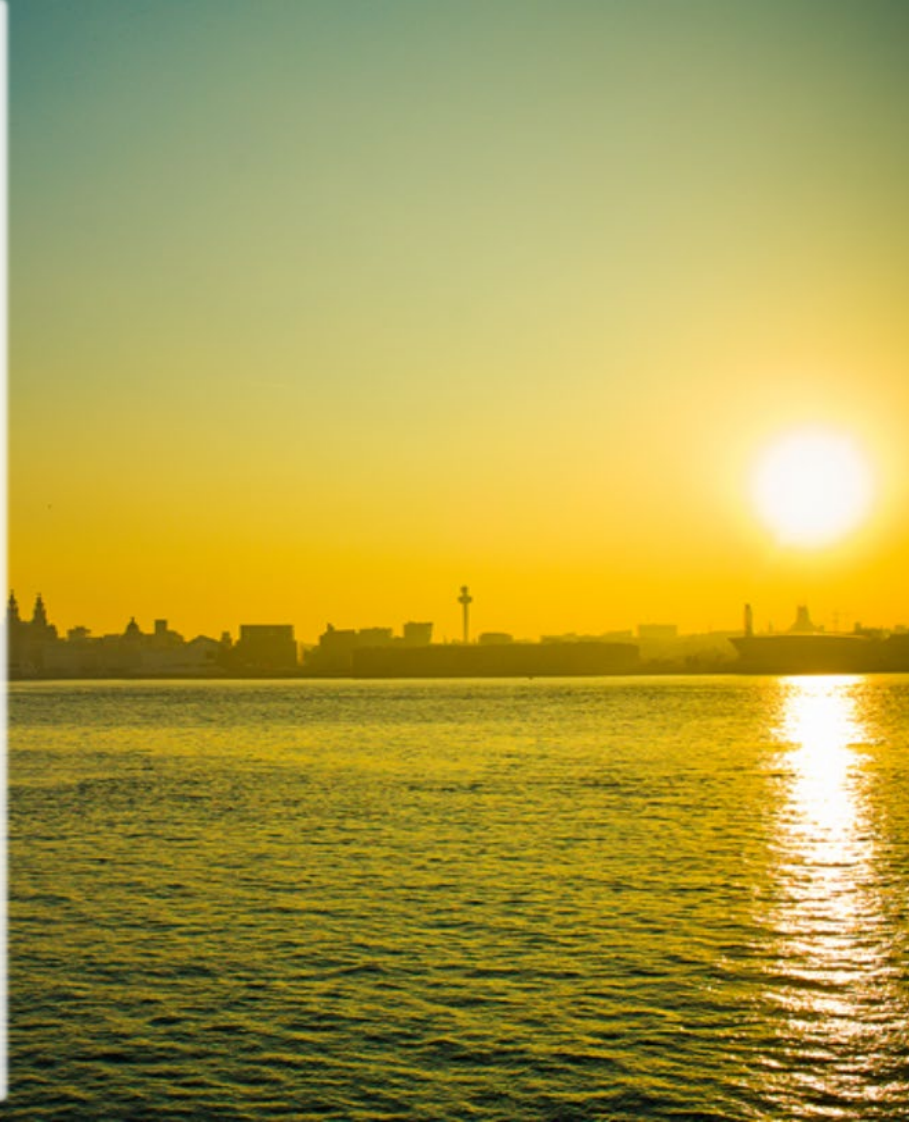


Kendrick Hall, Reading

Sustainability and Energy Statement

Ensphere Group Ltd on behalf of
Hudson Advisors



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Kendrick Hall, Reading

Sustainability and Energy Statement

Client Name: Hudson Advisors

Document Reference: 23-E126-001

Project Number: 23-E126

Quality Assurance Approval Status

This document has been prepared and checked in accordance with Ensphere Group Ltd's Quality Management System.

Issue:	Version:	Prepared by:	Reviewed by:	Date:
Final	V3	Scott Plumridge	Pete Jeavons	December 2023

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1. Executive Summary

- 1.1 This Sustainability and Energy Statement presents the sustainability credentials for the proposed redevelopment at 4 Crown Place, Reading, RG1 5AE.
- 1.2 The proposal is for a new ancillary amenity hub building for use by the residents of the existing Kendrick Hall student accommodation at the above Site.
- 1.3 A range of sustainable design features are proposed, and construction will be responsibly managed to ensure minimal impact on the environment and local community.
- 1.4 Overall, the proposals for the scheme are in line with the overarching principles of sustainable development as well as the policy requirements of the National Planning Policy Framework, and policies of the Council. When implemented, the scheme will provide an efficient and low carbon development.

2. Introduction

- 2.1 Ensphere Group Ltd was commissioned on behalf of ROK by Hudson Advisors to produce a Sustainability and Energy Statement for a proposed development at 4 Crown Place, Reading, RG1 5AE.

Site & Surroundings

- 2.2 The application site (the 'Site') is located in the south east of Reading town centre and to the south of London Road (A4).
- 2.3 The proposal is to create a new ancillary amenity hub building for use by students in the adjacent Kendrick Hall student accommodation.
- 2.4 Existing buildings forming part of the student complex are configured to create a series of landscaped courtyards with a principal access from Crown Place. The proposed development site is located within one of these courtyards at the centre of the complex and is therefore bounded by a single-storey reception building, 3, 4 and 5-storey accommodation blocks and a tall masonry boundary wall, which separates the site from existing villas to the west.
- 2.5 The immediate surroundings are predominantly educational, with the University of Reading, London Road Campus, Kendrick School, and The Abbey School all within a 0.2 mile radius. There are over 5 bus stops within a 5-minute walk, serving several routes including 81, 21 claret, and 21a claret spritzer. Reading train station is also located less than a mile away, with connections to London and the other neighbouring cities.

Development Proposals

- 2.6 A new ancillary amenity hub building for use by the residents of the existing Kendrick Hall student accommodation.

Report Objective

- 2.7 The objective of the Sustainability and Energy Statement is to outline how sustainability and the principles of sustainable development have been incorporated into the development proposals, as well as outline how energy efficiency, low carbon and renewable technologies have been considered as part of the energy and sustainability strategy.

3. Assessment Methodology

Sustainability & Sustainable Development

- 3.1 “Sustainability” is a broad concept generally used to describe the ability to perpetuate a particular state of being. It is widely used in the context of development and where there is potential for changing circumstances to cause an impediment to the perpetuation of a phenomenon.
- 3.2 The term is subjective and the understanding of the concept is influenced by perceptions and aspirations. “Sustainability” is therefore variably defined but normally encapsulates a wide range of issues, often characterised by their relationship with the economy, society and the environment (the “three pillars” of sustainability).
- 3.3 These issues are not necessarily mutually exclusive and whilst they are often presented as such, technically, the economy is a function of society; and society concerns the interrelationships and behaviours of one species within the wider environment. Nevertheless, the identification and characterisation of these issues enables a better understanding of the things that matter in decision making, which enable a balance to be struck when priorities compete.
- 3.4 The term “sustainable development” is often used interchangeable with “sustainability” but it is narrower in scope and seeks to promote the perpetuation of human advancement. The “Brundtland Report” (officially titled “Our Common Future” and written by the United Nations World Commission on Environment and Development, Chaired by Gro Harlem Brundtland in 1987), presents perhaps the most widely cited and understood interpretation of this concept:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

- 3.5 The definition introduces the concept of “needs” and the generational timeframe for evaluating whether an action is sustainable or otherwise.

Analysis Methodology

- 3.6 Given the broad definitions associated with the terminology of “sustainability” and “sustainable development”, understanding how these concepts have been interpreted and incorporated into the local planning regime requires a review of the planning policy as well as the documents upon which the policy is based. The report therefore commences with an overview of the sustainable communities’ strategy, planning policy and other considerations.

- 3.7 An appraisal of the sustainability credentials of the scheme then follows. Structure is important when assessing sustainability due to the breadth of issues being considered; an approach has been created based upon the phases of the development cycle relevant to the planning decision making processes, with consideration given to the “three pillars” (discussed above) and requirements of policy.

Assessment Matrix

	Economic	Social	Environmental
Strategic	✓	✓	✓
Design	✓	✓	✓
Construction	✓	✓	✓

- 3.8 It is recognised that the scale and nature of the scheme will affect the relative importance of the matrix dimensions and entries. For example, a single residential unit is unlikely to be viewed as having a major societal impact on the basis of its scale relative to its context. However, the societal implications of an urban extension may be much more significant.
- 3.9 The emphasis is therefore case specific, and the assessment sections of this report seek to highlight the relevant factors in a suitably balanced manner.

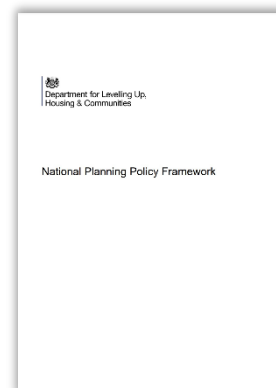
4. Planning Context

4.1 Local planning policy relevant to this report are considered below:

National Context

National Planning Policy Framework (2023)

4.2 The National Planning Policy Framework (NPPF) was updated in September 2023. Paragraphs 7, 8 and 10 of the revised NPPF include reference to the following:



7. *“The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. At a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being and environmental protection”.*

8. *“Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):*

- *An economic objective - to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;*
- *A social objective - to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities’ health, social and cultural well-being; and*
- *An environmental objective - an environmental objective – to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.”*

10. “So that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development”

Planning Practice Guidance (2016; updated 2023)

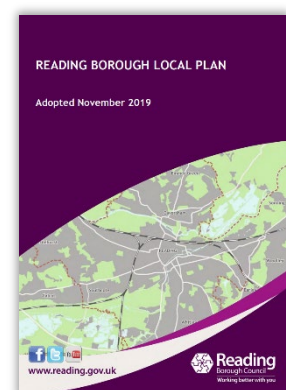
- Climate Change - Advises how planning can identify suitable mitigation and adaption measures in plan-making and the application process to address the potential for climate change.
- Design - Design affects how people interact with places and can affect a range of economic, social and environmental objectives. The guidance states that planning policies and decisions should seek to ensure that the physical environment supports these objectives.
- Natural Environment - Explains key issues in implementing policy to protect biodiversity, including local requirements.
- Environmental Impact Assessment – Explains requirements of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. This allows local planning authorities to better consider the environmental effects of a project when granting planning permission.
- Renewable and Low Carbon Energy - Guidance to help local councils in developing policies for renewable and low carbon energy and identifies the planning considerations.
- Flood Risk and Coastal Change - Advises how to take account of and address the risks associated with flooding and coastal change in the planning process.

Local Context

Reading Borough Local Plan (2019)

4.3 Adopted in November 2019, this plan guides development in Reading up to 2036, addressing some of the key issues facing the borough. A preliminary review of the local planning policy has identified the following:

- Policy CC1 (*Presumption in Favour of Sustainable Development*) – a positive approach to considering development proposals will be taken that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework (NPPF);
- Policy CC2 (*Sustainable Design and Construction*) – ensures the design of buildings and site layouts use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change.



Includes a BREEAM “Very Good” rating for minor non-residential developments or conversions, and a requirement for water conservation measures;

- Policy CC3 (*Adaptation to Climate Change*) – All developments will need to demonstrate how they have been designed to incorporate measures to adapt to climate change;
- Policy CC4 (*Decentralised Energy*) – Larger developments will need to demonstrate how consideration has been given to securing energy for the development from a decentralised energy source;
- Policy CC5 (*Waste Minimisation and Storage*) – development should demonstrate measures to minimise the generation of waste in the construction, use and life of buildings and promote more sustainable approaches to waste management.
- Policy EN12 (*Biodiversity and the Green Network*) – New development shall demonstrate how the location and type of green space, landscaping and water features provided within a scheme have been arranged such that they maintain or link into the existing Green Network and contribute to its consolidation;
- Policy EN16 (*Pollution and Water Resources*) – Development will only be permitted where it would not be damaging to the environment and sensitive receptors through land, noise or light pollution; where it would result in no deterioration in, or ideally enhance, ground and surface water quality; and where adequate water resources, sewerage and wastewater treatment infrastructure will be in place to support the proposed development prior to occupation;
- Policy EN14 (*Trees, Hedges and Woodlands*) - New development shall make provision for tree retention and planting within the application site, particularly on the street frontage, or off-site in appropriate situations, to improve the level of tree coverage within the Borough, to maintain and enhance the character and appearance of the area in which a site is located, to provide for biodiversity and to contribute to measures to reduce carbon and adapt to climate change;
- Policy EN18 (*Flooding and Sustainable Drainage Systems*) – Development will be directed to areas at lowest risk of flooding in the first instance, following the Sequential and Exceptions Test set out in the NPPF, and taking into account the effects of climate change. It will consider flooding from all sources, including fluvial, surface water, groundwater and sewer flooding;
- Policy TR1 (*Achieving the Transport Strategy*) – Planning permission will not be granted for major development proposals unless there is a commitment to implement measures to promote and improve sustainable transport facilities, such as through provision to encourage walking, cycling and the use of public transport; and through agreed travel plans,

safe routes to local facilities and services, including schools and parks, and similar measures;

- Policy TR5 (*Car and Cycle Parking and Electric Vehicle Charging*) – Development should provide car parking and cycle parking that is appropriate to the accessibility of locations within the Borough to sustainable transport facilities, particularly public transport;

Sustainable Design and Construction Supplementary Planning Document (SPD) (2019)

- 4.4 Sets out the Council's commitment to producing sustainable buildings. It also interprets existing policy on issues like climate change, energy efficiency and renewable energy. It also includes a 'Sustainable Design Checklist', which has been completed and appended to this report for reference.

5. Sustainable Design Proposals

5.1 This section presents an overview of the proposed sustainable design features for the scheme.

Materials & Waste

5.2 The materials strategy for the development shall consider lifecycle environmental impacts, durability, responsible sourcing and pre-fabrication potential, with a view to optimising materials utilisation and safeguarding natural resources.

- Consideration shall be given to embodied carbon as part of the materials selection process, in addition to other factors such as structural properties, aesthetics and cost. As a minimum reference shall be made to the BRE's Green Guide to Specification for the major elements (walls, floors, roof) where applicable, with a view to targeting products with a predominantly 'A' or 'A+' rating.
- All timber and timber-based products should be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of forestry Certification (PEFC) source.
- A preference will also be given to products and suppliers which can demonstrate operation within the structure of a formal Environmental Management System (e.g., BS EN ISO 14001, EMAS, BES 6001) on the basis that environmental risks and impacts should be better controlled.
- Durability will form part of the design with features incorporated to ensure robustness and reduced risk of damage. This is to ensure longevity and reduced need for maintenance.
- Circular economy principles will be applied with consideration given to how the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life.
- The developer will also endeavour to avoid the use of materials with a high VOC (volatile organic compound) content; therefore ensuring an improved air quality for the completed development.
- The operational waste strategy comprises provision of dedicated space of adequate size and in convenient locations for storage of general refuse and recyclables.

Ecology

The existing site is covered by hardstanding and some soft landscaping including an area of grass, areas of shrub planting, as well as formal grid of ornamental trees. Planting will aim to be enhanced as part of the development proposals, with a biodiverse green roof also proposed.

Sustainability Standards

- 5.3 Assessment against BREEAM with a targeted rating of “Very Good” is stated in the local plan. Whilst policy requirements are acknowledged, given the size of the proposed hub, this requirement is not considered viable for such a small scheme of circa 160 m².

Water

Water Conservation

- 5.4 Water saving fittings and appliances shall be installed and the following outlines the proposed maximum flow / consumption rates for each of the potential installation types:
- Dual flush toilets of 6/3 litres;
 - Bath capacity to overflow to be ~100 litres;
 - Shower flow rates to be ~7.75 litres / minute;
 - Taps to have a flow rate <5litres / minute;
 - Washing machine to be <9.5litres / kg;
 - Dishwasher to be <1.25 litres / place setting
- 5.5 Overall water consumption levels to be <105 litres / person / day.

Drainage

- 5.6 Drainage systems and wastewater discharge shall be designed in line with best practice guidance, to eliminate any pollution risks for watercourses and underground water.

Transport

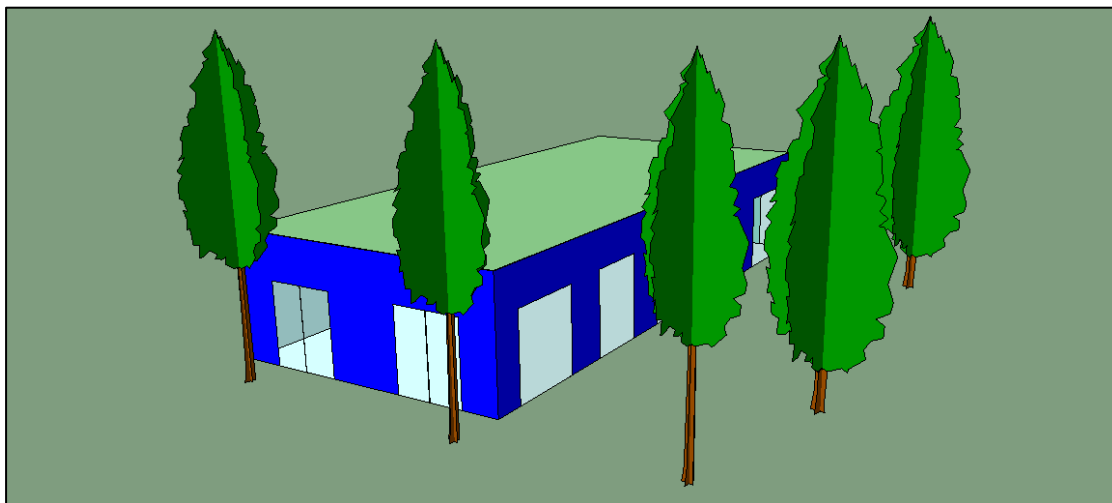
- 5.7 Access arrangements to, from and within the site remain as existing. There are therefore no access matters arising from this proposal. However, it is understood that cycle storage is provided as part of the Kendrick Hall surrounding development.

Energy

- 5.8 The approach follows the Energy Hierarchy. The first principle of the Hierarchy is to reduce demand and the need for energy in the first place. Where opportunities to improve the efficiency of the design have been maximised, consideration is then given to the second principle whereby priority is given to the efficient use of energy. This is on the basis that low carbon technologies can be cost-effective and provide significant carbon savings when compared to conventional technologies. The third principle of the hierarchy promotes the use of renewable technologies.

- 5.9 The modelling follows the Part L 2021 methodology. The development has been modelled using IES VE 2023 software and the output is appended to this report for reference.

Figure 5.1 IES Energy Model



Demand Reduction

- 5.10 In line with the first principle of the Hierarchy, the design has explored measures to reduce demand as follows:

- It is intended to optimise the extent of glazing to improve access to natural daylight whilst preserving heating within the properties.
- It is intended that the performance of the building fabric will incorporate relatively low U-values to reduce the rate at which the building loses heat, preserving the heat within the space and reducing the requirement for mechanical heating. The U-values for the basic building elements shall be enhanced compared to minimum Building Regulations standards (updated 2021); indicative upper limits are given below:

Table 3.1 Proposed Building Fabric U-Values (Indicative)

Fabric Element	Part L2 (W/m ² K)	Proposed (W/m ² K)
External Wall	0.26	0.18
Roof	0.16	0.12
Floor	0.18	0.12
Windows	1.6	1.4

- A high level of air tightness is proposed and a level below 3m³/h/m² is targeted, meaning that air infiltration between the internal and the external environment will be largely controlled and space heating demand further reduced.
- Thermal bridging is the penetration of the insulation layer by a highly conductive non-insulating material allowing rapid heat transfer from an interior to exterior environment (and vice versa). In well insulated buildings, as much as 30% of heat loss can occur through thermal bridges. The building fabric shall be constructed so that there are no reasonably avoidable thermal bridges in the insulation layers caused by gaps within the various elements.
- It is anticipated that the building will have the potential to be ventilated naturally via openable windows and / or trickle vents. This has the advantage of lower energy consumption; decreased costs associated with capital expenditure, operation and maintenance. Mechanical ventilation heat recovery and comfort cooling will also be included where necessary to ensure that energy is used efficiently in cooler months, and when it is less desirable to open windows.
- Good internal air quality will be achieved through the creation of a building envelope with a low air permeability; meaning that the building fabric will reduce the infiltration of pollution from the external environment.
- At this stage, detailed lighting design calculations have not yet been undertaken, but lighting design is intended to be highly efficient and in excess of Building Standards requirements. It is intended that lighting efficacy shall be in excess of 100 lumens/circuit Watt (likely LED).
- The external lighting strategy shall be designed to minimise light spillage and night time light pollution in line with the ILP's Guidance notes for the reduction of obtrusive light; low illuminance levels, fittings and controls shall be employed accordingly.
- Time and temperature controls by suitable arrangement will be installed in order to maximise the efficiency of the heating system.

Heating Systems

- 5.11 Where energy is required, there is a preference at this stage for the use of electrical sources on the basis that the National Grid is decarbonising relatively swiftly with electricity now being lower carbon than natural gas.

Carbon Savings

- 5.12 The energy strategy is therefore reliant on highly efficient building fabric. Since the new systems are all electric, it is anticipated that the building will effectively become net-zero overtime, in line with the National Grid.

6. Sustainable Construction Proposals

- 6.1 It is recognised that the construction industry has the potential to cause significant environmental impacts through resource use, waste generation and pollution. It is therefore proposed to manage the construction phase in a sustainable manner to ensure that these impacts are reduced.

Responsible Construction Practices

- 6.2 It is anticipated that the scheme will be registered with the Considerate Constructors Scheme to ensure that the contractor carries out the construction operations in a safe and considerate manner, with due regard to local residents, road users, the workforce and the environment.
- 6.3 It is expected that the principal contractor for the project shall also operate a third party certified Environmental Management System (EMS), demonstrating sound management and systematic control of environmental impacts.

Materials Optimisation and Waste

- 6.4 Suitable waste and recycling facilities will be provided within the Development to collect and segregate wastes generated through the operation of the Site.
- 6.5 During construction, waste generation will be minimised where possible, with appropriate mechanisms/protocols for segregating waste on-site and for overall waste management.

Pollution Prevention

Pollution Prevention Guidelines

- 6.6 The Environment Agency's (EA) Pollution Prevention Guidelines (PPG) shall be followed as appropriate to minimise pollution risk from construction activities; works will also be in line with the Environment Agency's Building a better environment, A guide for developers (2006) guidance.

Air Pollution

- 6.7 Best practice methods for minimising the formation of dust and emissions from construction activities shall be implemented, as appropriate to the specific site and proposed activities. In addition, the contractor shall comply with the BRE Code of Practice to control dust from construction and demolition activities.

Water Pollution

- 6.8 Appropriate measures shall be implemented to minimise risks of watercourse and underground water pollution, in line with EA's PPG 5 Works in, near or liable to affect watercourses and the Guide for developers Building a better environment, as stated above.

7. Summary

- 7.1 This Sustainability and Energy Statement provides an overview as to how the proposed scheme contributes to sustainable development in the context of the strategic, design and construction considerations.
- 7.2 Sustainability is a broad concept and covers a range of environmental, social and economic considerations. A review of the policies outlined within the Reading Borough Local Plan has identified a number of requirements relating to sustainable development. Of these, Policy CC1 (*Presumption in Favour of Sustainable Development*) and Policy CC2 (*Sustainable Design and Construction*) are considered most pertinent.
- 7.3 The proposal is for a new ancillary amenity hub building for use by the residents of the existing Kendrick Hall student accommodation.
- 7.4 A range of sustainable design and construction features are proposed including:
- Highly thermally efficient building fabric.
 - A biodiverse green roof.
 - All-electric heating strategy.
 - Highly efficient lighting.
 - Water saving sanitary fittings and appliances to deliver a water efficient development.
 - The use of materials with a low lifecycle environmental impact and embodied energy.
 - Consideration of the principles of Secured by Design.
 - Efficient construction and operational waste management.
- 7.5 Overall, the proposals for the scheme are in line with the overarching principles of sustainable development as well as the policy requirements of the planning authority. When implemented, the scheme will provide an efficient and low carbon development.

Appendices

A. Site Plan

B. Reading Sustainable Design and Construction

SPD Checklist

Table A1.2: SUSTAINABLE DESIGN CHECKLIST FOR NON-RESIDENTIAL DEVELOPMENT

Sustainable Design Checklist	
Management	
<i>Aim: To recognise and encourage environmentally and socially considerate development.</i>	
1.	Will guidance for the non-technical building user be provided so they can understand and operate the building efficiently and understand how the design reduced the overall environmental impact of the building and raise environmental awareness? Yes
2.	What consideration has been given to resource use, energy consumption and pollution in terms of the construction site impacts? See section 6 above
3.	Will site investigation and appropriate remedial action be undertaken? N/A
4.	Will the community and stakeholders be involved in the design process encouraging flexibly designed buildings which cater for shared use with the local community? N/A
5.	How has the building been designed to reduce the opportunity for and the fear of crime? Located in the student accommodation courtyard - external lighting & CCTV installed
6.	What consideration has been given to the maintenance of the building? Material durability considered. Building management will likely be the same as the student accommodation.
Health and Well-being	
<i>Aim: To ensure a good quality amenity level is afforded to occupants of buildings.</i>	
7.	How has the development been designed to ensure users have sufficient daylight, an external view, adequate and appropriate lighting, ventilation, air quality and drinking water? Will be used for amenity, nevertheless there will be large openable windows, adequate lighting etc provided.
Energy	
<i>Aim: To conserve energy and maximise the use of energy efficiency techniques.</i>	
8.	How has the building been designed to minimise CO2 emissions associated with their operational energy consumption? High fabric efficiency with consideration of energy hierarchy.
9.	How has the development been designed to optimise the use of the energy from the sun, natural daylighting and controlled natural ventilation? Balance has been sought see section 5
10.	How will the design of the building make efficient use of energy? (e.g. use of thermally massive materials, levels of insulation and use of green/brown roofs etc.). See section 5 above
11.	Have renewable energy sources or decentralised energy been considered for this development and if so, how would they be incorporated within the development? An all electric heating strategy is proposed to align with the decarbonisation of the National Grid.
Transport	
<i>Aim: To reduce the need to travel through appropriately located development.</i>	
12.	How has the design and layout incorporated measures to reduce the need to travel, especially by car, and promote alternative and sustainable modes of transport such as walking, cycling and the use of public transport? N/A as development located within existing student halls
13.	How have public transport networks been considered in terms of the location of the development and proximity to local amenities? In close proximity to local bus routes but same as previous statement so N/A
14.	How have deliveries and the manoeuvring of delivery vehicles been considered? N/A as development within existing halls of residence with relevant infrastructure

Water

Aim: To improve efficiency in the use of water, conserve water resources and minimise vulnerability to flooding.

15. How will the development incorporate the use of water saving devices to achieve a maximum consumption of 5.5 cubic m per year per person for office developments? (or the most appropriate benchmark for other types of development) [See section 5.4 consumption rates for appliances](#)
16. Will the development and access to and from it such as roads and paths be located away from areas of potential flooding? [Located in flood zone 1 so low risk of flooding](#)
17. How will the development incorporate harvesting and re-use of rainwater? [N/A](#)
18. Does this development meet the requirements of EN18? [Appropriate drainage to be created.](#)

Materials

Aim: To retain local character and promote the use of materials with a low environmental impact.

19. How will the selected materials help retain local character, ensure long life and ensure a low environmental impact, including consideration of embodied energy? [See section 5.2 - green roof will also increase biodiversity and minimise impact](#)
20. What consideration has been given to reusing materials in-situ, responsibly sourcing materials and re-using existing structures? [No existing building so no re-use - see section 5.2 for details of strategy](#)

Waste

Aim: To minimise the production of waste and maximise re-use and recycling.

21. Has an audit of the materials present on the site been conducted with an assessment of the extent to which materials could be re-used? [N/A](#)
22. How will the development make the maximum use of construction, demolition waste and recycled materials? [Materials strategy aims to optimise material utilisation - section 5.2](#)
23. How will provision be made for the storage and recycling of waste for all users of the site? [Proposed operational waste strategy incorporates location and storage considerations](#)

Land Use and Ecology

Aim: To retain, protect and enhance wildlife habitats and natural features.

24. How have the wildlife habitats and natural features on and adjacent to the site been considered and how will they be retained, protected and enhanced? [Green roof and planting proposed to enhance biodiversity](#)
25. What consideration has been given to not using previously undeveloped land? [N/A](#)
26. What consideration has been given to the removal of contamination from the land?

Pollution

Aim: To minimise damage to the environment through air, ground/surface water, land, noise or light pollution.

27. What measures have been incorporated to ensure that noise and light pollution plus pollution transported through surface water runoff or infiltration will be minimised through the development? [Noise and light pollution will be minimised - see section 5.13](#)
28. What measures have been incorporated to ensure that light pollution will be minimised through the development? [Considerate of the ILP's Guidance notes for the reduction of obtrusive light: low illuminance levels, fittings and controls shall be employed accordingly.](#)
29. What consideration has been given to reducing refrigerants and minimising nitrogen dioxide emissions? [Energy strategy is all electric. Refrigerant leakage will aim to be minimised.](#)
30. How has the development been sited to minimise the impact of flooding? [Green roof proposed](#)
31. How has the design considered the use of sustainable drainage systems (SuDS) and how will they be incorporated within the development?
[Green roof and soft landscaping to be incorporated to improve site drainage](#)

Innovation

Aim: To recognise innovation in the field of sustainability.

32. What consideration has been given to innovative sustainability measures in terms of a procurement strategy, design feature, management process or technological
[Applicant aims to maximise sustainable procurement and high quality design.](#)

C. Indicative Energy Modelling Output

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

Kendrick Hall

As designed

Date: Fri Dec 08 12:40:30 2023

Administrative information

Building Details

Address: 4 Crown Place, Reading, RG1 5AE

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.23

BRUKL compliance module version: v6.1.e.1

Certifier details

Name:

Telephone number:

Address: , ,

Foundation area [m²]: 158.55

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	9.86
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	8.86
Target primary energy rate (TPER), kWh _m /m ² annum	104.24
Building primary energy rate (BPER), kWh _m /m ² annum	92.77
Do the building's emission and primary energy rates exceed the targets?	BER <= TER BPER <= TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _a Limit	U _a Calc	U _i Calc	First surface with maximum value
Walls*	0.26	0.18	0.18	SP000001_W1
Floors	0.18	0.12	0.12	SP000001_F
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.12	0.12	SP000001_C
Windows** and roof windows	1.6	1.4	1.4	SP000001_W1_O0
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors
U _a Limit = Limiting area-weighted average U-values [W/(m ² K)] U _a Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i Calc = Calculated maximum individual element U-values [W/(m ² K)]				
* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.				
** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.				
^ For fire doors, limiting U-value is 1.8 W/m ² K				
NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				
Air permeability	Limiting standard	This building		
m ³ /(h.m ²) at 50 Pa	8	3		

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Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- ASHP Space heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.5	5	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system	YES				

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

"No zones in project where local mechanical ventilation, exhaust, or terminal unit is applicable"

General lighting and display lighting		General luminaire		Display light source	
Zone name		Efficacy [lm/W]		Efficacy [lm/W]	Power density [W/m ²]
Standard value		95		80	0.3
Space		100		-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Space	NO (-27.8%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m ²]	158.6	158.6		Retail/Financial and Professional Services
External area [m ²]	519	519		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m ³ /h/m ² @ 50Pa]	3	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	133.46	182.47		Storage or Distribution
Average U-value [W/m ² K]	0.26	0.35		Hotels
Alpha value* [%]	31.07	19.6		Residential Institutions: Hospitals and Care Homes
			100	Residential Institutions: Residential Schools
				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
				Residential Spaces
				Non-residential Institutions: Community/Day Centre
				Non-residential Institutions: Libraries, Museums, and Galleries
				Non-residential Institutions: Education
				Non-residential Institutions: Primary Health Care Building
				Non-residential Institutions: Crown and County Courts
				General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger Terminals
				Others: Emergency Services
				Others: Miscellaneous 24hr Activities
				Others: Car Parks 24 hrs
				Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	19.41	30.68
Cooling	7.71	4.84
Auxiliary	0	0
Lighting	6.36	5.16
Hot water	28.83	28.83
Equipment*	25.92	25.92
TOTAL**	62.32	69.53

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
 ** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	343.67	368.34
Primary energy [kWh _{PE} /m ²]	92.77	104.24
Total emissions [kg/m ²]	8.66	9.86

HVAC Systems Performance

System Type	Heat dem MJ/m ²	Cool dem MJ/m ²	Heat con kWh/m ²	Cool con kWh/m ²	Aux con kWh/m ²	Heat SSEE SSEEF	Cool SSEE SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	239.9	103.7	19.4	7.7	0	3.43	3.74	3.5	5
Notional	291.6	76.7	30.7	4.8	0	2.64	4.4	----	----

Key to terms

Heat dem [MJ/m ²]	= Heating energy demand
Cool dem [MJ/m ²]	= Cooling energy demand
Heat con [kWh/m ²]	= Heating energy consumption
Cool con [kWh/m ²]	= Cooling energy consumption
Aux con [kWh/m ²]	= Auxiliary energy consumption
Heat SSEE	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEE	= Cooling system seasonal efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

D. General Notes

The report is based on information available at the time of the writing and discussions with the client during any project meetings. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by Ensphere Group Ltd for inaccuracies in the data supplied by any other party.

The review of planning policy and other requirements does not constitute a detailed review. Its purpose is as a guide to provide the context for the development and to determine the likely requirements of the Local Authority.

No site visits have been carried out, unless otherwise specified.

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