

Manor Road
Sustainability Statement

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61564 – Manor Road
Sustainability Statement

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1 Executive Summary

This Sustainability Statement has been prepared by chapmanbdsp on behalf of Avanton Richmond Developments Ltd ('the Applicant') in support of an application for full planning permission to enable the development of 84 Manor Road, North Sheen, London Borough of Richmond upon Thames ('the Site').

The purpose of this Sustainability Statement is to demonstrate compliance with London Borough of Richmond upon Thames council policies to meet sustainable design-related requirements of the Development Plan. This Sustainability Statement also demonstrated how the design meets relevant policies in the London Plan and the National Planning Policy Framework.

This Sustainability Statement starts by highlighting the principal sustainability drivers, relevant key policies and industry guidance (Sections 1-3). In Sections 4-9, the document then details the approach adopted with regards to different sustainability aspects, namely: climate change (mitigation and adaptation), energy, water (including flood risk and drainage), material, pollution and biodiversity.

In section 10, assessment figures from BREEAM 2018 New Construction (non-domestic) have been presented with conclusions outlined in section 11.

2 Introduction

This Sustainability Statement has been prepared by chapmanbdsp on behalf of Avanton Richmond Developments Ltd ('the Applicant') in support of an application for full planning permission to enable the development of 84 Manor Road, North Sheen, London Borough of Richmond upon Thames ('the Site').

The document summarises the pertinent regulatory and planning policies applicable to the Proposed Development and sets out how the relevant policy requirements are addressed.

It seeks to describe in full the proposals to enhance sustainability on Site and deliver a development fit for the future. It responds to national, regional, and local planning policy relating to environmental sustainability, describing measures adopted which meet and often exceed these requirements.

2.1 Site description

The site is located in the administrative area of the London Borough of Richmond upon Thames approximately 1.1 km south of Kew Gardens and approximately 1.6 km north of Richmond Park. The Thames is approximately 1.5 km to the west.

The site is bound to the north by Manor Road Circus (a roundabout where the A316 and B353 meet), to the east by Manor Road (with residential development and Sainsbury's beyond), to the south and west by the railway (with residential development beyond in both cases). The railway to the south is the South Western Railway main line and the railway to the west is part of the London Overground / Underground network.

The surrounding uses in the area are predominantly residential with some light industrial and retail uses. The closest Conservation Areas to the site are Sheendale Road (to the west) and Sheen Road (southwest of the site). There are a number of Buildings of Townscape Merit in the vicinity of the site (for example along Manor Grove to the east).

The site has a rating of Public transport Accessibility Levels (PTAL) 5 (very good). North Sheen station is approximately 50m to the south-east. Pedestrian, cyclist and vehicular access to the site is from Manor Road.

2.2 Proposed Development

In summary, full planning permission is sought for the following (herein referred to as 'the Proposed Development') is as follows:

"Demolition of existing buildings and structures and comprehensive phased residential-led redevelopment to provide 453 residential units (of which 173 units will be affordable), flexible retail, community and office uses, provision of car and cycle parking, landscaping, public and private open spaces and all other necessary enabling works."

The area schedule for the proposed uses is as below:

- Residential: 453 units / 37,248 square metres
- Commercial: 495 square meters

Full details and scope of the planning application is described in the submitted Town Planning Statement, prepared by Avison Young.



Figure 2.1. Ground floor plan of the Proposed Development

3 Sustainability Drivers

This section outlines the most appropriate set of sustainability targets that the project is required to adhere to. The policies relevant to the development are as follows:

- LBRuT Local Plan (2018)
- LBRuT Climate Emergency Strategy (2019)
- The London Plan (2021)
- GLA Energy Assessment Guidance, 2022
- The National Planning Policy Framework (NPPF) July 2021 Update
- The National Planning Policy Guidance

Key targets from these documents are summarised below:

- Site layout and sustainable design principles to reduce energy demand and increase efficiency.
- Minimum 35% reduction in regulated CO2 beyond the Building Regulations Part L 2013 baseline for nonresidential areas.
- 'Zero Carbon' (i.e. 100% reduction in regulated CO2 beyond the Building Regulations Part L 2013 baseline) for residential areas.
- BREEAM 'Excellent' rating for commercial spaces greater than 100 m2.
- Assessment of the Whole Life Carbon (embodied and operational carbon emissions)
- Consideration given to the Circular Economy of building materials used, and waste produced

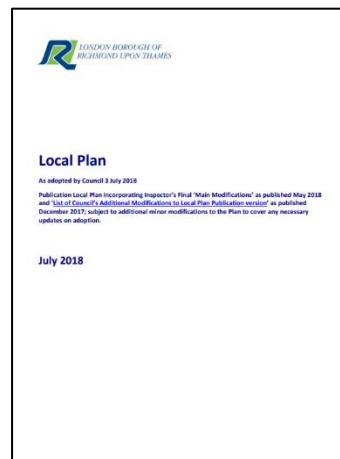
3.1 Local Planning Policy

The policies of the London Borough of Richmond upon Thames (LBRUT) applicable to the Proposed Development are contained in the development plan. The following documents have been reviewed:

- LBRuT Local Plan (2018)
- LBRuT Climate Emergency Strategy (2019)

3.1.1 LBRuT Local Plan (2018)

LBRuT's Local Plan 2018 sets out policies and guidance for the development of the borough over the next 15 years. It looks ahead to 2033 and identifies where the main developments will take place, and how places within the borough will change, or be protected from change, over that period. Key policies relating to sustainability are summarised below.



- Policy LP 10 Local Environmental Impacts, Pollution and Land Contamination
- Policy LP 12 Green Infrastructure
- Policy LP 15 Biodiversity
- Policy LP 16 Trees, Woodlands and Landscape
- Policy LP 17 Green Roofs and Walls
- Policy LP 20 Climate Change Adaptation
- Policy LP 21 Flood Risk and Sustainable Drainage
- Policy LP 22 Sustainable Design and Construction
- Policy LP 23 Water Resources and Infrastructure
- Policy LP 24 Waste Management
- Policy LP 28 Social and Community Infrastructure
- Policy LP 29 Education and Training
- Policy LP 30 Health and Wellbeing
- Policy LP 40 Employment and Local Economy
- Policy LP 44 Sustainable Travel Choices

3.1.2 LBRuT Climate Emergency Strategy (2020-2024)

Richmond Council proclaimed a climate emergency in July 2019 and committed to strive towards become carbon-neutral by 2030. In order for the council and Richmond as a whole to play its part in resolving the climate emergency, the Richmond Climate Emergency Strategy (RCES) and Action Plan developed and identified six key areas that must be addressed to meet legislative requirements as well as contributing to reducing carbon emission:

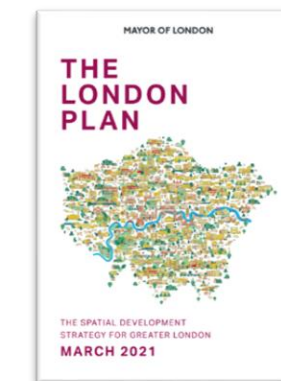


- a. Our council: Becoming Carbon Neutral as an Organisation by 2030
- b. Our legacy: Climate Change Mitigation and Energy Efficiency
- c. Our waste: Waste and Plastics and the Circular Economy
- d. Our air: Improving Air Quality
- e. Our nature: Green Infrastructure and Biodiversity
- f. Our resilience: Climate Resilience and Flooding

3.1.3 Emerging Policy

LBRuT are in the process of preparing a new Local Plan and currently anticipate consultation on the pre-publication (Regulation 19) will commence in early June 2023. Whilst the emerging plan is acknowledged, we note that it carries limited weight at this time due to its early stage of preparation and possibility for further amendments.

3.2 The London Plan 2021



The London Plan 2021 is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years and the Mayor's vision for Good Growth.

The Plan is part of the statutory development plan for London, meaning that the policies in the Plan should inform decisions on planning applications across the capital.

The following provides a high-level summary of the policies affecting this Sustainability Statement.

- Policy GG2 Making the best use of land
- Policy GG3 Creating a healthy city
- Policy GG4 Delivering the homes Londoners need
- Policy G1 Green infrastructure
- Policy SI7 Reducing waste and supporting the circular economy
- Policy SI12 Flood risk management
- Policy SI13 Sustainable drainage
- Policy G4 Open space
- Policy G5 Urban greening
- Policy G6 Biodiversity and access to nature

- Policy SI1 Improving air quality
- Policy SI5 Water infrastructure
- Policy T1 Strategic approach to transport
- Policy T2 Healthy Streets
- Policy T4 Assessing and mitigating transport impacts
- Policy T6 Car parking

Policy Good Growth (GG) 6 – Increasing Efficiency and Resilience

To help London become a more efficient and resilient city:

- Improve energy efficiency, move towards a low carbon, circular economy and target a zero-carbon city by 2050; and
- Ensure buildings and infrastructure are designed to adapt to a changing climate, making efficient use of water, reducing the impact from natural hazards such as flooding and heatwaves, while mitigating against the urban heat island effect.

Policy SI2 – Minimising Greenhouse Gas Emissions

Major developments should be “net zero-carbon”. This means reducing greenhouse gas emissions in operation, and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

- Be Lean: use less energy and manage demand during operation.
- Be Clean: exploit local energy resources and supply energy efficiently and cleanly.
- Be Green: maximize opportunities for renewable energy by producing, storing and using renewable energy on-site.
- Be Seen: monitor, verify and report on energy performance.

The London Plan 2021 sets minimum performance targets using regulated Carbon emissions which is measured in the form of a percentage improvement on Part L of the Building Regulations (2021) as follows:

- Residential developments should achieve **10%** savings through passive design and energy efficiency measures (Be Lean).
- Non-residential developments should achieve **15%** savings through passive design and energy efficiency measures (Be Lean).
- Target net zero regulated carbon emissions (100% savings beyond Building Regulations) with a minimum on-site reduction of at least 35%.

Major development proposals should calculate and minimize Carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e., unregulated emissions.

Policy SI2 is summarised in the figure below:

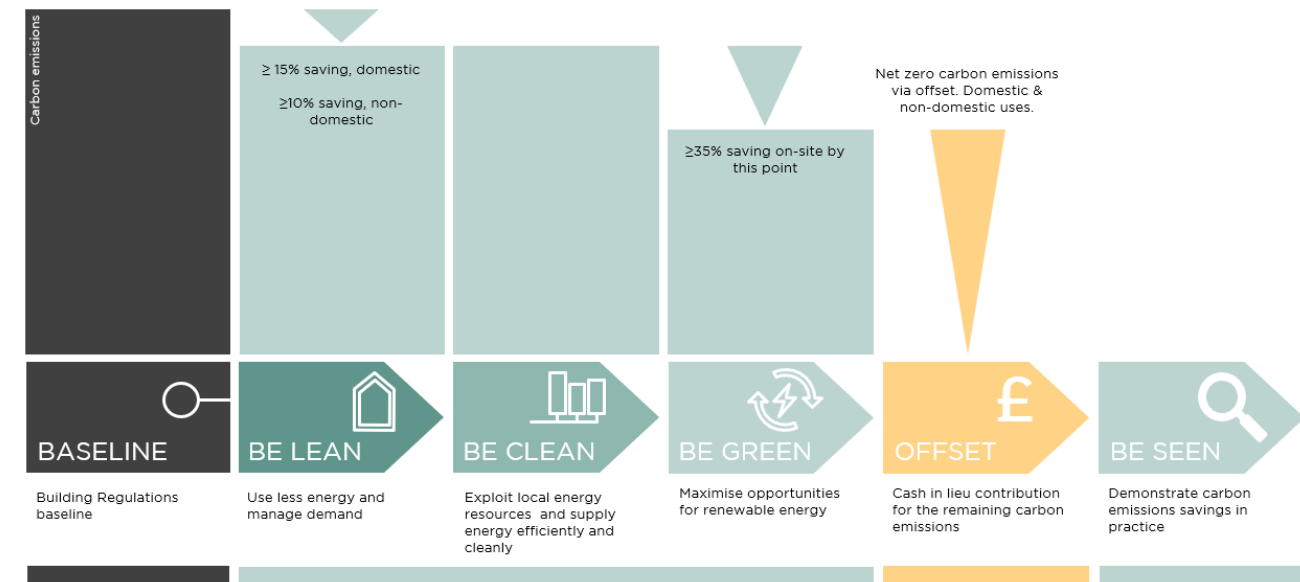


Figure 3.1. The Energy Hierarchy with associated London Plan 2021 regulated carbon emissions targets.

While the above targets form the overarching framework that are followed in the preparation of this statement, a recognition exists that the non-domestic element of the Proposed Development might not be able to achieve these savings. As part of the formal introduction of Building Regulations Part L 2021 on the GLA have issued ‘15 June 2022 – Note to accompany GLA Energy Assessment Guidance 2022’. The cover note acknowledges that:

Initially, non-residential developments may find it more challenging to achieve significant on-site carbon reductions beyond Part L 2021 to meet both the energy efficiency target and the minimum 35 per cent improvement. This is because the new Part L baseline now includes low carbon heating for non-residential developments but not for residential developments. However, planning applicants will still be expected to follow the energy hierarchy to maximise the carbon savings before the offset is considered.

It continues to advise that:

Over time it is expected that performance against Part L 2021 will improve to enable these developments to achieve the closer alignment with the energy efficiency targets and the minimum 35 per cent on-site improvement due to technological improvements and as cost come down. We will monitor this progress and may update the benchmarks to reflect these improvements as appropriate. In the intervening period applicants should continue to aim to maximise on-site carbon reductions as far as possible.

Policy SI3 – Energy Infrastructure

Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new developments. Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system and the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

- Connect to local existing or planned heat networks.
- Use zero-emission or local secondary heat sources (in conjunction with heat pump, if required).
- Use low-emission Combined Heat and Power (CHP), only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development’s electricity demand and provide demand response to the local electricity network.
- Use ultra-low NOx gas boilers.
- CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements of policy SI1 – Improving air quality; and

- Where a heat network is planned but not yet in existence the development should be designed to allow for a cost-effective connection at a later date.

Policy SI4 – Managing Heat Risk

Development proposals should minimize adverse impacts on the urban heat island through design, layout, orientation, materials, and the incorporation of green infrastructure.

Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

- Reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation, and the provision of green infrastructure.
- Minimize internal heat generation through energy-efficient design.
- Manage the heat within the building through exposed internal thermal mass and high ceilings.
- Provide passive ventilation.
- Provide mechanical ventilation.
- Provide active cooling systems in a way that utilizes rejected heat locally.

3.3 GLA Energy Assessment Guidance, 2022

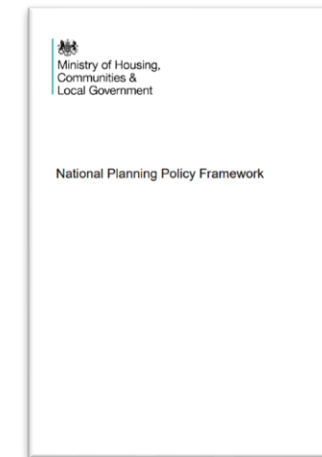
In June 2022, the GLA released a new guidance on preparing Energy Assessments as part of planning applications. Within this guidance, it states that Part L 2021 carbon factors are expected to be used for referable applications unless the development is expected to comply with London Plan Policy SI 3 – development in Heat Network Priority Area. In this case, developments should be provided with communal low-temperature heating system and the heat source shall be selected according to the below (most preferable – least preferable)

- Local existing / planned heat networks
- Heat source which uses zero-emission or local secondary heat source (in conjunction with heat pumps)
- Heat source which uses low-emission CHP
- Heat source which uses ultra-low nitrogen oxides (NO^x)
- The above CO2 factors associated with the heat supplied by a network shall be obtained by the network operator and be provided in the energy assessment.

3.4 National and Regional Policies

The following documents have formed an integral part of developing the energy strategy.

3.4.1 National Planning Policy Framework (July 2021)



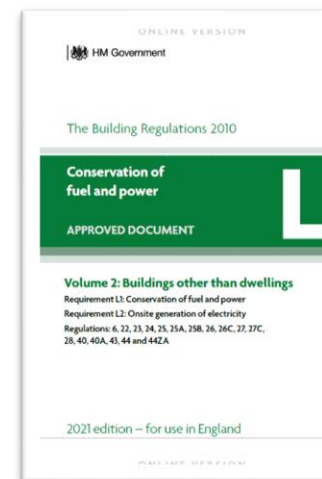
The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced. Planning law requires that applications for planning permission be determined in accordance with the development plan unless material considerations indicate otherwise. The NPPF must be taken into account in preparing the development plan and is a material consideration in planning decisions. Planning policies and decisions must also reflect relevant international obligations and statutory requirements.

The purpose of the NPPF is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways:

- 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 a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being.
- An environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

This statement has been developed in line with NPPF and alongside the suite of documents submitted as part of this application fulfils the requirements of the NPPF.

3.4.2 The Building Regulations Approved Document Part L 2021



Part L of the Building Regulations is the mechanism by which the Government is driving reductions in the regulated CO2 emissions from new buildings.

- As part of the introduction of Building Regulations Part L 2021, GLA have issued an updated Energy Assessment Guidance along with a cover note, this Energy Statement have been prepared using Part L 2021 methodology as per GLA's energy assessment guidance and cover note.

Part L 2021 considers 12 sections which must be satisfied as follows:

Section 1: Calculating the Target Primary Energy Rate and Target Emission Rate

The first section of the AD L states that "A new building must be built to a minimum standard of total energy performance. This is evaluated by comparing calculations of the performance of the 'actual building' against

calculations of the performance of a theoretical building, called the 'notional building'. This must be carried out both at the design stage and when work is complete."

The energy performance of the notional building is described by the Target Primary Energy Factor (kgCO₂/(m².yr)) and by the Target Emission Rate (kgCO₂/(m².yr)). These two values shall be assessed using a calculation tool in the approved methodology. This can be either Simplified Building Energy Model (SBEM) or any other software approved under the Notice of Approval.

Section 2: Calculating the Building Primary Energy Rate and Building Emission Rate

This section states that the same tool used to assess CO₂ emissions shall be used to assess the Target Primary Energy Rate - TPER, the Target Emission Rate - TER, the Building Primary Energy Rate - BPER, the Building Emission Rate - BER.

The above shall be assessed before works start using design values and when the work is complete using figures for the building as built, including any occurred changes and the measured tested air permeability. At both stages the following must be achieved: BER<TER and the BPER<TPER

Section 3: Consideration of High-efficiency Alternative Systems

The building regulation asks to analyse the technical, environmental, and economic feasibility of using high-efficiency alternative systems in the building design, before building work starts on a new non-domestic building. BCB - building control body shall be notified and the output available to be verified.

Regulation 25A of Building Regulation 2010 (consideration of high-efficiency alternative systems for new buildings) also applies.

Section 4: Limiting Heat Gains and Losses

The section focuses on U-values which shall be assessed using conventions and method set out in BR443, on Limiting standards for new or replacement elements and Limiting standards for renovated and retained elements which shall not be less than those specified in tables 4.1 & 4.2 of the document. These cover continuity of insulation, airtightness in existing buildings, limiting the effects of solar gains in summer, limiting heat losses and gains from building services.

Section 5: Minimum Building Services Efficiencies and Controls - General Guidance

This section states that for each new fixed building service in a new or existing building, the efficiency shall not be lower than those stated in section 6 tables of the document. Efficiencies shall be based on the appropriate test standard and the test data should be certified by a notified body.

Section 6: System Specific Guidance

This section sets out minimum standards for specific types of building services. These efficiencies are set out based on documented manufacturers' test data. Equipment should be designed, specified and installed with the aim of maximising its efficiency when installed.

Section 7: Air Permeability and Pressure Testing

It is mandatory to meet the minimum standard for air permeability in new buildings. This should be supported with evidence, in particular that the test equipment has been calibrated using a UKAS-accredited facility. This shall be reported to the BCB - Building Control Body.

Section 8: Commissioning

Fixed building services must be commissioned with the aim of ensuring that no more fuel and power than reasonable is used, and in-use performance is optimised. A commissioning manager shall be appointed for large

complex buildings and their competency shall meet the minimum requirement set out under CIBSE Commissioning Code M.

Section 9: Providing Information

This section outlines how O+M operations and maintenance instructions logbook (compliance with CIBSE TM31 guidance) should be provided to building users/operators.

Section 10: New Elements in Existing Buildings, Including Extensions

This guidance covers new or replacement thermal elements (opaque envelope, windows, doors, rooflights, etc.), for extending an existing building (i.e., adding a conservatory, extension, porch, etc.).

Section 11: Work to Fabric Elements in Existing Buildings

This is a guidance for renovations of existing elements, making a change of use or any other change that constitutes a change to energy status in existing buildings.

Section 12: Consequential Improvements

This section refers to existing buildings with a total useful area of over 1000 sqm, and it concerns overall energy efficiency improvement if the proposed work consists of an extension, a provision of fixed building services for the first time, or an increase in their capacity. Consequential improvements are to ensure that the entire building complies with part L of Building Regulations.

4 Climate Change

The GLA Policy GG3 – Increasing efficiency and resilience, provides further guidance on how developers should incorporate climate change adaptation and greening priorities outlined in the London Plan.

Climate change brought about by man-made emissions of greenhouse gases and its effects are complex and include:

- Increased average temperatures
- Rising sea levels
- Increased precipitation
- More frequent extreme weather

Action to address climate change falls into two categories: mitigation and adaptation. Mitigation measures are designed to reduce greenhouse gas emissions to slow down or stop climate change, whilst adaptation measures are designed to adjust society and buildings to cope with climate change.

The proposed development incorporates the following climate change mitigation and adaptation features in line with London Plan 2021 planning requirements.

4.1 Climate Change Mitigation

The energy strategy of the scheme has considered multiple measures in line with the energy hierarchy to mitigate the effects of climate change through the specification of passive design, energy-efficient systems and low and zero carbon (LZC) technologies. The measures mitigate energy use in the first instance, then providing a appropriate renewable technologies for the scheme to supply cooling, heating, and electric power in line with the London Plan 2021.

A brief summary of the strategy and the resultant energy and carbon emission savings can be found in Section 5 of this report, with further details provided in the Energy Statement prepared by chapmanbdsp and submitted as part of this application.

4.2 Climate Change Adaptation

4.2.1 Adapting to hotter, drier summer

Alongside energy conservation and carbon emission savings, the energy strategy of the scheme has included considerable measures to adapt to the effects of climate change through an optimised design to mitigate the risk of overheating. Measures have been developed in line the London Plan Cooling Hierarchy to promote passive design before active cooling and have been verified using best practice modelling methods (CIBSE TM52 for non-domestic areas and TM59 for domestic areas).

They include:

- Optimising glazing to limit solar gains, maintain fabric performance, and encourage the benefits of daylighting
- High levels of thermal insulation for opaque elements, reducing heat loss.
- Thermal bridging mitigated in design detailing wherever possible to limit heat loss.
- High levels of airtightness, reducing heat loss and mitigating drafts.
- High levels of airtightness

Detailed dynamic modelling was undertaken to ensure building compliance with CIBSE TM59 criterion A and B. The results (using DSY1 2020 50% percentile weather files) showed compliance for all target zones. DSY1 results can be summarised as follows:

	No. Tested	Pass	Fail
Bedrooms	31	31	0
Living rooms/Kitchens	18	18	0

Table 4.1. Overheating results for the dwellings during a moderately warm summer (DSY1 2020 50% percentile).

Please refer to the submitted Energy Statement prepared by chapmanbdsp for a detailed summary.

In addition, green and biodiverse finishes will be implemented across the site at roof and ground level. These areas will contribute to reducing the urban heat island effect by absorbing solar irradiance and reducing the temperature of the roof surfaces and surrounding air, positively impacting the development.

The Proposed Development will prioritise the use of native plants and the planting list generally is selected to include resilient plants suited to local London conditions. The planting selected from the recommended plant palette will therefore be appropriate for the site, typically drought resistant, and have a lower demand for supplementary watering.

4.2.2 More extreme weather events

The development will be on piled foundations (rather than shallow foundations). The piled foundations will be bounded in strata, which means the foundation will not be influenced by the weather.

5 Energy

The energy strategy for this proposed development focuses on providing spaces that are comfortable throughout the year and designed to mitigate energy consumption and resultant carbon emissions. The design approach for the proposed development follows the GLA energy hierarchy, i.e. 'Be Lean, Clean, Green, Seen'.

This approach places the primary emphasis on mitigating energy use in the first instance via passive and energy efficient design (Be Lean).

The second step is to deliver the required energy as cleanly and efficiently as possible (Be Clean).

Once the energy demand of the development has been reduced as far as practically possible, renewable energy sources are utilised to offset the demand of the development (Be Green).

Throughout the design process measures are implemented to enable the team to monitor energy consumption and remediate excessive consumption to enable the development to operate as intended (Be Seen).

The design has been developed to be in line with the Greater London Authority (GLA) energy hierarchy, i.e. being 'lean, clean, and green', and relevant National, London Plan 2021, and LBN requirements.



Figure 5.1 - The energy hierarchy.

5.1 Be Lean

The design approach targets demand reduction measures, giving priority to the optimisation of the building fabric to reduce the need for heating, cooling, and artificial lighting. The objective is to have buildings as energy-efficient (i.e. 'lean') as possible without relying on systems or technologies which require energy to operate and deliver low carbon performance. Where energy is required to operate systems, efficient plant has been selected to minimise demand.

The following passive design features are proposed that reduce the energy demand of the Site in the first instance:

- Optimising glazing to limit solar gains, maintain fabric performance, and encourage the benefits of daylighting
- High levels of thermal insulation for opaque elements, reducing heat loss.
- Thermal bridging mitigated in design detailing wherever possible to limit heat loss.
- High levels of airtightness, reducing heat loss and mitigating drafts.

Full details of the Be Lean measures are provided in the Energy Statement submitted as part of this application.

5.2 Be Clean

A desktop-based study was undertaken using London Heat Map to identify if there are any district energy networks that the Proposed Development could connect to. No existing or proposed district heat networks in the local area has been identified.

Moreover, space allowance has also been made for heat interface units to each building's ground floor. If a district energy system were to become available in the future to which the proposed development could connect, trenching would be provided between buildings through the space allocated for district energy pipework.

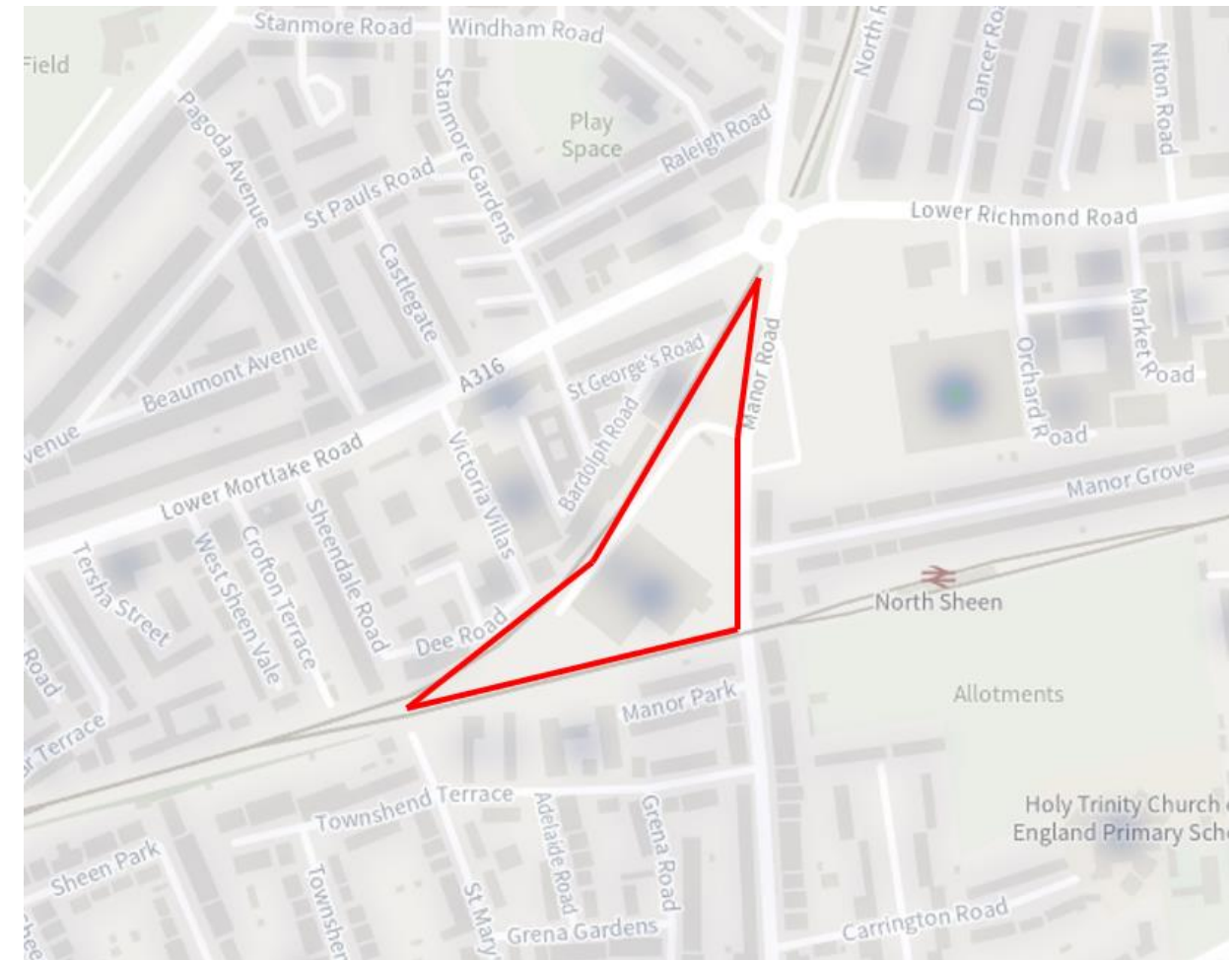


Figure 5.2. Heat Map of Manor Road site (red - the Site)

5.3 Be Green

At an early stage, a holistic review of low and zero carbon technologies was undertaken to consider a wide range of factors that influence their successful design and operation. The following have been considered in the low and zero carbon matrix:

- Current and future planning policies/aspirations
- Opportunities of the site and energy demand/profile of the development
- Practical implementation considerations
- Installation and maintenance issues
- Implications for internal arrangement and space allocation, infrastructure and site layout
- Public acceptability
- Environmental and visual impact
- Deliverability
- Security and availability of fuel supply
- Capital and life cycle costs, payback and grants
- Carbon contribution and cost per CO₂ saving
- Interactions of the technologies with one another.

A feasibility study for various LZC technologies established air source heat pumps and photovoltaic panels as suitable solutions for the Site. Air source heat pumps are considered as part of the ambient loop network above whilst PV panels are being proposed at the roof levels. The overall site-side savings are outlined in the next section, while further detail is provided in the submitted Energy Statement.

5.4 Estimated design performance

In summary, the proposed development seeks to deliver savings in line with the GLA energy hierarchy, limiting energy use in the first instance and selecting energy efficient plant and building services thereafter. Table 5.1 summarises the unregulated and regulated CO₂ savings from each stage of energy hierarchy.

Overall, the Site could be expected to achieve a x% reduction in regulated carbon emissions over Part L 2021 when performing a SAP 10.2 carbon factor calculation. This overall figure breaks down into regulated carbon emissions reductions of x% (domestic) and x% (non-domestic) at 'Be Lean' stage, x% (domestic) at 'Be Clean' stage, and x% (domestic) and x% (non-domestic) at 'Be Green' stage.

A detailed summary of the approach to energy conservation and carbon emissions savings is provided in the Energy Statement provided as part of this planning application.

Table 5.1 - Regulated & unregulated CO₂ savings from each stage of the energy hierarchy for the proposed development

	Total regulated emissions (Tonnes CO ₂ / year)	CO ₂ savings (Tonnes CO ₂ / year)	Percentage savings (%)
Part L 2021 baseline	355.4	-	-
Be Lean	316.9	38.5	11%
Be Clean	316.9	38.5	0%
Be Green	133.7	183.2	52%
Total Savings	-	221.7	62%

Cumulative carbon to be off-set by payment	4,012 tCO ₂ /annum
Cash in-lieu contribution (£)	£381,164

5.5 Monitoring of Energy Use

Metering of the cold water and electrical supplies will be provided. Energy metering of lighting, small power and all central systems will be included. Metering to allow billing of individual tenants of the building will be installed.

Demand Side response opportunities will be considered during the detailed design stages.

6 Water, Flood Risk & Drainage

Consideration has been made with regards to the conservation of water resources through water efficiency measures, in addition to the risk posed by flooding. This includes the use of Sustainable Urban Drainage Systems (SuDS) to reduce the risk of surface water flooding, in line with the LBRuT Local Plan, Policy LP 21: Flood Risk and Sustainable Drainage and The London Plan 2021, policies SI 12: Flood risk management, and SI 13: Sustainable drainage.

6.1 Flood Risk and SuDS

A Flood Risk Assessment and Drainage Strategy have been created. According to the SuDS Manual 2015, the surface water disposal system has been created to guarantee that the drainage hierarchy has been executed in the most reasonable and effective way possible to benefit the site. Additionally, the Non-Statutory Technical Standards for sustainable drainage systems have been taken into account in the design, and it has been guaranteed that these criteria have been addressed.

All water on the property is managed by the planned drainage method through infiltration discharge. There won't be any runoff from the development outside of its boundaries (subject to infiltration tests being completed and proving favourable ground conditions).

The proposed development is thought to be in Flood Zone 1, which corresponds to a low yearly risk of flooding, according to the Environment Agency Flood Risk Map and Flood Risk Assessment (FRA), as displayed in the accompanying image:



Figure 6.1. Flood risk map

For the other source of flooding, FRA and Drainage Strategy confirms that all sources of flooding have been considered, which includes:

- Tidal/fluvial
- Surface water and drainage
- Groundwater
- Reservoirs, canals and other artificial sources
- Sewers

The FRA also states the mitigation measures to be provided as required.

6.2 Surface Water Runoff

The London Plan aims for either a reduction in surface water runoff to the greenfield runoff rate or, when feasible, a 50% improvement in the current surface water runoff rate.

The current location is entirely hardstanding and does not have a connection to the public sewage system. It drains through infiltration, which is carried over into the new development's suggested drainage strategy.

Tenants will receive advice from the Building User Guide on good environmental practises to lower danger to the London water ecosystem.

The main contractor will have to use an Environmental Management System (EMS) and exhibit best practise pollution prevention, management, and control techniques through a construction management plan.

6.3 Water Efficiency

Water consumption in the UK has risen by more than 50% over the last 25 years. This represents a huge strain on natural water resources such as reservoirs and rivers and has a knock-on effect on wetland habitats and ecosystems.

6.3.1 Water demand reduction and metering

Water use can be minimised by installing water-efficient equipment and appliances and increasing awareness of water consumption. The scheme will incorporate water-efficient fittings in line with the following requirements.

The Proposed Development will be provided with water efficient fixtures, fittings and appliances, and include measures to encourage efficient water use, including:

- Installation of water meters with pulsed or other open protocol communication output to enable connection to a utility monitoring and management system.
- A leak detection system on the mains water supply between the building and the utilities water meter.
- Processes to reduce unregulated water demand

Residential dwellings will be fitted with water efficient appliances, and will meet a water consumption rate of 105 litres per person per day, or less, exclusive of external water uses (e.g. watering of plants).

For non-residential spaces, water credits have been targeted as part of the BREEAM preassessment report, which includes:

- Installation of water meter(s) with pulsed or other open protocol communication output to enable connection to a utility monitoring and management system.
- Processes to reduce unregulated water demand.
- Installation of water appliances will be carried out by future tenants.

6.3.2 Rainwater Harvesting

Rainwater harvesting for re-use in irrigation of planted areas is not being considered for the Proposed Development. However, the proposed surface water runoff is being attenuated via infiltration methods on-site, providing two levels of treatment, improving the water quality into the local aquifer and illustrating an efficient management of stormwater.

A large proportion of the site is proposed as permeable to increase infiltration and decrease stormwater runoff and collection.

Green roofs have been incorporated in the design.

7 Materials & Waste

Preference will be given to the selection of sustainable materials with a low environmental impact over their life cycle, as well as sustainable procurement and waste disposal.

The environmental impact of construction activities will be minimised through the implementation of best practice measures detailed in the following sections.

7.1 Whole Life-Cycle Carbon Assessment

A Whole Life-Cycle (WLC) Carbon assessment has been carried out for the proposed development. The WLC has been undertaken at an early stage in order to demonstrate the full picture of the project carbon emissions resulting from materials extraction, construction and operation. It has been undertaken in line with the widely accepted environmental performance assessment structure illustrated in EN 15978 to facilitate coherence in the calculations even at early design stages where only limited detailed project-specific information is available.

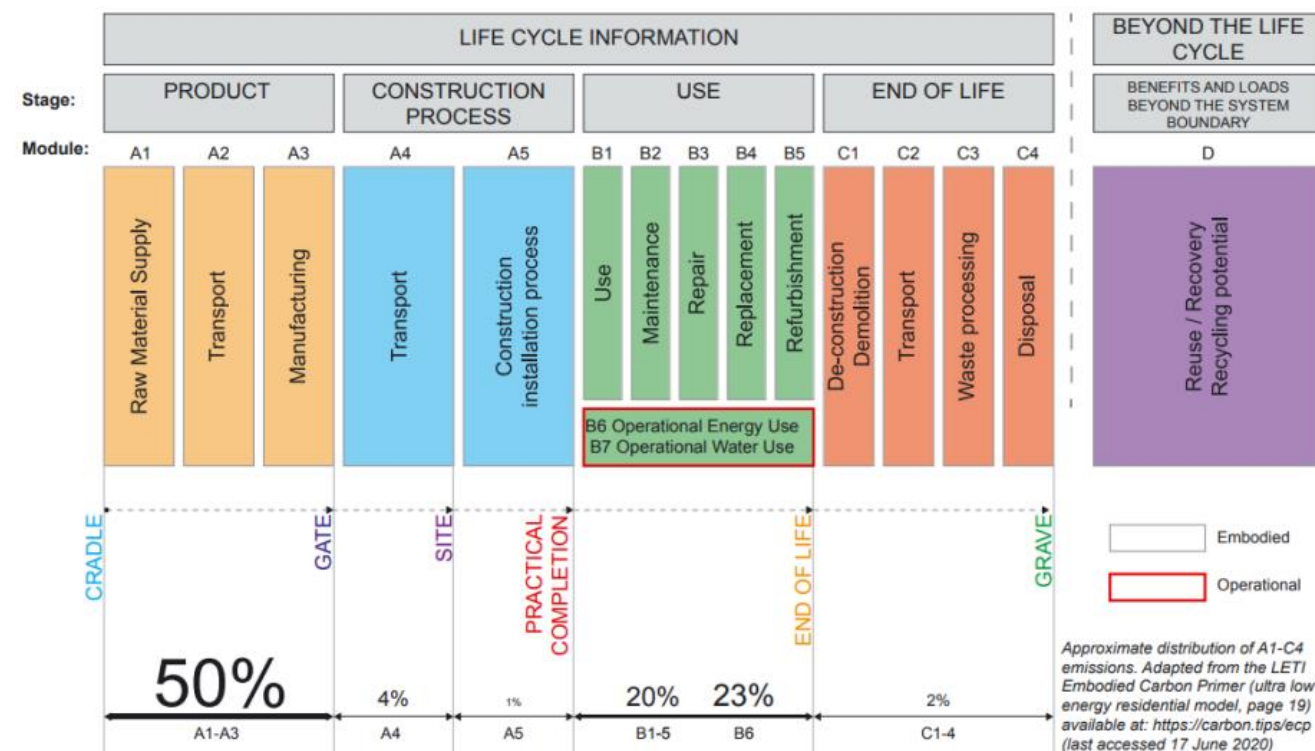


Figure 7.1. System Boundary EN 15978:2011 Display of modular information for the different stages of the building assessment

The design team has focused on reducing the energy demand while also looking for solutions that may reduce the embodied carbon of the widely used materials, such as GGBS replacement in concrete. The following are some of the measures that the proposed development is currently reviewing in order to reduce the carbon footprint:

- GGBS Cement Replacement;
- High Recycled - Content Steel Reinforcement ;
- Structural Framing System;
- Use of concrete brick instead of fired clay brick; and
- Use of composite window frame. Circular economy-based recycled content targets

Further analysis will be undertaken as the project progresses to limit the embodied carbon of the development.

For further information, please refer to the WLC report.

Table 7.1 - Embodied carbon results using assessment 1: Current status of the grid for the calculation of B6 (operational energy) using SAP 10 carbon factors.

	Module A1-A5	Module B1-B5	Module B6-B7	Module C1-C4	Module D
Total kg CO2e	18,410,443	10,426,467	8,307,858	1,342,641	-5,594,881
Total kg CO2e/m2 GIA	470	266	212	34	-143

7.2 Sustainable Construction

Consideration has been given to the use of recycled materials and materials with low environmental impact. Sustainable waste management practices will be promoted during both construction and operation phases of the Proposed Development.

All timber will be responsibly sourced, and the main contractor will be required to source materials in accordance with a documented sustainable procurement plan. A construction waste resource efficiency benchmark of ≤ 6.5 tonnes per 100 m² has been targeted and 80% of non-demolition and 90% of demolition waste (by weight) will be diverted from landfill.

The materials procurement and waste strategy (during construction and in operation) for the development have been assessed holistically in the Circular Economy Statement. This sets out key strategic initiatives implemented in the Development so that as much as possible, materials, components and parts can be continually and easily reused and/or recycled.

Furthermore, the Main Contractor will be required to implement an Environmental Management System (EMS) as well as a Site Resource Management Plan.

7.3 Construction materials

All of the timber used at the Proposed Development will be Forest Stewardship Council (FSC) certified or similar.

Wherever feasible, selected materials will be in the range of A+ to D as confirmed by the BRE Green Guide to Specification.

7.4 Construction waste

A pre-demolition audit has been undertaken, to investigate how recycling of construction, demolition and excavation material can be maximised. This has highlighted specific elements of the existing building and hardstanding on the Site which can be re-used or recycled/recovered.

The main contractor will be required to produce a Site Resource Management Plan prior to commencement of any demolition or construction works on-site. One of the aims of the document will be to highlight means to divert specific waste streams from landfill.

7.5 Prefabrication Elements

The scheme has been designed based on a grid allowing for a simple structural solution. Structural elements including floor slabs, beams, and columns are able to be pre-fabricated and transported to site.

Stone details, including lintels, arches, stairs, and columns have been unified across the project to reduce the number of moulds required for fabrication. These elements will all be pre-fabricated off-site to improve construction time and reduce on-site waste. Further assessments in detail will take place at the next design stages.

7.6 Operational waste

Finishes and other materials will not contain or emit toxic substances.

A waste strategy has been prepared. Waste segregation is incorporated in the design, and waste stores will be accessible to building users and refuse collectors. A dedicated centralised recyclable waste storage facility will be provided for commercial areas, as required under the BREEAM Wst 03 credit requirements.

Further detail on materials and waste is provided in the Circular Economy Statement prepared by chapmanbdsp.

8 Pollution

The development has minimised its impact on noise, air and light pollution in line with the guidance of the, London Plan 2021, LBRuT Policy LP 10: Local Environmental Impacts, Pollution and Land Contamination, and LBRuT Climate Emergency Strategy 'Our air: Improving Air Quality'.

8.1 Land contamination

A desk study has been carried out to address the risks of contamination site. Please refer to the 'Geotechnical and Geoenvironmental Preliminary Risk Assessment' submitted in support of this planning application. Ground investigation will be carried out at a later stage to investigate contamination prior to works.

In relation to uses, the Proposed Development is not proposing to include uses that would lead to land contamination.

8.2 Construction air pollution

During the construction phase, emissions of dust and exhaust gases from construction activities will be effectively controlled through the use of suitable mitigation measures implemented through the Construction Environmental Management Plan and a dedicated Dust Management Plan, which will be in place prior to the start of construction.

The main contractor will be required to register under the Considerate Constructors Scheme and achieve compliance beyond best practice.

Also, the development proposal discourages private vehicle use through the omission of general use car parking on site. The development site has excellent accessibility and public transport links to both bus and rail, which will meet the transport demand of building occupants. It is proposed that the minimal requirement for transport trips by cars (as drivers or passengers) will be undertaken using the proposed Car-Club vehicles or by taxi.

8.3 Operational air pollution

The development is expected to meet the air quality neutral (AQN) benchmarks for transport and building emissions as it is electrically powered and traffic generated by the development is less than the previous benchmark use for the site, and will therefore reduce local emissions compared to the previous use.

Also, The development proposal discourages private vehicle use through the omission of general use car parking on site. The development site has excellent accessibility and public transport links to both bus and rail, which will meet the transport demand of building occupants. It is proposed that the minimal requirement for transport trips by cars (as drivers or passengers) will be undertaken using the proposed Car-Club vehicles or by taxi.

8.4 Operational noise pollution

The Noise Impact Assessment carried out for the Proposed Development has not identified areas classified as having positive sound features or as being tranquil within proximity of the Application Site.

The Proposed Development will seek to reduce noise at source and then design noise out of the scheme to reduce the need for mitigation measures. The proposed design includes three residential courtyards - the north and central courtyards are protected from external noise via the planted buffer zone, and the south courtyard is slightly more exposed. This will be mitigated via other design measures at a later stage.

8.5 Light Pollution

All external lighting provided as part of the Proposed Development will be designed in compliance with Table 2 (and its accompanying notes) of the ILP Guidance notes for the reduction of obtrusive light, 2011, and will be automatically switched off between 23:00 and 07:00.

9 Landscape & Biodiversity

9.1 Landscape strategy

The Landscape Masterplan includes a significant area of soft landscape (planting and lawn) around the buildings on site, in paved areas, and on building roofs. This greening of the site, combined with the tree planting proposed, including street trees and buffer planting to the edges of the site (south and west) contribute to the Green Infrastructure of the locality and create linkages to the existing green infrastructure in Richmond.

The Proposed Development will increase the extent of total tree cover owing to the improved planting conditions through contemporary soil volume creation systems. It is estimated that the development will include the planting of 141 new trees, as a mix of 13 large streetscape trees, 6 large feature trees in the public square, and 122 medium and smaller trees.

The approximate canopy cover currently (60 live trees), based upon an average of 15 m²/live tree, equates to 900m² total. Proposed new trees, based upon an average canopy development of 30 m²/live tree (subject to contemporary planting and maintenance) provides a projected approximate canopy cover of 4,250m². This is a projected approximate increase of canopy cover by 470% (15-20 years). Thus, the proposed landscaping including tree planting makes a significant contribution to the locality in terms of additional tree cover over an estimated 15-20 years, and goes far beyond the 5% target sought by the GLA.

9.2 Nature and Habitats

Existing habitats will largely be retained and enhanced where possible, and new habitat created on-site in line with local planning policy and the Richmond Upon Thames Biodiversity Action Plan (BAP). New habitats will be of native and of local provenance where possible.

Measures to ensure the site contributes to local biodiversity will include:

- Sensitive lighting along south and west rail corridors to avoid disturbance of commuting bats along the south and west site boundaries.
- Planting of native flora in retained or newly created habitats; including dense scrub, scattered scrub and trees, tall ruderal and marginal vegetation, particularly planting of native trees along rail corridors to the south and west of the site. Thus, providing new opportunities for fauna.
- Green Infrastructure; Inclusion of brown; sedum roofs and terrace gardens to increase areas of accessible green space and provide a net biodiversity gain on site;
- Provision of bird and bat boxes to increase the number of nest and nesting sites across the site, and hedgehog boxes and highways and bug hotels to provide a net biodiversity gain.
- Placement of bug hotels within terrace gardens, sedum roofs, and newly created habitats across the site to encourage insects to the site.

10 BREEAM strategy

10.1 Background

BREEAM is the leading environmental assessment method for UK non-residential buildings and UK domestic refurbishments. It sets the standard for best practice design and encourages and certifies the incorporation of best environmental practice within the building design and construction.

The BREEAM assessment process involves the evaluation of the building's performance against the scheme and its criteria using an independent third-party auditor: a BREEAM Assessor. The BREEAM certificate provides formal verification that the Assessor has completed an assessment of the building in accordance with the requirements of the scheme and its quality standards and procedures. A BREEAM certificate verifies that a building's BREEAM rating, at the time of certification, accurately reflected its performance against the BREEAM standards.

10.2 BREEAM schemes

Due to the development's speculative character, it is presently appraised utilising a "shell only" assessment type. According to LBRuT Local Plan Policy 22, the non-domestic proposed development will aim for a minimum BREEAM "Excellent" rating.

The current predicted baseline score is 81.5%, which is equal to an "Excellent" rating and is 11.5% more than the score needed to receive an "Excellent" grade, which is 70%.

Table 10.1. BREEAM 2014 credit summary for the 'shell only' assessment of retail areas.

Category	Issue	Credits		
		Available	Targeted	Potential
		4	4	-
Management	Man 01: Project brief and design			
	Man 02: Lifecycle cost and service life planning	4	3	-
	Man 03: Responsible construction practices (M _e), (M _o)	6	6 (+1)	-
	Man 04: Commissioning and handover (M _e), (M _o)	1	1	-
	Man 05: Aftercare (M _e), (M _o)	N/A	-	-
Health & Wellbeing	Hea 01: Visual comfort	4	2	-
	Hea 02: Indoor air quality	N/A	-	-
	Hea 04: Thermal comfort	N/A	-	-
	Hea 05: Acoustic performance	1	1	-
	Hea 06: Security	1	1	(+1)
	Hea 07 Safe and healthy surroundings	2	2	-
Energy	Ene 01: Reduction of energy use and carbon emissions (M _e) (M _o)	9	4	+1
	Ene 02: Energy monitoring (M) (M _e) (M _o)	N/A	-	-
	Ene 03: External lighting	1	1	-
	Ene 04: Low carbon design	3	1	-
	Ene 05: Energy efficient cold storage	N/A	-	-
	Ene 06: Energy efficient transportation systems	N/A	-	-
	Ene 07 Energy efficient laboratory systems	N/A	-	-
	Ene 08: Energy efficient equipment	N/A	-	-
Transport	Tra 01: Transport assessment and travel plan	2	2	-
	Tra 02: Sustainable transport measures	10	8	+2
Water	Wat 01: Water consumption (M) (M _e) (M _o)	5	-	-
	Wat 02: Water monitoring (M) (M _e) (M _o)	1	1	-
	Wat 03: Water leak detection	1	0	-
	Wat 04: Water efficient equipment	1	1	-
Materials	Mat 01: Environmental impacts from construction products - Building life cycle assessment (LCA)	7	4 (+1)	-
	Mat 02: Environmental impacts from construction products - Environmental Product Declarations (EPD)	1	1	-
	Mat 03: Responsible sourcing of construction products (M) (M _e) (M _o)	4	2	+1
	Mat 05: Designing for durability and resilience	1	1	-

Category	Issue	Credits		
		Available	Targeted	Potential
		1	1	-
	Mat 06: Material efficiency			
Waste	Wst 01: Construction waste management (M _o)	4	3	+1
	Wst 02: Use of recycled and sustainably sourced aggregates	1	1	-
	Wst 03: Operational waste (M _e), (M _o)	1	1	-
	Wst 04: Speculative finishes	N/A	-	-
	Wst 05: Adaptation to climate change	1	1	-
	Wst 06: Design for disassembly and adaptability	2	1	+1
Land Use and Ecology	LE 01: Site Selection	2	1	-
	LE 02: Identifying and understanding the risks and opportunities for the project	2	2 (+1)	-
	LE 03: Managing negative impacts on ecology	3	3	-
	LE 04: Change and enhancement of ecological value	4	4 (+1)	-
	LE 05: Long term ecology management and maintenance	2	2	-
Pollution	Pol 01: Impact of refrigerants	N/A	-	-
	Pol 02: Local air quality	N/A	-	-
	Pol 03: Flood and surface water management	5	5	-
	Pol 04: Reduction of night time light pollution	1	1	-
	Pol 05: Reduction of noise pollution	N/A	-	-
Innovation	Inn 01: Approved Innovation Credits	10	-	-
	Targeted weighted score rating:	81.5% 'Excellent'		
	Potential score rating	86.4% 'Excellent'		

11 Conclusion

This Sustainability Statement has been prepared by chapmanbdsp to detail the sustainability aspects of the proposed development and demonstrate compliance with the relevant Site Wide Strategies for sustainability through meeting the enhanced requirements in the latest planning policy and guidance including the National Planning Policy Framework, the London Plan 2021, and LBRuT Local Plan.

The adopted strategy for the proposed development demonstrates that the design will holistically incorporate sustainable principles into the full range of sustainability aspects that are in line with the relevant planning policies in relation to:

- Climate Change Mitigation & Adaptation
- Energy
- Water Efficiency
- Flood Risk and SUDs
- Sustainable Construction Processes/Materials & Recycling
- Noise, air and light pollution
- Landscaping & Biodiversity

In line with BREEAM standard, the preassessment targeted score indicates an “Excellent” rating which complies with the local plan’s sustainable design and construction requirement.