

Sustainability Statement

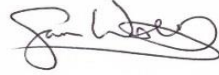
Broad Street Mall, Reading

Prepared for McLaren (Broad Street Mall) Ltd and UREF III LP
22nd December 2023



envision

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1 EXECUTIVE SUMMARY

- 1.1 Envision has been appointed by McLaren (Broad Street Mall) Ltd and UREF III LP (the applicant) to produce a Sustainability Statement to support a planning application for the construction of a residential-led scheme with ground floor retail units, associated landscaping and public realm improvements. As well as, alterations to the existing vehicular access to the shopping centre car park and provision of cycle parking and waste storage at Broad Street Mall, Reading.
- 1.2 The primary purpose of this document is to explain how the scheme can meet with Reading Borough Council's energy and sustainability policies.
- 1.3 Envision have undertaken a review of the relevant policies and worked with the design team to determine and agree the relevance and approach that should be taken to fulfil each policy.

Scope

- 1.4 To explain the approach that will be taken to address sustainable design and construction in line with the ambitions of Policies CC2-CC5, EN18 and H5 of the Reading Borough Council local plan, the Sustainability Statement is structured as follows:
 - Section 2 provides a description of the proposed development;
 - Section 3 provides a description of the main sustainability policies relevant to the application;
 - Section 4 provides a summary of the sustainability commitments for the project, including examining the practical application of BREEAM;
 - Section 5 provides responses to the Reading SPD Sustainability Checklists for the project, measuring performance and compliance;
 - Section 6 provides a concluding summary;
 - Appendix I contains the BREEAM Pre-Assessment;
 - Appendix II contains the Part L BRUKL for the scheme, used to inform the BREEAM Pre-Assessment.

2 CONTEXT AND PROPOSALS

Location & Existing Situation

- 2.1 The Site is located at Broad Street Mall, Broad St, Reading RG1 7QE. The site is referred to in this application as Broad Street Mall and the proposed development comprises three tower blocks (Blocks A - C) that extend from west to east along Dusseldorf Way. The blocks are interconnected at ground floor level and first floor levels. A smaller residential block is connected to the easternmost tower block (Block D) and is accessed from this block, but provides a distinct change in scale, design ethos and materiality. The towers and smaller block comprise apartments and residential amenity and servicing space. The ground floor of the development also consists of a mix of non-residential units, which include flexible Class E uses, residential lobbies and a gym. The basement will provide an amended vehicle access to the existing shopping mall car park via a new car park ramp, as well as accommodating plant spaces and refuse stores for each of the non-residential units and apartment blocks above. The site is bounded by the existing shopping centre to the north, existing buildings on St. Mary's Butts to the east, Dusseldorf Way to the south and Queens Walk to the west.

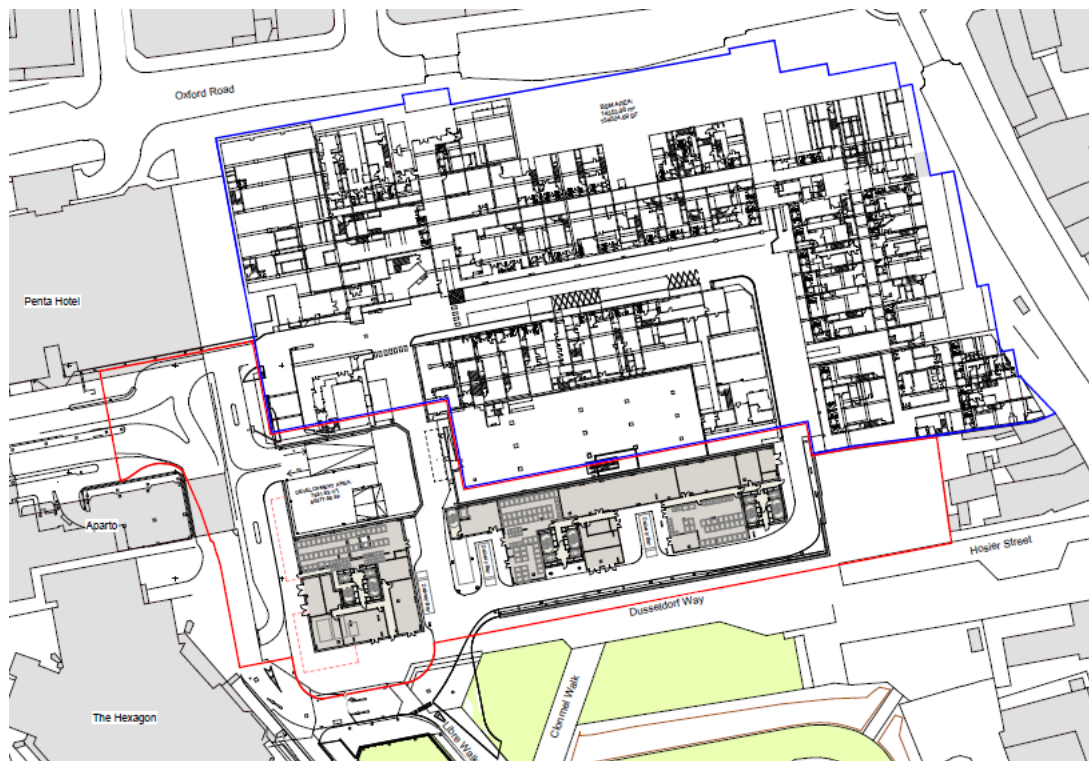


Figure 2.1 – Site Location (image courtesy of AHR Architectures Ltd)

The Proposed Development

2.2 The proposal is for a redevelopment to the south part of the existing shopping mall at Broad Street to provide adjacent ground floor retail units with three residential tower blocks above ranging from ground plus 18-29 storeys and a smaller 7 storey residential block. With residential amenity and servicing space, associated landscaping, public realm improvements, alterations to the existing vehicular access and provision of cycle parking and waste storage. The scheme comprises:

1. Flexible Class E uses, residential uses and shopping centre entrance provided on Dusseldorf Way;
2. Three residential towers to Dusseldorf Way;
3. A smaller, separate residential block;



Figure 2.2 – South Elevation (image courtesy of AHR Architectures Ltd)

3 SUSTAINABILITY POLICY & DRIVERS

- 3.1 A key mechanism for delivering the principles of sustainable and low-carbon development lies within the UK planning system, which is implemented through national guidance along with regional and local planning policies. A review of all the relevant policy documents was undertaken in order to gain an understanding of the guiding policies for sustainability.

National Planning Policy Framework

- 3.2 The National Planning Policy Framework was updated on 19 December 2023 and sets out the government's planning policies for England and how these are expected to be applied. This revised Framework replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018, updated in February 2019 and revised in July 2021.
- 3.3 The NPPF sets out a presumption in favour of sustainable development, and the need to support economic growth through the planning system. 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 – 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.
- 3.4 The NPPF notes that the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.
- 3.5 Furthermore, the NPPF sets out how local authority development plans should take a proactive approach to mitigating and adapting to climate change, taking into account the

long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures.

Reading Borough Council Planning

3.6 The most relevant policies which need to be considered when assessing the scheme's compliance to sustainability policy are those provided within local development documents. Reading Borough Council (RBC) is currently working to three primary documents relating to energy, CO₂ reductions and sustainability:

1. Reading Borough Local Plan (Adopted November 2019);
2. Sustainable Design & Construction SPD (Adopted December 2019).
3. Reading Climate Emergency Strategy 2020-25 (Adopted November 2020)

3.7 The policies and guidance pertinent to the energy and sustainability of new-build development from the aforementioned policy documents are as follows:

Policy CC2: Sustainable Construction and Design (Local Plan)

3.8 This policy requires proposals for new development, including the construction of new buildings to comply with the following;

1. The design of buildings and site layouts must use energy, water, minerals, materials and other natural resources appropriately, efficiently and with care and take account of the effects of climate change;
2. All minor non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM 'Very Good' standard as a minimum;
3. All non-residential development or conversions to residential should incorporate water conservation measures so that predicted per capita consumption does not exceed the appropriate levels set out in the applicable BREEAM standard. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy and cost effective.

Policy CC3: Adaptation to Climate Change (Local Plan)

3.9 This policy requires proposals for new development to incorporate measures to adapt to climate change including;

1. New buildings shall be orientated to maximise the opportunities for both natural heating and ventilation and reducing exposure to wind and other elements;
2. Proposals involving both new and existing buildings shall demonstrate how they have been designed to maximise resistance and resilience to climate change for example by including measures such as solar shading, heating and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, etc.
3. Use of trees and other planting, where appropriate as part of a landscape scheme, to provide shading of amenity areas, buildings and streets and to help to connect habitat,

designed with native plants that are carefully selected, managed and adaptable to meet the predicted changed climatic conditions; and

4. All development shall minimise the impact of surface water runoff from the development in the design of the drainage system, and where possible incorporate mitigation and resilience measures for any increases in river flooding levels as a result of climate change

Policy CC4: Decentralised Energy (Local Plan)

- 3.10 Any development of more than 20 dwellings and/ or non-residential development of over 1,000 sq m shall consider the inclusion of decentralised energy provision, within the site, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision.

Policy CC5: Waste Minimisation & Storage (Local Plan)

- 3.11 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, including the reuse and recycling of construction waste and the promotion of layouts and designs that provide adequate, well-designed space to facilitate waste storage, reuse, recycling and composting.

Policy EN18: Flooding & Sustainable Drainage Systems (Local Plan)

- 3.12 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. Where development in areas at risk of flooding is necessary, it will not reduce the capacity of the flood plain to store floodwater, impede the flow of floodwater or in any way increase the risks to life and property arising from flooding. Wherever possible, development should be designed to reduce flood risk, both on- and off-site.
- 3.13 All major developments must incorporate sustainable drainage systems (SuDS) as appropriate and in line with the Government's Technical Standards.

Policy H5: Standards for New Housing (Local Plan)¹

- 3.14 New build housing should be built to the following standards, unless it can be clearly demonstrated that this would render a development unviable:
 1. All new build housing will be built to the higher water efficiency standard under Regulation 36(3) of the Building Regulations;
 2. All major new-build residential development should be designed to achieve zero carbon homes.²

¹ This is the primary policy against which the Energy Statagy, by Hoare Lea will be structured.

² Zero Carbon Homes as defined in Sustainable Design & Construction SPD: In achieving Zero Carbon Homes for major residential developments, the preference is that new build residential of ten or more dwellings will achieve true carbon neutral development on-site. If this is not achievable, it must achieve a minimum of 35% improvement in regulated emissions over the Target Emissions Rate in the 2013 Building Regulations, plus a Section 106 contribution of £1,800 per

Sustainable Design Checklist (Sustainable Design & Construction SPD)

- 3.15 For major applications, a Sustainability Statement based on a sustainability checklist should be submitted at the submission stage. The two sustainable design and construction checklists (domestic & non-domestic) are based on the BREEAM standards but are not a complete repetition of these requirements. They are intended to help provide pointers as to the type of considerations that the development should be taking into account in order to achieve relevant standards of the BREEAM and/or Zero Carbon Homes and thereby comply with policies CC2-CC5, EN18 and H5.³

remaining tonne towards carbon offsetting within the Borough (calculated as £60/ tonne over a 30 year period).

³ The sustainability checklist forms the structure of the sustainability statement.

4 SUSTAINABILITY STATEMENT

4.1 This section provides an account of the sustainability benefits of the proposed development, and how the requirements of Reading Borough Council (RBC) Local Plan policies have been met by the development proposals. The following headlines are considered in this section:

- BREEAM;
- Water Conservation;
- SuDs & Flood Risk Management;
- Materials and Waste;
- Sustainable Transport;
- Pollution Prevention; and
- Biodiversity.

BREEAM

4.2 Policy CC2 of the RBC Local Plan relates to sustainable construction standards and requires; “All major non-residential developments or conversions to residential are required to meet the most up-to-date BREEAM ‘Excellent’ standards,” and “should incorporate water conservation measures so that predicted per capita consumption does not exceed the appropriate levels set out in the applicable BREEAM standard. Both residential and non-residential development should include recycling greywater and rainwater harvesting where systems are energy and cost effective.”

4.3 BREEAM assessments provide a sustainability rating for non-domestic buildings by giving consideration to a range of criteria. This includes principles of Management, Health & Wellbeing, Energy, Transport, Water, Materials, Waste, Land Use & Ecology and Pollution. Innovation credits are also available, representing new or exemplary performance in a specific sustainability issue.

4.4 Envision is a BREEAM assessment organisation and holds Accredited Professional status with the BRE. A review has been undertaken to consider the applicability of the BREEAM standards towards a development of this nature.

4.5 The non-domestic part of the development is being taken forward to include shell only with associated landscaping and provision of cycle parking and waste storage located in the basement.

Target Levels

- 4.6 The target for the proposed works is 'Excellent' which is equal to or greater than 70%. BREEAM scoring bands are shown below.

Table 3.1 – BREEAM Scoring Bands

Target	Score
UNCLASSIFIED	<30
PASS	≥30
GOOD	≥45
V GOOD	≥55
EXCELLENT	≥70
OUTSTANDING	≥85

Mandatory Credits

- 4.7 The majority of credits within BREEAM New Construction are tradable, meaning that there is some flexibility to how a specific target can be achieved. BREEAM also includes a number of mandatory standards, which must be met in order to achieve Excellent. These credits are shown in the table below. The predictive assessment makes reference to these where appropriate.

Table 3.2 – Mandatory Credits

BREEAM issue	Minimum Requirement for Excellent
Man 03 – Responsible construction practices	One Credit (Responsible construction management)
Man 04 – Commissioning and handover	One Credit (commissioning test schedule & responsibilities)
Man 04 – Commissioning and handover	Criterion 11 (Building User Guide)
Man 05 – Aftercare	One Credit (Commissioning implementation)
Ene 01 – Reduction of energy use and carbon emissions	Four credits
Ene 02 – Energy monitoring	One Credit (First sub-metering credit)
Wat 01 - Water consumption	One Credit
Wat 02 – Water Monitoring	Criterion 1 only
Mat 03 – Responsible Sourcing	Criterion 1 only
Wst 03 - Operational waste	One Credit

Assessment Scope

- 4.8 In order to complete the assessment, a number of parameters need to be fixed. These define the criteria and effectively remove erroneous credits for the assessment procedure. The following scope has been selected for this purpose.

Table 3.3 – Assessment Parameters

Parameters	Industrial
Project Scope	Shell Only
Building Type	Retail
Building Type – Sub Group	Class E, D2
Heating and Cooling	Yes
Commercial Scale Refrigeration	No
Internal / External Soft Landscaping	Yes
Unregulated Water Demands	Yes
Unregulated Energy Demand Systems	No
Lifts / Escalators	No

BREEAM Scoring

- 4.9 The proposed development is predicted to reach a score of Excellent (78%). The scoring against each category is shown in Figure 3.1.

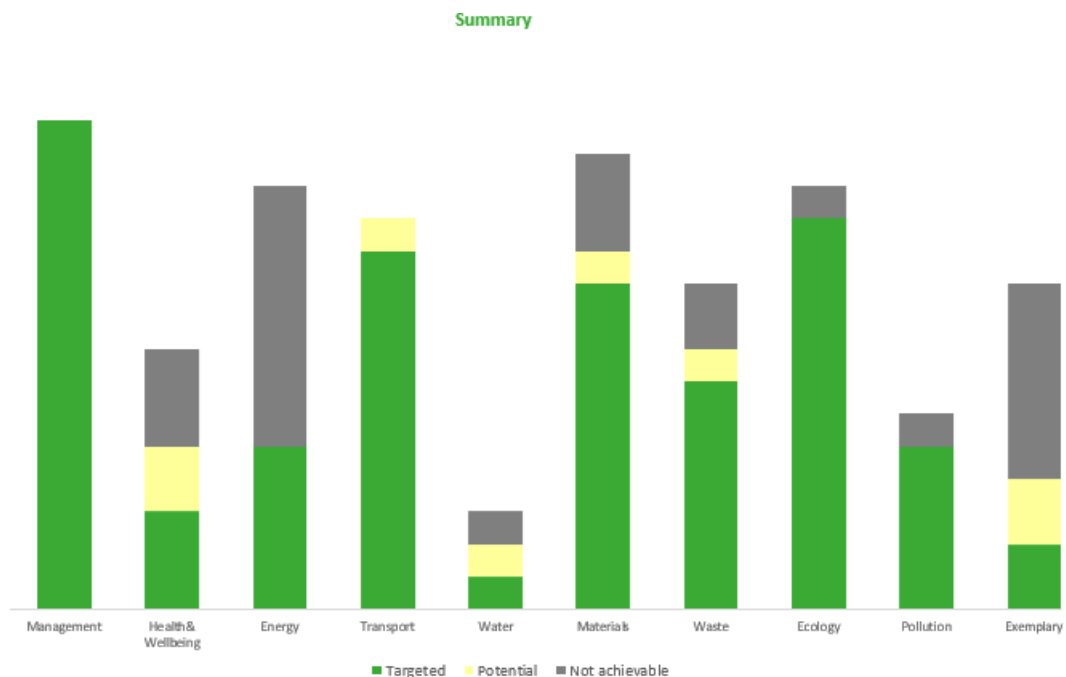


Fig 3.1 – Whole Building Score

Proposed BREEAM Measures

- 4.10 The proposed BREEAM measures to achieve the Excellent rating are discussed within this statement and presented in full in Appendix I. These include, but are not limited to:
- An energy strategy, by Hoare Lea which demonstrates how building regulations standards can be achieved through the use of high efficiency equipment and solar panels.
 - Energy efficient lighting, utilising PIR, daylight sensors and timers.
 - A materials efficiency and durability assessment will be carried out, with a view to promote circularity in the development.
 - A Net Gain in Biodiversity will be achieved through installation of native flora species and habitat creation. This will be supported by a Landscape and Habitat Management Plan.
 - Sustainable drainage, improving attenuation on site from existing conditions.
 - Light pollution from the buildings has been considered and would be mitigated through the layout and specification of highly efficient LED lighting.

Water Conservation

- 4.11 Policy CC2 of the RBC Local Plan requires developments to make efficient use of water.
- 4.12 Water consumption for retail units will vary depending on the end use. The scheme is being brought forward as a Shell Only scheme resulting in the water efficiency of water appliances being filtered out of the BREEAM assessment. However water meters with pulsed output and BMS connected on mains water supply will be installed.
- 4.13 The measures will include:
- Building water meter(s) with pulsed output.

SuDs & Flood Risk Management

- 4.14 Climate change is also considered to yield wetter winters with an increased frequency of intense rainfall. This can overcome drainage infrastructure and cause flash flooding. RBC Local Plan Policy CC3 requires that any new development “shall minimise the impact of surface water runoff from the development in the design of the drainage system, and where possible incorporate mitigation and resilience measures for any increases in river flooding levels as a result of climate change.” This has been reviewed as part of the Flood Risk Assessment and Drainage Strategy and appropriate measures will be implemented as part of the development.
- 4.15 A Flood Risk Assessment and Drainage Strategy has been undertaken by Meinhardt, which has outlined that ‘the Site there are no significant flood risk concerns for the development. All sources of flooding have been investigated and have been deemed low/negligible.’ The

Environment Agency's indicative floodplain map also indicates that the site falls within Flood Zone 1, i.e. at less than 0.1% chance of flooding in any one year. Therefore, the probability of tidal or fluvial flooding is assessed as negligible.

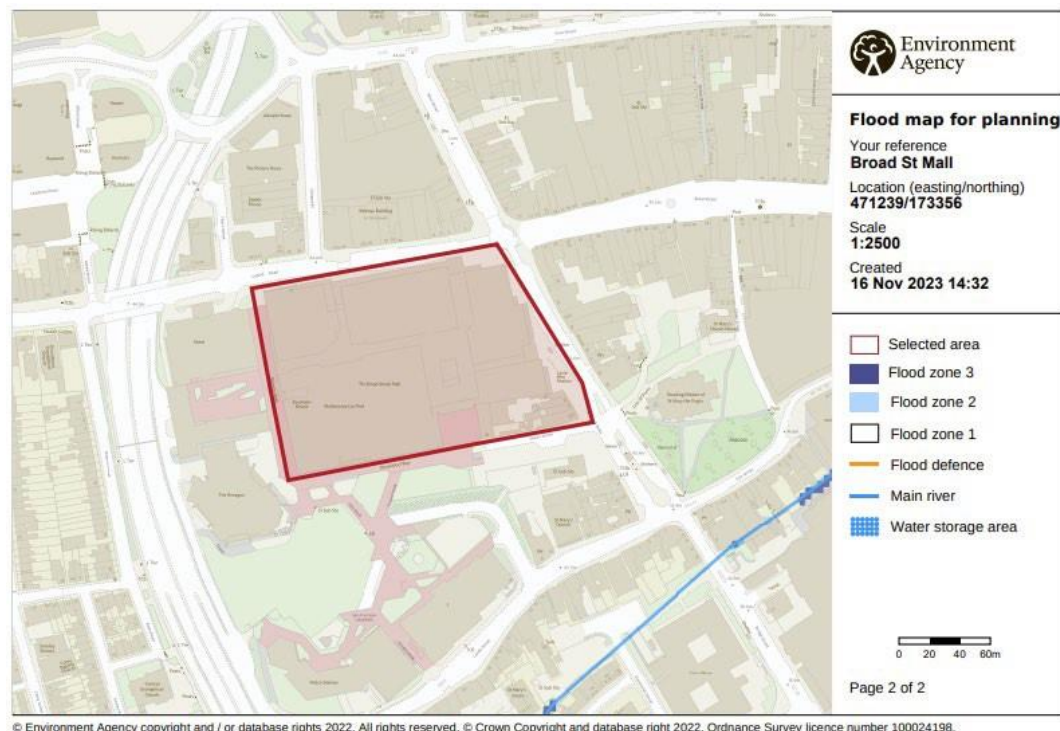


Fig 3.2 – EA Flood Risk Mapping, showing flood risk from surface water flows.

- 4.16 To ensure there is no increase in surface water runoff from the site the surface water drainage strategy prepared by Meinhardt 'has been designed in line with the most recent EA Climate Change Guidance to consider and manage the impact of a 1:100 year plus climate change rainfall event. The surface water drainage strategy considers surface water runoff management: the solutions proposed ensure that for the 100 year plus 40% climate change allowance event, surface water will be accommodated within the Site and therefore prevent potential exceedance flows off-site.' As a result, this will minimise the impact of localised flooding on-site, as well as off-site.
- 4.17 Although there is expected to be no increase in impermeable surface from the development, the SuDs strategy has been designed for incorporation into the development as follows:
- Surface water discharge will be limited through the use of a blue roof system with a connection to the existing surface water drainage network. This will ensure that there is a 30% reduction in peak discharge rates in comparison with the existing regime.

Sustainable Waste Management

- 4.18 Waste, both through construction and building operation, can have a detrimental effect on a building's overall sustainability and environmental performance. In lieu of this, the Government's "Our Waste, Our Resources: A Strategy for England (2018)" document sets targets to reduce the amount of waste going to landfill sites.

Construction Waste

- 4.19 Principles of the Waste Hierarchy will be reflected during the site clearing and enabling works phase to meet Policy CC5 of the RBC Local Plan. Targets will be established within a Site Waste Management Plan which accords with the Government's waste strategy, and aligns with BREEAM, with targets to include:
- A minimum of 90% non-hazardous construction waste will be diverted from landfill, with an expectation to achieve closer to 100%.
 - A target for waste generation $<6.5 \text{ m}^3$ per every 100m^2 of floor area will be established to qualify for BREEAM credits. This will require consideration to prefabrication and standardisation where possible.

Operational Waste

- 4.20 Policy CC5 of the RBC Local Plan requires "layouts and designs that provide adequate, well-designed space to facilitate waste storage, reuse, recycling and composting." Dedicated space(s) will be provided for the segregation and storage of operational recyclable waste volumes generated by the retail units and residents of the apartments. This space will be clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams. It is expected that the retail tenants will engage with a private waste contractor and/or council to remove waste from the site.

Material Use

- 4.21 Maximising the sustainability of all the materials used in the build will be an important factor from the outset. The requirement to achieve BREEAM 'Excellent' requires that consideration is given to material selection and their associated environmental impact through a responsible sourcing strategy. As well as this, assessing the environmental impacts of the construction products will be an important part of the design stage. As part of this process a BREEAM Mat 01 – Building Life Cycle Assessment (LCA) will be carried out to assess the embodied carbon of the development. This assessment involves reviewing the whole life carbon impact of the building and going through various design options to assess and review the embodied carbon impact.

Sustainable Transport

- 4.22 Sustainable transport promotes the use of public transport, cycling and walking in advance of private car use. A Transport Statement has been prepared by Stantec that confirms the pedestrian and cyclist accessibility. 'Dusseldorf Way will provide pedestrian and cycling

access to the proposed residential block entrances. Similarly, the proposed retail units will have a direct frontage access onto Dusseldorf Way with a rear linked service corridor.’ As well as this ‘the proposed cycle store is located on the eastern end of the development site which will be accessed from the footways on Hosier Street.’ As a result making the development easily accessible.

Public Transport Provision

- 4.23 As outlined in Section 7 of the Transport Statement carried out by Stantec, the site is highly accessible via public transport. The development is located within walking distance to multiple bus stops providing services to the local and wider region, as well as Reading railway station being located 0.4 miles away, providing access to a wide range of destinations.
- 4.24 The BREEAM Accessibility Index defines a compliant transport node as bus stops within 650m and railway stations within 1000m of a buildings main entrance and these should be included for assessment purposes. There are 9 compliant transport nodes within the requisite distances that have been included within the Accessibility assessment, resulting in an AI of 27.4. This result means the site is highly accessible.

On site Infrastructure

- 4.25 In support of BREEAM requirements and the wider sustainable transport strategy, the development will provide cycle parking. Under BREEAM the expectation for a retail use is to provide cycle parking based 4 spaces in total for small retail schemes or 1 space per 10 staff members for larger retail schemes. On this basis 1 cycle spaces per 10 employees are being proposed, which would be covered and accessible. This is in line with local standards. Within the Transport Assessment prepared by Stantec the below cycle parking is proposed which meets the RBC parking guidance, as well as for BREEAM:
- 347 cycle parking spaces for residents;
 - 17 cycle parking spaces for the retail units;
 - 30 cycle parking spaces for the public realm space.

Pollution

- 4.26 Any new development can potentially lead to detrimental environmental effects and these potential effects have been considered during the planning stages of this proposal. An Environmental Impact Assessment (EIA) has been carried out by Trium. The measures as outlined in this section, and subsequently implemented, will ensure that any potential impacts can be appropriately controlled.

Avoidance of Light Pollution

- 4.27 The proposed development is expected to have an adverse impact on surrounding properties due to the nature of its location with regards to light pollution. However any new external lighting will be limited to safety and security lighting and will avoid upward light spillage through following the ILE guidance on the Reduction of Obtrusive Light.

Avoidance of Noise Pollution

- 4.28 The development is expected to yield noise impacts to surrounding areas during demolition and construction phases. A Noise and Vibration Assessment has been undertaken by Sol Acoustics as part of the planning application. The assessment confirms that 'noise generated during the demolition and construction works of the Proposed Development has the potential to adversely affect nearby residential receptors.' However mitigation measures have been outlined within their assessment, to reduce noise and disturbances.

Avoidance of groundwater pollution

- 4.29 Whilst the uses proposed for the site are not expected to create significant pollution risks, pollution control measures will be incorporated into the scheme. The lower level of the development includes servicing and has a potential risk of spillages from fuel. As a result a small petrol interceptor will be introduced at this level, in case of a fuel spill.

Biodiversity

- 4.30 The site of the proposed development is occupied land, including Broad Street Mall and other individual buildings. A Preliminary Ecological Appraisal Report was carried out on 20/11/2023 by a suitably qualified ecologist at SWECO. The survey determined that the site is dominated by habitats of low ecological value with habitats of ecological value limited to mature trees adjacent to the site, nesting birds and invasive non-native plant species, including, butterfly bush.
- 4.31 The proposed development sits on previously occupied ground that has a limited existing ecological value. The proposal therefore offers an opportunity to deliver benefits to biodiversity. This will be achieved through incorporating planting within the public realm at street level and providing landscaped areas for residents on terraces. As stated in the report by SWECO other measures include:
- Planting of locally sourced native plant species with a benefit to UK wildlife (i.e. fruiting and/or flowering) within soft landscaping
 - Inclusion of green roofs/walls on any new and existing buildings
 - Installation of bird and bat boxes, swift bricks within buildings or erected onto retained trees.
 - Inclusion of a bug hotel and/or log piles to provide habitat for invertebrates.
- 4.32 The findings from the Biodiversity Net Gain (BNG) report carried out by SWECO has outlined a 727% net gain on account of creation of 0.58 Biodiversity Units (BU). The development is therefore expected to exceed the target +10% net gain.

5 SUSTAINABILITY CHECKLISTS

5.1 This section provides an account of the sustainability benefits of the proposed development, and how relevant policy will be addressed in the development proposals. The section is structured against the Sustainability Checklist as detailed in Appendix 1 of the Reading Borough Council (RBC) Sustainable Design & Construction SPD, thereby demonstrating compliance with policies CC2-CC5, EN18 and H5 of the RBC local plan.

Residential Sustainability Checklist

Table 5.1 – Sustainability Checklist (Residential)

Energy & CO ₂ Reduction	
<i>Aim: To conserve energy, in particular carbon dioxide emissions and maximise the use of energy efficient techniques.</i>	
Criteria	Design & Construction Commitments
How has the development been designed to optimise the use of the energy from the sun and limit heat losses?	The building predominantly faces towards the south which provides generous exposure to the sun throughout the day. These solar gains help to reduce the energy demand from space heating systems. Heat losses have been limited through a highly insulated fabric and low air permeability, with specified values below the upper limit values as detailed in Part L (Volume 1) of Building Regulations.
How has the development been designed to optimise natural daylighting, energy efficient lighting, external lighting and natural ventilation?	The building predominantly faces towards the south which provides generous exposure to the sun throughout the day, providing a high level of natural light. The balance between natural light, solar gain and overheating is struck by specifying the glazing with a g-value of 0.28 (retail) – 0.4 (residential) as confirmed in the Energy Strategy by Hoare Lea, which reduces <i>excessive</i> solar gain (and resultant overheating risk) whilst still allowing adequate levels of natural light. All dwellings will be specified with LED lighting or similar low energy lamps, with lighting control systems incorporating daylight linkage and presence detection. Internal temperatures will be modulated through the use of openable windows, promoting natural ventilation. A Mechanical Ventilation Heat Recovery (MVHR) system will provide an adequate level of background ventilation, whilst reducing overall space heating demand.

How will the design of the building make efficient use of energy? (e.g. use of thermally massive materials, levels of insulation, energy efficient white goods and use of green/brown roofs etc.).	The development will be specified with a highly insulated fabric and low air permeability, resulting in a high level of fabric energy efficiency. A green roof has not been specified due to the potential to install solar PV on the roof or a blue roof. The apartments will be fitted with energy efficient white goods or homeowners will be provided details on energy efficiency and choosing white goods through the Home User Guide.
Has local energy generation from renewables and/or decentralised energy been considered as part of the scheme?	Renewable energy generation will be provided in the form of communal air-source heat-pumps, which will provide high-efficiency space and water heating to each dwelling on site. Roof mounted PV could also be implemented to further reduce carbon emissions. As stated in Section 6 of the Energy Strategy, Hoare Lea.
How have cycle storage facilities been considered?	Section 5.4 of the Transport Statement prepared by Stantec confirms 347 cycle parking spaces will be provided as part of the residential development in secure and sheltered space. The level of provision is in accordance with the standards set out in RBC's adopted Revised Parking Standards and Design (2011).
Does the development meet the requirements of policies H5? Is this clearly illustrated?	Section 7 of the Energy Strategy by Hoare Lea, details how the development fully accords with the requirements of Policy H5.
Is a Section 106 contribution required? If so, what amount?	As detailed in Section 7 of the Energy Strategy by Hoare Lea has identified a potential £313,380 carbon offset payment to be secured via Section 106 for payment to Reading Borough Council.
Water <i>Aim: To improve efficiency in the use of water, conserve water resources and minimise vulnerability to flooding.</i>	
Criteria	Design & Construction Commitments
How will the development incorporate the use of water saving devices to achieve the higher water efficiency	Policy H5 includes the requirement for new residential development to meet the higher water efficiency standard under Regulation 36(3) of the Building

standard under Regulation 36(3) of the Building Regulations?

Regulations? As part of this, the council requires the consideration of grey water, and rainwater harvesting systems.

The table below illustrates the various fittings-based water consumption levels to achieve various water efficiency scenarios. In this case, the Scenario 1, 3 or 4 specification demonstrate consumption of less than 110 litres/person/day. This is an example of the specification to be followed by the scheme at Broad Street Mall.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6
Strategy, Code level	Fittings-based, Code level 3/4	Fittings-based, Code level 3/4	Fittings-based, Code level 3/4	Fittings-based, Code level 3/4	Fittings-based, Code level 5/6	Recycling-based, Code level 5/6
WC	4 (single flush)	4/2.6 (dual flush)	5/3 (dual flush)	6/4 (dual-flush toilet)	4/2.6 (dual flush)	6 (supplied by greywater)
Taps (excluding kitchen taps)	4	5	4	4	1.6	3
Bath	180	155	180	180	155	155
Shower	8	8	8	8	6	7
Kitchen sink taps	6	8	6	6	3	4
Washing machine	8.17 (not supplied)	8.17 (not supplied)	8.17 (not supplied)	6.14 (supplied)	6.14	8.17 (not supplied)
Dishwasher	1.25 (not supplied)	1.25 (not supplied)	1.25 (not supplied)	1.25 (not supplied)	0.67	1.25 (not supplied)
Water Recycling	0 (not supplied)	0 (not supplied)	0 (not supplied)	0 (not supplied)	0 (not supplied)	26.52 (greywater supplying toilet)
Predicted per capita consumption (Code)	104.65	99.81	103.28	103.43	79.99	79.84

How will the development incorporate recycling rainwater and reduce the use of potable water?	There is limited external landscaped amenity area that would benefit from a rainwater harvesting system. Instead, the proposed drainage strategy will limit surface water discharge through the use of a blue roof system with a connection to the existing surface water drainage network.
Has the collection, treatment and re-use of grey water been considered? If so, how will these facilities be incorporated within the development?	Greywater harvesting was not considered for use within the development as its application in a development of this nature would not be feasible - the dual plumbing and infrastructure required in an apartment block constructed above an existing building would cause excessive engineering and cost challenges.
Materials <i>Aim: To retain local character and promote the use of materials with a low environmental impact.</i>	
Criteria	Design & Construction Commitments
How will the selected materials help retain local character, ensure long life and ensure a low environmental impact, including consideration of embodied energy?	Maximising the sustainability of all the materials used in the build will be an important factor from the outset. The development will be designed and constructed as to maximise the sustainability of materials. The client will ensure the following standards are met in the development: 1. At least 90% of timber and timber products are to be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of Forestry Certification (PEFC) scheme; 2. No construction or insulation materials are to be used which will release toxins into the internal and external environment, including those that deplete stratospheric ozone.

Surface Water Run-Off

Aim: To reduce flooding, pollution and other environmental damage.

Criteria	Design & Construction Commitments
How has the development considered flooding and pollution?	A Flood Risk Assessment has been prepared with this application by Meinhardt which confirms: 1. The Environment Agency (EA) Flood Zone map shows the site lies within Flood Zone 1 'Low Probability' (as defined in NPPF Planning Practice Guidance (PPG) 'Flood Risk and Coastal Change' Table 1) 2. Other potential sources of flooding have been investigated and are deemed negligible to low, as confirmed in the FRA and Drainage Strategy by Meinhardt. 3. EA modelled flood data has confirmed that the site lies outside of the 1 in 100 annual probability +25% allowance for climate change 'design flood event' and the equivalent +35% allowance scenario. Since the site is within the Flood Zone at lowest probability of flooding, the Sequential Test is passed.
Has the design considered the use of sustainable drainage systems (SuDS) and how will they be incorporated within the development?	Although there is expected to be no increase in impermeable surface from the development, the SuDs strategy prepared by Meinhardt has been designed for incorporation into the development as follows: • Surface water discharge will be limited through the use of a blue roof system with a connection to the existing surface water drainage network. This will ensure that there is a 30% reduction in peak discharge rates in comparison with the existing regime.
Does the development meet the requirements of policy EN18?	As detailed above, the Sequential Test has been passed, and a SuDs strategy is being implemented, the development is therefore deemed to meet the requirements of Policy EN18.

Waste <i>Aim: To minimise the production of waste and maximise re-use and recycling.</i>	
Criteria	Design & Construction Commitments
How will the development minimise waste sent to landfill?	A site waste management strategy will be prepared for the construction phase of the development, which identifies measures to minimise construction waste, and maximise the use of demolition and construction waste. This will meet the BREEAM requirements for the non-domestic part of the scheme by diverting 90% of demolition waste and 80% of non-demolition waste (tonnage) from landfill. Homeowners will be provided details on how to recycle and minimise waste in the Home User Guide.
How will the development make the maximum use of construction and demolition waste?	A site waste management strategy will be prepared for the construction phase of the development, which identifies measures to minimise construction waste, and maximise the use of demolition and construction waste.
How will the development make maximum use of re-used and recycled materials?	A pre-demolition audit will be undertaken to review the opportunities for reusing and recycling of existing materials. Construction materials will be procured from 'responsible sources' as specified by BRE, including suppliers certified to ISO14001/BES6001.

How will provision be made for the storage and recycling of waste for all users of the site?	As detailed under Criterion 1 of this section, residential waste storage space would take account of the requirement of BS5906:2005. This requires that suitable refuse and recycling space provision is allocated for the residential apartments in a centralised waste store. The necessary provision is as follows: • 100 litres for first bed/1 bed; • 70 litres for each bedroom after that. In accordance with storage requirements in BS5906:2005, 50% of this quantity of waste arisings should be for recyclable waste and 75% of the quantity should be for general municipal waste. This over provision of storage capacity will ensure that sufficient space is always allocated to cater for waste volumes.
Pollution <i>Aim: To minimise damage to the environment through air, ground/surface water, land, noise or light pollution.</i>	
Criteria	Design & Construction Commitments
What measures have been incorporated to ensure that noise and light pollution will be minimised through the development?	Any new development can potentially lead to detrimental environmental effects; as is the nature of construction. These potential effects have been considered during the planning stages of this proposal. The development is of the scale that requires an Environmental Impact Assessment (EIA), which has been carried out by Trium. The report confirms how potential impacts can be appropriately controlled in order to demonstrate compliance with Local Plan Policy EN16: Pollution & Water Resources. Noise A Noise Impact Assessment carried out by Sol Acoustics has been submitted with this application, which will set limits that will be met when specifying the external heat pump condensers. In addition, the inclusion of Mechanical Ventilation Heat Recovery (MVHR) will allow fresh air to be provided without

	the need to open windows, reducing the impact of external noise on internal occupants. External Lighting The development's lighting strategy will ensure that it does not have adverse effects at night-time. Although a detailed lighting design scheme for the site that ensures light pollution is minimised has not yet been undertaken the following measure are expected to be incorporated: • External lighting will be designed in compliance with Table 1 and accompanying notes of ILE Guidance Note for reduction of obtrusive light; All non-safety/security lighting will be automatically switched off between 2300hrs and 0700hrs.
What measures have been incorporated to reduce nitrogen oxide emissions and reduce the global warming potential of insulants?	As detailed under the 'Management' section, no construction or insulation materials are to be used which will release toxins into the internal and external environment, including those that deplete stratospheric ozone. With regards to nitrogen oxide emissions (NOx), no on-site fossil combustion will occur as the servicing strategy is fully electrified with the use of heat pumps, therefore no NOx emissions are expected.
What measures have been incorporated to reduce the release of pollution into the atmosphere?	As detailed in the Energy Strategy by Hoare Lea in Section 6, the scheme will have no on-site fossil fuel combustion through being an all electric scheme.

Health & Well-being

Aim: To improve the quality of life in homes through good daylighting, improved sound insulation, provision of outdoor space with good accessibility.

Criteria	Design & Construction Commitments
How has the development been designed to maximise natural lighting, reduce the likelihood of noise complaints, incorporate private outdoor space and ensure the layout of the development can be easily adapted to meet the needs of future occupants?	The building predominantly faces south which provides generous exposure to the sun throughout the day, providing a high level of natural light. On northern elevations, large apertures will ensure adequate levels of natural light are maintained. The development will be constructed in accordance with Part E of Building Regulations, reducing the impact of noise between apartments. The inclusion of Mechanical Ventilation Heat Recovery (MVHR) will allow fresh air to be provided without the need to open windows, reducing the impact of external noise on internal occupants. The development includes private amenity space through balconies, which are added to the south east and south west corners of Blocks A, B and C and to all the apartments within the lower element of Block C. The scheme also offers amenities to residents, including a gym, lounge, external courtyards and roof terraces.

Management

Aim: To manage the site in an environmentally and socially considerate manner.

Criteria	Design & Construction Commitments
What measures have been taken to ensure the construction of the site is managed in an environmentally and socially considerate manner, mitigating environmental impacts?	It is expected that the demolition and construction phase will yield an adverse level of disturbance, particularly given the surrounding residential properties, although various measures adopted by the contractor will ensure that any potential disturbance is minimised. The principal contractor will be required to deliver high standards of sustainable construction, which will be achieved through the following:

	• Registering the site against the Considerate Constructors Scheme; • Managing the construction site to reduce environmental effects, this will include adopting best practice measures to protect water and air quality, monitoring water and energy use from construction activities.
How has the development been designed to ensure people feel safe and secure?	The development will provide a secure, gated cycle parking area. Access to the apartments will be via secure lobby entrances with only residents having access. The development is also situated in a prominent, built-up area of Reading providing good levels of oversight and external lighting.
Ecology <i>Aim: To retain, protect and enhance wildlife habitats and natural features.</i>	
Criteria	Design & Construction Commitments
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?	The Preliminary Ecology Appraisal Report by SWECO confirms that the current habitats on-site have the potential to support breeding birds requiring a pre-works nesting bird check by a suitably qualified ecologist. The development itself does not have distinct ecological value, however there are mature trees located adjacent to the site. Due protection will be given to these mature trees. The proposed landscaping for the development will have a BNG of 10% to enhance wildlife habitats.

Non-Residential Sustainability Checklist

Table 5.2 – Sustainability Checklist (Non-Residential)

Management <i>Aim: To recognise and encourage environmentally and socially considerate development.</i>	
Criteria	Design & Construction Commitments
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?	The proposed commercial uses will be taken forward on a speculative basis and assessed as shell only. The aftercare credits in BREEAM under Shell Only do not include requirements for building user guides, which generally focus on the building controls. Details will be provided in the O&M manuals and health and safety files regarding building performance.
What consideration has been given to resource use, energy consumption and pollution in terms of the construction site impacts?	The principal contractor will be required to deliver high standards of sustainable construction, which will be achieved through the following: • Registering the site against the Considerate Constructors Scheme; • Managing the construction site to reduce environmental effects, this will include adopting best practice measures to protect water and air quality, monitoring water and energy use from construction activities.
Will site investigation and appropriate remedial action be undertaken?	Yes, the site has been subject to a Phase 1 environmental review.
Will the community and stakeholders be involved in the design process encouraging flexibly designed buildings which cater for shared use with the local community?	The commercial spaces are designed to be flexible and could be taken by a range of operators. The scheme design has been informed through liaison with commercial letting agents.
How has the building been designed to reduce the opportunity for and the fear of crime?	The proposed development includes a mix of uses and introduces a greater level of activity into the site, including provision of natural surveillance.
What consideration has been given to the maintenance of the building?	A maintenance strategy will be developed post planning.

Health & Wellbeing

Aim: To ensure a good quality amenity level is afforded to occupants of buildings

Criteria	Design & Construction Commitments
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?	The commercial aspects include Class E and D2 uses. The requirements for these vary depending on uses. The scheme addresses these where relevant through the BREEAM requirements. The scheme is taken forward as shell only, and therefore many of these considerations are relevant to the fit out.

Energy & CO₂ Reduction

Aim: To conserve energy, in particular carbon dioxide emissions and maximise the use of energy efficient techniques.

Criteria	Design & Construction Commitments
How has the building been designed to minimise CO₂ emissions associated with their operational energy consumption?	The building will be designed to a high degree of thermal performance and low air permeability, which will help to reduce energy demand and associated emissions from space heating. Heat losses have been limited through a highly insulated fabric and low air permeability, with specified values below the upper limit values as detailed in Part L2a of Building Regulations.
How has the development been designed to optimise the use of the energy from the sun, natural daylighting and controlled natural ventilation?	The building predominantly faces towards the south which provides generous exposure to the sun throughout the day. These solar gains help to reduce the energy demand from space heating systems.
How has the development been designed to optimise natural daylighting, energy efficient lighting, external lighting and natural ventilation?	The building and retail units faces south which provides generous exposure to the sun throughout the day, providing a high level of natural light. The balance between natural light, solar gain and overheating is struck by specifying the glazing with a g-value of 0.28, which reduces excessive solar gain (and resultant overheating risk) whilst still allowing adequate levels of natural light. The commercial units are expected to include active cooling to regulate internal conditions in accordance with market demands.

How will the design of the building make efficient use of energy? (e.g. use of thermally massive materials, levels of insulation, energy efficient white goods and use of green/ brown roofs etc.).	The development will be specified with a highly insulated fabric and low air permeability, resulting in a high level of fabric energy efficiency.
Have renewable energy sources or decentralised energy been considered for this development and if so, how would they be incorporated within the development?	The commercial units will be fitted out by the tenants in accordance with a design brief which follows the principles established by this statement. Renewable energy generation will be provided in the form of air-source heat-pumps, which will provide high-efficiency space heating, with the option of cooling. Hot water is expected to be generated by point of use / direct electric systems, working in tandem with the heat pumps.
Transport <i>Aim: To reduce the need to travel through appropriately located development.</i>	
Criteria	Design & Construction Commitments
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?	The planning application is submitted with a Transport Statement and Travel Plan carried out by Stantec which explains the approach taken to promote sustainable forms of transport.
How have deliveries and the manoeuvring of delivery vehicles been considered?	The units are not expected to have high servicing demands. Further details on the delivery requirements are set out in Section 5.7 of the Transport Statement carried out by Stantec.
Water <i>Aim: To improve efficiency in the use of water, conserve water resources and minimise vulnerability to flooding.</i>	
Criteria	Design & Construction Commitments
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).	The scheme is being brought forward on a shell only basis, with water consuming fittings being the responsibility of the occupier. The scheme proposes a D2 Gym and Class E uses, which have varying requirements for water demand. The Gym will be the highest demand, with an expectation for showers and washroom facilities. The tenants will be required through a fit out specification to install water efficient equipment, not exceeding targets laid out by BREEAM Excellent (25% reduction from a notional baseline).

Will the development and access to and from it such as roads and paths be located away from areas of potential flooding?	The Flood Risk Assessment by Meinhardt confirms that the site is located in Flood Zone 1 and other potential sources of flooding have been investigated and are deemed negligible to low. Safe access to and from the site is a matter which has been addressed within the report.
How will the development incorporate harvesting and re-use of rainwater?	There is limited external landscaped amenity area that would benefit from a rainwater harvesting system. Instead, the proposed drainage strategy will limit surface water discharge through landscaped areas and the use of a blue roof system with a connection to the existing surface water drainage network.
Does this development meet the requirements of EN18?	EN18 directs development away from areas that are liable to flood. In areas of lower risk, development may move forward if it passes the exception test in the NPPF. It also requires major developments to incorporate Sustainable Drainage Systems (SuDS). The scheme demonstrates alignment with this policy.
Materials <i>Aim: To retain local character and promote the use of materials with a low environmental impact.</i>	
Criteria	Design & Construction Commitments
How will the selected materials help retain local character, ensure long life and ensure a low environmental impact?	The Design and Access Statement by AHR Architects confirms how local character will be retained within the design. Also maximising the sustainability of all the materials used in the build will be an important factor from the outset. The development will be designed and constructed as to maximise the sustainability of materials. The client will ensure the following standards are met in the development: • All timber and timber products are to be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of Forestry Certification (PEFC) scheme;

	No construction or insulation materials are to be used which will release toxins into the internal and external environment, including those that deplete stratospheric ozone.
What consideration has been given to reusing materials in-situ, responsibly sourcing materials and re-using existing structures?	A pre-demolition audit will be carried out to consider if materials can be reused in-situ. A sustainable procurement plan will be used by the contractor for the development setting aims and objectives, including the use of 100% legal and sustainable timber. Responsible sourcing of materials will also be measured as part of the BREEAM assessment.
Waste <i>Aim: To minimise the production of waste and maximise re-use and recycling.</i>	
Criteria	Design & Construction Commitments
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?	A pre demolition audit will be undertaken prior to demolition works to consider what options exist to recover materials.
How will the development make the maximum use of construction, demolition waste and recycled materials?	A site waste management strategy will be prepared for the construction phase of the development, which identifies measures to minimise construction waste, and maximise the use of demolition and construction waste. Also meeting the BREEAM requirements of diverting 90% of demolition waste and 80% of non-demolition waste (tonnage) from landfill.
How will provision be made for the storage and recycling of waste for all users of the site?	Commercial waste storage space would take account of the requirement for BREEAM, including for provision of suitable space for separate general and recyclable waste streams. BREEAM requires 4m ² of waste storage to be provided for a development of this size (1355 sqm of Class E units). Depending on the uses, waste composting should also be considered by provision of points for washdown. This will depend on tenant requirements.

Land Use & Ecology

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

Criteria	Design & Construction Commitments
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?	The Preliminary Ecology Appraisal Report by SWECO confirms that the habitats on-site have the potential to support breeding birds requiring a pre-works nesting bird check by a suitably qualified ecologist. The development itself does not have distinct ecological value, however there are mature trees located adjacent to the site. Due protection will be given to these mature trees. The proposed landscaping for the development will have a BNG of 10% to enhance wildlife habitats.
What consideration has been given to not using previously undeveloped land?	The site is located on previously developed land.
What consideration has been given to the removal of contamination from the land?	Any contamination identified will be treated appropriately and remediation will take place where necessary.

Pollution

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

Criteria	Design & Construction Commitments
What measures have been incorporated to ensure that noise and light pollution will be minimised through the development?	Any new development can potentially lead to detrimental environmental effects; as is the nature of construction. These potential effects have been considered during the planning stages of this proposal. The development is of the scale that requires an Environmental Impact Assessment (EIA), which will be carried out by Trium. Which will confirm how potential impacts can be appropriately controlled in order to demonstrate compliance with Local Plan Policy EN16: Pollution & Water Resources.

	Noise A Noise and Vibration Assessment by Sol Acoustics has been submitted with this application, which will set limits that will be met when specifying the retail units external plant equipment. External Lighting The development's lighting strategy will ensure that it does not have adverse effects at night-time. Although a detailed lighting design scheme for the site that ensures light pollution is minimised has not yet been undertaken, the following measures are expected to be incorporated: • External lighting will be designed in compliance with Table 1 and accompanying notes of ILE Guidance Note for reduction of obtrusive light; • All non-safety/security lighting will be automatically switched off between 2300hrs and 0700hrs.
What consideration has been given to reducing refrigerants and minimising nitrogen oxide emissions?	As detailed under the 'Management' section, no construction or insulation materials are to be used which will release toxins into the internal and external environment, including those that deplete stratospheric ozone. With regards to nitrogen oxide emissions (NOx), no on-site fossil combustion will occur as the servicing strategy is fully electrified with the use of heat pumps, therefore no NOx emissions are expected.
What measures have been incorporated to reduce the release of pollution into the atmosphere?	As detailed in the Energy Strategy by Hoare Lea presented in Section 6, there will be no on-site fossil fuel combustion from the scheme.

Land Use & Ecology

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

Criteria	Design & Construction Commitments
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?	The Preliminary Ecology Appraisal Report by SWECO confirms that the current habitats on-site have the potential to support breeding birds requiring a pre-works nesting bird check by a suitably qualified ecologist. The development itself does not have distinct ecological value, however there are mature trees located adjacent to the site. Due protection will be given to these mature trees. The proposed landscaping for the development will have a BNG of 10% to enhance wildlife habitats.

6 CONCLUSION

- 6.1 This Sustainability Statement has been prepared by Envision on behalf of McLaren (Broad Street Mall) Ltd and UREF III LP (the applicant), and is submitted to support a planning application for the part demolition to the existing south side of Broad Street Shopping Mall along with other existing buildings to provide a residential-led scheme with ground floor retail units, associated landscaping, public realm improvements, alterations to the existing vehicular access to the car park and provision of cycle parking and waste storage areas.
- 6.2 A BREEAM predictive assessment has been undertaken to consider the possible performance of the development against BREEAM. The non-domestic elements of the scheme are greater than 1000 m² and the applicant is targeting a BREEAM Excellent rating, which would be an acceptable target to apply. The BREEAM predictive assessment identifies that the development aligns to an Excellent rating. Further details on the BREEAM Pre-Assessment are provided in Appendix I.
- 6.3 The residential and non-residential Sustainability Checklists confirm how the requirements set out in the Reading Borough Council Sustainable Design & Construction SPD (Adopted December 2019) will be met through the design and implementation of the development.
- 6.4 The development is therefore considered to comply with the sustainability & energy requirements outlined in the Reading Borough Council Local Plan (adopted November 2019) and the Reading Borough Council Sustainable Design & Construction SPD (Adopted December 2019).

APPENDIX I – BREEAM PRE-ASSESSMENT

Project Name: **Broad Street Mall, Reading**

Targeted BREEAM rating % **78.09% Excellent**

Building Type: **Retail**

Project Type: **Shell Only**

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
MANAGEMENT					
Man 01	Project Brief and Design	Project Delivery Planning	1	1	A clear sustainability brief developed prior to concept design. Identify and define roles, responsibilities and contribution of project team for key phases of the project delivery.
		Stakeholder Consultation (Interested Parties)	1	1	Consult all relevant parties on minimum consultation content at RIBA Stage 2. Prior to completion of RIBA Stage 4 feedback to all relevant parties must be given and received.
		Pre-requisite for BREEAM Advisory Professional credits: Have the client & the contractor formally agreed performance targets?			BREEAM target must be formally agreed with the design team.
		BREEAM Advisory Professionals (AP) (Concept Design)	1	1	Appointment of BREEAM AP prior to RIBA Stage 2. BREEAM target must be formally agreed with the design team.
		BREEAM AP (Developed Design)	1	1	BREEAM AP monitor and report progress against agreed BREEAM performance targets throughout the project up to PC Stage.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Man 02	Life Cycle Cost and Service Life Planning	Elemental Life Cycle Cost (LCC)	2	2	An outline, entire asset elemental life cycle cost plan has to be carried out at RIBA stage 2 in line with Standardised method of life cycle costing for construction procurement PD 156865:2008.
		Component Level Life Cycle Cost Options Appraisal	1	1	A component level LCC plan has been developed by the end of RIBA Stage 4 in line with 'Standardised method of life cycle costing for construction procurement' PD 156865:2008.
		Capital Cost Reporting	1	1	Report the capital cost for the fit-out works in pounds per meter square (£/m2) via the BREEAM Assessment Scoring and Reporting tool.
Man 03	Responsible Construction Practices	Pre-requisite: Legal and sustainable timber			All timber and timber-based products used during construction process of the project are legal and sustainable i.e. FSC or PEFC certified.
		Environmental Management	1	1	Contractor operates EMS: certificate of ISO 14001, EMAS or have a structure that is in compliance with BS 8555:2003 and has reached stage four of the implementation stage. And implement best practice pollution prevention procedures: PPG6, Pollution Prevention Guidelines.
		Pre-requisite for BREEAM AP on site: Have the client & the contractor formally agreed performance targets?			BREEAM target must be formally agreed with the main contractor.
		BREEAM AP (Site)	1	1	A BREEAM AP is appointed to monitor the project to ensure ongoing compliance with the relevant sustainability performance/process criteria, and therefore BREEAM target, during the Construction, Handover and Close Out stages.
		Responsible Construction Management Minimum Standard: 1 credit Excellent, 2 credits Outstanding	2	2	Responsible Construction Management based on Considerate Contractors Scheme score of: >25 to <35 - 1 credit >35 - 2 credits (plus BRE specific requirements that are good site management practices).

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
		Monitoring of Construction Site Impacts - Utility and Water Consumption	1	1	Principal contractor monitor energy and water consumption on site.
		Monitoring of Construction Site Impacts - Transport of Construction Materials and Waste	1	1	Principal contractor to monitor fuel consumption of transport of materials and waste to/from site.
Man 04	Commissioning and Handover	Testing and Inspecting Building Fabric	1	1	Thermographic survey to be undertaken by professional holding a UKTA certificate and an airtightness test undertaken by professional holding with membership of ATTMA or IATS.

MANAGEMENT	TOTAL	15	15
	% of total score	12.00%	12.00%
	% of each credit	0.80%	

HEALTH & WELLBEING					
Hea 01	Visual Comfort	Daylighting	2	0	Daylighting study to be carried out and achieve average daylight factor of 2%, over 80% of the floor plate. Not typically achieved for retail space with internal back of house.
		View Out	1	0	95% of the floor area in 95% of spaces for each relevant building area is within 5m of a wall which has a window or permanent opening providing an adequate view out. The window or opening must be $\geq 20\%$ of the surrounding wall area. Not typically achieved for retail space with internal back of house.
		Internal and External Lighting Levels, Zoning and Controls	1	1	Internal lighting requirements scoped out of shell only assessment. External lighting designed in accordance with BS5489-1:2013 and BS EN 12464-2:2-14.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Hea 05	Acoustic Performance	Acoustic Performance	1	1	Meet relevant acoustic performance standards for indoor ambient noise levels. A programme of acoustic measures set out by a compliant test body in accordance with the relevant good practice. Confirmed achievable by Sol.
Hea 06	Security	Security of Site and Building	1	0	Security Needs Assessment (SNA) undertaken by Suitably Qualified Security Specialist (SQSS) during RIBA Stage 2 and design embodies recommendations. Any deviation from recommendations to be justified and agreed with SQSS. Secured by Design being undertaken
Hea 07	Safe and Healthy Surroundings	Safe Access	1	1	As access to the building is direct from the footpath, the safe access criteria are not applicable and the credit can be awarded by default.
		Outside Space	1	0	There is an outside space providing building users with an external amenity area. This has to be non-smoking

HEALTH & WELLBEING	TOTAL	8	3
	% of total score	7.00%	2.63%
	% of each credit	0.88%	

ENERGY

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Ene 01	Reduction of Energy Use and Carbon Emissions	Energy Performance Minimum Standard: 4 credits Excellent, 6 credits Outstanding	9	4	BRUKL calculations must be undertaken in DSM modelling to inform the results. Shell only assessments only consider actual vs notional primary energy – greater emphasis on the building's thermal fabric and air tightness. Shell only doesn't consider the energy efficiency of building services or renewable energy. This will be assessed against the new Part L building regs as a baseline.
Ene 03	External Lighting	External Lighting	1	1	Average initial luminous efficacy of not less than 70 luminaire lumens per circuit Watt. Automatic control to prevent operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.
Ene 04	Low Carbon Design	Passive Design Analysis	1	0	Carry out passive design analysis, including thermal comfort modelling at RIBA Stage 2, which identifies passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption.
		Free Cooling	1	0	Passive design is achieved and any of the free cooling strategies are implemented: night time cooling; ground coupled air cooling; displacement ventilation; ground water cooling; surface water cooling; evaporative cooling; desiccant dehumidification and evaporative cooling, using waste heat; absorption cooling, using waste heat; building does not require any significant form of active cooling or mech. ventilation i.e. naturally ventilated. Not achievable based on cooling strategy
		Low Zero Carbon Feasibility Study	1	0	LZC Study carried out at RIBA Stage 2 by an energy specialist to establish most appropriate low or zero carbon energy source(s). Technology(ies) to be specified and resulted in a meaningful reduction in regulated CO2 emissions.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
ENERGY		TOTAL	13	5	
		% of total score	9.50%	3.65%	
		% of each credit	0.73%		
TRANSPORT					
Tra 01	Transport Assessment and Travel Plan	Travel plan	2	2	Transport Assessment and Travel Plan to be carried out at RIBA Stage 2 early considering the impact onto the surrounding infrastructure and to calculate the public transport Accessibility Index (AI) for the assessed building.
Tra 02	Sustainable Transport Measures	1. The existing AI calculated in Tra 01 as being >8	10	9	Targeted Credit. Expected achievable given city centre location
		2. Demonstrate an increase over the existing Accessibility Index.			
		3. Provide a public transport information system in a publicly accessible area, to allow building users access to up-to-date information on the available public transport and transport infrastructure.			Public transport, cycling, and walking information boards in communal staff areas as a way to increase awareness of sustainable travel options a travel information pack will be provided to residents before occupation.
		4. Provide electric recharging stations of a minimum of 7kw for at least 10% of the total car parking capacity for the development.			Would not include parking accessible only to residents, and would require installing EV in existing car parking
		5. Set up a car sharing group or facility to facilitate and encourage building users to car share. Raise awareness of the sharing scheme.			
		6. During preparation of the brief, the design team consults with the local authority (LA) on the state of the local cycling network and public accessible pedestrian routes, to focus on whichever the LA deems most relevant to the project, and how to improve it.			

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
		7. Install compliant cycle storage spaces to meet the minimum levels set out in a BREEAM manual Table 7.5			Potential Credit - would need 10 cycle storage spaces that are publicly accessible and covered
		8. Provide at least two compliant cyclists' facilities for the building users – Showers; – Changing facilities; – Lockers; – Drying spaces.			Potential Credit - Provide water fittings and space for facilities to be provided in future. Required for staff only.
		9. At least three existing accessible amenities are present within 500m of the main entrance.			Targeted Credit - see column D for details
		10. Enhanced amenities			
		11. Implement one site-specific improvement measure, not covered by the options already listed in this issue, in line with the recommendations of the travel plan.			
TRANSPORT		TOTAL	12	11	
		% of total score	14.50%	13.29%	
		% of each credit	1.21%		

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
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WATER

Wat 02	Water Monitoring	Water Monitoring Minimum Standard: Criterion 1 - water meter on mains Good, Very Good, Excellent and Outstanding	1	1	Specification of water meter with pulsed output and BMS connected on mains water supply to each building. Install sub-meters or water monitoring equipment to water-consuming plant or building areas consuming 10% or more of the building's total water demand
Wat 04	Water Efficient Equipment	Water Efficient Equipment	1	0	Mitigate or reduce unregulated water usage - irrigation system. Assume no significant external planting therefore once established no need for manual watering.

WATER	TOTAL	3	1
	% of total score	2.00%	0.67%
	% of each credit	0.67%	

MATERIALS

Mat 01	Environmental Impacts from Construction Products - Building Life Cycle Assessment (LCA)	Superstructure - Concept Design	6	4	Using BREEAM simplified Building LCA tool or an IMPACT approved tool, carry out building Life Cycle Assessment (LCA) at RIBA Stage 2. Integrate the LCA options appraisal within the wider design decision-making process. Only 4 credits are available for retail shell-only.
		Superstructure - Technical Design			Using BREEAM simplified Building LCA tool or an IMPACT approved tool, carry out building LCA for superstructure design options at RIBA Stage 4.
		Substructure and Hard Landscaping Options Appraisal during Concept Design	1	1	Using BREEAM simplified Building LCA tool or an IMPACT approved tool, carry out the LCA options appraisal for s substructure and hard landscaping at RIBA Stage 2.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Mat 02	Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)	Specification of Products with a Recognised Environmental Product Declaration (EPD)	1	1	To specify products with recognised EPD and use BREEAM Mat 01/02 results submission tool.
Mat 03	Responsible Sourcing of Construction Products	Pre-requisite: Legal and sustainable timber			100% of timber and timber-based products used in the project are 'Legal' and 'Sustainable' as per UK Government's Timber Procurement Policy (TPP).
		Enabling Sustainable Procurement	1	1	Sustainable Procurement Plan includes sustainability aims, objectives and strategic targets to guide procurement process must be in place before RIBA Stage 2.
		Measuring Responsible Sourcing	3	1	To specify materials from manufacturers who can provide EMS Certification, FSC, PEFC, SFI, CARES, Eco-reinforcement, BES 6001, Supply chain.
Mat 05	Designing for Durability and Resilience	Protecting Vulnerable Parts of the Building from Damage and Protecting Exposed Parts of the Building from Material Degradation	1	1	The building incorporates suitable durability and protection measures and specification to limit materials degradation between environmental factors.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Mat 06	Material Efficiency	Preparation and Brief	1	1	Set targets and report opportunities and methods for optimise the use of materials for each of the RIBA Stage. Consideration should be given to pre-fabrication and WRAP compliance.
		Concept Design			
		Developed Design			
		Technical Design			
		Construction			

MATERIALS	TOTAL	14	10
	% of total score	22.00%	15.71%
	% of each credit	1.57%	

WASTE					
Wst 01	Construction Waste Management	Pre-demolition Audit Minimum Standard: 1 credit Outstanding	1	1	Pre-demolition audit must be carried out at RIBA Stage 2 and include any existing building, structures and hard surfaces. Audit needs to be referenced in RMP below.
		Construction Resource Efficiency	3	2	Prepare a compliant Resource Management Plan (RMP) covering the targets of non-hazardous waste arising from site construction and main contractor to achieve a construction waste resource efficiency benchmark of 6.5 tonnes / 7.5 m3 of construction waste generated per 100m2 GIA.
		Diversion of Resources from Landfill	1	1	Prepare a compliant RMP and divert at least 80% (tonnes) non-demolition waste from landfill.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Wst 02	Recycled Aggregates	Project Sustainable Aggregate Points	1	0	Identify all aggregate types, quantities and calculate the distance travelled by transport type. Points are awarded using BREEAM Wst 02 calculator. Often awarded where demolition on-site and reuse of crushed materials in situ, therefore expected feasible for this development. Would need to be reviewed prior to demolition.
Wst 03	Operational Waste	Operational Waste Minimum Standard: 1 credit Excellent and Outstanding	1	1	A dedicated central space for storage of recyclable waste, clearly labelled and accessible to building occupants/facilities operators.
Wst 06	Design for Disassembly and Adaptability	Design for Disassembly and Functional Adaptability - Recommendations	1	1	Carry out and implement a functional adaptation appraisal at RIBA Stage 2 and developed recommendations and solutions (i.e. alternative building uses, functions, etc.)
		Disassembly and Functional Adaptability – Implementation	1	1	Provide an update during RIBA Stage 4, how the recommendations have been implemented i.e. plant replacement, horizontal / vertical expansion, refurbishment potential etc.
WASTE		TOTAL	10	7	
		% of total score	8.00%	5.60%	
		% of each credit	0.80%		

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
LAND USE & ECOLOGY					
LE 01	Site Selection	Previously Occupied Land	1	1	At least 75% of new development footprint is built on the previously occupied land.
		Contaminated Land	1	0	Specialist's land contamination report and summary details of the implementation plan of the remediation strategy to be developed. Assumed no contamination therefore not feasible to achieve.
LE 02	Ecological Risks and Opportunities	Pre-requisite: Statutory Obligations			The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.
		Survey and Evaluation	1	1	A Suitably Qualified Ecologist (SQE) carries out a survey and evaluation (in line with BREEAM methodology) for the site early enough to influence site preparation works, layout, and where necessary, strategic planning decisions. The SQE's survey and evaluation determines the site's ecological baseline, and recommendation and data collected are shared with project team to influence decisions
		Determining Ecological Outcomes	1	1	The first credit achieved. Liaise with stakeholders to determine optimum ecological outcomes, and to identify, appraise, and selection measures to meet this. Evaluation is shared with design team to influence decision-making process.
LE 03	Managing Impacts on Ecology	Prerequisite: Ecological Risks and Opportunities			LE 02 has been achieved. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.
		Planning and Measures On-Site	1	1	Roles and responsibilities to be assigned. Plan and implement site preparation and construction work early; collaborate and implement solutions and measures with stakeholders.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
		Managing Negative Impacts	2	2	Route 2: Negative impacts from site preparation and construction works have been managed according to the mitigation hierarchy and no overall loss of ecological value has occurred (2 credits), or the loss of ecological value has been minimised (1 credit)
LE 04	Ecological Change and Enhancement	Prerequisite: Managing Negative Impacts on Ecology			LE 03 has been achieved. Roles and responsibilities to be assigned. Site preparation and construction works have been planned. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.
		Change and Enhancement of Ecology	3	3	Credits awarded based on the change in ecological value occurring, calculated in accordance with GN36.
		Ecological Enhancement	1	1	Measures have been implemented that enhance the site's ecological value, based on input from the project team and SQE in collaboration with stakeholders an data collated as part of LE02. Date collated are analysed, and where potentially valuable, provided to local environmental records centres.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
LE 05	Long Term Ecology Management and Maintenance	Prerequisite: Statutory Obligations, Planning and Site Implementation			LE 03 and LE 04 have been achieved. The client or contractor confirms compliance is monitored against all relevant UK and EU or international legislation relating to the ecology of the site.
		Management and Maintenance	1	1	Measures have been implemented to manage and maintain ecology throughout the project, based on input from LE02. These measures monitor and review the effectiveness of the mitigation and enhancement measures in place for LE 03 & 04. A section on Ecology and Biodiversity is included in the BUG
		Landscape and Ecology Management Plan	1	1	A Landscape and Ecology Management Plan, or equivalent, has been developed in accordance with BS42020:2013 Section 11.1 covering 5 years after project completion
LAND USE & ECOLOGY		TOTAL	13	12	
		% of total score	19.00%	17.54%	
		% of each credit	1.46%		
POLLUTION					
		Flood Resilience	2	2	Site specific Flood Risk Assessment prepared by specialist to confirm that the site is a low probability of flooding from all sources of flooding.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Pol 03	Flood and Surface Water Management	Surface Water Run Off	2	2	For Brownfield sites - Peak rate of runoff from site shows 30% improvement compared to pre-development, for 1-yr and 100-year return Flooding of property will not occur in the event of a local drainage system failure Runoff volume no greater than pre-development, for 100-year, 6 hour event. All calculations include an allowance for climate change Relevant maintenance agreements for ownership, operation and maintenance of SuDs. Expected to achieve first credit for run-off rates given Reading Council's requirements. Blue roof and ground attenuation proposed currently.
Pol 04	Reduction of Night Time Light Pollution	Reduction of Night Time Light Pollution	1	1	External lighting design is in line with ILP guidance of obtrusive light and can be automatically switched off. Illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.

POLLUTION	TOTAL	6	5
	% of total score	6.00%	5.00%
	% of each credit	1.00%	

EXEMPLARY					
Man 03	Responsible Construction Practices	Responsible Construction Practices	1	1	Responsible Construction Management based on Considerate Contractors Scheme score of >40 (plus BRE specific requirements that are good site management practices).
Hea 01	Visual Comfort	Daylighting	1	0	When relevant building areas exceed good practice daylight factor OR the relevant building areas exceed good practice average and minimum point daylight illuminance criteria.

Credit Ref.	Credit Title	Credit Name	Available	Targeted	Credit Requirement / Project Specific Notes
Hea 06	Security	Security of Site and Building	1	0	The performance against the scheme has been confirmed by independent assessment and verification.
Mat 01	Life Cycle Impacts	LCA and LCC Alignment	1	0	Align LCA and LCC options appraisal activity. Both credits LCA and LCC must be achieved.
		Third Party Verification	1	1	A suitably qualified third party work or verifies the building LCA work and produces a report.
Mat 03	Responsible Sourcing of Materials	Responsible Sourcing of Construction Products	1	0	Achieve 50% of the points available in the Mat 03 calculation through sourcing of main building materials from responsible suppliers.
Wst 01	Construction Waste Management	Construction Resource Efficiency and Diversion of Resources from Landfill	1	0	To achieve a construction waste resource efficiency benchmark of 1.6m3 (or 1.9 tonnes) of construction waste generated per 100m2 GIA and divert at least 85% by volume or 90% tonnage of non-demolition waste from landfill and 85%y volume or 95% in tonnage of demolition waste from landfill.
Wst 02	Recycled Aggregates	Project Sustainable Aggregate Points	1	0	Identify all aggregate types, quantities and calculate the distance travelled by transport type. Points are awarded using BREEAM Wst 02 calculator.
LE 02	Ecological Risks and Opportunities	Wider Site Sustainability	1	0	Wider sustainability related activities and potential ecosystem service benefits are considered as part of determining the optimal ecological outcomes for the site.
LE 04	Managing negative impact on ecology	Enhancement of Ecological Value	1	0	The change in ecological value calculated under criterion 6 above confirms significant net gain has been achieved
EXEMPLARY		TOTAL	10	2	
		% of total score	10.00%	2.00%	

APPENDIX II – BRUKLS FOR SCHEME

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

Broad Street Mall

As built

Date: Thu Nov 09 14:32:37 2023

Administrative information

Building Details

Address: Address 1, City, Postcode

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.19

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.19

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 1324.39

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	2.61
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	1.75
Target primary energy rate (TPER), kWh _{ep} /m ² .annum	27.79
Building primary energy rate (BPER), kWh _{ep} /m ² .annum	18.8
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	0.15	0.15	L0000008:Surf[0]
Floors	0.18	0.11	0.11	ZL0000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.11	0.11	ZL0000001:Surf[1]
Windows** and roof windows	1.6	1.2	1.2	L0000008:Surf[4]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors ^Δ	1.6	1	1	L0000008:Surf[3]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building
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. Δ 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		

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- Block A

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.2	5.5	0	-	0.8
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.					

2- Block B

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.2	5.5	0	-	0.8
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.					

3- Block C

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.2	5.5	0	-	0.8
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.					

"No HWS in project, or hot water is provided by HVAC system"

"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
A-L00-Retail 2		120	80	1.875
B-L00-Retail 3		120	80	1.875
B-L00-Retail 4		120	80	1.875
Circulation		100	-	-
B-L00-Main Entrance		120	-	-
B-L00-Retail 5		120	80	1.875
B-L00-Gym		120	-	-
B-L00-Gym Store		120	-	-
B-L00-Studio		120	-	-
B-L00-Delivery Store		100	-	-
B-L00-Acc WC		120	-	-
B-L00-Staff Room		120	-	-
B-L00-Office		120	-	-

General lighting and display lighting		Display light source	
Zone name	General luminaire	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
B-L00-Corridor & Stairs	100	-	-
B-L00-Corridor	100	-	-
B-L00-Corridor	100	-	-
C-L00-Retail 6	120	80	1.875
C-L00-Entrance	120	-	-
C-L00-AOD Varies	100	-	-
C-L00-Car Park	100	-	-
C-L00-Retail 7	120	80	1.875
B-L01-Amenity	120	-	-
B-L01-Amenity	120	-	-
B-L01-Amenity	120	-	-
B-L01-Delivery Store	100	-	-
B-L01-Stairs & Circ	100	-	-
C-L01-Stairs & Circ	100	-	-
C-L01-Amenity	120	-	-
B-L24-Amenity	120	-	-
B-L24-Amenity	120	-	-
B-L24-Corridor	100	-	-
B-L24-Stairs	100	-	-
B-L24-Corridor	100	-	-
A-L00-Retail 1	120	80	1.875
A-L00-Entrance	120	-	-

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?
A-L00-Retail 2	NO (-88.6%)	NO
B-L00-Retail 3	NO (-24.7%)	NO
B-L00-Retail 4	NO (-1.5%)	NO
Circulation	NO (-95.1%)	NO
B-L00-Main Entrance	NO (-1.7%)	NO
B-L00-Retail 5	NO (-17.5%)	NO
B-L00-Gym	NO (-8.5%)	NO
B-L00-Gym Store	N/A	N/A
B-L00-Studio	N/A	N/A
B-L00-Delivery Store	N/A	N/A
B-L00-Acc WC	N/A	N/A
B-L00-Staff Room	N/A	N/A
B-L00-Office	N/A	N/A
B-L00-Corridor & Stairs	NO (-55%)	NO
B-L00-Corridor	N/A	N/A
B-L00-Corridor	N/A	N/A
C-L00-Retail 6	NO (-85.1%)	NO
C-L00-Entrance	NO (-34.4%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
C-L00-Retail 7	NO (-4%)	NO
B-L01-Amenity	NO (-28.5%)	NO
B-L01-Amenity	NO (-40.7%)	NO
B-L01-Amenity	NO (-50.1%)	NO
B-L01-Delivery Store	N/A	N/A
B-L01-Stairs & Circ	N/A	N/A
C-L01-Stairs & Circ	N/A	N/A
C-L01-Amenity	N/A	N/A
B-L24-Amenity	NO (-45.9%)	NO
B-L24-Amenity	NO (-55.4%)	NO
B-L24-Corridor	N/A	N/A
B-L24-Stairs	N/A	N/A
B-L24-Corridor	NO (-62%)	NO
A-L00-Retail 1	NO (-6.5%)	NO
A-L00-Entrance	NO (-50.7%)	NO

Regulation 25A: Consideration of high efficiency alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Floor area [m ²]	4513.5	4513.5	56	Retail/Financial and Professional Services
External area [m ²]	4886.7	4886.7		Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	LON	LON		Offices and Workshop Businesses
Infiltration [m ³ /hm ² @ 50Pa]	3	3		General Industrial and Special Industrial Groups
Average conductance [W/K]	1164.09	1693.7	5	Hotels
Average U-value [W/m ² K]	0.24	0.35		Residential Institutions: Hospitals and Care Homes
Alpha value* [%]	25	10		Residential Institutions: Residential Schools
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				Residential Institutions: Universities and Colleges
				Secure Residential Institutions
			40	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	3.32	6.15
Cooling	2.07	1.78
Auxiliary	0	0
Lighting	7.31	10.08
Hot water	0.67	0.61
Equipment*	16.94	16.94
TOTAL**	13.37	18.62

* 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	0.71	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0.71	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	79.88	91.23
Primary energy [kWh _{HE} /m ²]	18.8	27.79
Total emissions [kg/m ²]	1.75	2.61

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	58.2	50.3	3.9	3.4	0	4.12	4.11	4.2	5.5
Notional	72.6	38	7.3	2.3	0	2.78	4.63	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	52.2	33.4	3.5	2.3	0	4.12	4.11	4.2	5.5
Notional	63.7	34.2	6.4	2.1	0	2.78	4.63	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	68.7	31.3	4.6	2.1	0	4.12	4.11	4.2	5.5
Notional	92.2	29.7	9.2	1.8	0	2.78	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	0	---	---

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 SSEFF	• Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	• Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	• Heating generator seasonal efficiency
Cool gen SSEER	• Cooling generator seasonal energy efficiency ratio
ST	• System type
HS	• Heat source
HFT	• Heating fuel type
CFT	• Cooling fuel type