list of targeted credits, including core requirements
- Different scoring scenarios. i.e.
    1. to achieve targeted rating; and
    2. additional credits to reach a higher rating (i.e. Outstanding)
- Areas of risk and opportunity
- Early actions required to secure time-critical credits (see table below)
- Clear break-down of relevant requirements
- Confirmation of individual responsibilities (i.e. for compliance and evidence provision)
- Written progress updates/ reports

It is particularly important that clear responsibilities for individual measures are defined by individual and discipline. It should be noted however that the whole team are expected to familiarise themselves with, and support implementation of all targeted credits, as required.

UPOs/ Project Managers are responsible for tracking the progress of the BREEAM assessment including any risks of non-compliance or opportunities for additional credits. They should also ensure that evidence is being provided to the assessor in a timely manner in relation to the programme, noting that BREEAM is divided into design stage and post-construction assessments.

BREEAM: Early Actions and Responsibilities

A number of BREEAM credits require actions during the earliest stages of the project – not least the appointment of a BREEAM AP by RIBA Stage 1. The following table provides a list of these early actions and typical responsibilities.

BREEAM Issue	ACTION REQUIRED	RIBA	WHO?
Man 01: BREEAM AP	Ensure that BREEAM AP is appointed and BREEAM is an item on all DTM agendas/ minutes	**1**	UPO/ PM
Wst 05: Adaptation to climate change	Requires a climate change adaptation strategy, including hazard and risk analysis	**1**	Architect
LE 05: Enhancing Site Ecology	Involve a suitably qualified ecologist to consider and report specifically on BREEAM requirements (and also in support of the UCL Biodiversity Action Plan and Strategy)	**1**	UPO/ PM/ Ecologist
Mat 06: Materials Efficiency	Provide clear documented evidence of materials efficiency considerations at EVERY design stage	**1-4**	Architect

BREEAM Issue	ACTION REQUIRED	RIBA	WHO?
Man 01: Stakeholder Consultation	Ensure all relevant 3rd party stakeholders have been consulted, including all minimum consultation content required under this issue	**2**	UPO/ PM
Man 02: Life cycle costing	Commission initial elemental life cycle cost analysis	**2**	UPO/ PM
Hea 06: Security of Site & Building	Consult security specialist/ provide site-specific security needs assessment (may be carried out on site-wide basis but needs to account for building-level requirements)	**2**	UPO/ PM
Ene 04: Low Carbon Design	Carry out passive design analysis and implement appropriate measures resulting in meaningful reduction in total energy demand	**2**	Architect/ Energy Consultant
Ene 04: Low Zero Carbon Feasibility	Complete LZC/ renewables feasibility study compliant with detailed BREEAM requirements CO2 reduction calculations.	**2**	Energy Consultant
Tra 05: Travel Plan	Where required, commission supplementary building-level Travel Plan to include all elements required for BREEAM compliance.	**2**	Transport Consultant
Wst 06: Functional Adaptability	Undertake building-specific functional adaptability strategy	**2**	Architect
Mat 01: Life Cycle Impacts	Ensure that specification of key building elements takes account of Green Guide to Specification, prioritising A/ A+ rated materials as far as possible	**2/3**	Architect
Contractor Requirements	Ensure contractor requirements relating to individual BREEAM issues are included in tender documents	**4**	UPO/ PM

Full details of individual BREEAM credits which UCL requires to be targeted on every project are included in Section 3.

Additional details of the sustainability interventions required at each project stage (i.e. beyond BREEAM alone) are set out in the Sustainable Project Planner table provided in Appendix 1 of this document.

Ska

Operated by the Royal Institution of Chartered Surveyors (RICS), Ska Rating is an environmental assessment tool for sustainable fit-outs. The Ska process is used by UCL in the following ways:

- Commissioning a quality-assured assessment and formal certification using an external RICS-accredited Ska assessor (this will normally be a contractor responsibility) OR
- Informal assessment of the environmental performance facilitated by internal UCL Ska assessor

Engaging with the Ska process will provide clear guidance and structure for implementing and achieving sustainable fit-outs; and help to benchmark performance and provide comparisons between UCL projects and the wider industry.

As a guide, UCL generally requires full Ska Higher Education assessments on fit-out projects over the value of £2M; however this should be confirmed with the Sustainability Team given the range of project types/ scopes. Assessments should be carried out at design and handover stages.

Requirements for formal certification will be determined on a project-by-project basis; however, in all cases evidence will need to be provided to demonstrate compliance with targeted measures, and for audit purposes.

The Ska assessor will be expected to provide all relevant project stakeholders with guidance on the assessment, including a copy of the Ska scope and targeted criteria; clarification of requirements; and written progress updates/ reports. In particular, they will need to assign clear responsibilities for individual measures, by individual/ discipline. It should be noted however that the whole team are expected to familiarise themselves with, and implement the full criteria list.

Mini Ska/ Ska Labs

For smaller projects, UCL has developed a 'Mini-Ska' template which is designed to be completed independently by the UPO/ Project Manager in conjunction with relevant colleagues or external consultants. Examples of relevant projects include refurbishments of single rooms or corridors; toilet upgrades; space reconfiguration etc.

Mini-Ska includes a limited set of adapted measures from the RICS Ska methodology. UPOs/ Project managers will be responsible for determining which of these measures are relevant to the project and which can be 'scoped out'. Requirements will then need to be included in the design specification and notes on compliance included in the template.

A variation of this tool has also been developed for lab refit works and includes a number of additional specialist requirements; this version of the tool should therefore be used where specialist lab services or equipment are being replaced/ upgraded.

Infrastructure Projects

For major projects involving civil engineering, infrastructure, landscaping and works in public spaces, please consult with the UCL Sustainability Team to determine the most appropriate assessment method. Depending on the scope, it may be appropriate to carry out a CEEQUAL or BREEAM infrastructure assessment. In exceptional cases we may need to adopt an alternative, bespoke approach.

Evidence Requirements

A variety of evidence will be required to support compliance with BREEAM/ Ska assessments. In many cases, it should be possible to source readily available project documentation for this purpose. However, in some circumstances it will be necessary to amend or mark-up documents or, possibly, prepare additional evidence from scratch. All members of the project team are required to contribute to this process and individual disciplines are expected to have allowed for this in their fees.

Evidence must be provided so that an external assessor can be satisfied beyond reasonable doubt that it demonstrates unambiguous compliance against all relevant criteria. Documents must be appropriately referenced to identify, as a minimum, the purpose of the document, author, organisation and date of publication/ version.

The following table provides an indication of the types of evidence which may be required:

Design Stage	Implementation/ Post-Construction Stage
• Specifications • Tender Documentation • Design Drawings • Plans • Manufacturer's details • Formal letters (e.g. client, design team, manufacturer)	• Site photographs • Purchase Orders and Invoices • Installation Schedule • Delivery notes • Certificates from suppliers regarding products • Physical inspection of products on site • Waste transfer notes

Of particular importance is the inclusion of specific sustainability requirements in tender and contract documents, both as evidence of intention to comply, and to ensure any instances of non-compliance can be dealt with effectively. Further information is provided below under 'Specifications and Tender Documents'.

Actions & Responsibilities

1. **Identify correct assessment method (e.g. BREEAM, Ska)**
2. **Appoint/ identify relevant assessor to guide the process**
3. **Carry out pre-assessment exercise to identify relevant measures/ credits**
4. **Commission early inputs required for compliance (e.g. reports, surveys)**
5. **Ensure that clear responsibilities have been defined by individual/ discipline**
6. **Include requirements in tender and contract documents**
7. **Identify areas of risk or opportunity**
8. **Set clear deadlines for the provision of evidence documents**

Carbon Appraisal

Input Required: Energy Consultant
RIBA Stages: 1 and 3

UCL has a strong ambition and obligation to measure, monitor, report and reduce carbon emissions associated with its estate and operations, as set out in the UCL Carbon Management Plan. The UCL Cost and Carbon Tool must be used on all projects which have an impact on building energy consumption (i.e. including provision or changes to building fabric or fixed services). The level of detail required will be dependent on project scope and determined within the Tool.

The aims of the cost and carbon appraisal are as follows:

- Part of feasibility assessment in order to inform business case decision making
- To evaluate different building servicing/ fabric options during early design stages
- To identify the option with lowest life cycle carbon and associated costs
- Provide accurate and auditable carbon data to assist with UCL reporting

Full guidance on inputs required is contained within the Cost and Carbon Tool itself.

For projects where an energy consultant has not yet been appointed, the initial Carbon Appraisal should be undertaken in house by the UPO/Project Manager with the support of the Sustainability Team, where required. Where appointed, the Cost & Carbon Tool will be completed by the energy consultant drawing on the following information for each of the options being assessed, including the baseline option:

Role	Responsibility
Project Manager	• Capital cost of project including amount allocated to environmental improvement (i.e. the additional cost of measures which go beyond standard works/ regulatory compliance) • Expected lifetime (design life) of project • Running cost of project, including maintenance cost/frequency of product or project and energy cost/savings (support available from UCL Energy Manager) • Total expected energy consumption • Total baseline ('do nothing' option or building regulations minimum standard option) energy consumption • Include figures for carbon savings/ increases in project monthly report
MEP/ Energy Consultant	• Complete the Cost and Carbon Tool • Running cost of plant/ equipment options (supporting PM in determine Energy cost/savings) • Operational CO_2 emissions total expected (calculated) • CO_2 emissions total for baseline (do nothing option) (calculated)
UCL Energy Manager	• Review/ assurance
Cost Consultant	• Feed in CapEx data to the calculation (i.e. NPVs and paybacks)

The UCL Portfolio Services (PSO) team will maintain a register of anticipated and actual carbon costs and/or savings. This will provide a carbon balance sheet for projects moving forward.

Actions & Responsibilities

1. **Ensure that the Cost & Carbon Tool is used for all projects which have an impact on building energy consumption**
2. **Facilitate the provision of relevant performance data for different scenarios**
3. **Identify the option with lowest life cycle carbon and associated costs**
4. **Provide accurate and auditable carbon data to assist with UCL reporting**

Soft Landings

Input Required: UPO/ External PM
RIBA Stage: 1 onwards

A common criticism of sustainable design initiatives is that buildings fail to perform in practice to the levels intended during the design and construction phases. This represents a major challenge for the UCL Estate.

The principal reasons for this discrepancy typically fall into the following categories:

1. Lack of sufficient consultation with existing/ future building users to understand how the building is likely to be used (e.g. hours of operation, current/ emerging operational requirements; key areas of energy consumption etc)
2. Energy modelling is inaccurate, lacking sufficient detail or fails to be updated to give a realistic prediction of building energy performance.
3. Energy consuming and generating systems are not commissioned properly or managed efficiently.
4. Building users and managers may not have sufficient training in how to operate/ adjust equipment to maximum efficiency.
5. User behaviour may conflict with energy performance (for example where lights are left on unnecessarily or windows left open to conflict with HVAC systems)

Investment in comprehensive building energy modelling (covered in detail in the next section) and realistic target-setting, right through to effective post-occupancy evaluation and systems adjustments can result in better predictions and substantial operational savings. However, close, early collaboration between members of the project team, building occupants and building managers is also essential.

This needs to be underpinned by a clear process which highlights potential issues and solutions at each and every stage of a project development – from inception through to carefully planned aftercare. As such, UCL is committed to the principles of the (BSRIA) Soft Landings framework.

It is essential that this process is started as early as possible; even the earliest design decisions can effectively 'lock in' unsustainable building traits, potentially leading to a lifetime of compromised performance and management issues.

The later stages of Soft Landings will also support the 'fine-tuning' of building performance, including seasonal and ongoing commissioning; and effective post-occupancy evaluation. These elements have the potential to benefit both new and existing projects alike.

Actions & Responsibilities

1. **Use the Soft Landings process to ensure close, early collaboration between members of the project team, building occupants and building managers**
2. **Identify and avoid potential unsustainable building traits**
3. **Pin down an effective handover process including best practice commissioning, seasonal commissioning and post-occupancy evaluation**
4. **Specific elements of Soft Landings which must be included are set out in Section 3.**

Energy Modelling

Input Required: Energy Consultant
RIBA Stages: 2 onwards

Differences between basic energy modelling and actual building energy performance (the 'energy gap') can result in operational costs which are significantly higher than anticipated. In order to help understand, manage and reduce these costs, UCL is therefore committed to energy modelling which goes beyond minimum standards for regulatory compliance (i.e. in addition to the requirements of Part L Building Regulations).

For new build and major refurbishment projects (generally >£2m), it is essential that UPO's specify base building energy performance in conjunction with MEP and/ or specialist energy consultants (as appointed), based on absolute operational energy consumption rather than the regulatory minimum required under Part L Building Regulations. Indeed, calculations for regulatory compliance simply do not account for all energy uses in buildings. These calculations are commonly misinterpreted as predictions of in-use energy consumption, when in fact they are simply mechanisms for complying with the Building Regulations.

UCL therefore requires the following to help ensure that design assumptions properly reflect the in-use performance of buildings:

- Initial indicative modelling must be carried out no later than RIBA 2 in order to provide an early prediction of operational energy consumption. Assumptions used for this early model must be made available for detailed design calculations.
- During detailed design stages, a standalone bespoke energy model is required following the process of TM54 or similar, including climate change modelling and alternative weather scenarios.
- Energy modelling is required to predict actual, absolute in-use energy consumption. It must therefore include bespoke model settings (e.g. daylight, heat gains, temperatures, occupancy patterns etc.) and not just be Part L modelling plus NCM unregulated loads. This is essential to reflect an accurate energy balance for the building. Unless otherwise agreed, these should be:
    - Passive buildings: 2050s, medium scenario, 50th percentile
    - Mechanical vented buildings: 2030s, medium scenario, 50th percentile (based on UKCP09 data)
- Calculations must account for ***all main building loads***, over and above basic regulatory compliance. This must include those in CIBSE Guide A (2015) Table 5.22 (i.e. both regulated and unregulated). See below.
- Unregulated sources of energy consumption, including specialist functions, must be considered at the design stage (these typically account for more than 30% of the energy consumption in standard office-type buildings).
- Ensure that assumptions about the performance of building components are correct (such as party walls).

In addition, uncertainty should be reflected by providing a 'results envelope'. This will help understand the sensitivity of some design decisions. For example, alternative weather years could be considered or varying occupancy levels could be included, as appropriate. Results should then be presented in terms of 'absolute energy demand is expected to be between x and y kWh per year'. This is more useful than a single figure prediction – which will inevitably be incorrect.

CIBSE Guide A (2015) Table 5.22 – Main sources of building energy demand

Current 'regulated' energy total demands in England & Wales	Additional demands contributing to building loads
Heating	Small power
Cooling	Catering
Fans, pumps and controls	Business/ process loads
Fixed lighting	External lighting
Domestic hot water	Lifts/ escalators

Carbon Buzz

Available energy modelling data will be used to populate the Carbon Buzz project tool through design and, ultimately, with actual performance data. Modelling data for Part L etc. will be required to be converted to operational performance data in accordance with CIBSE TM54 for inclusion in Carbon Buzz.

Actions & Responsibilities

1. **Specify base building energy performance in conjunction with MEP and specialist energy consultants**
2. **Calculations must account for all energy uses in buildings over and above basic regulatory compliance**
3. **Calculations must include bespoke model settings (e.g. heat gains, temperatures, occupancy patterns etc.) and not just be Part L modelling plus NCM unregulated loads.**
4. **Unregulated sources of energy consumption such as small power loads, server rooms, external lighting, as well as specialist functions, must be considered at the design stage**

Life Cycle Costing

Input Required: Cost Consultant
RIBA Stages: 2 and 4

UCL recognises that investing in efficiency measures, as well as robust and durable fabric and services, can result in significantly lower operating costs. We therefore require all our projects to look beyond the initial capital costs, through to the operation, maintenance, refurbishment and eventual decommissioning of the building.

For maintenance, minor works and smaller refurbishment projects the completion of our cost and carbon tool, which includes calculation of simple financial paybacks and net present value associated with different options, is likely to be sufficient. However, for our major projects, and where a BREEAM assessments are required, a formal life cycle costing exercise should be carried out in accordance with recognised standards, as summarised below (i.e. ISO 15686 Standardised method of life cycle costing for construction procurement). In general, this will be coordinated by the cost consultant.

In addition to long term financial considerations, this process should also account for impacts which are more difficult to measure in direct economic terms. This includes carbon impacts and, in particular, the potential health and productivity benefits of investing in sustainable design and construction. Whilst this part of the exercise should aim to make use of existing studies on this subject, we recognise that it may need to be a predominantly qualitative assessment due to relatively limited data in this area.

We do not specify a rigid approach to life cycle costing; however, basic output requirements are as follows:

Elemental LCC Plan (Stage 2)

An outline, entire asset elemental life cycle cost (LCC) plan is to be carried out at Concept Design stage in order to:

a. Provide an indication of future replacement costs over the anticipated life cycle of the building (minimum 25 years)
b. Include service life, maintenance and operation cost estimates.

The design team must be able to demonstrate how the elemental LCC plan has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value

Component level LCC option appraisal (Stage 4)

A component level LCC option appraisal is to be developed by the end of Technical Design stage (RIBA 4) in line with PD 156865:2008 including the following component types (where present):

a. Envelope, e.g. cladding, windows, and/or roofing
b. Services, e.g. heat source cooling source, and/or controls
c. Finishes, e.g. walls, floors and/or ceilings
d. External spaces, e.g. alternative hard landscaping, boundary protection.

The above process will also support compliance against relevant BREEAM credits (Man 04). The design team must be able to demonstrate how the component level LCC cycle appraisal has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.

Our consultants may choose to use their own method where the above requirements, including all elements for BREEAM compliance, are covered. LCC results must be included in the relevant stage gate review documentation to aid informed decision-making about the balance between capital and operational costs. This should include consideration of best-practice or innovative solutions which can provide long term value.

Actions & Responsibilities

1. **Projects of all types and sizes must be able to demonstrate sound financial sense throughout their projected lifecycle – capex should not be prioritised over opex.**
2. **For major projects, formal lifecycle costing analysis must be carried out starting at Stage 2. Ensure that this responsibility is identified and allocated.**
3. **Facilitate the provision of energy and cost information to support the process.**
4. **Account for non-economic benefits, particularly relating to health & wellbeing.**

Specifications, Tender and Contract Documents

Input Required: UPO/ External PM
RIBA Stages: 2-4

It is essential that our project teams embed relevant requirements from this UCL Sustainable Building Standard and environmental assessments within project documentation to ensure that valuable opportunities for improved sustainability performance are not missed - particularly where these were not previously seen as part of a 'standard' approach.

Where appointed, project sustainability consultants are required to feed into this process, including through the review/ provision of appropriate wording for specification, tender and contract documents. Alternatively, the UCL Sustainability Team can provide guidance in this area.

Sustainability expertise must also be included in design team and contractor evaluation. Ensuring that we have specialists with relevant experience – and commitment – to achieving sustainable project outcomes means that we are also more likely to manage costs and optimise value.

The following documentation should reflect project sustainability requirements, and be reviewed by the sustainability consultant and/or UCL Sustainability team:

- Business case/ PSO Stage Gates/ monthly reports
- Specification documents (particularly architectural and MEP)
- Tender documents: ITT, prelims, employer's information requirements
- Pre-construction information
- Additional contract documents

For BREEAM or Ska assessments a formal pre-assessment must be a contractual requirement; specifications and tender documents may then need to be supplemented by additional evidence materials prepared by individual disciplines. This includes letters, reports, design plans, drawings, manufacturers' details, technical calculations and models etc.

Value Engineering (VE)

It is particularly important to account for implications of any value engineering exercises which may impact on sustainability performance, including BREEAM/ Ska compliance. Indeed, UCL's absolute priority is to ensure that cost-cutting and value engineering are not seen as the same thing, particularly in relation to long-term operation and maintenance costs.

A VE template is available from the UCL Portfolio Services Office (PSO) and should be used for all VE exercises. This requires consideration of life cycle cost impacts.

<u>The sustainability consultant and/or UCL Sustainability Team must be included as part of this process to agree design changes or VE items, to consider the potential impact on sustainability performance.</u>

Actions & Responsibilities

1. **Account for sustainability expertise in design team and contractor evaluation.**
2. **Ensure all members of the team are aware of the requirement to comply with the UCL SBS.**
3. **Ensure consultants account for specific, detailed requirements in design documentation.**
4. **Include sustainability targets and requirements in contract documents.**
5. **Ensure that any value-engineering is not simply a cost cutting exercise, particularly where this has ongoing operational and maintenance cost implications.**

Compliance and Assurance

Any deviation from the requirements set out in this document must be agreed with the UPO and Sustainability Team, and clearly documented.

In carrying out its assurance role the UCL Sustainability Team will undertake regular project sustainability reviews and report on performance against project aims and standards.

Unless otherwise agreed, failure to comply with the requirements of the Standard at an elemental level may result in withholding of payments based on:

- Recovery of any costs associated with non-compliance with statutory requirements
- Increased life cycle cost implications of non-compliance (e.g. additional energy or maintenance costs)

Project teams are required to assess sustainability performance against the appropriate scheme criteria (BREEAM, Ska etc.), and to report progress against agreed targets to the Portfolio Services Office in monthly reports.

In addition, all stage gate reviews will need to include a statement detailing sustainability performance, documenting any uncertainties; life cycle and carbon cost of different options; risks of non-compliance; and justification for any derogations. This will allow project boards to make informed decisions relating to potential variations/ mitigating actions.

Heritage Considerations

UCL operates a number of buildings within the Bloomsbury Conservation Area and/ or with significant heritage value in their own right.

Some modern sustainable design solutions will not always be appropriate in this context. However, more often than not, such buildings actually present significant opportunities for long-term sustainability, and it is important that initiatives are not ruled out without due consideration.

For example, proper attention will need to be given to the special characteristics of heritage buildings when considering energy efficiency measures. Improvements should always be made where the work does not prejudice the character or cultural significance of the building, or increase the risk of long-term deterioration to the fabric or fittings.

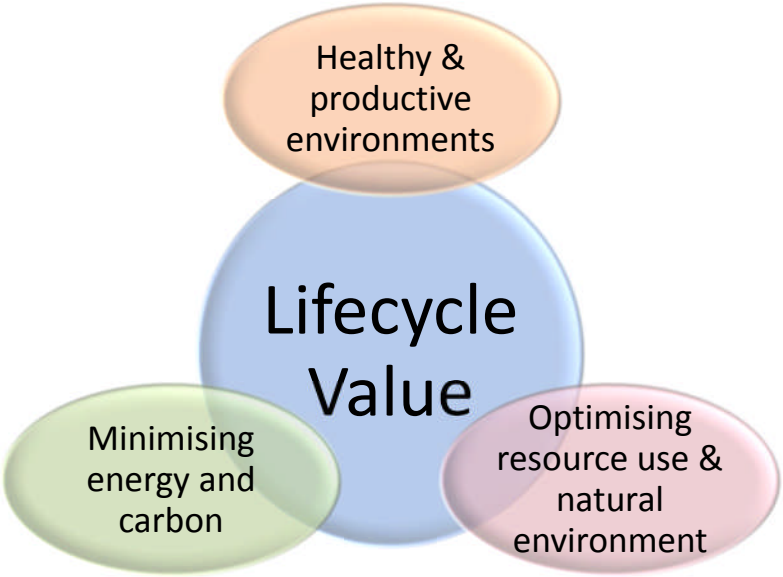
Any projects which fall into this category must involve early engagement between the design team and relevant external experts to establish the most beneficial way forward, including the management and reduction of energy consumption and carbon emissions.

Further guidance on how to optimise sustainability for heritage projects is available from the following sources:

- Balson, K., Summerson, G., and Thorne, A. (2014) *Sustainable Refurbishment of Heritage Buildings* BREEAM
- English Heritage (2011) *Energy Efficiency and Historic Buildings* English Heritage
- Miles, N (2013) *Retrofitting Historic Buildings for Sustainability* Westminster City Council

Part 3: Sustainable Design Requirements

This section of the Sustainable Building Standard sets out the minimum standards we require for all our construction projects in support of our overarching vision and targets for sustainable development. It is categorised in line with the core principles set out in Part 1 of this document:



Each requirement is set out as follows:

- **Issue**: descriptive name of requirement
- **Standard to be achieved/ minimum requirement**: the detail of what is required on all relevant projects
- **Lead**: the discipline normally responsible for overall implementation/ compliance (note that where more than one discipline is involved with implementation, a lead should be identified)
- **RIBA**: the stage at which action is required
- **BREEAM**: credits which relate to the UCL requirement under BREEAM 2014
- **Ska**: measures which relate to the UCL requirement under Ska HE

It is the responsibility of the project team led by the UPO/ PM to identify which requirements are relevant to the project scope/ context and ensure that responsibility for their delivery is clearly assigned to individual specialists (organisation and, ideally, individuals).

Maximising value throughout the building life cycle

Issue	Standard to be achieved/ UCL minimum requirement	Lead	RIBA	BREEAM	Ska
Life cycle costing					
Life cycle costing	Projects of all types and sizes must be able to demonstrate sound financial sense throughout their projected lifecycle, specifically balancing capital expenditure with operational and maintenance cost implications. For projects over £2m, a formal life cycle costing (LCC) analysis must be carried out to identify and justify the best design options considering building form and fabric; servicing provision, operation and maintenance of the building and associated infrastructure. The period of analysis must be appropriate to the building/ facility, but no less than 25 years. For new build and major refurbishment projects, this must be in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008, and carried out at elemental level (Stage 2) and component level (Stage 4). Further details of calculation requirements are included in Part 2 of the SDS. Project teams must be able to demonstrate, with evidence, how the LCC analysis has been used to influence building and systems design/specification to minimise life cycle costs and maximise critical value.	**Cost Consultant**	**2 & 4**	**Man 02**	**N/A**
Smaller projects	Smaller projects (below £2m) are not required to carry out full LCC analysis. However, the UCL Cost & Carbon Tool must still be used to determine potential savings and to demonstrate that the specification of more efficient solutions has been considered.	**PM/ UPO**	**2**	**N/A**	**N/A**
Recognising non-financial value	In addition to the consideration of financial costs and payback, project teams must be able to demonstrate how non-financial benefits have been considered, with particular attention to UCL's environmental targets as set out in the Sustainability Policy, and the potential impacts on health and productivity of staff, students and other building users. UCL recognises that this may need to be qualitative assessment where there is a lack of reliable data.	**PM/ UPO**	**1+**	**N/A**	**N/A**

Issue	Standard to be achieved/ UCL minimum requirement	Lead	RIBA	BREEAM	Ska
Carbon appraisal					
Carbon Appraisal	The carbon impact of all projects must be taken into account as part of the early decision-making process for different design options. Project managers are required to use the UCL Cost & Carbon Tool to determine the most appropriate calculation which will depend on project size and scope. Guidance within the tool itself will support this decision-making process. Results are to be provided at Stages 1 and 3 and included in the relevant stage gate review documentation where options are being discussed, to aid informed decision making and to ensure best value. Results must be provided to the PSO via monthly reports. All new build projects and major refurbishment projects will be required to input data into the CarbonBuzz portal, in accordance with their energy modelling outputs. CarbonBuzz will be used by the UCL Sustainability Team to benchmark carbon performance against other similar institutions.	**PM/ UPO**	**1 & 3**	**N/A**	**N/A**
Life cycle design					
Robust and durable building fabric	In order to maximise the life expectancy of building fabric, project teams must be able to demonstrate how suitable design features/solutions, or durability and protection measures are incorporated. This must be documented in design team meeting minutes and drawings and include the following elements, as applicable: 1. Foundation/substructure/lowest floor/retaining walls 2. External walls 3. Roof/balconies 4. Glazing: windows, skylight 5. External doors 6. Railings/balusters (where exposed to external environment) 7. Cladding (where exposed to external environment) 8. Staircase/ramps (where exposed to external environment) 9. Hard landscaping	**Architect**	**2+**	**Mat 05**	**N/A**

Issue	Standard to be achieved/ UCL minimum requirement	Lead	RIBA	BREEAM	Ska
Environmental adaptability	Both new build and major refurbishment projects must be planned to ensure that buildings can continue to operate efficiently and comfortably in a changing climate, with particular emphasis on projected temperature and rainfall patterns. Relevant areas are likely to include building fabric & insulation; design for natural ventilation; risk of overheating; HVAC provision/ upgrades; impact on energy consumption; water management; soft landscaping and biodiversity. An appropriate balance between comfort and low carbon design solutions must be determined on a project-by-project basis, taking into account building type, function and design life. As such, an early, documented risk assessment must be used to identify and evaluate potential impacts on the building over its projected life cycle and, where feasible, appropriate mitigation measures. The following aspects must be included, as relevant: a) Structural stability b) Structural robustness c) Weather proofing and detailing d) Material durability e) Health and safety of building occupants and others f) Impacts on building contents and business continuity.	**Architect**	**2+**	**Wst 05**	**N/A**
Functional adaptability	Design teams must provide recommendations to facilitate future adaptation allowing for changes in functional requirements, working practices or user profiles - either by UCL or other potential occupiers. This should aim to minimise future material changes (particularly wastage) and/ or reconfiguration costs. As such, high level approaches must be developed and documented at the concept stage (Stage 2 reports) demonstrating how function may be changed to an alternative agreed use. (e.g. office to student hall, or office to lab etc.) The following aspects must be included, as relevant: a) Internal layouts/ partitions, including modular solutions b) Furniture, fittings and internal decoration c) Facilitating the replacement or upgrade of major plant d) Accessibility of local services including power, data infrastructure, specialist services, distribution routes etc. e) Potential for future extension - either horizontally or vertically	**Architect**	**2+**	**Wst 06**	**N/A**

Issue	Standard to be achieved/ UCL minimum requirement	Lead	RIBA	BREEAM	Ska
Maintainability	As far as practically possible, and without prejudicing broader UCL/ statutory requirements, buildings should be designed to be simple and easy to maintain throughout their lifecycle in close consultation with UCL Estates EM&I team, and through the development of a maintenance strategy appropriate to the scope of works. This strategy should include the following considerations as a minimum: 1. Preventive maintenance requirements 2. Procurement - availability and cost of parts and materials 3. Coordination with existing UCL procedures and systems 4. Technical requirements and capabilities 5. Ability to measure ongoing performance 6. End of life considerations (i.e. following 'cradle-to-cradle' principles) This process should seek to minimise lifecycle costs in terms of both financial expenditure and carbon emissions through intelligent design and efficient operation.	**PM/ UPO**	**2+**	**Man 01**	**N/A**
Consultation, handover and aftercare					
Consultation process	Early consultation must be carried out with relevant university; project delivery; and third party stakeholders. This must account for the potential to influence positive behaviour change to help ensure the ongoing sustainable operation of our buildings. Consultation content will vary according to project scope but will typically include the following: 1. Functionality, build quality and impact (including aesthetics) 2. Management and operational implications 3. Community impacts 4. Opportunities for shared use of facilities 5. Compliance with statutory (national/local) consultation requirements 6. Inclusive and accessible design 7. Impacts or opportunities relating to adjoining/ adjacent buildings/ facilities or district level services (e.g. district heating network) 8. Sizing, optimisation and integration of equipment and systems 9. Opportunities for building/grounds to facilitate learning 10. How the design can best provide a range of social spaces appropriate to the needs of students and other users	**PM/ UPO**	**1**	**Man 01**	**N/A**

Issue	Standard to be achieved/ UCL minimum requirement	Lead	RIBA	BREEAM	Ska
	The project team must be able to demonstrate how the outcomes of the consultation process have influenced or changed the Initial Project Brief, including if appropriate, the project execution plan, communication strategy, and the concept design. In addition to the above, independent 3rd party consultation is a requirement for BREEAM. (i.e. needs to be undertaken by a consultant outside the client/ project team).				
Soft Landings	Adopt the principles of Soft Landings, or an equivalent process, to allow for the continual assessment of the emerging design and completed building, with a particular emphasis on actual performance and user expectations. The following key elements must be included and documented: a) Inception & briefing: Establish project design targets against UCL and statutory requirements, with reference to performance outcomes on previous/ similar projects. b) Design & construction stages: Review performance expectations; plan for commissioning, handover and aftercare; and ensure that relevant UCL stakeholders are involved in decisions which affect operation and maintenance. c) Handover: Prepare to deliver the building on a better state of operational readiness; provide on-site support to liaise with building users and coordinate troubleshooting and fine-tuning. d) Post-occupancy: Monitor performance for 3 years (minimum), carry out POE surveys (see below); coordinate ongoing/ seasonal commissioning as necessary. Feedback lessons learned to other relevant projects.	**PM/ UPO**	**1 - 6**	**Man 01 Man 04 Man 05**	**D56**
Commissioning	UCL requires comprehensive, objective commissioning and seasonal commissioning of building services, accounting for specialist building uses where changes to/ installation of any of the following form part of the scope of works: a) Building services (including both complex and non-complex systems) b) Building services control systems (including Building Management Systems) c) Changes to the building fabric that will affect thermal performance Responsibility for monitoring and programming pre-commissioning, commissioning, testing and, where necessary, re-commissioning activities must be clearly defined during the project design stages.	**MEP**	**2 - 6**	**Man 04**	**D56**

Issue	Standard to be achieved/ UCL minimum requirement	Lead	RIBA	BREEAM	Ska
	A schedule of commissioning and testing must be provided to identify appropriate commissioning standards required for the scope of works (e.g. Building Regs; CIBSE; BSRIA). This must include a suitable timescale for commissioning and re-commissioning of all relevant works carried out. **Full details of UCL Commissioning requirements are set out in UCL MEP Design Guidance.**				
Building User Guide	For projects >£2m, a Building User Guide must be developed prior to handover and made available to UCL Estates for distribution to the building users and in a format suitable for publication on relevant UCL web pages. Smaller projects should also develop a guide where suggested by the nature of operational requirements. The guide must be written for the non-technical building user (an O&M manual/ Log Book will not suffice) with the purpose of assisting with access and efficient operation of the building in keeping with the original design content. Whilst the content of the guide will be specific to building type and user, minimum requirements must be covered as set out in the relevant version of BREEAM/ Ska.	**Contractor**	**5 - 6**	**Man 04**	**D45**
Training	For new build projects, and where works result in changes to building mechanical or electrical systems, appropriate training must be provided for the UCL Engineering, Maintenance and Infrastructure Team, and relevant external FM providers to ensure optimum operational efficiency. A training schedule must be provided and timed appropriately around handover and proposed occupation plans. **Full details of UCL handover training requirements are set out in UCL MEP Design Guidance.**	**Contractor**	**5**	**Man 04**	**D56**
Post-Occupancy Evaluation (POE)	Projects over £2m (or as agreed with the UCL Sustainability Team) are required to carry out post-occupancy evaluation to ensure buildings are operating as intended. POE should normally be carried out one year following building occupation/ re-occupation and must include the following: a) In-use performance feedback from building users to inform operational processes b) Recommendations for maintaining or improving productivity, health, safety and comfort c) Subsequent re-commissioning activities **The individual/ organisation carrying out the POE must be able to demonstrate independence from the design process.**	**UCL**	**6**	**Man 05**	**D56**

Minimising energy use & carbon emissions

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
Energy modelling and performance					
Whole-building energy modelling	Projects involving major changes to building fabric or services must carry out comprehensive 'whole building' energy modelling, going beyond the basic requirements required for Part L Building Regulations to account for both regulated and unregulated loads, including specialist functions/ equipment. Calculations must therefore account for all significant energy uses in buildings. This must be carried out according to guidance set out in CIBSE TM54 or equivalent and must include bespoke model settings (e.g. heat gains, temperatures, occupancy patterns etc.) and not just be Part L modelling plus NCM unregulated loads. For the climate change modelling sections, alternative weather scenarios are required to add a level of robustness (i.e. what probability of occurrence could be considered and what timeframe). As an alternative, CIBSE also offer 3 present day "Design Summer Years" for London. These consider differing lengths of warm spells, and may be considered as an alternative to climate change weather files. Additional guidance is provided in Section 2 of this Sustainable Building Standard	**Energy Consultant**	**3**	**N/A**	**N/A**
Building energy performance	New build and part new build projects must aim to achieve 40% improvement on the target emissions rating, as calculated under Building Regulations Part L2A (2013). Major refurbishment projects are required to develop a strategy in accordance with the energy hierarchy, and to achieve the minimum level for an 'Excellent' BREEAM rating (i.e. 6 credits; Energy Performance Ratio of ≥ 0.36)	**Energy Consultant**	**2**	**Ene 01**	**D66**
Embodied Carbon	UCL requires that embodied carbon be taken into account as part of minimising the environmental impacts and wider resource efficiency considerations relating to different design decisions and materials choices. We do not require exhaustive calculations of every single building component, but encourage the provision of appropriate data to assist high level decision making, and support the environmental case for selecting key	**Architect**	**3+**	**Mat 01 Mat 02 Mat 04**	**See Ska Manual (Materials**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	building elements (e.g. the relative embodied carbon impacts of different steel or concrete specifications). Where design options represent a clear change in embodied carbon (e.g. including high levels of thermal mass or using novel construction materials) the balance between operational carbon improvements and embodied carbon penalty should be taken into account. Please refer to additional guidance in the 'RICS Methodology to calculate embodied carbon of materials'; Table 3 includes a list of 'carbon critical elements' which should be considered.				
Contractor energy use and carbon emissions	Principal contractors will be required to measure, monitor and report energy consumption associated with all on-site construction processes throughout the build programme. This information must be made available to the UCL Environmental Sustainability Team and BREEAM/ Ska assessors on request. In addition, data on transport movements and impacts resulting from delivery of the majority of construction materials to site and construction waste from site must be recorded. As a minimum this must cover: a) Transport associated with materials used for major building elements, groundworks and landscaping - from the factory gate to the building site, including any transport, intermediate storage and distribution. b) Transport of construction waste from the construction gate to waste disposal processing/recovery centre gate. Scope of this monitoring must cover the construction waste groups outlined in the project's waste management plan.	**Contractor**	**6**	**Man 03**	**P01**
Passive design					
Passive design analysis	Where relevant to the project scope (e.g. projects involving new build elements or changes/ upgrade to the building envelope), project teams must carry out an analysis of the proposed building design/ development to identify opportunities for the implementation of passive design solutions that reduce demands for energy consuming building services (i.e. lighting, heating, cooling, mechanical ventilation, lighting loads and other energy consumption). Results/ recommendations from this process must be documented. This must include clearly assigned responsibilities for taking forward the chosen solutions to detailed	**Energy Consultant**	**2**	**Ene 04**	**D66**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	design and implementation stages. Overheating and daylight studies should also be carried out in tandem to ensure an optimum balance between: size of glazing; natural daylight; natural ventilation; and active cooling needs.				
Building orientation and massing	In order to optimise the passive performance of new buildings, UCL requires that orientation and massing are considered from project inception stage. This should include consideration of daylight availability/ provision; sun path analysis; opportunities for natural ventilation; wind analysis; acoustics and impact on microclimate. Consideration of the position/ orientation of buildings in relation to the wider site, as well as potential interaction of MEP systems with existing and future buildings should also be considered at this stage.	**Architect**	**1**	**Ene 04**	**N/A**
Building & Thermal Mass	Design teams must explore the potential to exploit the thermal mass of building structures to help moderate internal environmental conditions and minimise/ level out heating and cooling requirements, reducing reliance on mechanical systems (including plant and system size) and optimising energy performance. This analysis must be linked to thermal comfort/ overheating studies being carried out for the project.	**Architect**	**2**	**Ene 04**	**N/A**
Insulation/ U-values	UCL does not provide specific requirements for insulation/ U-value requirements due to the range of building types and functions across our estate. However, design teams must be able to demonstrate how heat loss through the building envelope has been reduced *below* the requirements for regulatory compliance for all relevant aspects of the building envelope. Whilst opportunities will be greater on new build projects, improved building fabric performance must be considered on all projects which impact on the building envelope (i.e. walls, windows, roofs etc.).	**Architect**	**2**	**Ene 04**	**N/A**
Air leakage/ integrity of building fabric (design)	The amount of air leakage shall be minimised through design detailing to minimise air leakage paths and thermal bridging, with a view to reducing the building heating/ cooling loads.	**Architect**	**3+**	**Ene 04** **Man 04**	**N/A**
Air leakage/ integrity of	The construction process must be planned to optimise building air tightness through: a) Strict adherence to design detail with particular attention to sealing of joints, avoidance of penetrations, use of infiltration barriers, continuity of insulation etc.	**Contractor**	**5**	**Ene 04** **Man 04**	**N/A**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
building fabric (construction)	b) Identification of additional opportunities to improve air leakage paths and thermal bridging. In addition to basic airtightness testing required for statutory compliance, principal contractors on new build and major refurbishment projects involving extensive changes to building envelope will be required to carry out a full thermographic survey. Any defects identified must be rectified prior to handover and close out. This must be carried out as per best practice in CIBSE TM23 - Testing Buildings for Air Leakage.				
Natural Day Lighting	See also: Health & Productivity: Visual Comfort In addition to the health & productivity benefits, optimising natural daylight will also help to reduce reliance on artificial lighting and lower energy consumption/ carbon emissions. Ensure that analysis is linked to thermal comfort and energy studies.	**Architect**	**2**	**Hea 01**	**D04 P10**
Efficient systems					
Plant Energy Usage	Regulated loads need to accurately respond to intended operation of the building, for example: hours of operation; occupancy, cooling/ heating set points; etc. Modular plant and equipment such as boilers, pumps etc. shall be sized to operate at maximum efficiency and installed to enable plant to be turned down to match building loads in and out of season. Plant equipment and engineering systems must be specified and designed to operate efficiently under part loads - i.e. modulating systems that retain efficient operation at maximum turndown. Where appropriate, zoning of the environmental building systems is to be maximised such that small areas of the building can operate efficiently independently.	**MEP**	**3**	**Ene 01**	**D03 D05 E11 E22**
On-site CHP/DH	The UCL Bloomsbury Campus operates an on-site district CHP system serving several of its buildings. Projects involving provision or upgrades to heating plant must prioritise connection to this system over additional/ new plant installation, wherever feasible. Buildings forming part of the UCLE development on the Queen Elizabeth Olympic Park will be required to connect to the district heating network served by the Stratford Energy	**Energy Consultant**	**2**	**Ene 04**	**N/A**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	Centre. On other sites, the potential for district heating should be considered as part of an energy/ low carbon feasibility study taking into account carbon reduction, cost/benefit and lifecycle improvements. Where relevant, the feasibility test should align with local authority requirements.				
Low or zero carbon technologies (i.e. including renewables)	Design teams must actively investigate the feasibility of incorporating low or zero carbon (LZC) energy technologies as part of the building/ site energy strategy. For new build and major refurbishment projects this should include a technical analysis of potential solutions focussing on life cycle benefits, and including the following elements: 1. Energy generated from LZC energy source per year 2. Carbon dioxide savings from LZC energy source per year 3. Life cycle cost assessment of the potential specification, accounting for NPV 4. Life cycle assessment to also account for embodied carbon emissions. 5. Potential for immediate or future energy storage NOTE: Additional elements will be required where a BREEAM assessment is being carried out. Where opportunities for LZC technologies exist, but fall outside the scope of the project, these should be notified to the UCL Sustainability Team for consideration.	**Energy Consultant**	**2**	**Ene 04**	**N/A**
Ventilation Efficiency	<u>Natural ventilation must be prioritised wherever feasible and appropriate to the building type/ space function.</u> This must be considered as part of a combined strategy also addressing air-quality, noise and overheating needs. The type of ventilation used will ultimately be based on the results of thermal modelling and any specialist/ lab uses, and aim to achieve the best balance between comfort and low energy consumption. CIBSE TM52 will be applied for new build and major refurbishments projects to ensure appropriate ventilation of the space/ minimise risk of overheating. It is recognised that mechanical ventilation with heat recovery may be preferable during winter seasons to optimise efficiency. Where this is the case, supply and extract air	**MEP**	**2**	**Hea 02** **Ene 01**	**D03**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	ventilation systems shall incorporate high efficiency air to air heat recovery methods through both passive and mechanical means (≥85% efficiency).				
Artificial Lighting	The need for artificial lighting should be reduced as far as possible through design, and use of lighting controls, for both internal and external areas. Natural daylighting must be optimised for internal areas, including separate consideration of core and perimeter areas, complemented by daylight dimming technology (i.e. to automatically dim lights according to ambient light level). Due consideration must be given to the potential for glare. Internal lighting designs must seek to minimise energy usage and use dedicated energy-efficient fittings selected using criteria on the ECA Energy Technology List. LED options are the UCL default standard with T5 as the minimum unless operational requirements dictate otherwise. Automatic lighting controls, suitable for building function, must be used in all areas (timed, daylight and/ or presence) with manual override switches for staff/ students where appropriate to the space - manual-on: auto-off (i.e. absence detection). (see also Heath & Productivity: Zoning & User Control). Where appropriate, task lighting should be specified to minimise background lighting requirements. External space lighting shall only use energy efficient fittings selected from the ECA Energy Technology List, and with average initial luminous efficacy not less than 70 luminaire lumens per circuit Watt. Subject to security considerations, light fittings must be automatically controlled for prevention of operation during daylight hours and with presence detection in areas of intermittent pedestrian traffic.	**MEP**	**4**	**Ene 01**	**P10**
External funding	The design and choice of equipment shall be selected to maximise the possibility of external funding/discounts. Grant funding may be available during the course of development, design and construction from such sources as Enhanced Capital Allowances, Carbon Trust, DETR, HEFCE etc. Where relevant, the project team shall provide information and submissions to support the application process.	**PM/ UPO**	**1**	**N/A**	**N/A**
Monitoring & Management					
Building Management System	Where appropriate to the scope of works being undertaken, a fully tested and commissioned Building Management System (BMS) shall be provided to ensure that building systems can be closely controlled and monitored.	**MEP**	**4**	**Ene 02**	**N/A**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	Systems will be commissioned in both the heating and cooling seasons and on an annual basis to further improve performance. Zones shall be generally based on a floor-by-floor basis (or by department as appropriate) Further details of BMS requirements are set out in UCL MEP Design Guidance				
Energy Metering	Energy metering provision must be planned in accordance with the UCL Metering Strategy to support detailed and transparent measurement and monitoring of energy use, and highlight ongoing opportunities to reduce consumption in conjunction with effective management procedures. All meters shall have a volt free pulse or other open protocol communications output compatible with the UCL BMS system digital inputs. Outputs must be linked to the BMS energy dashboard, and the 'Carbon Culture' platform used by UCL to track live energy performance. Metering provision must be specified with reference to CIBSE TM39: Building energy metering, and capable of monitoring energy use by building system AND functional area/ department, as relevant: Building Systems: space heating, domestic hot water, humidification, cooling, ventilation, pumps, lighting, small power, renewable or low carbon systems, controls. Other major energy consuming systems/ plant must also be covered (e.g. kitchen plant, cold storage, laboratory plant, sterile services, lifts, dedicated computer rooms, ovens/ furnaces etc) Functional area/ department: the following area types are provided as a guide but this list is not exhaustive: kitchens, computer suites, workshops, lecture halls, conference rooms, drama studios, sports halls, process areas, labs (high containment suites should be separate), BSU areas, data centres. Where there is zone control each zone will have a meter including heat meters. Please see the UCL Metering Strategy for further information.	**MEP**	**4**	**Ene 02**	**E08** **E09**

Ensuring healthy & productive environments

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
Internal Environment					
Visual comfort	New build and major refurbishment projects (where windows are replaced/ upgraded) must consider the optimisation of natural daylight as part of the design process including, as appropriate, a daylight design study and/ or modelling to help maximise useful daylight levels. Window and glazing design is to deliver optimum daylighting to the occupied areas, whilst reducing solar gain through the use of appropriate solar shading (with due consideration for planning/ heritage issues). Glare control and reflections from other buildings must also be taken into account. The feasibility of incorporating light tubes/ chimneys and/ or light wells should be considered to introduce additional daylight to building interiors, with due regard to the constraints imposed by existing structures and/ or heritage listing. New build projects should aim to achieve the following: a) Minimum daylight factors of 2% (target 3%) over 80% of occupied space OR b) Minimum average daylight illuminance, averaged over the entire space, of at least 300 lux for 2000 (target 2650) hours per year or more with at least 90 lux for 2000 (target 2650) hours at the worst lit point. Whilst opportunities to improve natural daylight levels may be more limited for refurbishment and smaller/ fit-out projects, design teams must be able to demonstrate how this has been approached and optimised. Simple measures may include changes to room layout or window upgrades.	**Architect**	**2**	**Hea 01**	**D04 D30 D31**
Air quality	Projects of all sizes and scopes are required to implement appropriate design measures to optimise indoor air quality by minimising pollutant levels, and through the provision of clean outdoor air where possible.	**Architect**	**2**	**Hea 02**	**D40 D63 D64 P12**

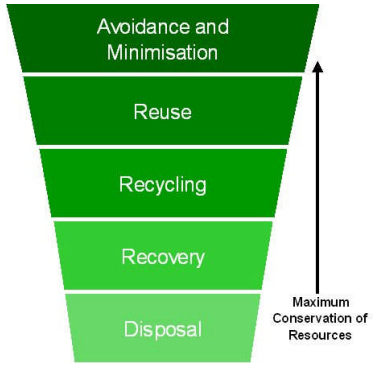
Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	a) New build and major refurbishment projects (generally >£2m) should provide an indoor air quality plan to influence design, specification and installation decisions that minimise indoor air pollution through the building lifecycle. Typically, fresh air rates of 12l/s/person and CO2 of 800ppm must be targeted for office type spaces. b) With due regard for the functional and technical constraints of the building/ project, design teams must prioritise the provision of fresh air using a natural ventilation strategy as far as reasonably practicable. Mechanical ventilation with heat recovery may be preferable during the winter season as it is more energy efficient. c) For buildings with clear mechanical ventilation requirements, zoning should be considered to allow for natural ventilation in areas with lower requirements for environmental control (e.g. offices; recreation areas etc). d) Extracts from fume/safety cabinets or boiler flues must be designed to respond to the recommendations in the air quality plan with a view to minimising air quality impacts. e) The balance between comfort, air quality and low carbon design must be taken into account. f) Low or zero formaldehyde and low VOC products shall be specified with reference to relevant standards (e.g. as set out by BREEAM/ Ska); PVC products shall be avoided where suitable alternatives exist.				
Thermal comfort	New build projects, or any project involving significant changes to thermal elements or HVAC, must carry out thermal modelling appropriate to the complexity of the buildings. Operative temperature ranges for both mechanically and naturally ventilated buildings, must be in accordance with the criteria set out in CIBSE Guide A: Environmental Design For buildings which provide some degree of occupant control, risk of overheating must be limited in accordance with the adaptive comfort methodology outlined in CIBSE TM52: The limits of thermal comfort: avoiding overheating in European buildings. All thermal modelling must take into account projected climate change scenarios (using London 2050s 50th percentile weather file), with any risk of future non-compliance mitigated through design changes, or potential for future adaptation using passive design solutions.	**MEP**	**2**	**Hea 04**	**D28**
Zoning and user control	The design should allow for non-transient building users to have some control over their internal environment, subject to functional and planning requirements. This may be via	**MEP**	**2**	**Hea 04**	**D02**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	opening windows in summer, or user controls for heating, mechanical ventilation and/ or lighting. Due regard must be given to the consequences of any user controls, particularly in relation to energy conservation and out of hours operation. As a general guide non-transient users should be able to control their internal environment as set out below. a) Thermal zoning: Temperature control strategy should be informed by the thermal model with zoning planned to maximise efficiency of heating and cooling, including consideration of systems interaction. Degree of occupant control will need to account for building/ area function; occupancy type and patterns; and user expectations. As a guide, this should typically be: Temperature: +/- 2°C either side of the BMS set point b) Lighting zoning: Internal lighting should be zoned to allow an appropriate level of occupant control for the type of area/ function, and generally in accordance with the requirements of the relevant version of BREEAM/ Ska. Specify 'manual on - automatic off' (i.e. absence detection) as standard.				
External environment					
External lighting levels	All external lighting associated with the development must be designed to provide illuminance levels that enable users to perform outdoor visual tasks efficiently and accurately, especially during hours of darkness, as well as optimising personal safety. The following standards should be complied with, as relevant: • BS 5489-1:2013 Lighting of roads and public amenity areas • BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places. Due regard must be given to impacts on light pollution, including any specific planning requirements in this area.	**MEP**	**3**	**Hea 01**	**N/A**
Security	Buildings and associated external spaces (e.g. car parks, amenity spaces) must be planned, designed and specified to minimise security risks associated with property and personal safety. UCL Security must be engaged on all projects that involve provision, replacement or upgrade of buildings and relevant services/ infrastructure. A UCL Design Security Form is available to aid with the assessment of security risks and facilitate the process for recommending appropriate design solutions.	**Architect**	**2**	**Hea 06**	**N/A**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	Projects which require a BREEAM assessment may also need to engage an external Security Specialist to develop recommendations in accordance with the principles of 'Secured by Design'				
Sustainable Travel Arrangements					
Reduce/ eliminate the need for travel	The design of internal spaces and facilities should include measures to reduce or eliminate the need for staff/ student travel through the provision of adequate networking, audio and video conferencing provision, allowing for both current and likely future requirements.	**PM/ UPO**	**1+**	**Tra 03**	**N/A**
Travel Plan	All new build, refurbishment and major fit out projects must account for the targets and requirements set out in the UCL Green Travel Plan. However, separate Travel Plans or additional content may be required on a project-by-project basis depending on location (i.e. the UCL Green Travel Plan focuses on the Bloomsbury campus) or where additional guidance is required (e.g. due to local planning requirements or where BREEAM/ Ska assessments are being carried out). The following content must be covered as a minimum: a) Existing travel patterns and opinions of existing building or site users towards cycling and walking so that constraints and opportunities can be identified. 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) Disabled access (accounting for varying levels of disability and visual impairment). e) Public transport links serving the site. f) Current facilities for cyclists.	**PM/ UPO**	**2**	**Tra 05**	**N/A**
Optimise environment for pedestrians	The design of external areas and building/ site entrances and exits should promote low risk, safe and secure access. Potential microclimate impacts must also be accounted for; this may include the use of planting to provide shade and cool in the summer or minimising wind tunnel effects. Lighting to be in accordance with 'External Lighting Levels', above. In addition, design teams should be able to demonstrate how the external environment has been planned and designed to encourage walking to and from the site. This should include aesthetic considerations, use of materials for hard and soft landscaping,	**Architect**	**2+**	**Hea 06**	**N/A**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	segregation of footpaths from other forms of transport, safe pedestrian crossings, disabled access (accounting for different types of disability and visual impairment) etc.				
Enhance facilities for cyclists	Adequate cyclist facilities must be provided accounting for both current and anticipated future demand, and planned with a view to encouraging more building users to take up cycling. Precise provision will depend on building location and function; however, in general must include: a) Secure short stay and covered long stay cycle racks b) Clear signage for cycle parking facilities c) Showers with changing areas and lockers This requirement may be addressed at the individual building level, or based on shared, centralised facilities depending on the nature of the site and adjacent buildings/ projects. Buildings on the Bloomsbury Campus must take into account the UCL 'Core Campus Cycle Strategy' (June 2016).	**Architect**	**2+**	**Tra 03**	**D41 D42 D43**
Car parking	Car parking provision should be restricted to essential operational vehicles and adequate disabled parking spaces for urban sites, including UCL East. For out-of-town developments and/ or where public transport is limited, consideration should be given to the feasibility of a shuttle bus service or car sharing schemes to minimise individual, private car journeys.	**UCL**	**1**	**Tra 04**	**N/A**
Construction Site Management					
Considerate Constructors	All construction projects over 6 weeks in duration are required to register with the Considerate Constructors Scheme (CCS). The contractor will be required to take all reasonably practicable steps to achieve a minimum overall score of 40 and meet or exceed the “excellent” standard of 8 in each of the 5 sections. Scores below 35 total and 7 in each section will not be acceptable.	**Contractor**	**5**	**Man 03**	**D44**

Optimising resource use and the natural environment

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
Design for material resource efficiency					
Waste hierarchy	Design teams will plan project resource use with reference to the waste hierarchy: 1. Eliminate; 2. Reuse; 3. Recycle; 4. Recover; 5. Dispose  	**Architect**	**2+**	**Mat 06 Wst 02**	**D60**
Designing out waste	All projects shall demonstrate the steps taken to reduce the quantity of materials used in the design and construction of buildings and wider infrastructure projects. This information must be included within stage gate reports. The overall quantities of materials required and waste generated should be optimised through an iterative process which considers building design, procurement, construction, maintenance and end of life. This process should be documented as part of design team meetings at each separate RIBA Stage (1 - 5).	**Architect**	**1 - 5**	**Mat 06**	**D60**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	UCL recommends the use of the WRAP principles for designing out waste: 1. Design for reuse and recovery 2. Design for offsite construction 3. Design for materials optimisation 4. Design for waste efficient procurement 5. Design for deconstruction and flexibility (WRAP. *Designing out Waste: A Design Team Guide for Buildings*)				
Minimising construction waste					
Construction waste management	All projects should have a documented plan for the management of material resources on the site and tailored according to the project scope (i.e. Site Waste Management Plan/ Resource Management Plan or equivalent). This must be produced <u>during the design stages</u> and shall include reduce/reuse/recycling targets that meet/ exceed best practice benchmarks. The plan must include the following, as relevant: 1. Target benchmark for resource efficiency (tonnes/ 100m²) 2. Procedures and commitments for minimising non-hazardous waste in line with the target benchmark 3. Procedures for minimising hazardous waste, where present 4. A waste minimisation target and details of waste minimisation actions to be undertaken 5. Procedures for estimating, monitoring, measuring and reporting hazardous and non-hazardous site waste. 6. Procedures for sorting, reusing and recycling construction waste into defined waste groups, either on-site or through a licensed external contractor 7. The name/ job title of the individual responsible for implementing the above The plan must be updated at relevant stages of project planning and construction process to account for changes likely to affect waste	**Contractor**	**4/ 5**	**Wst 01**	**See Ska Manual (Waste Category)**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	quantities and management (e.g. changes to design, construction methods, suppliers, waste management contractors etc). Contractors are required to review opportunities for the reuse/ recycling of demolition, excavation and construction materials throughout the project works. Accurate and verifiable waste data must be made available to UCL/ the project sustainability consultant on request (e.g. using data from approved EA Waste Return Forms).				
Demolition/ Refurbishment Audit	For all projects involving demolition works, including internal strip out, the design team and contractor must be able demonstrate how materials have been actively and directly used in construction (on or off site) or provide evidence of closed loop recycling. For existing buildings, structures or hard surfaces, a documented pre-demolition audit should be completed to maximise the recovery of material for subsequent high grade/value applications. Basic requirements are as follows: a) Identification of the key refurbishment/demolition materials. b) Potential applications and any related issues for the reuse and recycling of the key refurbishment and demolition materials in accordance with the waste hierarchy.	**Contractor**	**4/ 5**	**Wst 01**	**See Ska Manual (Waste Category)**
Diverting Waste from Landfill	UCL requires that all construction projects can demonstrate how they have approached a target of **ZERO WASTE TO LANDFILL**. Where adequate justification can be provided for not reaching this target, the following diversion from landfill figures must be achieved as a minimum: • Non demolition: 85% (volume) OR 90% (tonnage) • Demolition 85% (volume) OR 95% (tonnage) • Excavation 95% (volume) OR 95% (tonnage) Waste materials will be sorted into separate key waste groups (according to the waste streams generated by the scope of the works) either on-site or through a licensed contractor for recovery	**Contractor**	**4/ 5**	**Wst 01**	**See Ska Manual (Waste Category)**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
Operational waste planning					
Recycling infrastructure	The UCL Sustainability Strategy aims to achieve an 85% operational recycling rate with 100% diverted from landfill. Project teams must be able to demonstrate how the provision of internal and external recycling facilities is able to support this target. This should include, as relevant: • Provision of space for waste storage and dedicated recycling areas • Locating waste facilities to maximise accessibility for relevant building users (staff, students, FM and waste management contractors). • Liaising with UCL Facilities Services to determine the appropriate approach. • No individual office bins shall be supplied • All outside bin storage facilities shall enable waste segregation as determined by the current UCL Waste Strategy, be secure and provide adequate access for waste collection vehicles • No paper towel systems shall be supplied to washroom and toilet areas. Options for paper towel alternatives should be explored for kitchen areas. For campus-located buildings, centralised recycling infrastructure may be provided as long as it provides adequate capacity (or adaptability) for current and potential future operational waste streams.	**Architect**	**3**	**Wst 03**	**D08**
Materials with low environmental impact					
Environmental Impact of Materials	All project teams must account for and minimise environmental impacts associated with materials selection. This should include: • The reuse of existing materials should be prioritised where practical • Use of materials with higher levels of recycled content (with reference to WRAP best practice recycled content benchmarks) • Use of materials certified to schemes recognising their lower environmental impact (e.g. FSC timber)	**Architect**	**3+**	**Mat 01** **Mat 02** **Mat 04**	**See Ska Manual (Materials Category)**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
	Materials used for all main building elements must achieve a minimum A rating from the BRE Green Guide to Specification. This includes: roofs, external walls, internal walls and partitions, floors, windows, external surfacing, boundary protection and insulation. All contractors/ suppliers shall aim to minimise emissions associated with the transport of construction materials. Contractors shall keep a comprehensive record of where all materials are sourced and provide this data to UCL as required so at to enable the calculation of scope 3 emissions associated with construction (water, waste, procurement, and transport). HEFCE guidance on data capture is available on-line.				
Responsible sourcing of building materials	Construction materials must be responsibly sourced, with due regard for practices that are environmentally responsible, ethical and fair. Consideration should be given to local sourcing as part of selection criteria. Wherever available, suppliers with at least one of the following recognised, certified environmental management systems must be used*: • FSC/ PEFC (all timber used on UCL projects must be certified to one of these standards) • BES 6001 • ISO 14001 (this should ideally cover both manufacturing/ production and supply chain processes such as raw material extraction/ cement production etc) • Green Dragon (Level 4 and above) This above list is not exhaustive. Please consult with UCL Sustainability team to confirm acceptability of alternative standards/ schemes. *This requirement may be relaxed in exceptional cases where it can be demonstrated that supply chain options are severely restricted and/ or no suitable products with such certification exist.	**Contractor**	**3+**	**Mat 03**	**See Ska Manual (Materials Category)**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
Reducing water consumption					
Improving Water Efficiency	All projects involving the provision, upgrade or replacement of domestic water consuming components must carry out an analysis of the potential for water efficiency improvements. Potential water savings will be dependent on the scope of works and type of facilities involved. However, typical measures will include low/ dual flush WCs; push-button/ water-efficient urinals; push-button, low flow taps and showers; automatic flow regulators. Products from the ECA Water Technology List shall be used wherever appropriate. For new build projects with standard facilities a minimum 40% improvement over baseline water consumption must be achieved, as calculated using the BREEAM Wat 01 Calculator. For labs and other specialist applications, project teams must demonstrate how the design of water-consuming systems has incorporated waterless and low water-consuming technologies and equipment and/ or how operational management procedures can reduce water consumption.	**MEP**	**3**	**Wat 01** **Wat 03** **Wat 04**	**E12** **E14** **E16** **E19** **E20** **E21** **E23** **P08**
Rainwater harvesting/ Greywater recycling	Where appropriate to the project scope, the feasibility of incorporating a rainwater harvesting or greywater recycling system must be explored to further reduce potable water consumption.	**MEP**	**2**	**Wat 01**	**N/A**
Water Monitoring	In addition to mains supply water meters, sub-meters must be installed to monitor individual water consuming plant or building areas responsible for a significant proportion of overall consumption (typically >10%). Where available, all meters must be connected to the building management system to facilitate ongoing monitoring and to inform the campus water management strategy.	**MEP**	**3**	**Wat 02**	**E17** **E18**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
Pollution and surface water management					
Noise, vibration and dust	Specific contractor requirements relating to noise, vibration and dust issues are set out in UCL 'Information for Contractors and Designers' at: http://www.ucl.ac.uk/estates/contractors-and-designers/index.php	**Contractor**	**3**	**Man 03**	**D25**
Light pollution	The external lighting strategy must be designed to minimise, or ideally eliminate, external light pollution as follows: a) Minimise the need for external lighting through good design of site layout, and without compromising requirements for safety and security of the site and its users. b) Ensure lighting strategy complies with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 2011. c) Install automatic controls to switch off/ reduce lighting at night/ outside operational hours (not including safety and security lighting)	**MEP**	**3**	**Pol 04**	**N/A**
Refrigerants	UCL MEP Design Guidance requires that all specified refrigeration systems should have minimal or zero global warming potential (GWP). Where this is not possible due to technical/ functional considerations, leak detection connected to the BMS system should be provided with consideration given to automatic pump down where feasible. Consideration of the consequences of equipment failure is essential.	**MEP**	**3**	**Pol 01**	**D23**
Minimising flood risk/ surface water management	All developments must seek to minimise, and preferably reduce, any impacts associated with surface water runoff to minimise local flood risk/ surface water pollution. Where relevant, this should include the use of sustainable drainage principles (SUDS) in the design of all surface water storage and discharges. Risk assessments must identify any sources of surface or ground water pollution, including potential future changes in use, and provide appropriate mitigation measures. The feasibility and benefits of incorporating green, brown or blue roofs as part of a broader drainage strategy must be considered and documented, where relevant.	**Structures/ Civils**	**2+**	**Pol 03**	**N/A**

Issue	Standard to be achieved/ UCL Requirement	Lead	RIBA	BREEAM	Ska
Ecology & Biodiversity					
Ecological value	All projects including work to external areas should be approached in accordance with the UCL Biodiversity Strategy & Action Plan with a view to improving the ecological value of the site, through a net increase in planting area, plant species and/ or provision of additional features to increase biodiversity of flora and fauna. This should include considering the feasibility of green/ brown roofs or green walls which will also provide additional advantages for micro-climate and building thermal performance. The potential for enhancing wildlife connectivity must also be included. A net negative ecological impact will only be allowable in exceptional cases and once all technically and economically viable solutions have been considered. This must be agreed with the UCL Sustainability Team.	**Ecologist**	**2**	**LE 02 LE 03 LE 04**	**N/A**
Impact on biodiversity	Contractors are required to nominate a Biodiversity Champion with the authority to influence site activities and ensure that detrimental impacts on site biodiversity are minimised. The contractor's site induction must promote awareness of ecological features relevant to the site, and measures required to protect them. Where available, this should take into account the findings of a formal ecology survey/ report. Records must be kept, and made available on request, detailing actions taken to protect biodiversity and monitor their effectiveness throughout key stages of the construction process. Where flora and/or fauna habitats exist on-site, the contractor must work with UCL, the ecologist and the wider project team to programme site works with a view to minimising disturbance to wildlife. This includes site preparation, ground works, and soft landscape works which should be scheduled at an appropriate time of year.	**Contractor**	**5**	**LE 05**	**N/A**

Further Information

The following list sets out the various standards and guidance referred to in this document:

BRE Green Guide to Specification	http://www.bre.co.uk/greenguide/
BRE Green Book Live	http://www.greenbooklive.com/
BREEAM 2014 (New Construction)	http://www.breeam.com/BREEAMUK2014SchemeDocument/
BREEAM 2014 (Refurbishment & Fit Out)	http://www.breeam.com/ndrefurb2014manual/
BSRIA Soft Landings	https://www.bsria.co.uk/services/design/soft-landings/
Carbon Buzz	http://www.carbonbuzz.org/
CIBSE Guide A: Environmental Design (subscription required)	http://www.cibse.org/knowledge/cibse-guide/cibse-guide-a-environmental-design-new-2015
CIBSE AM 11 Building Performance Modelling (2015) (subscription required)	http://www.cibse.org/knowledge/cibse-am/am11-building-performance-modelling-new-2015
CIBSE TM23 Air Leakage Tests (subscription required)	http://www.cibse.org/knowledge/cibse-tm/tm23-testing-buildings-for-air-leakage
CIBSE TM39 Building Energy Metering (subscription required)	http://www.cibse.org/knowledge/cibse-tm/tm39-building-energy-metering
CIBSE TM52 The Limits of Thermal Comfort (subscription required)	http://www.cibse.org/knowledge/cibse-tm/tm52-limits-of-thermal-comfort-avoiding-overheatin
CIBSE TM54 Evaluating Operational Energy Performance of Buildings at the Design Stage (subscription required)	http://www.cibse.org/knowledge/cibse-tm/tm54-evaluating-operational-energy-performance-of
ECA Energy Technology List	https://www.gov.uk/guidance/energy-technology-list
ECA Water Technology List	http://www.watertechnologylist.co.uk/search.asp
Mayor's Office for Policing & Crime (MOPAC) - Secured by Design	http://www.securedbydesign.com/
RICS Ska HE Good Practice Measures	https://ska-tool.rics.org/
RICS Standardised Method for Life Cycle Costing	http://www.rics.org/uk/shop/Standardized-Method-of-Life-Cycle-Costing-for-Construction-Procurement-17474.aspx
UCL Design Security Form	Please contact UCL Sustainability Team
UCL Metering Strategy	Please contact UCL Sustainability Team
WRAP Designing out Waste: A Design Team Guide for Buildings	http://www.wrap.org.uk/content/designing-out-waste-design-team-guide-buildings-0

Appendices

1. SBS Implementation Planner

Sustainable Building Standard (SBS) Sustainable Project Planner

Issue/ Requirement	Activity	Notes	RIBA Stage 0	1	2	3	4	5	6	7	Relevant Standards & Guidance THIS PLANNER MUST BE READ IN CONJUNCTION WITH THE FULL SBS AND ADDITIONAL GUIDANCE DOCUMENTS OUTLINED BELOW
Project Management (Strategy Manager/ University Project Officer/ Lead Project Manager)											
Project Brief/ Business Case	Identify and reflect project sustainability requirements with reference to the SBS	Establish project-specific sustainability targets and requirements during RIBA Stage 1 and include in project brief/ business case documents. Lead PM (UCL or external) will be accountable for compliance and reporting against these targets throughout the project.	PREPARE / ACTION								SBS (Full Document)
Masterplan opportunities/ implications	**Account for potential interactions with wider buildings/ estate**	Potential opportunities for synergies within and between both existing and future buildings must be considered. For example, Bloomsbury projects must explore feasibility and potential benefits of connecting to the existing district CHP system.									SBS (Full Document)
Stakeholder Consultation Exercise	Undertake consultation with relevant University and project delivery stakeholders	Effective consultation with relevant stakeholders should be planned to inform and influence the initial project brief and concept design, helping to ensure buy-in from building users and also reduce the risk of costly design changes or remedial works later on.									SBS (Part 3: Maximising value throughout the building lifecycle) BREEAM
Carbon Appraisal	Ensure Carbon Appraisal Tool is completed and updated.	All projects affecting scope 1 and 2 carbon emissions must undertake a carbon appraisal to help evaluate options with a view to improving life cycle efficiency. Results to be included in relevant stage gate review documentation at RIBA Stage 1, and updated at Stage 2/ 3, as									SBS (Part 3) Carbon Trust Guidance UCL Carbon Appraisal Methodology
Life Cycle Costing	Commission project-specific life cycle cost appraisal at feasibility stage	Lifecycle costing analysis is essential to demostrate the business case for sustainable design options and can lead to dramatic reductions in operational costs if carried out effectively at during the early stages of project planning.									SBS (Part 3) ISO 15686 - Service Life Planning RICS - Standardised Method for Life Cycle Costing
Sustainability Assessment (BREEAM/ SKA/ Mini-SKA)	Appoint relevant assessor, initiate and monitor assessment process according to project scope	Minor works: Mini-SKA Refurbishment/ fit-out: SKA (Gold) Major refurbishment: BREEAM 2014 Refurbishment/ Fit-Out (Excellent) New Build: BREEAM 2014 New Construction (Excellent)									SBS (Part 2: Managing sustainable projects) BREEAM SKA
Sustainability Specialists	Commission relevant specialists to support sustainability targets and reporting	As required: ecologist, transport planner, life cycle costing analyst, carbon consultant, specialist M&E inputs, acoustician, security specialist Note that BREEAM requires specific appointments/ reports to be commissioned as early as RIBA Stage 1.									*Inputs will depend on project scope/ assessment method. Seek early advice from sustainability consultant and/ or the UCL Sustainability Team.*
Sustainable Procurement	Include targets and reporting requirements in tender documents and selection criteria	Ensure that design team and contractor sustainability obligations (e.g. BREEAM, SKA, compliance with specific measures, reporting etc.) are embedded within relevant documents and not treated as optional extras.									SBS (Part 2) PSO Project Procedures Discipline-specific design specification documents (e.g. MEP Design
Post-occupancy/ Soft Landings	**Implement Soft Landings process to ensure buildings operate as efficiently as possible**	Follow the Soft Landings process to effectively plan and optimise operational efficiency and occupant comfort, addressing any performance gap between design and operation, thereby reducing running costs. Include design stage workshop and regular feedback.									SBS (Parts 2 & 3) Building Regs; BSRIA/ CIBSE Commissioning Guides Soft Landings Methodology
Design Management											
Carbon Appraisal	Ensure Carbon Appraisal Tool is completed and updated	All projects affecting scope 1 and 2 carbon emissions must undertake a carbon appraisal to help evaluate options with a view to improving life cycle efficiency. Results to be included in relevant stage gate review documentation at RIBA Stage 1, and updated at Stage 2/ 3, as									SBS (Parts 2 & 3) Carbon Trust Guidance UCL Carbon Appraisal Tool
Passive design measures	**Optimise passive performance/ minimse M&E services as far as possible**	Considerations (as relevant) include: building position/ orientation; thermal mass; insulation/ U-values; air leakage; shading; daylight modelling/ optimisation. Explore and document opportunities at a whole building and sub-building level, and for both new and existing buildings, wherever									SBS (Part 3) CIBSE TM52 - Limits of Thermal Comfort; CIBSE TM23 - Testing Buildings for Air Leakage
Energy efficient services and equipment	**Design and specify efficient mechanical and electrical services and equipment**	All mechanical and electrical services and equipment must be designed and specified in accordance with the relevant standard/ energy efficiency scheme (e.g. Energy Technology List). Balance correct sizing & future-proofing to optimise energy efficient operation, including under part-load									SBS (Part 3) ECA Energy Technology List CIBSE TM54 - Evaluating Operational Energy Performance at Design Stage
Comprehensive Energy Modelling	**Use enhanced energy modelling to fully account for both <u>regulated and unregulated</u> loads.**	Detailed modelling (beyond Building Regs requirements) is required to accurately predict building energy consumption, operating costs and user comfort. In addition to new build projects, this will also highlight key areas to make improvements in major refurbishments.									SBS (Part 3) CIBSE TM54 - Evaluating Operational Energy Performance at Design Stage
Low or zero carbon technologies (eg renewables)	Carry out an analysis of potential for appropriate LZC energy solutions	**<u>Reducing building energy demand is always the first priority.</u>** However, design teams must investigate feasibility for renewables/ LZC tech to meet residual demand whilst achieving best balance between carbon reduction and payback									SBS (Part 3) BREEAM
Energy Monitoring	Provide smart sub-metering linked to BMS for key building systems, areas and large plant/ equipment	Where appropriate to the scale of works, sub-metering compatible with UCL BMS system digital inputs must be provided to support monitoring, management and reduction of energy consumption. Agree scope with UCL Energy Manager/ consult UCL Metering Strategy									SBS (Part 3) UCL Metering Specification; BSRIA Building Energy Management Guidance; BREEAM
Water efficiency and management	Specify systems and equipment to reduce overall consumption, particularly potable water	Specify/ upgrade to water-efficient sanitaryware, related controls and water sub-metering (including connection to BMS where feasible). Explore feasibilty of rainwater harvesting and/or grey water recycling systems where scope allows.									SBS (Part 3) ECA Water Technology List BREEAM
Reduce waste through design and construction	Carry out waste audits/ design out waste/ produce resource management plan	1. Carry out pre-demolition/ refurbishment audits to minimise waste and optimise reuse/ recycling; 2. Account for life cycle waste minimisation in building design, including end of life; 3. Produce Waste Management Plan to manage residual site waste.									SBS (Part 3) WRAP Designing out Waste; WRAP SWMP Guidance; CIRIA Design for Deconstruction; BREEAM 2008/ 2011
Environmental impact of materials	Minimise the quantity and environmental impact of new materials	Project teams must minimise the quantity of materials used in their projects. Specification of new materials must prioritise recycled content, local sourcing and recognised environmental rating systems (e.g. Green Guide ≥A rated).									SBS (Part 3) WRAP Designing out Waste: Guide for Buildings
Responsible sourcing of materials	Design & specify materials which can be responsibly sourced with appropriate certification	The majority of materials must be responsibly sourced and hold appropriate certification (e.g. FSC/PEFC for timber, BES 6001). Low or zero formaldehyde and low VOC products must be specified; PVC products shall be avoided.									SBS (Part 3) BREEAM
Sustainable Transport and Connectivity	Implement design options to minimise the need for travel and/ or encourage sustainable options	Develop site-specific travel plan inputs. Provide network and audiovisual facilities which reduce the need to travel to events and meetings. Provide adequate facilities to encourage walking/ cycling as far as									SBS (Part 3) BREEAM
Adaptability - Building Function	Optimise design to enhance space use and functionality, also allowing for future adaptability.	Ensure that layouts, furnishings and decoration complement and enhance building functionality, including specialised uses and consideration of future adaptability. Plan to reduce future reconfiguration costs, and potentially extend building life.									SBS (Part 3) Consultation Guidance BSRIA Soft Landings
Adaptability - Future Climate Change	**Allow for climate change in energy performance and occupant comfort calculations**	Accounting for future climate scenarios ensures that comfort/ energy consumption are optimised in the long term and prevents expensive retrofit work.									SBS (Part 3) DEFRA National Adaptation Programme (2013) RIBA Design for Climate Change (2013)
Indoor air quality/ health & wellbeing of building users	Design HVAC systems and select materials to optimise air quality.	Optimise indoor air quality by minimising pollutant levels, and through the provision of clean outdoor air where possible. Carry out thermal modelling. Eliminate products with high levels of volatile organic compounds/ formaldehyde.									SBS (Part 3) CIBSE Guide A - Environmental Design CIBSE TM52 - Thermal Comfort EU REACH Guidance
BREEAM/ SKA/ Mini-SKA	Prepare appropriate evidence with reference to the relevant standard	Members of the design team responsible for compliance/ provision of evidence in relation to BREEAM/ SKA will be identified during a pre-assessment workshop. Fully compliant evidence must be provided to the assessor by the agreed date.									SBS (Part 2) BREEAM SKA
Construction Management											
Sustainability Targets/ Assessment	**Review SBS, Project Sustainability Brief and project-specific targets/ strategies (as applicable)**	Prinicipal contractors must familiarise themselves with the UCL SBS and be able to demonstrate how all relevant aspects have been addressed as part of their project plan; and how they will achieve targets/ certification. Compliant evidence to be provided in accordance with relevant standards.									SBS - Whole Document Project Sustainability Brief BREEAM SKA
	Register risks associated with sustainability targets/ assessment	It is the contractor's responsibility to report on any risk associated with sustainable design objectives including the SBS; targeted BREEAM/ SKA ratings; and other project-specific environmental KPIs.									BREEAM SKA
Site Waste Management	Demolition and Construction Waste Management	Contractors must produce a Site Waste Management Plan with the aim of minimising overall waste and achieving zero waste to landfill. This should be developed in accordance with the waste hierarchy: eliminate - reduce - reuse - recycle.									SBS (Part 3) Project Sustainability Brief BREEAM SKA
Sustainable Site Management	Register project with Considerate Constructor's Scheme (CCS)	The SBS requires registration with CCS and a minimum score commensurate with BREEAM/ SKA. UCL contractors are expected to achieve a score of 40, with 8 in each section; minimum acceptable score is 35, with 7 in each section.									SBS (Part 3) UCL EHS Rules for Contrators BREEAM SKA
	Plan/ ensure capture of environmental performance data	The prinicpal contractor must be able to demonstrate that procedures are in place for monitoring environmental performance during any construction/ demolition works, with particular emphasis on energy, water and waste. All relevant data must be reported to UCL or their appointed assessors.									SBS - Whole Document BREEAM SKA
	Implement biodiversity protection/ management	It is the contractor's responsibility to implement any recommended ecological protection measures and document procedures relating to biodiversity impacts.									SBS (Part 3) BREEAM SKA