University of Exeter

Sustainable Design and Construction Standard:
- £500k-£5M refurbishment and maintenance projects and works

CONTENTS

REVISION SUMMARY

Revision: 1 Date: 5.1.26

Revision	Purpose	Author	Approvers	Date
1	Renewed standard for use	Amy Harvey	James Hutchinson	5.1.26

NB: This standard replaces the Sustainability Design Guide introduced in 2019 and updated in 2021.

GLOSSARY

Acronym	Meaning
EC and CE	Embodied Carbon and Circular Economy
CMG	Capital Management Group
Gateway	Internal UoE sign off process (part of Project Delivery Process)
GIA	Gross Internal Area
GPM	Good Practice Measures (SKA)
LTM	Long Term Maintenance
LZC	Low and Zero Carbon
PDP	Project Delivery Process, internal UoE process
PMG	Project Monitoring Group
RIBA	Royal Institute of British Architects
SDCS	Sustainability Design and Construction Standard
UKNZCBS	UK Net Zero Carbon Building Standard
UoE	University of Exeter

HOW TO APPLY THIS STANDARD

Overview

The standards in this document are applicable to projects £500K-£5M (total project value, inclusive of fees and VAT).

This document should be read in conjunction with the Estates Project Delivery Process (under £5M), which signposts this Sustainable Design and Construction Standard (SDCS) throughout the RIBA stages. The SDCS sits alongside the Mechanical Services Design Guide and The Electrical Standard Specification. The requirements are aligned across these documents and key signposts made where relevant, however requirements across each of the documents need to be adhered to.

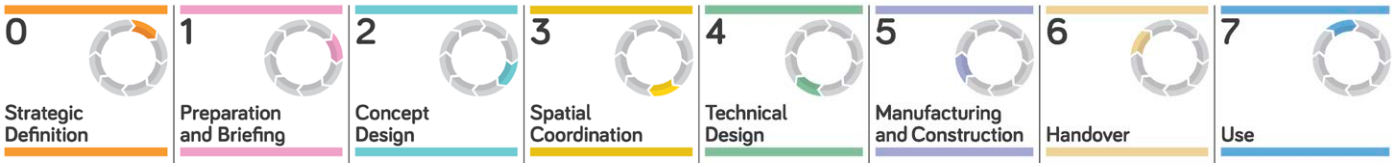
The SDCS is split into sustainability 'topics'. For each topic, one or more requirement is listed, together with key appointments and a series of actions by RIBA stage. These actions are compiled within the RIBA stage checklists.

To determine which of the requirements are applicable to any given project, it is **essential that the Sustainability team are consulted at RIBA 0**. Following this, a project-specific list of the applicable requirements will be created, with tailored RIBA stage checklists. Checklist actions must be completed within each RIBA stage to ensure the project is on track to meet the requirements. Completion of the RIBA stage checklists is required for the UoE Gateway sign-off process – see Project Delivery Process (PDP), business case completion and to support derogations.

Further details on the alignment with the PDP, business cases and the derogations process is provided below.

Implementation of the SDCS will be reviewed annually, including analysis of reasons for derogations.

RIBA Stages



Alignment with PDP, Business Cases and PMG Role:

Key Actions

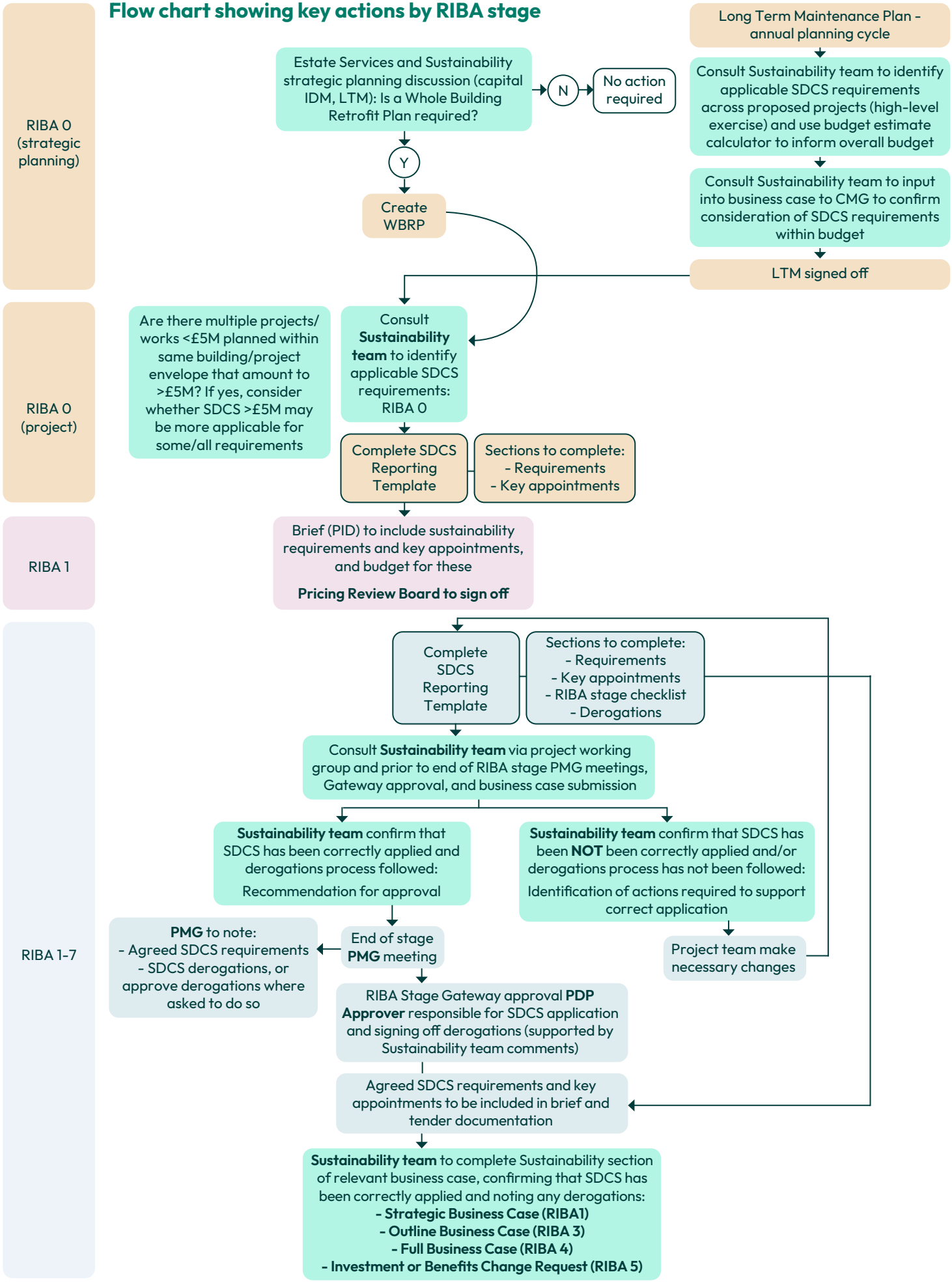
At every RIBA stage	☐ Complete the SDCS Reporting Template demonstrating the following: o The ***SDCS requirements and key appointments*** section has been completed/updated to align with any material project scope changes. o All actions on the relevant RIBA stage checklists are completed. ☐ For PDP Gateway sign-offs by the Approver and associated end of stage Project Monitoring Group (PMG) meetings: o The ***Derogations*** section within the SDCS Reporting Template must be completed where there are known derogations (see Derogations process). **NB:** PMG are required to note agreed sustainability requirements, progress towards meeting these and any derogations. In some cases – e.g. where derogation is significant – PMG will be required to approve derogations.
RIBA 0 	☐ Consult Sustainability team to determine applicable requirements and key appointments. For the Long Term Maintenance (LTM) plan, this should be completed initially during the planning period, prior to sign off of the plan to support budgeting, and again upon project commencement. o Complete ***SDCS requirements and key appointments*** section within the SDCS Reporting Template.[1]
RIBA 1 	☐ Embed ***SDCS requirements and key appointments*** section into Project Initiation Document (brief). ☐ Ensure budget covers applicable requirements and key appointments. To be checked and signed off by Pricing Review Board. ☐ RIBA 1 Gateway approval/PMG meeting – consult Sustainability team to confirm SDCS has been applied, budgeted for appropriately and that any derogations are supported by sufficient justification (see Derogations process). ☐ For business cases – consult Sustainability team for completion of Sustainability section.

[1]**Please note:** Determination of applicable requirements will include discussion between Estate Services and the Sustainability team of all projects within the same building envelope that are likely to run concurrently. These may individually have project values <£5M, but together may have a total value >£5M. At this point, requirements within the SDCS for projects >£5M may be applicable. This is to be determined on a case-by-case basis so as to a) raise standards, and b) limit repetition and number of appointments made. See also Whole Building Retrofit Plans.

Key Actions continued

RIBA 2 & 3 	☐ For business cases – consult Sustainability team for completion of Sustainability section.
RIBA 4 	☐ RIBA 4 Gateway approval/PMG meeting – consult Sustainability team to confirm: o SDCS has been applied and included in tender documentation (in line with the updated ***SDCS requirements and key appointments*** section of the Reporting Template) and tender returns. o Correct process to determine derogations has been followed. ☐ For business cases – consult Sustainability team for completion of ***Sustainability*** section.
RIBA 6 	☐ RIBA 6 Gateway approval/PMG meeting – consult Sustainability team to confirm SDCS has been applied, and correct process to determine derogations has been followed.

Flow chart showing key actions by RIBA stage



Derogations process

As above, applicable requirements will be identified through consultation with the Sustainability team at RIBA Stage 0 (and again if the project scope changes later). Derogations will only be needed for the specific requirements deemed applicable during this consultation – not for the entire SDCS. Any derogation from the SDCS must be supported by:

- Completed RIBA stage checklists to evidence that the correct process has been followed at each stage.
- Reason(s) for derogation, which could include, for example, specific brief requirements where these prohibit ability to achieve the SDCS requirement (e.g. scientific needs in laboratory settings). While budget, timescales and site constraints may in some cases justify derogations, the SDCS requirements must be considered and planned for from the outset. Late engagement with the SDCS is unlikely to be considered a valid reason for derogation.
- All reasons for derogations must be supported by the following for both scenarios (i.e. derogation from SDCS requirement vs meeting SDCS requirement) to demonstrate that the derogation is justified:
    - capital cost impacts
    - maintenance impacts (both cost and practical considerations)
    - utilities cost
    - carbon impact (operational and embodied)
    - health and wellbeing impacts

Responsibility for approving derogations

The information above should be supplied by completing the ***Derogations*** section of the SDCS Reporting Template. The Sustainability team will be responsible for checking and confirming the above, as well as providing a recommendation (also to be included in the Derogations section) as to whether the derogation on sustainability grounds is acceptable. This will be for consideration and agreement by the PDP Approver, or in some cases PMG, where the Approver choses to elevate this responsibility to PMG.

Confirmation of derogations must be included in all reports to PMG and all business cases to the Capital Management Group (CMG), along with confirmation that the above process has been followed.

It should be noted that some project changes are to be managed via UoE change management process. Any derogations from the SDCS arising from such changes must be agreed in accordance with the above derogations process.

Whole Building Retrofit Plans:

Long Term Maintenance, Infrastructure Decarbonisation Masterplan and Capital Planning

To maximise opportunities to align with the principles and requirements set out within this SDCS, and to ensure a coordinated approach to planning the energy efficient upgrade of the UoE estate, the Estate Services and Sustainability teams will work together at strategic project/budget allocation stage. This joint approach will help to identify and understand the programme of capital, Long Term Maintenance (LTM) and Infrastructure Decarbonisation (IDM) works planned across the estate and which buildings are likely to undergo significant levels of refurbishment in the coming years or concurrently.

Where >50% of the Gross Internal Area (GIA) of a building is likely to be refurbished, or refurbishment/ replacement of 100% of one or more element(s) of the building's thermal envelope, a Whole Building Retrofit Plan should be created ahead of the individual projects coming forward. The retrofit plan should be produced in accordance with the UK Net Zero Carbon Building Standard (UKNZCBS) requirements for a retrofit plan, setting out the approach for achieving UKNZCBS targets by 2040, and identifying at which point(s) any 'deep' refurbishment/upgrades should be undertaken to ensure a coordinated approach. The plan should take into consideration whole-life costs, maintenance, and health and wellbeing. It should also consider the comparative whole-life costs and impacts associated with undertaking the thermal envelope upgrades later in the retrofit plan, or not at all.

Individual projects must then refer to this and deliver appropriate measures from the overall retrofit plan within their scope.

SKA RATING ASSESSMENT

Requirements

SK1: Projects >£1M construction value to achieve Silver rating at design and handover stage – certified.

SK2: Projects <£1M construction value to undertake 'mini' SKA assessment and target Silver rating at design and handover – uncertified. Where <20 Good Practice Measures (GPM) are in scope, aim to achieve as many of those GPMs identified by the 'mini' SKA assessment as feasible.

Key appointments

- Projects >£1M: Qualified SKA assessor.
- Projects <£1M: UoE SKA assessor (or other designated person).

Actions by RIBA stage

RIBA 0	☐ In consultation with the Sustainability team, confirm which requirements apply.	
RIBA 1	☐ Appoint SKA assessor >£1M or UoE SKA assessor <£1M (or other designated person).	SK1, SK2
	☐ Undertake scoping exercise to identify in-scope GPMs, noting GPMs identified by UoE as not to be targeted.	SK1, SK2
	☐ Appointed Design team members to complete required SKA training.	SK1, SK2
RIBA 2	☐ Complete SKA pre-assessment to identify which GPMs are to be targeted by Design team to achieve Silver rating, noting: A) that some GPMs are UoE mandatory requirements as stipulated elsewhere in this document. B) that some GPMs have been identified by UoE as not to be targeted (e.g. where there is a conflict with other University standards). C) that some products to achieve GPM criteria have been identified on UoE's list of compliant products.	SK1, SK2
RIBA 3/4	☐ Develop design that meets the GPMs.	SK1, SK2
	☐ Complete design stage assessment – Silver rating.	SK1, SK2
	☐ Design stage assessment identifying included GPMs to form part of tender pack.	SK1, SK2
	☐ Obtain design stage SKA certification.	SK1
RIBA 5	☐ Contractor to be briefed on SKA by SKA assessor/UoE SKA assessor.	SK1, SK2
	☐ Contractor to build as per SKA assessment – confirmation by employer's agent/ New Engineering Contract (NEC) supervisor.	SK1, SK2
	☐ Assessor to provide recommended compliant alternatives where changes are required.	SK1, SK2
	☐ Evidence and confirmations to be gathered as directed by SKA assessor.	SK1, SK2
RIBA 6	☐ Remaining evidence to be gathered as directed by SKA assessor.	SK1, SK2
	☐ SKA rating handover certificate provided, confirming Silver rating >£1M projects. SKA compliance confirmation provided by UoE SKA assessor <£1M.	SK1, SK2
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	SK1, SK2
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	SK1, SK2

OPERATIONAL ENERGY

Requirements

For whole building deep refurbishment

Deep refurbishment provides an opportunity to improve the thermal envelope of the building. The preferred standard (i.e. Passivhaus/EnerPHit) should be the starting point for all projects. The minimum standard should only be selected where Passivhaus/ EnerPHit is deemed to be unfeasible for the project - determined in consultation with the sustainability team and following initial feasibility studies.

Minimum standard

OE1: Achieve UKNZCBS Energy Use Intensity limits and undertake operational energy modelling (e.g. TM54) (achieving SKA GPMs D66 (Energy Modelling), D85 (Energy Use Intensity) and E29 (Energy Demand Reduction) where in scope).

OE2: Maximise use of low and zero carbon (LZC) technologies towards achieving net zero operational energy, including supporting opportunities for future provision/heat network connection.

OE3: Report project impact on energy demand, using outputs from energy modelling (design stage) and metered data (post occupancy).

OE4: All refurbished technical spaces must assess suitability for the Laboratory Efficiency Assessment Framework (LEAF), and **register to the platform** if applicable.

Key appointments

Minimum standard for whole building deep refurbishment

- Architect with experience of low energy building design/refurbishment.
- Building physics consultant.
- Independent third-party reviewer responsible for verifying that the proposed building design meets the UKNZCBS Energy Use Intensity limits (OE1) throughout the design and construction.
- MEP consultant with capability in renewable energy systems design, TM54 and dynamic thermal modelling.
- For complex projects or those with grant funding requirements, consider retention of consultant project manager (where employed) after the 12-month defects liability period to manage resolution of any energy-related issues/metering requirements.

Preferred standard

OE5: Achieve EnerPHit certification, achieving SKA GPM D66 (Energy Modelling), D85 (Energy Use Intensity) and E29 (Energy Demand Reduction) where in scope.

OE2: Maximise LZC use towards achieving net zero operational energy, including supporting opportunities for future provision/heat network connection.

OE3: Report project impact on energy demand, using outputs from energy modelling (design stage) and metered data (post occupancy).

OE4: All refurbished technical spaces must assess suitability for the Laboratory Efficiency Assessment Framework (LEAF), and **register to the platform** if applicable.

Key appointments

Preferred standard for whole building deep refurbishment

- Architect/EnerPHit designer with experience of low energy building design/refurbishment.
- Certified EnerPHit designer/consultant (where EnerPHit is targeted).
- UK-based EnerPHit certifier (to be appointed direct by UoE) (where EnerPHit is targeted).
- MEP/sustainability consultant with capability in renewable energy systems design and energy calculations.
- For complex projects or those with grant funding requirements, consider retention of consultant project manager (where employed) after the 12-month defects liability period to manage resolution of any energy-related issues/metering requirements.

For all other projects (including whole or partial building fit out)

OE6: Achieve in-scope SKA energy GPMs wherever possible, including D85 (Energy Use Intensity), D66 (Energy Modelling) and E29 (Energy Demand Reduction).

NB: Some GPMs have been identified by UoE as exempt from targeting. An up-to-date list can be provided by the Sustainability team. The Electrical Standard Specification refers to relevant SKA GPMs to be targeted throughout.

OE7: If a Whole Building Retrofit Plan has been decided upon during the LTM/IDM/Capital planning cycle and subsequently developed, individual projects must align with and deliver relevant elements of that plan.

OE2: Maximise LZC technology use towards achieving net zero operational energy, including supporting opportunities for future provision/heat network connection.

OE8: Report project impact on energy demand, using energy calculations (e.g. full energy model or spreadsheet based, as appropriate), product specifications or benchmark figures to estimate, and metered data (post occupancy).

OE9: Where there is scope to improve thermal performance of building fabric, target best practice U-values and air tightness, taking into consideration existing building systems and UKNZCBS Energy Use Intensity limits. It may be appropriate to undertake energy modelling to inform the approach.

OE4: All refurbished technical spaces must assess suitability for the Laboratory Efficiency Assessment Framework (LEAF), and **register to the platform** if applicable.

Key appointments

For all other projects (including whole or partial building fit out)

- MEP/sustainability consultant with capability in renewable energy systems design and energy calculations.
- For complex projects or those with grant funding requirements, consider retention of consultant project manager (where employed) after the 12-month defects liability period to manage resolution of any energy-related issues/metering requirements.

Actions by RIBA stage

RIBA 0	☐ In consultation with the Sustainability team, confirm which requirements apply.[1]	
RIBA 1	☐ Make key appointments (refer to ***Key appointments*** section).	
	☐ Undertake scoping exercise to identify in-scope GPMs, noting GPMs identified by UoE as not to be targeted.	OE1, OE5, OE6
	☐ Initial surveys and massing studies to assess feasibility of achieving EnerPHit (where applicable)/UKNZCBS limits/LZC technologies and opportunity to improve fabric U-values.	OE1, OE5, OE2, OE9
	☐ Identify relevant parts/targets within the Whole Building Retrofit Plan and build into project brief.	OE7
RIBA 2	☐ Complete SKA pre-assessment to determine which SKA energy GPMs are to be targeted to achieve a Silver rating, noting: o that some GPMs are UoE mandatory requirements as stipulated elsewhere in this document. o that some GPMs have been identified by UoE as not to be targeted (e.g. where there is a conflict with other University standards). o that some products to achieve GPM criteria have been identified on UoE's list of compliant products.	OE1, OE5, OE6
	☐ Confirmation of requirements (where these were dependent on feasibility studies).	OE1, OE5, OE2, OE9
RIBA 3	☐ Develop outline strategy for achieving the agreed requirements.	OE1, OE2, OE5, OE6, OE7, OE9
	☐ Undertake initial energy modelling where identified as a requirement. Demonstrate this has informed the design (including building services, fabric, thermal bridges, plant design) and that the project is on track to achieve the agreed requirements.	OE3, OE1, OE5, OE6, OE9
	☐ Report estimated project impact on energy demand.	OE3, OE8
	☐ Finalise strategy for LZC technologies.	OE2
RIBA 4	☐ Detailed design to include all items necessary to achieve requirements.	OE1, OE2, OE5, OE6, OE7, OE9
	☐ SKA design stage assessment to confirm which SKA energy GPMs have been included in the design.	OE6
	☐ Finalise energy calculations/modelling and report project impact on energy demand.	OE3, OE8

[1] This doesn't need to include determination of whether preferred/minimum standard will be targeted at this stage, but **it does need to identify** if there are a group of projects that, when considered together, push project value >£5M. If it does, **SDCS for projects >£5M applies** rather than this version. See Overview section for further information. It should also determine whether this project is (or has scope to be, e.g. when grouped with other forthcoming projects) a deep refurbishment and therefore which set of requirements apply. For any project (or group of projects) where the scope includes fit out of >50% of the building GIA or replacement/ refurbishment of 100% of one or more thermal elements, a Whole Building Retrofit Plan should have been created. If it hasn't, it should now be created. See Whole Building Retrofit Plans.

Actions by RIBA stage continued

RIBA 4	☐ EnerPHit certifier (OE5)/independent third-party reviewer (OE1) to do pre-construction design check, confirming design is on track to meet requirements.	OE1, OE5
	☐ Incorporate LZC systems into Mechanical & Electrical (M&E) detailed design, consulting with suppliers and installers to ensure that plant spaces and hydraulic designs are suitable for contractor design elements.	OE2
	☐ Contractor specification and requirements to include relevant items aligned to achievement of the agreed requirements.	OE1, OE2, OE3, OE5, OE6, OE7, OE8, OE9
	☐ Finalise energy metering and sub-metering strategy to support post occupancy evaluation, aligned to SKA rating requirements where appropriate.	OE3, OE8
RIBA 5	☐ Contractor to meet all requirements as set out in the Contractor Specification and Requirements document – confirmation by employer's agent/NEC supervisor.	OE1, OE2, OE3, OE5, OE6, OE7, OE8, OE9
	☐ Liaison with EnerPHit certifier/independent third-party reviewer for construction check and compliance against relevant requirements.	OE1, OE5
	☐ Monitor installation of renewable and low carbon technologies to ensure compliance with design. Witness commissioning and ensure controls are correctly set up.	OE2
RIBA 6	☐ Final certificates or third-party confirmations to be issued confirming agreed requirement(s) met, including air testing.	OE1, OE2, OE5
	☐ Provide 'as built' energy calculations/modelling and report project impact on energy demand.	OE3, OE8
	☐ SKA handover assessment to confirm which SKA energy GPMs have been implemented.	OE6
	☐ Participate in client training on building systems.	OE1, OE2, OE3, OE5, OE6, OE7, OE8, OE9
	☐ Provide full detail of systems in Operation & Maintenance (O&M) manual and simple instructions for building handover.	OE1, OE2, OE3, OE5, OE6, OE7, OE8, OE9
	☐ Assess suitability for the Laboratory Efficiency Assessment Framework (LEAF) and register to the platform if applicable	OE4
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	OE1, OE2, OE3, OE5, OE6, OE7, OE8, OE9
	☐ Report to the Sustainability team monthly in-use energy consumption and sub-metered energy consumption against as-designed energy consumption for 24 months, as defined by the metering strategy developed at RIBA 4. Any identified issues are to be resolved in accordance with contractual requirements.	OE3
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	OE1, OE2, OE3, OE4, OE5, OE6, OE7, OE8, OE9

EMBODIED CARBON & CIRCULAR ECONOMY

Requirements

CE1: Target all in-scope SKA materials and waste/resource management GPMs, including D72 (Pre-refurbishment Audit), D60 (Design for Whole Life Resource Optimisation (DfO)), D07 (Site Waste Management Plan), and D84 (Fixed Asset Tagging and Register).

CE2: Follow and report against the Embodied Carbon and Circular Economy (EC and CE) Rules of Thumb Checklist – this should assist with the achievement of SKA GPMs (CE1).

CE3: Complete monthly **construction waste reporting**.

Key appointments

- Embodied Carbon and Circular Economy champion.
  - This could be a member of the Design team or a specialist appointment, depending on project scale. They will hold responsibility for driving and demonstrating the achievement of the above circular economy requirements.

Actions by RIBA stage

RIBA 0	☐ In consultation with the Sustainability team, confirm which requirements apply.	
RIBA 1	☐ SKA assessor to undertake scoping exercise to identify in-scope materials/waste/ resource management GPMs. NB: This will be undertaken as part of SK1 and SK2.	CE1
	☐ Scope in/out applicable requirements from the EC and CE Rules of Thumb Checklist and use to inform brief.	CE2
RIBA 2	☐ Complete SKA pre-assessment to identify all in-scope SKA materials/waste/resource management GPMs as targeted. NB: This will be undertaken as part of SK1 and SK2.	CE1
	☐ Hold meeting to consider in-scope items on the EC and CE Rules of Thumb Checklist, and embed into the concept design, adding any additional EC and CE opportunities to the list.	CE2
	☐ Add notes to the Checklist to confirm approach taken.	CE2
RIBA 3/4	☐ Include EC and CE in Design team meeting agendas, using the EC and CE Rules of Thumb Checklist to support discussion.	CE2
	☐ Integrate identified opportunities into design and specifications. Record outcome in the Rules of Thumb Checklist Notes section, including justification where not possible to achieve.	CE2
	☐ Design to achieve SKA materials/waste/resource management GPMs and report via SKA design stage assessment (where this is a requirement), or a separate report (where full SKA assessment is not a requirement).	CE1
RIBA 5	☐ Contractor to build in accordance with the specification with reference to the completed EC and CE Rules of Thumb checklist, identifying any additional circular economy opportunities. Confirmation by employer's agent/NEC supervisor.	CE1, CE2
	☐ Contractor to implement design to achieve SKA materials/waste/resource management GPM criteria and provide evidence for the relevant materials/waste/resource management SKA GPMs, as instructed by SKA assessor.	CE1
	☐ Contractor to complete monthly construction waste reporting.	CE3
RIBA 6	☐ Incorporate relevant information into O&M manual – e.g. around future adaptability, disassembly and end of use/replacement/maintenance instructions.	CE1, CE2
	☐ Complete 'as built' reporting in EC and CE Rules of Thumb Checklist, adding in any additional achievements.	CE2
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	CE1, CE2, CE3
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	CE1, CE2, CE3

THERMAL COMFORT

Requirements

TC1: All projects should integrate the following best practice measures where in scope of the project, prioritising passive measures to reduce overheating risk and minimising cooling energy demand:

- Include appropriate glazing ratios (<30%), orientations and specification (g-value).
- Include appropriate solar shading (prioritising external shading, including through green infrastructure).
- Minimise heat gains from hot water plant/ distribution.
- Ensure ventilation design includes and maximises effective natural ventilation wherever possible, including overnight ventilation coupled with high thermal mass.
- Meet requirements for thermal comfort and internal air quality within **Mechanical Building Services Design Guide**, future-proofing the design to be climate-ready wherever feasible (e.g. through consideration of appropriate ventilations rates and duct sizing to maintain thermal comfort levels in warmer climates).
- Include appropriate placement of heat rejection plant.
- Ensure the design of external spaces reduces overheating impacts on internal spaces (e.g. lighter colour hard surfacing and/or blue/green infrastructure).
- Achieve SKA E29 (Energy Demand Reduction).

TC2: For projects (excluding solely external works projects) that meet A and B below:

- Complete TM52/TM59 assessment alongside dynamic thermal modelling of the building to inform the passive design approach and demonstrate there is no risk of overheating in current or future weather.
    - Modelling outputs should demonstrate no overheating risk when tested using 2050 weather files and should provide solution(s) for eliminating any identified risk of overheating when tested against 2080 weather file.
    - Reports produced should demonstrate in full how passive design has been tested and prioritised to optimise heating and cooling energy demand by providing results for 'passive only' and 'passive + active' designs.

A) The existing or proposed space/building meets one or more of the following, indicating that it could be at higher risk of overheating:

- *Occupant/BMS feedback indicating space/building gets too hot.*
- *>30% glazing ratio (as a proportion of the façade on solar exposed areas – i.e. east/south/west facing and anything in between).*
- *Barriers to opening windows or single aspect (reduced natural ventilation) with insufficient mechanical ventilation rates (see **Mechanical Building Services Design Guide for definition of appropriate ventilation rates**).*
- *Adjacent to heat rejection plant.*
- *Project includes/will create a top floor space.*
- *Space includes existing hot water pipe runs/heat generating equipment operating in summer.*
- *No trees or green spaces outside providing shading/cooling effects.*
- *Immediate surrounding surfaces outside the building/space are or could be dark in colour (not light/blue/green).*
- *Building/space has low thermal mass, or high thermal mass with no means for secure night ventilation.*

AND

B) The scope of works has potential to minimise overheating through inclusion of appropriate measures (as defined within TC1 above).

Key appointments

- M&E consultant with expertise in dynamic thermal modelling and overheating risk assessment in accordance with CIBSE TM52/59.
- Architect with knowledge of passive design for minimising overheating.

Actions by RIBA stage

RIBA 0	☐ In consultation with the Sustainability team, confirm which requirements apply.	
RIBA 1	☐ Appoint architect with knowledge of passive design for minimising overheating.	TC1, TC2
	☐ Identify site and client brief risks relating to overheating and recommend options for revision to avoid risks through passive measures, including positioning and massing, incorporating recommended options into brief.	TC1, TC2
RIBA 2	☐ Appoint M&E consultant with expertise in dynamic thermal modelling and reducing overheating risk.	TC2
	☐ Fully brief the Design team regarding overheating risks relevant to the project.	TC1, TC2
	☐ Develop strategy for controlling summertime overheating – prioritising passive measures – and integrating these into concept design.	TC1, TC2
RIBA 3	☐ Refine strategy for controlling summertime overheating – prioritising passive measures – and integrating these into design.	TC1
	☐ Carry out dynamic thermal modelling and use requirements stipulated to inform passive design approach, minimising cooling energy demand and demonstrating no overheating risk.	TC2
	☐ Ensure design specification integrates recommendations from thermal comfort assessment.	TC2
RIBA 4	☐ Develop and finalise technical design specification for controlling summertime overheating – prioritising passive measures – and integrating these into technical design.	TC1, TC2
	☐ Monitor building design for changes since RIBA 3 which could impact on overheating risk, and update thermal model and risk assessment to demonstrate the design meets the requirements prior to tender.	TC2
RIBA 5	☐ Contractor to be briefed on design elements contributing to managing overheating.	TC1, TC2
	☐ Contractor to demonstrate that construction is in accordance with the requirements of the thermal model (including but not limited to ventilation and glazing specification). Confirmation by employer's agent/NEC supervisor.	TC2
RIBA 6	☐ Building user guide/O&M manuals to include relevant information on the ventilation/ heating and cooling strategy that has been implemented to provide a comfortable environment for the end user.	TC1, TC2
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	TC1, TC2
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	TC1, TC2

LIGHT AND DAYLIGHT

Requirements

LD1: Do not make daylight levels worse, unless this is a specific requirement of the brief.

LD2: Where project scope allows, optimise daylight access following the principles below wherever feasible, taking into account the activities in the space:

- Consider proximity to other buildings.
  - When a window is to be used as a main source of light, external obstructions should not be higher than 25° above the horizon (see figure 1).
- Increase window head heights and limit below desk-height windows (these don't usually provide useful daylight and may increase overheating risk). Surfaces that are closer to a window than twice the height (2h) of the window head above desktop level receive adequate daylight for tasks for most of the working year (see figure 2).
- A room can have a daylit appearance if the area of glazing is at least 1/25th of the total room area (see figure 3).
- Avoid deep plan rooms. Areas of the room with no direct view of the sky have a low level of daylight (see figure 4).
- Select internal finishes that reflect light. Choose light-coloured internal surfaces.
- Position windows central to the space.
- Position rooms and furniture to optimise daylight levels in spaces/for activities that require more light, taking risk of glare into consideration.
  - Imagine that surfaces on and around the task are mirror-like. If the person at work would see a light source reflected, then in practice there may be reflected glare (see figure 5).
- Balance design for daylight with overheating risk (see **Thermal Comfort**).
- Specify windows with a higher visible light transmittance (VLT rating).

LD3: Achieve SKA GPM E29 (Energy Demand Reduction), D04 (Improvement in Daylighting) and D31 (Daylight Glare Control), where in scope.

Key appointments

- Architect and/or Sustainability consultant with understanding of façade design for natural daylight, and, where SKA D04 (Improvement in Daylighting) applies, capability in the use of the Climate-Based Daylight Modelling (CBDM) tool.

Figure 1.

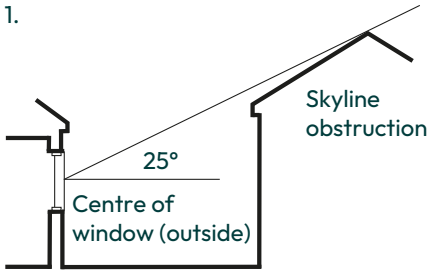


Figure 2.

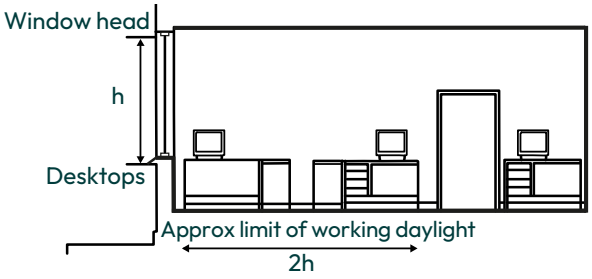


Figure 3.

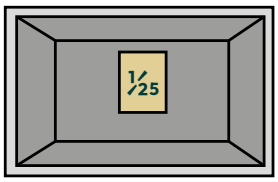


Figure 4.

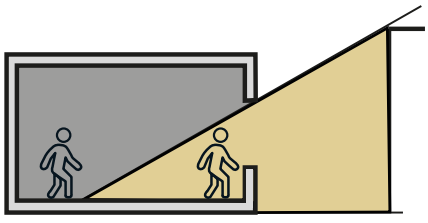
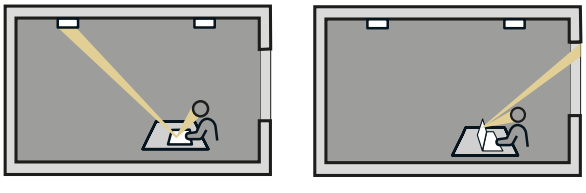


Figure 5.



Actions by RIBA stage

RIBA 0	☐ In consultation with the Sustainability team, confirm which requirements apply.	
RIBA 1	☐ Appoint architect and/or Sustainability consultant with understanding of façade design for natural daylight.	LD1, LD2, LD3
	☐ Brief Design team on principles for achieving well daylit buildings, including the concept of over illuminance and its link to overheating.	LD1, LD2, LD3
	☐ Review site and client brief to identify any risks and opportunities relating to daylight access, and consider any necessary changes to the brief to enable LD1-3 to be met.	LD1, LD2, LD3
RIBA 2	☐ Develop concept designs, taking the above requirements into account.	LD1, LD2, LD3
	☐ Report progress to client at end of RIBA 2.	LD1, LD2, LD3
RIBA 3/4	☐ Develop designs, taking the above requirements into account.	LD1, LD2, LD3
	☐ SKA D04: Complete daylight modelling to confirm that SKA criteria met as part of SKA design stage assessment.	LD3
	☐ SKA D31: Ensure SKA criteria met within technical specifications and room layouts.	LD3
	☐ SKA E29: Ensure passive measures are integrated into design.	LD3
	☐ Report progress to client at end of RIBA 3 and 4.	
RIBA 5	☐ Brief contractor on elements/specifications affecting daylight.	LD1, LD2, LD3
	☐ Construction in accordance with specification (in particular glazing specification, internal finishes and surface reflectance). Confirmation by employer's agent/NEC supervisor.	LD1, LD2, LD3
RIBA 6	☐ Include daylight and glare management measures and artificial lighting in building user guide.	LD1, LD2, LD3
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	LD1, LD2, LD3
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	LD1, LD2, LD3

WATER

Requirements

W1: For new components, meet level 5 for the water efficiency consumption performance within table 1 for all components except WCs and urinals. These must meet – or wherever possible exceed – level 3, considering whole life cost and maintenance.

Table 1: Water efficiency consumption levels by component type (adapted from BREEAM 2018 Calculator used for New Builds).

Component	Performance levels (quoted numbers are minimum performance required to achieve the level)						
	Base	1	2	3	4	5	Units
WC	6	4.5	4	3.75	3.5	1.5	Effective flush volume (litres)
Wash-hand basin taps	10	8	6	5	4	3	litres/min
Showers	12	10	8	6	5	3.5	litres/min
Baths	200	180	160	140	120	100	litres
Urinal (2 or more urinals)	7.5	6	3	1.5	0.75	0	litres/bowl/hour
Urinal (1 urinal only)	10	8	7	6	5	5	litres/bowl/hour
Greywater and rainwater system	0%	0%	0%	25%	50%	75%	% or WC or urinal flushing demand met using recycled non-potable water
Kitchen tap: kitchenette	10	8	7	6	5	5	litres/min
Kitchen taps: restaurant (pre-rinse nozzles only)	10.3	9	8.3	7.3	6.3	6	litres/min
Domestic sized dishwashers	17	13	13	12	11	10	litres/cycle
Domestic sized washing machines	90	60	50	40	35	30	litres/use
Waste disposal unit	17	17	0	0	0	0	litres/min
Commercial sized dishwashers	8	7	6	5	4	3	litres/rack
Commercial or industrial sized washing machines	14	12	10	7.5	5	4.4	litres/kg

W2: Meet SKA GPM E17 (Water Measurement and Reporting) where in scope.

W3: In buildings with swimming pools, large water tanks or aquariums, fit separate sub-meters on the water supply for these and any associated changing facilities (toilets, showers, etc.) irrespective of their water consumption levels.

W4: In buildings containing laboratories, fit a separate water meter on the water supply to any process or cooling loop for plumbed-in laboratory process equipment, irrespective of their water consumption levels.

W5: Explore opportunities to incorporate and/or future-proof for water supply via boreholes, rainwater reuse and greywater reuse where project scope includes addition or replacement of hard surfacing/roofing/guttering/drainage infrastructure or replacement or re-plumbing of fixtures and fittings that utilise water, or where the project is a new building or major refurbishment. Consider opportunities to install

infrastructure to support the reuse of rainwater/grey water for the following:

- to support external planted spaces (e.g. water butts that discharge into green spaces or raingardens/rain planters).
- to meet any localised needs within the building (e.g. flushing toilets), including future-proofing through provision of dual plumbing systems (i.e. rainwater/ grey water pipes and service water pipes), and
- to meet wider campus needs strategically for projects that present an opportunity to recover a significant amount of water that could be utilised elsewhere on campus (e.g. new builds or refurbishments >1000m2 GIA).

W6: Ensure no increase in surface water run-off rates, and where possible, achieve a reduction in surface water run-off (targeting greenfield run-off rates). Achieve this by:

- following the principles within the national standards for sustainable drainage systems (SuDS) wherever possible, with water reuse as the primary goal
- making water available for reuse
- deploying nature-based flood and pollution management solutions
- minimising hard surfacing
- using permeable/semi-permeable surfacing
- prioritising biodiversity rich SuDS (see Biodiversity B4)
- considering and planning for long term monitoring and maintenance

ONLY utilise hard engineering solutions once these have been explored.

W7: Report change in water demand as a result of the project/works (l/yr).

Key appointments

- Architect responsible for selecting low-water-use sanitaryware.
- **W5:** MEP consultant and civil engineer with capability of investigating boreholes, rainwater and grey water harvesting.
- **W6:** Sustainable drainage consultant/ landscape architect/architect with expertise in SuDS design.

Actions by RIBA stage

RIBA 0	☐ In consultation with the Sustainability team, confirm which requirements apply.	
RIBA 2/3	☐ Develop design to meet the agreed requirements.	W1, W2, W3, W4, W5, W6
	☐ Report progress towards meeting requirements at end of RIBA 3.	W1, W2, W3, W4, W5, W6
	☐ Report estimated change in water demand as a result of the project/works.	W1, W5
RIBA 4	☐ Provide comprehensive specifications that meet the agreed requirements.	W1, W2, W3, W4, W5, W6
	☐ Update estimated change in water demand as a result of the project.	W1, W5
RIBA 5	☐ Brief contractor on all elements/specifications included to meet the requirements.	W1, W2, W3, W4, W5, W6
	☐ Construction in accordance with specifications. Confirmation by employer's agent/NEC supervisor.	W1, W2, W3, W4, W5, W6
RIBA 6	☐ Monitor the systems to check they are set up and working as designed.	W1, W2, W3, W4, W5, W6
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	W1, W2, W3, W4, W5, W6
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	W1, W2, W3, W4, W5, W6

BIODIVERSITY

Requirements

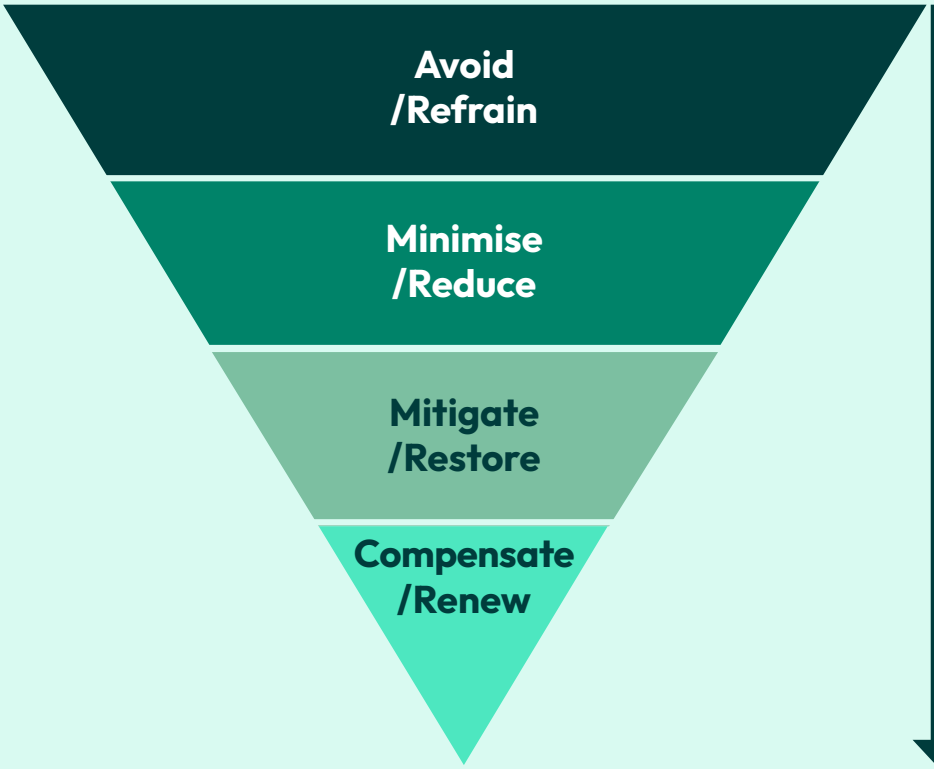
B1: Follow the mitigation and conservation hierarchy for protected species and those of conservation concern, natural and semi natural habitats, and those of horticultural heritage and amenity value. Consult with the UoE Grounds team to assess impact and identify appropriate on-site mitigation, off-site offsetting and enhancement opportunities.

- Where unsure whether this requirement applies:
  - Seek advice from Grounds/Sustainability team relating to habitats and built environment, and contact a suitably qualified ecologist if advised to do so.
  - Review guidance from the Bat Conservation Trust.
  - Check campus GIS of protected species and biodiversity features to guide location and brief of development and location of site compounds, to avoid impacts on protected species.[1]
- Create corridors for wildlife to move around sites, and link up habitats where possible.
- Create buffer zones around existing habitats with biodiversity and protected species value – e.g. water courses, ponds, hedges, woodland, scrub and known protected species locations.

Key appointments

- Suitably qualified ecologist, e.g. member of CIEEM or equivalent experience.
- Lighting professional.

Mitigation and conservation hierarchies



Avoid/refrain – know where you are likely to have biggest environmental and biodiversity impacts, and avoid this as part or project/site selection process.

For unavoidable impacts, **minimise** e.g. via site selection, project process, timing of works.

Mitigate and restore environmental and biodiversity impacts on site e.g. via adding additional habitats.

For any remaining impact, offset by enhancing the environment elsewhere to **compensate for losses**, and deliver additional environmental and biodiversity gains.

Environmental and biodiversity gain – environment in a better state that before project

[1] **NB:** Absence of records on the map does not indicate absence of species. Surveys become out of date and if the habitat is suitable, protected species may move in, so surveys prior to works may still be required. Where protected species may be present but is not known, employ suitably qualified ecologist to undertake checks.

B2: Contact a suitably qualified ecologist to confirm whether any of the legislation below applies. Where necessary, appoint ecologist and follow their advice to comply.

- The Wildlife and Countryside Act 1981
- The Conservation of Habitats and Species Regulations (HM Government, 2017) (as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (HM Government, 2019)), referred to as the 'Habitat Regulations'
- EU Habitats Directive & EU Birds Directive
- The Invasive Alien Species (Enforcement and Permitting) Order (IASO) 2019
- National Parks & Access to the Countryside Act 1949
- Hedgerow Regulations 1997
- The Protection of Badgers Act 1992
- Countryside and Rights of Way Act 2000
- Wild Mammals (Protection) Act 1996
- Natural Environment and Rural Communities Act 2006
- The Environment Act 2021
- The Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024

B3: Deliver 10% Biodiversity Net Gain where required by planning.

B4: Enhance natural capital provided by building projects or external works projects.

- Confirm whether the project could impact people's ability to use campus green spaces and connect with nature (i.e. by removing external seating/amenity areas, formal and informal). Compensation for any lost areas should be re-provided on or off site in discussion with the Grounds team. All projects should incorporate opportunities to engage with green spaces where possible.
- Where providing SuDS as per Water WA6, all SuDS must be biodiversity rich with amenity value (such as longer grass/wildflower habitats or ornamental shrubs with biodiversity value), designed in consultation with Grounds team. See B1.
- Use planting to provide multiple benefits, such as:
  - cooling (shading of benches/buildings)
  - edible planting (both dedicated areas and incorporated into ornamental planting schemes)
  - water retention
  - supporting pollinator populations
  - aesthetic/cultural value, such as sensory planting and enhancing wellbeing benefits from nature

This includes considering green roofs and low-maintenance, biodiversity-rich green walls.

- Adapt to changing climate within site designs and planting plans, including considering species suitability and maintenance requirements.

B5: Internal lighting

- Reduce the impacts of artificial light on biodiversity while maintaining safety standards.
- Prioritise wildlife over aesthetic considerations.
- Avoid light spill by internal features – such as timed light switches and blinds – and external features such as overhangs and balconies.

B6: External lighting

- Reduce the impacts of artificial light on biodiversity while maintaining safety standards.
- Prioritise wildlife over aesthetic considerations.
- Consider existing lighting levels available and if additional lighting is needed.
- If lighting is required for safety standards, mitigate by using wildlife-friendly lighting (directionality, timing of use, light colour spectrum). See **ILP and BCT Guidance**.

B7: Create wildlife habitats within the built environment by incorporating bat roosting habitats (e.g. bat boxes/ bricks), bird nesting habitats (e.g. swift/swallow bricks, nest boxes) and bee bricks, where appropriate.

B8: Ensure appropriate biodiversity-friendly planting schemes, with UoE Grounds team given option to design first and consulted on designs if external contractors used.

- Use native or near-native plant species where possible.
- Use horticultural plants with wildlife value, e.g. pollen/nectar, food/nesting sources for birds.
- Do not use invasive or near-invasive plants.
- Make design decisions which consider resources for long term maintenance.
- Make design decisions which avoid or reduce any chemical use for maintenance, e.g. herbicide sprays of block pavement.
- Consider and minimise watering requirements of anticipated design and planting and ensure they can be met (consider Grounds team resource and water supply, including grey water harvesting).
- Follow relevant items on the UoE Biodiversity Design Checklist to enhance biodiversity, mitigate and adapt to climate change, and consider nature positive management and maintenance.

Actions by RIBA stage

RIBA 0	☐ In consultation with the Sustainability team, confirm which requirements apply, noting that some refurbishment projects will affect outside spaces via their compounds.	
	☐ Consider mitigation and conservation hierarchy within strategic definition and location of project, consulting Grounds team and Sustainability team, and appointing an ecologist where necessary to support checks.	B1
RIBA 1	☐ Where identified as necessary, appoint ecologist and use advice and recommendations, together with advice from Grounds team, to apply mitigation and conservation hierarchy and meet other relevant requirements. Where advised to do so, complete a Preliminary Ecological Appraisal, Arboricultural Survey to British Standard (BS5837:2012) and Ecological Impact Assessment at the relevant stage.	B1, B2
	☐ Build applicable requirements into brief.	B1, B2, B3, B4, B5, B6, B7, B8
	☐ Identify whether Grounds team or external contractors will undertake planting designs, and make external appointment where necessary.	B8
RIBA 2	☐ Appoint lighting professional.	B5, B6
	☐ Complete Biodiversity Metric to understand Biodiversity Net Gain Requirements.	B3
	☐ Develop concept design to meet each of the applicable requirements, in consultation with the Grounds team, following ecologist's and lighting professional's advice. Report on progress at end of RIBA 2.	B1, B2, B3, B4, B5, B6, B7, B8
RIBA 3/4	☐ Develop design and specification to meet each of the applicable requirements, in consultation with the Grounds team, following ecologist's and lighting professional's advice. Report on progress at end of RIBA 3 & 4.	B1, B2, B3, B4, B5, B6, B7, B8
RIBA 5	☐ Contractor to carry out works to meet the relevant requirements in accordance with the specification – confirmation by employer's agent/NEC supervisor.	B1, B2, B3, B4, B5, B6, B7, B8
RIBA 6	☐ Provide 'as built' records, including species records (see ecologist scope of service).	B1, B2, B3, B4, B5, B6, B7, B8
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	B1, B2, B3, B4, B5, B6, B7, B8
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	B1, B2, B3, B4, B5, B6, B7, B8
	☐ Follow any monitoring requirements provided by ecologist, and provide records in live format (in accordance with ecologist scope of service).	B1, B2, B3, B4, B5, B6, B7, B8

TRANSPORT

Requirements

T1: Consult Sustainability team

- Where the project will be affecting or reconfiguring external transport infrastructure – roads, footpaths, pavements, cycle paths – consult with the Sustainability team to get input on ways in which the project can support delivery of Sustainable Transport Strategy.

T2: Building Travel Plan

- Where changing building capacity or ratio of staff to students, consult the Sustainability team who will determine whether a Building Travel Plan should be created (or an existing plan should be updated) to meet the criteria of SKA D78 (Travel Plan) and inform requirements T4-T7. This plan should be created in consultation with the Sustainability team to ensure it meets the objectives of the University's wider Sustainable Transport Strategy.

This plan would be supported by a Transport Demand Assessment for the project, with requirements aligned to those set within the Sustainable Transport Strategy 2024-30, Campus Masterplan, survey(s) of existing and proposed sustainable transport network, and any other relevant information provided by the Sustainability team, including the campus travel plan(s) (see below).

T3: Updates to campus travel plans

- The University is currently developing a campus travel plan for each campus (in accordance with SKA D79 (Campus Travel Plan)). Once these are complete, all projects that would impact them (see criteria listed in D79) should provide updates to it in consultation with the Sustainability team.

T4: Cycle parking

- Meet requirements of SKA D41 (Cycle Parking) (where in scope as determined by the sustainability team) and building travel plan (where produced).

T5: Cyclist lockers

- Minimum requirement: Meet requirements of SKA D43 (Cyclist Lockers) (where in scope as determined by the sustainability team) and building travel plan (where produced).
- Preferred requirement: Provide one cyclist locker per four workspaces.

In either case, liaise with person at UoE in charge of general lockers to ensure compliance with the specifications and management of the University's lockers.

T6: Showers

- Minimum requirement: Meet requirements of SKA D42 (Shower Facilities) (where in scope as determined by the sustainability team) and building travel plan (where produced).
- Preferred requirement: Where SKA D42 (Shower Facilities) is in scope, provide a minimum of two showers per building for the first 100 occupants. Thereafter in line with SKA D42, with reference to building travel plan (where produced).

T7: Drying cabinets

- Where there is scope to provide a drying cabinet (to be determined in consultation with the Sustainability team but generally this is where there is sufficient space, an electrical supply and drainage provision), provide at least one drying cabinet per building (or as per the building travel plan, where produced). Sized and specified appropriately in consultation with Sustainability team.

T8: Construction travel impacts and mitigation

- For large new build/refurb projects, follow **CLOCS** (part of the Considerate Constructors Scheme)

AND

- For all projects (including fit out and refurb projects), produce a site-specific construction travel plan in line with SKA D59 (Construction Phase CO_2 Emissions). The plan should reduce impacts and include travel arrangements for site workers. It should be used to inform compound/consolidation locations.

Make contractors aware that they can benefit from University reduced-rate bus passes and car share parking spaces, free University transport from the station and between Streatham and St Luke's campuses. All facilities provided for University staff can be extended to third parties working on campus.

Key appointments

- **T1, T2, T4, T5, T6, T8:** Architect to hold responsibility for coordinating design to integrate these.
- **T2, T3 and T8:** Transport planning consultant with ability to provide necessary updates to campus wide travel plan (TR3), produce building travel plan (TR2), and produce a construction travel plan (TR8).

Actions by RIBA stage

RIBA 0/1	☐ In consultation with the Sustainability team, determine applicable requirements, including which of the SKA-aligned requirements are in scope in accordance with the SKA scoping assessment (see **SKA rating assessment** section). Build into project brief.	
	☐ Consult with Sustainability team to get input on ways in which the project can support delivery of Sustainable Transport Strategy 2024-2030. Build into project brief.	T1
	☐ Make key appointments as appropriate.	
RIBA 2	☐ Undertake transport assessment to support development of travel plans.	T2, T3 and T8
	☐ Develop travel plans in consultation with Sustainability team.	T2
	☐ Develop concept design to support achievement of requirements.	T1, T2, T4, T5, T6, T7
RIBA 3/4	☐ Develop design to meet the applicable requirements and include the measures within drawings.	T4, T5, T6, T7
	☐ Inform the Sustainability team of any updates to the campus travel plan.	T3
RIBA 5	☐ Contractor to build in accordance with design and follow construction travel plan and advise on contractor travel – confirmation by employer's agent/NEC supervisor.	T4, T5, T6, T7, T8
RIBA 6	☐ Building user guide and O&M manuals to incorporate relevant information on transport infrastructure provided.	T2, T4, T5, T6, T7
RIBA 7	☐ Review as part of Post Occupancy Evaluation (POE) and Soft Landings appraisal (only for projects £2.5M and above).	T2, T4, T5, T6, T7
	☐ Log lessons learned within the ***Lessons learned*** section of SDCS Reporting Template.	T1, T2, T3, T4, T5, T6, T7, T8

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