SUSTAINABILITY: BESPOKE STRATEGY

EMMAENABLES

Sustainability principle	Item	Target	Performance measures	Similar BREEAM 2018 credits
Minimise impact of the building	Construction site impacts	Manage construction site energy and waste	Monitor site energy use, water use, waste to landfill (by principal waste stream) and recycling. Report monthly and display on site.	Wst 01 Construction waste management
construction	Material impacts	Minimise carbon and other environmental impacts of new materials used in the development.	Use timber in lieu of higher impact materials in partition studwork Source all architectural and structural timber from FSC sources All insulating materials to be zero ozone depleting and have global warming potential (GWP) less than 5. Use reclaimed material in aggregates	Mat 01 Environmental impacts from construction products Mat 03 Responsible sourcing of construction products Mat 05 Designing for durability and resilience Wst 02 Use of recycled and sustainably sourced aggregates
Ecological benefits	Enhance ecological impacts of the local environment	Enhance ecological value of the redevelopment site with local planting and trees	Provide new planting and trees to all external landscaped areas within the development Provide a new water feature to South Court external area	LE 02 Ecological risks and opportunities
Minimise pollution to air	Pollution from combustion	Minimise emissions of NOx from combustion appliances	Use gas boilers with NOx emissions < 24mg/kWh and CHP with NOx emissions < 50 mg/kWh	Pol 02 Local air quality Target equivalent of 2 credits under Pol 02
Minimise operational carbon emissions	Heating and cooling energy demand	Enhance fabric thermal performance significantly beyond statutory limits to minimise heating and cooling energy demands	U-values for new-build: walls 0.18, roof 0.13, floor 0.15, windows 0.13, rooflights 0.15 U-values for refurbishment: walls 0.27, roof 0.13, floor 0.25, windows 0.15, rooflights 0.15 Air tightness for new-build: 3 m ³ /m ² /hr @ 50 Pa Glazing g-values for mechanically cooled spaces: 0.42	
	Lighting energy demand	Achieve good practice daylighting levels to minimise demand for artificial lighting during daylight hours. Use daylight and occupancy-based controls where appropriate to avoid unnecessary lighting use. Select high efficacy fittings for use internally and externally	Achieve minimum 1% daylight factor in student bedrooms Use occupancy-detection and photocells in circulation spaces, seminar rooms and offices Achieve an average of >90 lumens/watt for internal and external light fittings	Hea 01 Visual comfort Ene 03 External lighting
	Heating and cooling energy supply	Supply heating energy using low/zero carbon sources	Use a ground source system to supply heat and cooling to New College Court and the Furness Lodge system, if found to be feasible following borehole trials.	Ene 04 Low carbon design
	Hot water energy supply	Supply hot water using low/zero carbon sources	Use a Combined Heat and Power (CHP) system to deliver hot water to the New College Court and Furness Lodge buildings	Ene 04 Low carbon design
	Electrical energy supply	Supply electrical energy using low/zero carbon sources	Use a roof-mounted photovoltaic installation to generate electrical energy on site	Ene 04 Low carbon design
	Carbon emissions target	Reduce carbon emissions of the new buildings beyond statutory requirements and typical planning targets	<i>If ground-source heat pump feasible</i> : 50% improvement on Notional Building under Part L 2013 with 40% from on-site LZC technologies	Ene 01 Reduction of energy use and carbon emissions Target equivalent of 6 Energy Performance
			If ground-source heat pump not feasible: 20% improvement on Notional Building under Part L 2013 with 10% from on-site LZC technologies	credits under Ene 01 (minimum for Outstanding)
			SAP 10 carbon factors are to be used.	
principle Minimise impact of the building construction Ecological benefits Minimise pollution to air Minimise operational carbon emissions Minimise operational water demand Enhance performance in use	Reduce water demand	Use low-flow sanitaryware to reduce water demand in the development	Target the following maximum flow rates in the sanitaryware selection: basins 5 litres/min, sinks 6 litres/min, showers 8 litres/min, WC cisterns 4.5 litres/flush	Wat 01 Target equivalent of 3 credits under Wat 01
	Meet water demand using reclaimed water	Use a rainwater harvesting system to collect water for re-use in the building and the landscape	Provide a rainwater harvesting system to collect rainwater from the New College Court roofs for use in local irrigation and the events space WCs & urinals. Target 65% offset of mains water demand for these uses. Target use of 65% of rainwater landing on the roofs.	
Minimise operational water demand Enhance performance in use	Resource use monitoring	Install energy and water monitoring systems to allow use these resources to be reliably assessed during the operational phases.	Implement an automatic metering and to monitor electricity, gas, heat and water use. Heating, water and gas to be metered by principal end use. Electricity use to be logged at maximum 15-minute intervals for principal end use and building areas. Water use to be automatically monitored to detect for leaks.	Ene 02 Energy monitoring Wat 02 Water monitoring Wat 03 Water leak detection
	Mitigate summertime overheating for future climates	Use passive measures to mitigate summertime avoiding in future climates with the aim to avoid mechanical cooling retrofit.	Use natural ventilation and exposed concrete soffits for summertime passive cooling. Performance to be demonstrated using CIBSE TM52 method for median likelihood future Cambridge climates to 2080	Hea 04 Thermal comfort
	Management of the design and its delivery to optimise efficiency and performance.	Manage the design, construction and occupation phases to ensure that efficiency is engrained throughout and to deliver a building that performs optimally in the short and long terms.	Implement a Soft Landings process for the design, procurement, construction, handover and occupation of the project. Carry out the process for phases 2 to 6 as defined by the BSRIA Soft Landings Framework, including extended aftercare and POE to 36 months post PC.	Man 01 Project brief & design Man 04 Commissioning and handover Man 05 Aftercare

SUSTAINABILITY: LOW-CARBON DESIGN

EMMAENABLES



SUSTAINABILITY: LOW-CARBON DESIGN

EMMAENABLES

	Annual CO ₂ Emissions (kgCO ₂ /m ² /year)	Reduction in CO ₂ emissions compared to baseline (%)	% Actual CO ₂ emissions reduction owing to LZC sources (%)	BREEAM Ene 01 2018 credits achieved
Planning Baseline: Notional building	25.8	0	0	0
Actual building without with PVs, CHP or GSHP	22.3	13%	0%	4
Actual building with PVs & CHP	19.5	24%	13%	6
Actual building with PVs & CHP & GSHP	12.5	51%	44%	8

- **If ground-source heat pump feasible:** 50% improvement on Notional Building under Part L 2013 with 40% from on-site LZC technologies
- If ground-source heat pump not feasible: 20% improvement on Notional Building under Part L 2013 with 10% from on-site LZC technologies
 - 6 credits under BREEAM Ene 01

SUSTAINABILITY: CARBON 'PERFORMANCE GAP' EMMAENABLES

- Gap between Part L estimation and in-use carbon emissions (from bills etc.)
- In-use student accommodation carbon emissions (20 post-2000 buildings):

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	In-use kgCO ₂ /m²	
Minimum	25	
Lower quartile	33	
Median	44	
Upper quartile	55	
Maximum	80	



SUSTAINABILITY: IN-USE CARBON EMISSIONS EMMAENABLES

- Approximate New College Court in-use carbon emissions: 18 to 40 kgCO2/m2
- Target can be refined through more detailed modelling
 - Approximate uplift owing to scheme (including Furness Lodge allowance): 90 to 140 tCO2
 - Existing off-site emissions: 377 tCO2
 - Target net reduction of on-site/offsite emissions



SUSTAINABILITY: EMBODIED CARBON & CLIMATE CHANGE ADAPTATION

EMMAENABLES

EMBODIED CARBON: PROJECT TARGETS

- Re-use of existing structures (Furness Lodge)
- Use of timber in items with higher frequency replacement e.g. timber studs
- Long-life, durable materials e.g. concrete structures, stone finishes
- Adaptability of structures e.g. basement car park

CLIMATE CHANGE ADAPTATION: PROJECT TARGETS

- Passive methods to mitigate summertime overheating in bedrooms: exposed thermally massive concrete soffits; natural ventilation for enhanced airflow
- Mitigate risk of future air conditioning
- Target compliance with CIBSE TM52 modelling standard for climates to 2080 (BREEAM is to 2050 and intent only)
- Soft Landings process to fix this in the scheme
- Drought resistant planting
- Surface water systems sized for climate change

SUSTAINABILITY: WATER USE

EMMAENABLES

- Carbon impact of pumping and wastewater treatment (approx. 0.5% UK carbon emissions)
- Future increase of droughts
- Carbon impact of heating hot water

- Reduce demand using low-flow appliances
 - Rainwater harvesting scheme:
 - * water collected from new south, west and north block roofs of the new court
 - * events space WC flushing and irrigation
 - estimated 65% rainwater used & 65% mains water use offset
 - Target 3 out of 5 BREEAM Wat 01 credits (maximum practical level)
- Monitor water use automatically

SUSTAINABILITY: POLLUTION

EMMAENABLES

- * Mitigating urban air pollution
- * Mostly transport derived in city centres

- Specification of very low NOx boilers and CHP (BREEAM maximum)
- Use of ground-source heat pump system (if feasible)
- Addition of local planting to mitigate impacts
- Reduced transport demands owing to on-site accommodation
- Bicycle parking increase
 - Low VOC materials

SUSTAINABILITY: CONSTRUCTION IMPACTS

EMMAENABLES

- Energy use:
- * Site machinery
- * Site vehicles
- * Heating & lighting of site cabins
- * Approximately 10kgCO2/m2 or about 2-5% of embodied carbon impacts
- Water use:
- Dust suppression
- * Site accommodation

PROJECT TARGETS

On-site energy & water use monitoring and monthly reporting

SUSTAINABILITY: HEALTH & WELLBEING

EMMAENABLES

- * Enhancing health, comfort and wellbeing of occupants
- * Increased productivity, reduce illness etc.
- * Mitigating future refurbishment

- Summertime overheating standards
- Minimum daylight levels in bedrooms to good practice levels or better
 - Enhanced ventilation levels
 - Landscaping for improved views and summertime cooling

SUSTAINABILITY: ECOLOGY

EMMAENABLES

- Net biodiversity gain through landscape
- Enhanced foraging grounds and habitat for birds.
- Woodland edge style planting will be provided within the shaded courtyard to provide habitat for insects and potential foraging area for birds
- Native hedging will be used to replace existing hedges
 - Sedum roofs will be provided to new residential blocks and the South Court cafe roof