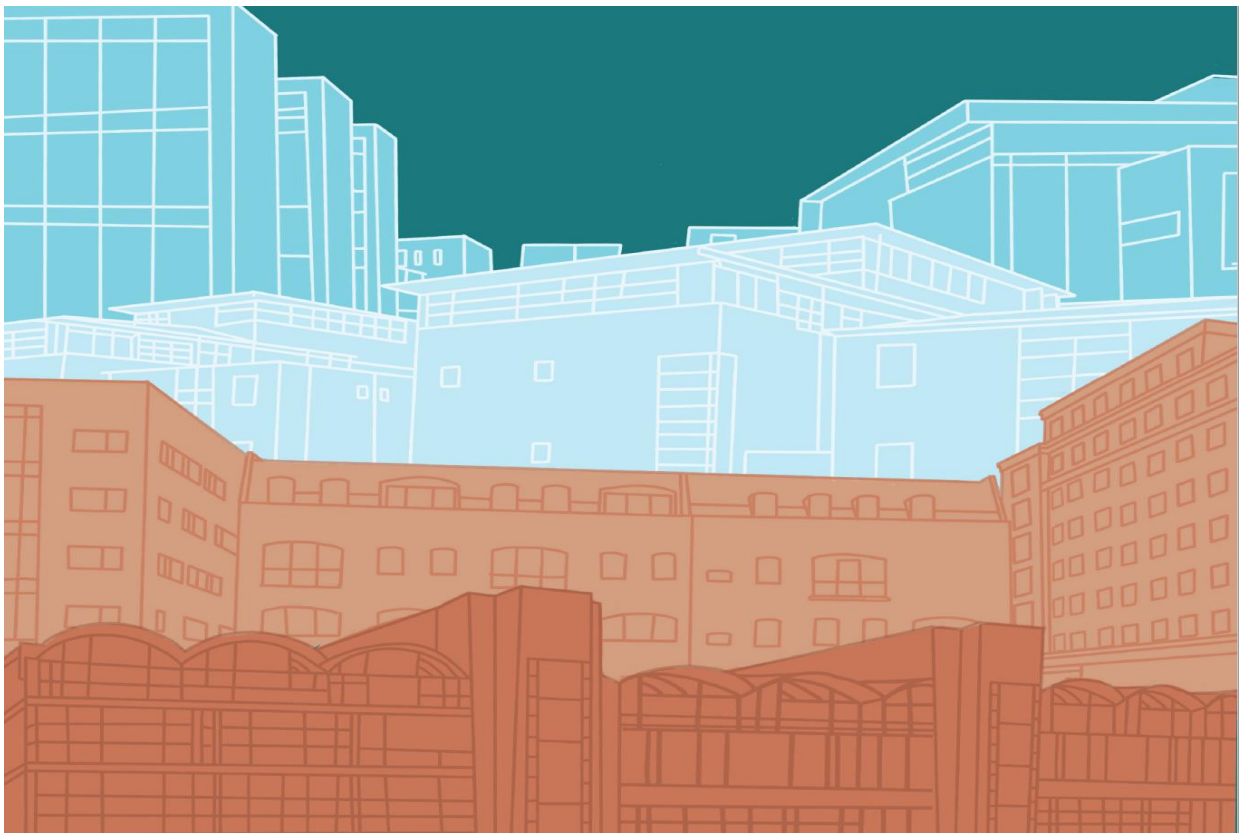
University of Lincoln

Sustainability Design Standard for Construction and Refurbishment Projects



"Our campuses and operations will be managed following best sustainable practice and we will embed our net zero vision in every area of Estates' activity."

University of Lincoln Environmental Sustainability Strategy, supporting the University of Lincoln Strategic Plan, 2022-2027

Version 1.0: July 2024

What's in this standard?

1.0 Introduction and Background

The environmental and sustainability impacts of new buildings and major refurbishment projects are an important consideration for the University of Lincoln.

These guidelines support the delivery of the following targets:

Target: To reduce carbon emissions by 60% by 2030 (against a 2009/10 baseline)
Target: Net Zero emissions by 2040

To achieve these targets, the University's buildings will need to be energy efficient and designed using firm sustainability principles.

Estates Masterplans have identified the need for additional buildings to deliver the targets and ambitions outlined in the University's Strategic Plan. To deliver on the #netzero2040 goal (and 2030 interim target), all new buildings must be designed to net zero standards.

The scope of the University's target to achieve Net Zero by 2040 includes indirect, or scope 3 carbon emissions, relating to purchased goods or services including the embodied carbon in buildings. It is therefore vital to consider the full Lifecycle Assessment (LCA) of projects to reduce the overall impact of the building.

There is a need to consider the sustainability impacts of the building at the design stage, which will need to include the impacts and costs of both the construction and operation phase of development. **The construction of a building should not be seen as a stand-alone project to be delivered to a set capital budget. For a successful estate, consideration of whole life costs needs to be at the heart of both new build and refurbishment projects.**

The principal target audience for this guide are the project design teams, project managers and contractors.

The aim of this standard is to allow maximum flexibility in the building design, heating method and ventilation strategy. It is not the intention that this standard should tie a project to a specific technology, design strategy or methodology of working - the main objective is to produce sustainable outcomes.

This standard sets out the specifications for capital projects, refurbishments and 'design and build' leases. The University of Lincoln wishes to embed sustainability and energy efficiency measures across the entirety of its Estate, although the level of specification is tailored to the value and scale of the project.

As the University's existing building stock ages, the frequency of refurbishment projects will increase over time. Many of the requirements relate to new build capital projects, so may not be applicable to refurbishments where there is less opportunity to influence building design and energy strategy. For this reason, the University will adopt the SKA assessment tool for use on all major refurbishment projects.

1.1 Sustainability Principles

The purpose of this standard is to enable the successful delivery of sustainable buildings for the University of Lincoln. All projects must address the three facets of sustainability - social, economic, and environmental.

This design standard sets a University benchmark for integrating sustainable design and construction for all major developments and outline minimum technical standards. New build construction projects and major refurbishment projects should fulfil requirements in all three areas, by:

Using our resources effectively:

- Increasing energy efficiency and reducing carbon emissions (including embodied carbon)
- Providing adequate metering facilities and BMS controls
- Minimising water consumption
- Minimising impact on biodiversity, offsetting any losses incurred
- Taking a whole lifecycle approach to project costing and design, including the embodied carbon impact
- Designing a waste management strategy that enables effective segregation, management, and collection of waste
- Meeting site-specific requirements, such as land contamination, flood risk alleviation and planning restrictions
- Delivering seasonal commissioning process, using 'soft landings'

Planning for the future:

- Ensuring comfort and experience of building users
- Provide new habitats for nature and wildlife to thrive and greenspaces for wellbeing
- Facilitating and supporting sustainable travel
- Incorporate the likely implications of a changing climate (adaptation), including extreme weather events, flooding and heatwaves

In conjunction with this guide, the University's **Environment and Energy Policy, Carbon Management Plan** and **Environmental Sustainability Strategy** shall be used as reference documents.

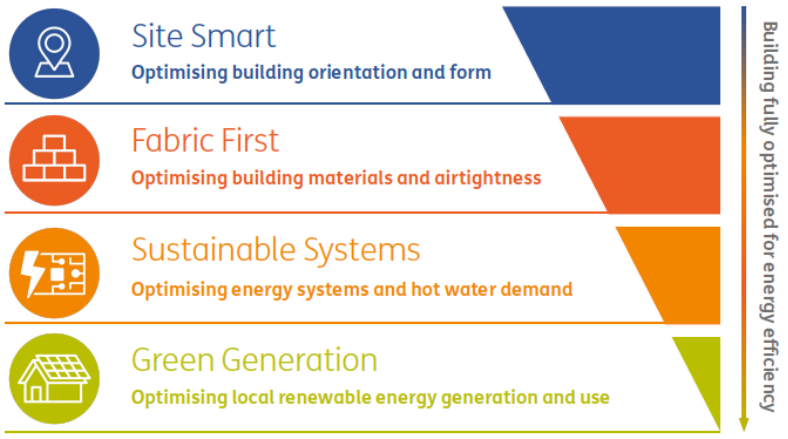


Figure 1: Energy Efficiency Hierarchy, Central Lincs Energy Efficiency Design Guide

1.2 The Language of this standard

This document uses the verbal terms from the ISO 14001:2015 Standard on Environmental Management Systems, where:

- “shall” indicates a requirement
- “should” indicates a recommendation
- “may” indicates a permission
- “can” indicates a possibility or capability

1.3 Relevant Guidance, Information and Tools

1.3.1 Guidance

UK Net Zero Carbon Building Standards

At the time of writing, The UK Net Zero carbon building standards are under consultation, once published these standards will inform this document. This document will be reviewed periodically considering any changes in published guidance and industry best practice.

LETI

LETI is a network of over 1,000 built environment professionals, working together to put the UK on the path to a zero carbon future. The voluntary group is made up of developers, engineers, housing associations, architects, planners, academics, sustainability professionals, contractors and facilities managers.

SKA Rating Good Practice Measures for Higher Education

SKA HE comprises 131 good practice measures covering ecology, energy and CO2, waste, water, pollution, transport, materials, well-being and other activities. For example, when wooden flooring is stripped out it should be sent for reuse to a salvage yard rather than sending it to landfill.

1.3.2 Information

Central Lincolnshire Local Plan, 2023

This updated Local Plan places climate change at its core and will help to ensure Central Lincolnshire is a Net Zero carbon area. A set of policies aimed at making Lincolnshire Net Zero, include the Central Lincolnshire Energy Efficiency Design Guide 2023. Figure 1, sets out the hierarchy for a building optimised for energy efficiency.

Central Lincs Energy Efficiency Design Guid

UK Green Building Council 2025 Strategy

The UKGBC 2025 Strategy sets out a shared industry ambition and industry targets which indicate what must be achieved by 2025.

Clean Air Lincolnshire

Our partnership works to raise awareness of issues of air quality and make it easier to find the information we need to keep ourselves and our families healthy, and the air we breathe clean.

Local flood map for planning

This service can be used (in England) to:

- Find out if you need a flood risk assessment as part of a planning application (sometimes known as planning permission)
- Download a printable flood map for planning (PDF) showing your flood zone
- Request flood risk assessment data

1.3.3 Tools

BREEAM

A BREEAM assessment uses recognised measures of performance, which are set against established benchmarks, to evaluate a building's specification, design, construction and use. The measures used represent a broad range of categories and criteria from energy to ecology. Each category focuses on the most influential factors, including reduced carbon emissions, low impact design, adaptation to climate change, ecological value and biodiversity protection.

LEED

To achieve LEED certification, a project earns points by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation, materials, health and indoor environmental quality. Projects go through a verification and review process by GBCI and are awarded points that correspond to a level of LEED certification.

SKA Rating

SKA rating is an environmental assessment method, benchmark and standard developed specifically for commercial office fit outs by the Royal Institute of Chartered Surveyors (RICS).

The SKA rating system helps landlords and tenants measure sustainability across factors like energy and water use, CO2 emissions, materials, waste, and pollution. It works by assigning either a bronze, silver or gold certification level based on performance against over 100 'good practice measures'.

Hierarchies

There are hierarchies for waste, embodied carbon, greenhouse gases and other environmental issues. The hierarchies set out how to approach the management of these issues, from most preferred (sustainable) option to least preferred option. These are included in the relevant sections of the standard, where applicable.

2.0 Standards and specifications

Project specifications for new construction projects may vary, depending on site-specific or building user requirements. However, as a minimum, all University construction projects shall achieve the requirements set out below – for either new build projects or refurbishment projects.

2.1 New Build Projects (including long term lease)

All new build projects, including long term leases, require complete application of this standard.

Design and Build

BREEAM Excellent

EPC 'A' as minimum

Fabric First Principles (optimising building materials and air tightness)

Site Waste Management Plan for projects >£300,000

Embodied Carbon Measured

Solar Car Port feasibility where >40 car parking spaces are created

Operation

Carbon Neutral in operation

DEC (Display Energy Certificate) A

2.2 Refurbishment Projects

All large refurbishment projects (projects exceeding £500,000) require complete application of this standard. Small scale projects, including remodelling projects and minor renovations (less than £500,000), may require bespoke expectations based on the current energy performance and characteristics of the building. Any deviation from the standard must follow the Governance arrangements for this standard.

Design and Build

SKA Tool: Silver as a minimum

Fabric First Principles (optimising building materials and air tightness)

Site Waste Management Plan for projects >£300,000

Solar Car Port feasibility where >40 car parking spaces are created

Operation

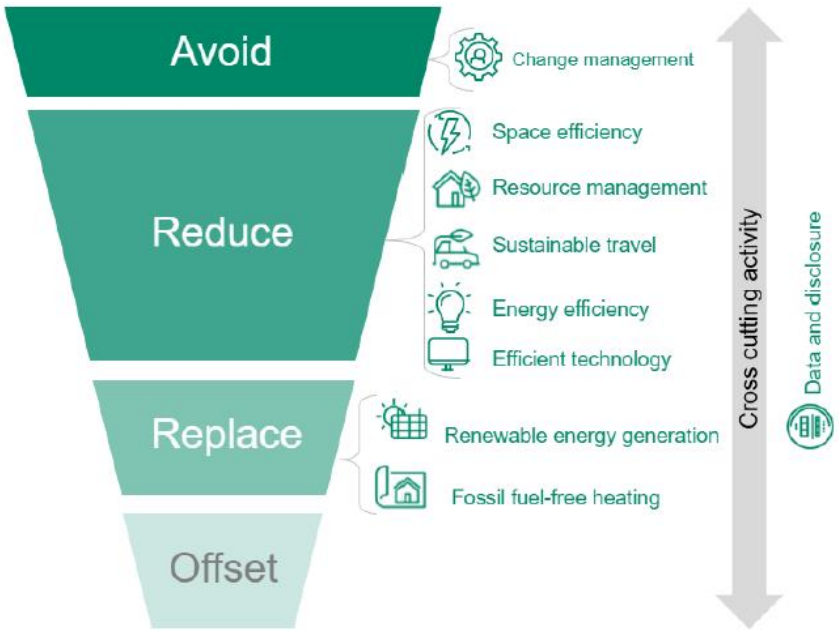
Improve energy efficiency Whole building refurbishment: DEC A; partial refurbishment: systems shall be upgraded to operate the whole building, with central BMS control of any new systems.

DEC (Display Energy Certificate) A

3.0 Setting Project Sustainability Objectives

All new and refurbishment construction projects shall deliver the objectives set out below.

3.1 Energy

	Objectives
Energy Strategy University's Energy Policy	• Employ renewable technology(s) in the energy strategy for the building. • A full dynamic thermal analysis shall be undertaken at the detailed design stage. The model shall include the energy use and heat gains associated with the equipment and the people that are likely to occupy the space. • An LCA (Lifecycle Assessment) shall be undertaken, with embodied carbon considered from the outset of the design process. This should make a clear case for new build, rather than refurbishment of an existing building (considering emboddied carbon).  The greenhouse gas management hierarchy
Energy Efficiency	• Energy reduction measures should be prioritised in projects to improve energy efficiency. • Energy modelling shall be undertaken in accordance with CIBSE TM54: Evaluating Operational Energy Performance of Buildings at Design Stage. • Post-occupancy monitoring should be undertaken to review the effectiveness of the energy modelling undertaken at the design stage. • Air tightness should target 2-3m^3 of air per hour per m^2.
Metering	• Individual metering requirements shall be included in the design brief and shall include the requirement for remote reading of meters. • The metering strategy shall be developed and agreed. • MID approved, MOD-BUS meters shall be installed. • Provision of construction site metering information shall be provided to the University's Sustainability team before project handover. • Large energy using equipment shall be separately metered. This should include boilers, hot water cylinders, air handling units as a minimum. • Electricity shall be metered at all distribution boards as well as for all main plant such as lifts and chillers.

3.2 People

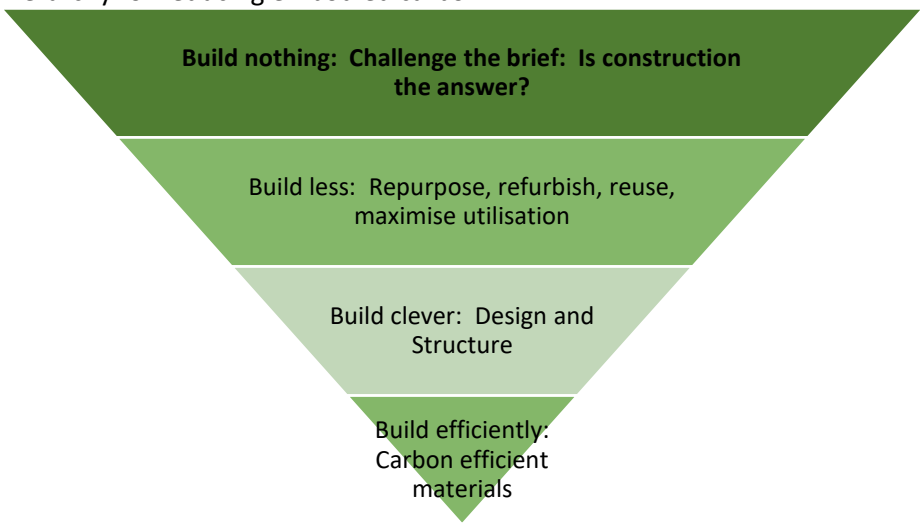
	Objectives
Occupant experience University's Thermal Comfort policy	• Wherever possible, buildings should be provided with fresh air. • Heat recovery ventilation systems shall be used to provide supply and extract air. • Simplified controls should be used to enable occupants with a level of thermal control with the University's Thermal Comfort Policy. • O3 sensor shall be fitted in all buildings to measure pollutants and control ventilation more efficiently via the BMS. • Biophillic design to help reduce CO^2 naturally and provide direct experiences of nature.

3.3 Design

	Objectives
Aspect and Orientation	• Design details for BMS and associated strategy shall be outlined in Design Stage reports. • User group feedback shall be gathered. • Specifications shall include appropriate controls, sufficient feedback, and use of Delta EntelliWeb BMS systems. • Office space planning should not site desks in front of south facing windows. • The aspect and orientation of the building shall be modelled at initial outlay of new build projects. • Designs for substantial new buildings (1,000m^2 plus) must be modelled thermally to check for any potential overheating issues. • The consideration of orientation in relation to solar PV energy generation should be integrated into building design. • Large atriums should be avoided in the design.
Whole lifecycle Assessment	• User group feedback shall be used to integrate flexibility into design and prepare for possible future changes in space utilisation. • Flexibility review shall be undertaken at the main stages, considering what buildings may be used for in the future, with consideration of: - *column height (floor to floor, and floor to ceiling)* - *Floor loadings* - *under floor heating* - *ability to alter room and floor layouts* • For new builds, a Life Cycle Cost plan should be developed at Design Stage 2 (in line with BREEAM guidance (MAN02)). • A whole life costing should use a reference period of 60 years, therefore whole life emissions should be divided by m2 and 60 years. This aligns to a wider range of European comparisons. • A third party lifecycle assessor should be appointed by the developer.

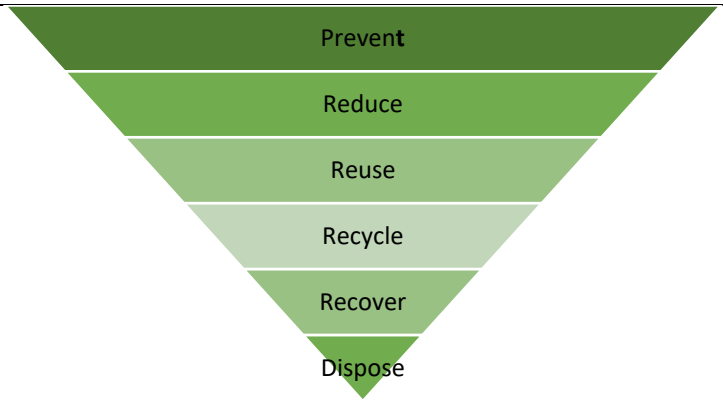
3.4 Embodied Carbon

	Objectives
Lifecycle impacts	• Use embodied carbon hierachies to reduce requirements for raw materials and optimise embodied carbon, supporting a circular economy • Products procured as part of projects shall have an EPD (Environmental Product Declaration), which includes information required to calculate embodied carbon.

	• Projects shall include an LCA at the design stage. • EPDs are required for materials, particularly products that will need to be replaced within the buildings' lifetime. • Include both operational and embodied carbon modelling and accounting, as well as material toxicity assessment, during building design to ensure a comprehensive assessment of impacts. • Hierarchy for reducing embodied carbon:  Adapted from NHS England Net Zero Building Standards (Feb 2023)

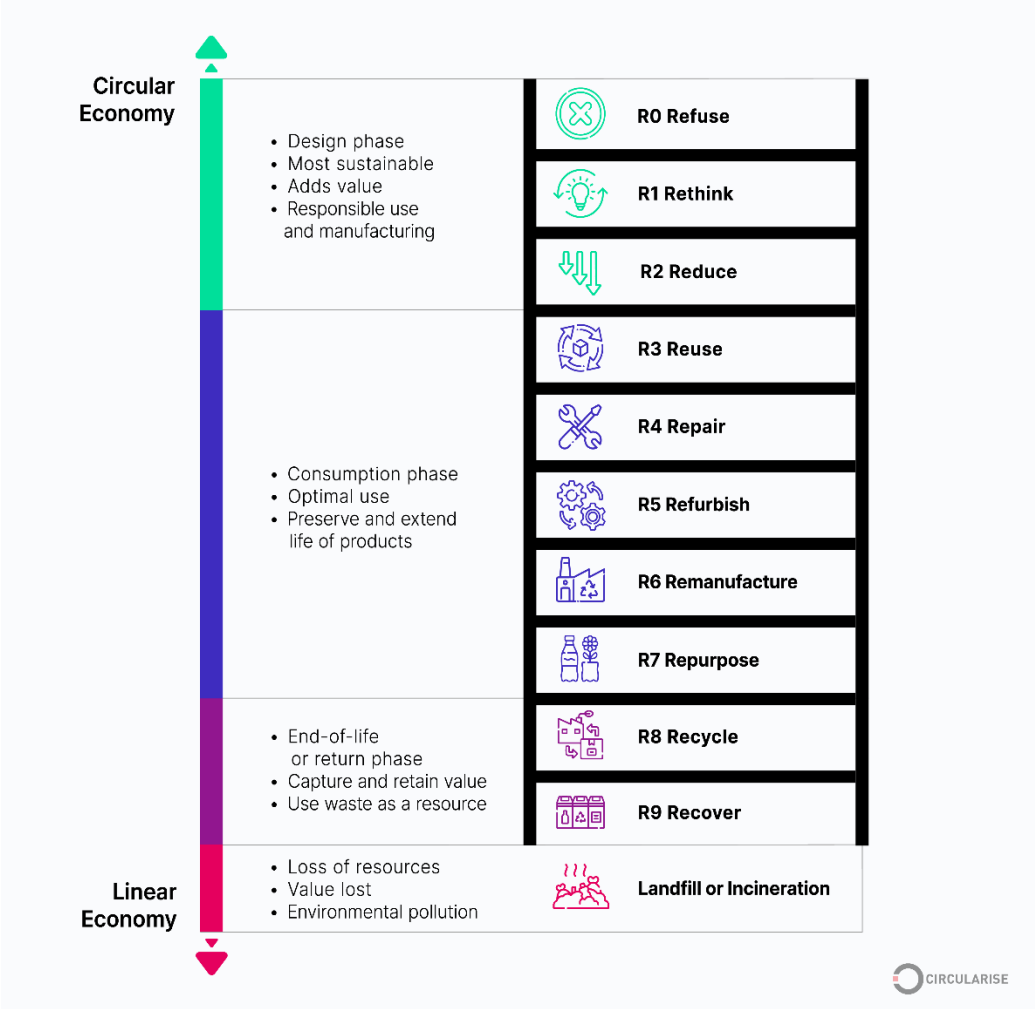
3.5 Waste

	Objectives
Managing Waste	• A Site Waste Management Plan shall be prepared prior to site works commencing. All works should aim to achieve as close to 100% diversion from landfill as possible. • Data on waste materials, volumes generated and disposal method (reuse/recycling/incineration/landfill) during construction shall be collected and reported to the University. • Recycled content should be included in materials, with communication of this information provided to Project Team, as well as building users. • Within buildings, facilities for segregating recycling and general waste streams shall be established and used, provided in line with the University's waste contract. • The University has a preference for uniform bins in all buildings across campus. Provision of bins in new build projects and refurbishments shall ensure building users have facility to segregate waste streams into 'general waste' and 'dry mixed recycling'. Where high volumes of paper are produced (i.e., adjacent to printers) paper recycling bins should also be provided. • Implement the waste hierarchy:



Circularity

- Where existing buildings or parts of a building on site will be demolished a pre-demolition audit of any existing buildings, structures shall be completed to determine if refurbishment or reuse is feasible.
- Existing furniture should be used via reupholstering and cleaning, to follow a circular approach to resource management.



Source: Circularise - R-Strategies for a Circular Economy (circularise.com)

3.6 Water

	Objectives
Efficiency Anglian Water – Strategic Direction Statement 2010-2035	• Information on flow rates shall be verified. • Low flow WCs and taps, with automatic shut off shall be installed as standard. • In new construction buildings, the BMS system should have sufficient sensors to quickly detect leaks from pipework. • Rainwater harvesters shall be used to reduce mains water consumption.
Metering	• Sub meters shall be installed for water, in accordance with the University's metering strategy.

3.7 Biodiversity

	Objectives
Nature Positive University University's Biodiversity policy University Biodiversity Action Plans	• A mixture of ecological features shall be considered as part of projects: - Green / brown roof - Green wall / hedging - Bird, bat, or bug boxes • The use of pollinator-friendly and native species shall be prioritised in landscaping schemes for new construction and landscaping projects. • All projects must adhere to legislation for biodiversity net gain. • The University's landscape management group shall be consulted on proposed landscape designs (when included in projects) to advise on ongoing maintenance requirements. • Trees shall be considered for natural shading on south facing aspects.

3.8 Travel and Transport

	Objectives
Sustainable Travel Sustainable Travel Policy	• Projects involving alternative location options, shall include consideration of the impact on the availability of sustainable travel modes. • Showers and changing facilities should be provided in all new buildings, with water efficiency measures installed. • Cycle parking spaces shall be provided for at least 10% of building users. • Cycle parking spaces shall be covered, well-lit and secure, with a preference for a locked compound with Sheffield bike stands. • In teaching and office buildings, at least one meeting room in new buildings shall have facilities for online meetings, to reduce the need for business travel.

3.9 Environmental Risks

	Objectives
Flooding	• A FRA (Flood Risk Assessment) and strategy shall be produced as part of design phase, outlining defence against the 1:100-year flood event as a minimum, plus a "freeboard" level of 100mm. • Drainage measures shall ensure that the peak rate of run-off from the site to watercourses is no greater for the developed site than for the pre-development site. • Flood calculations and assessment shall include an allowance for climate change and should be in accordance with current best practice planning guidance.

	• Building layouts shall be designed to protect key ICT services in existing buildings on the ground floor. For new buildings, key systems should be located on upper levels. • Identification of opportunities to reduce flood risk.
Extreme weather events - Heatwaves	• Adaptation to current and predicted heatwaves should be considered as part of the building design, using the Met Office UK Climate Projections (UKCP).
Land Contamination Delta Simons, 2012. – ***"Phase I Environmental Assessment Report – Land to the South and West of Brayford Pool"***	• An onsite contaminated land assessment shall be undertaken for any new developments. **Brayford Site History** The Brayford Campus is a previously developed site that has the potential for contamination. The site was a railway marshalling yard from the 1850s and there were several later industrial uses, including storage of oil. A large-scale remediation project was undertaken before the Brayford Campus was handed over to the University in the 1990s. The Science Park site also had previous industrial uses, which may have led to contamination. Due to the history of the site, it will be necessary to conduct an onsite contaminated land assessment for any new development. This is likely to be a condition of planning permission. Any intrusive investigation of contaminated land should comply with BS 10175:2011 + A2:2017 Investigation of Potentially Contaminated Sites – Code of Practice. As part of the Brayford Campus Masterplan a Phase One Geo-Environmental Assessment report was produced. This document should inform any Phase II contaminated land study around the Brayford Campus. For building projects external to the Brayford Campus it will be necessary to conduct both Phase I and II studies of the site. Liaison with the Contaminated Land Officer at the City of Lincoln Council is essential.

3.10 Procurement

	Objectives
Sustainable Procurement University's procurement strategy;	• The University shall include environmental criteria in tenders for projects. • The University, along with its appointed contractor, shall consider the environmental impacts over the lifecycle of the buildings or purchase. • Products and materials that contain recycled content should be specified.
Local	• Locally produced materials should be considered, such as Lincolnshire stone for cladding, for example. • Local contractors should be considered, to reduce travel to site.
Social Value	• The social value of projects should be mapped, including the locality of the human supply chain.

3.11 Delivery

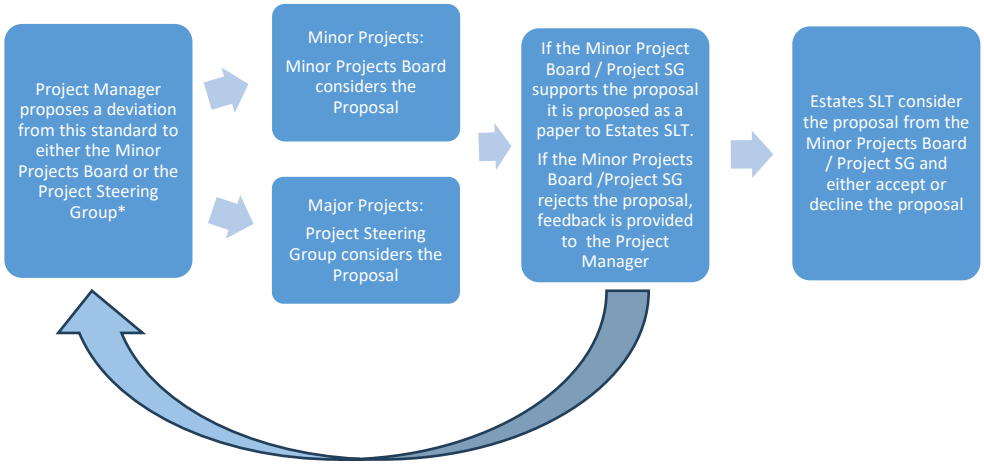
	Objectives
Commissioning and Handover	• Commissioning shall be included in the project plan from the outset, with a full commissioning plan using soft landings outlined and implemented. • A "Commissioning Manager" shall be appointed during design stage of the project • Heating/cooling pumps should have local signs documenting pump setting

4.0 Governance

The implementation of this standard is critical to reducing the University's Carbon emissions and achievement of the 2040 Net Zero goal.

Any proposed deviation from this standard must follow the process below.

Please note: A representative from the Sustainability Team should be invited to all Project Steering Groups.



*The Project Manager should propose any deviation from this standard to the appropriate Governance structure for the Project.

Version Control

Version	Author	Approved by	Date
1.0	Rebecca Mills & Claire Lea, Head of Sustainability / Sustainability Manager	ESLT	August 2024