

Environmental Standards Statement

Former Gamecock Pub, Booth Street West,
Manchester

Curlew Alternatives Eighth Property LP

August 2023



Turley
Sustainability

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Client
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The Booth Street West proposals comprise efficient, low carbon and sustainable development that is resilient to climate change and meets national and local planning policy requirements.

1. Introduction

1.1 Introduction

This Environmental Standards Statement has been prepared by Turley Sustainability, on behalf of Curlew Alternatives Eighth Property LP (the applicant) to support the planning application for a Purpose Built Student Accommodation (PBSA). It demonstrates the range of positive measures that are incorporated into the Booth Street West development proposals to ensure high levels of environmental sustainability performance in accordance with national and local policy objectives.

The statement has been prepared in accordance with relevant guidance, in particular Chapter 4 of Manchester City Council's Guide to Development SPD (2007) which sets out guidance on the requirements and content of Environmental Standards Statements.

1.2 Site Context

The development site is approximately 0.1 hectares located to the south of Manchester City Centre. It is bound to the north by Booth Street West and Camelford Close to the south. It is currently occupied by the former Gamecock pub and associated car parking (see **Figures 1 and 2**). The pub has been closed for an extended period of time and is now derelict.

The site has excellent public transport links and nearby local amenities, and is within an 800m walking catchment area of University of Manchester, Manchester Metropolitan University and the Royal Northern College of Music.

Figure 1: Application Site [Simpsonhaugh]

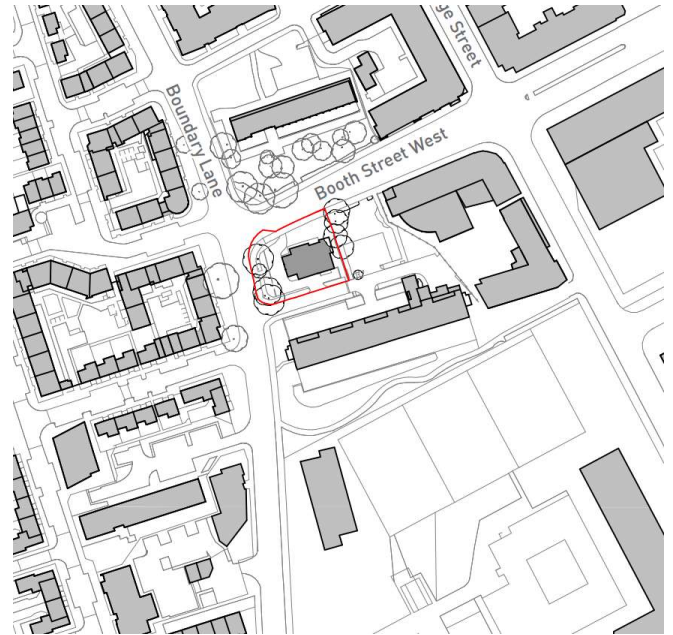


Figure 2: Former Gamecock Pub [Google Street View]



1.3 Proposed Development

The project description is as follows:

“The proposed redevelopment involves the demolition of existing building and structure and redevelopment of site for Purpose Built Student Accommodation (PBSA) uses (Sui Generis use class) comprising 146-bedroom units with ancillary amenity space, a ground floor ‘community hub’ (proposed for Use Classes F2(b), E(b), E(3), E(f)) associated landscape works and infrastructure.”

1.4 Document Structure

Chapter 2 of this report provides an overview of relevant national and local legislation, planning policy and guidance.

Chapter 3 provides detail of the sustainability and energy strategy of the proposed development, in line with local Planning Policy.

Chapter 4 provides details of the BREEAM strategy, credits targeted and how the criteria will be met.

Please note the terms “carbon”, “carbon dioxide (CO₂)” and “greenhouse gases (GHGs)” are used interchangeably in this Statement depending on the terminology of referenced documents etc.

2. Planning Policy Context

2.1 National Policy

This section sets out a summary of current national guidance and policy in relation to sustainable development.

2.1.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)¹ provides a framework for the development of locally prepared plans and the government's planning policies for England and how these are expected to be applied.

Paragraph 7 of the NPPF states that: 'the purpose of the planning system is to contribute to the achievement of sustainable development'.

It states clearly that in order to deliver sustainable development, the planning system must perform three distinct objectives, aligned to the three pillars of sustainability, which must not be taken in isolation and should be pursued jointly:



An **economic** objective to contributing to building a strong, responsive and competitive economy, by ensuring that sufficient land of the right type 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 supporting strong, vibrant and healthy communities, by providing the supply of housing required to meet the needs of present and future generations; and by creating a high-quality

built environment, with accessible local services that reflect the community's needs and support its health, social and cultural well-being.



An **environmental** objective contributing to protecting and enhancing our natural, built and historic environment; and, as part of this, helping to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate and adapt to climate change including moving to a low carbon economy.

These objectives are key to the development of plans and the NPPF sets out a number of key themes for consideration which guide the preparation of local plans and policies, ensuring the delivery of sustainable development.

The NPPF recognises the role planning has to play in support of the UK's pursuit of the United Nations Sustainable Development Goals (UNSDGs) which address social progress, economic wellbeing and environmental protection². Example UNSDGs are presented in **Figure 4**.

¹ [UK Government | NPPF](#)

² [UN Sustainable Development Goals](#)

Figure 4: Example UN Sustainable Development Goals



2.1.2 Planning Practice Guidance

Planning Practice Guidance (PPG) provides further advice on various planning issues associated with development, including those linked to sustainability and renewable energy and underpins the policies within the NPPF.

PPG is a material consideration in planning decisions and should generally be followed unless there are clear reasons not to. It sets out how local authorities should include policies that protect the local environment and strategies to mitigate and adapt to climate change and supports developments that are functional and adaptable for the future.

2.1.3 National Design Guide

The National Design Guide published in January 2021³ is based on the national planning policy practice guidance and objective for good design as set out in the NPPF. The Guide introduces ten characteristics of well-designed places which work together to create the developments Character and

Community, while positively addressing environmental issues affecting the climate.

2.1.4 Building Regulations

Part L, Conservation of Fuel and Power⁴ - Whilst not planning policy, the Building Regulations (and specifically Approved Document Part L: Conservation of Fuel and Power) set out the requirements for energy and carbon performance in new buildings.

Periodic updates to these national regulations will drive energy efficiency and carbon reduction improvements. The government has stated that developers will continue to have flexibility in how they meet carbon reduction targets; but that the emphasis is on using a “fabric first” approach.

On 15th June 2022, the Building Regulations were updated as an interim step towards part of the roadmap to the ‘full’ Future Homes and Buildings Standard, which comes into effect in 2025. The regulations aim to deliver buildings that are of a higher quality, with lower energy bills and reduce GHG emissions by around 30% for new homes and 27% for non-domestic buildings.

Part S, Infrastructure for Charging Electric Vehicles⁵

- New approved document Part S sets out guidance for electric vehicle (EV) charging infrastructure and specifies that EV charge points must be provided for each dwelling (or where the total number of parking spaces is less than each dwelling, all spaces should be provided with an active EV charging point). Any remaining spaces must have cable routes for charge points to be installed.

Part O, Overheating⁶ - Part O sets out new requirements for mitigating overheating, specifying that residential developments must limit unwanted solar gains in the summer and provide means to remove heat.

³ [National Design Guide](#)

⁴ [Approved Document L, Conservation of fuel and power, Volume 2: Buildings and other dwellings \(publishing.service.gov.uk\)](#)

⁵ [Approved Document S: Infrastructure for the charging of electric vehicles \(publishing.service.gov.uk\)](#)

⁶ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1057374/ADO.pdf

2.2 Local Planning Policy

Current and emerging Manchester City Council planning policy relating to sustainable development, energy and climate change is summarised below.

2.2.1 Manchester Core Strategy Development Plan Document (2012)

Manchester's Core Strategy (2012)⁷, is the key document in the Manchester Local Plan. It sets out the long-term strategic policies for Manchester's future development and forms the framework against which planning applications are assessed. The following Core Strategy policies are of greatest relevance to sustainable development and the focus of this Statement.

Policy EN4 – Reducing CO₂ emissions by enabling low and zero Carbon Development – Development should be designed in accordance with the energy hierarchy to reduce energy demand through active and passive design measures meeting residual requirements through the use of zero carbon, renewable energy technologies. Developments are encouraged to take into account the following principles:

- Located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies where possible;
- Where possible new development and retrofit projects will be used as a mechanism to help improve the energy efficiency and where possible provide low and zero carbon energy to existing buildings; and
- Where appropriate, new development and retrofit projects are encouraged to connect to and/or make commitments to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any

existing/potential decentralised energy networks.

Policy EN6 – Target framework for CO₂ reductions from low or zero carbon energy supplies – Applications for development over 10 dwellings or 1,000m² floor area are expected to meet sustainability targets which vary depending on the scale of the development, where feasible.

Development that meets the criteria above are required to be accompanied by an energy statement which sets out the projected regulated energy demand and associated carbon emissions and how the following targets will be met. Developments below the above thresholds are expected to meet the targets but do not need to have an accompanying energy statement.

For the purpose of this policy, the development is split into three target categories:

Target 1 - Network development areas: Locations where the proximity of new buildings, the mix of use and density of development provides the right conditions to support district heating.

Target 2 - Electricity intense areas: Locations where the predominant building type has all electric fit out, such as retail units and leisure complexes.

Target 3 – Micro-generation areas: Locations where lower densities and fragmented mix of uses tend to mean that only building scale solutions are practical.

The CO₂ emissions reductions targets for the above development are set out in **Table 1**. An Energy Assessment is required to be submitted, and developers are permitted to use green infrastructure elements to contribute to the carbon reduction requirements provided adequate evidence is provided.

⁷ [Manchester's Core Strategy \(2012\)](#)

Table 1: Manchester Core Strategy CO₂ Targets

Target	CO ₂ Reduction
1	CHP/district heating or connection or where not feasible 15% increase on Part L 2010
2	10% increase on Part L 2010
3	15% increase on Part L 2010

Policy EN8 – Adaptation to Climate Change – All new developments are expected to be adaptable to climate change and developments should have consideration of adaptation measures including:

- Minimising flood risk through sustainable drainage systems;
- Reducing the urban heat island effect through green infrastructure;
- Minimising overheating through passive design; and
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.

Policy DM1 - Development Management – All new development should have regard to a range of sustainability issues including site location, accessibility, waste management, biodiversity and flood risk, as well as incorporating sustainable construction techniques which includes the application of BREEAM.

Policy CC5 – Transport – Developers should work to ensure that all users are able to access the development by sustainable means, especially taking account of times when developments are likely to be busiest.

Policy EN9 - Green Infrastructure – New development is expected to maintain existing green infrastructure in terms of its quantity, quality and

multiple function. Developers are also encouraged to enhance existing green infrastructure where possible.

Policy EN 14 - Flood Risk – Development should be directed away from sites at the greatest risk of flooding, and towards sites with little or no risk of flooding.

Policy EN 15 – Biodiversity and Geological Conservation – Developers will be expected to identify and implement reasonable opportunities to enhance, restore or create new biodiversity, either on-site or adjacent to the site, contributing to linkages between valuable or potentially valuable habitat areas where appropriate

Policy EN 17 - Water Quality – New developments should avoid adverse impact on water quality, including during the construction phase, and minimise surface run-off.

Policy EN 19 – Waste – Requires all developers to demonstrate the proposal's consistency with the principles of the waste hierarchy.

2.2.2 Guide to Development in Manchester Supplementary Planning Document (SPD) (2007)

This Guide to Development Supplementary Planning Document (SPD) (2007)⁸ provides guidance to develop and enhance environments within Manchester which are visually attractive, have a unique and positive sense of place and where properly caters for the functions which it accommodates, both now and in the future.

Chapter 4 of the SPD sets out Manchester City Council's expectations on the content of Environmental Standards Statements.

2.2.3 Places for Everyone

Until December 2020, a joint Development Plan Document (DPD) of the ten Greater Manchester local authorities was being prepared, known as the Greater Manchester Spatial Framework (GMSF).

⁸ https://secure.manchester.gov.uk/site/scripts/download_info.php?downloadID=644&fileID=1424

However, progression of the GMSF ceased following the decision by Stockport Council to withdraw.

Instead, a joint committee of the nine other boroughs has been formed to prepare 'Places for Everyone' (PfE), a joint development plan for jobs, new homes and sustainable growth across these boroughs.

Places for Everyone: Publication Plan⁹ was published in July 2021, with a period for representations taking place between 9th August and 3rd October 2021. The Greater Manchester Combined Authority (GMCA) submitted the plan to the Secretary of State for examination on 14th February 2022. The Examination is currently ongoing. Within this Publication Plan, a number of ambitious sustainability policies are set out which account for climate mitigation and adaptation, social value, economic growth and the natural environment. This includes the following:

- A requirement for new commercial development to achieve at least BREEAM 'Excellent' standard for the Ene 01 Reduction of Energy Use and Carbon emissions credit issue, rising to 'Outstanding' from 2038; and
- Development should achieve a net gain in biodiversity of at least 10%.

In January 2023, the 'Schedule of Proposed Main Modifications to the PfE Plan'¹⁰ was published. Key changes include the approach to net zero development between the periods of 2022-2028 onwards, as follows:

- From 2028, development should work towards being net zero carbon, as defined in the UKGBC Framework. This can be broken down into the following:
 - i. 2022-2025 – applies to emissions in 'operation';

- ii. 2025-2028 – in addition to (i) and unregulated emissions; and
- iii. 2028 onwards – in addition to (i) and (ii), emissions 'in construction' should be considered.
- iv. Any residual carbon emissions should be offset by following the energy hierarchy. The above policies take into account the changes to the Building Regulations adopted in June 2022.

The policies within PfE are not considered further within this statement, due to its current stage of examination. However, the aspiration of Greater Manchester to become net zero carbon by 2038 is supported by the applicant.

2.2.4 Local Plan Issues Consultation

Manchester City Council Local Plan Issues Consultation (February 2020)¹¹ explains how the new Local Plan will contribute to a zero-carbon city by providing the spatial expression in support of the Council's intention to move towards a zero carbon Manchester by 2038 at the latest. The Issues Consultation covers a range of issues that will have a direct bearing on successfully meeting the zero-carbon challenge by 2038.

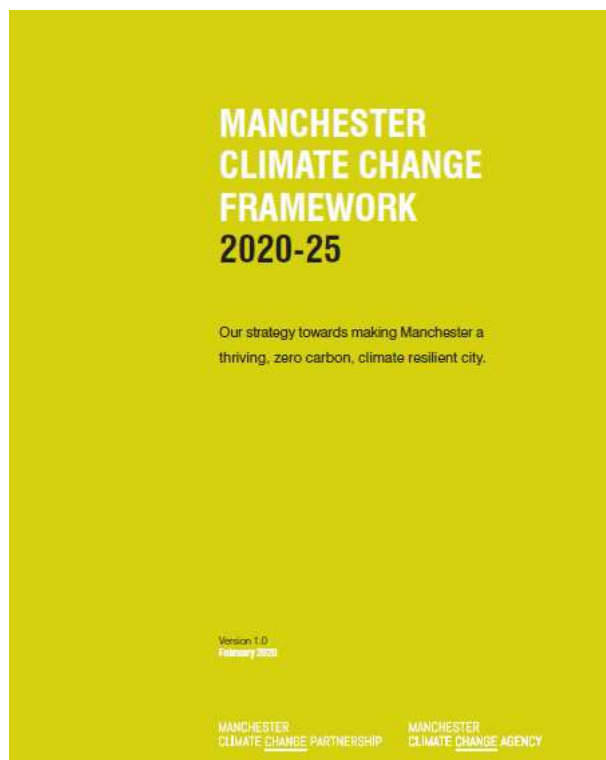
⁹ [Places for Everyone \(Greatermanchester-ca.gov.uk\)](https://placesforeveryone.greatermanchester-ca.gov.uk/)

¹⁰ [Schedule-of-Proposed-Main-Modifications_Issue-Three_ISSUED.pdf\(hwa.uk.com\)](https://www.greatermanchester-ca.gov.uk/media/10000/Schedule-of-Proposed-Main-Modifications_Issue-Three_ISSUED.pdf(hwa.uk.com))

¹¹ https://manchesterconsult.objective.co.uk/portal/planning/issues_and_options_2020/lpi?pointId=5581804

2.2.5 Manchester Climate Change Framework 2020-25

The Manchester Climate Change Framework 2020-25 (February 2020)¹² builds on the Draft Manchester Zero Carbon Framework 2020-38 (published February 2019) and Manchester City Council's declaration of a climate emergency in July 2019.



The Framework sets the following objectives to be met by 2025:

Objective 1: Staying within our carbon budgets –

Including reducing CO₂ emission from our homes, workplaces and ground transport by at least 50% during 2020-25.

Objective 2: Climate adaptation and resilience –

Adapting the city's buildings, infrastructure and natural environment to the changing climate.

Objective 3: Health and wellbeing – Improving the health and wellbeing of everyone in Manchester

through actions that also contribute to our climate change mitigation and adaption objectives.

Objective 4: Inclusive, zero carbon and climate resilient economy –

Ensuring Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit.

The framework was updated in October 2022¹³ to present the findings of detailed modelling undertaken to assess the city's carbon budget, provide an overview of progress against the framework so far, and recommend actions for the transition to a zero carbon and climate resilient city. Key recommendations include:

- Ensure new buildings are constructed to high standards of low carbon performance covering operational and embodied energy.
- Produce goods and services more sustainably, moving to a circular economy, alongside becoming more sustainable consumers.
- Reduce waste, including unnecessary food waste, and manage unavoidable waste as sustainably as possible, maximising reusing and recycling.

2.2.6 Validation Requirements

Manchester City Council's Validation Checklist (2018)¹⁴ requires applications for major new development to be accompanied by an Environmental Standards Statement to address the sustainability of the development proposals, in particular, Policies EN4 and EN6 of the Core Strategy.

The Statement must also confirm the proposals for the provision of onsite renewable energy to provide 20% of final site energy demand and CO₂ reduction.

2.3 Planning Policy Summary

There are several consistent themes across national and local sustainability policy which are relevant to the Booth Street West proposals.

¹² [Manchester Climate Change Framework \(2020\)](#)

¹³ [Manchester Climate Change Framework October 2022 Update](#)

¹⁴ [Manchester City Council Validation Checklist \(2018\)](#)

A minimum 15% reduction in CO₂ emission beyond Building Regulations Part L 2010 is required through a combination of building envelope performance, energy efficiency and on-site zero / low carbon energy technology. This performance is superseded by complying with Part L 2021.

Ensuring the development is resilient to a changing climate is a further key requirement at both national and local levels, particularly in relation to increased risk of floods and summertime overheating.

A minimum BREEAM 'Very Good' rating is required given the proposals comprise multi-residential development.

It is clear from the declaration of a climate emergency and ambitious target to achieve carbon neutrality by 2038, that MCC and GMCA expect new development to contribute to a carbon neutral future.

Chapter 3 details the approach proposed to address these policy requirements.

3. Sustainability at Booth Street West

3.1 Introduction

This chapter summarises the various sustainability, energy and climate change measures that are proposed for the PBSA at Booth Street West. It follows the topic headings of Chapter 4 ‘Environmental Standards’ of the Guide to Development in Manchester SPD (2007) as follows:

- Energy efficiency (incorporating renewable energy)
- Environmental design
- Water management & weather resilience
- Waste management
- Construction management
- Waterways.

3.2 Energy Efficiency

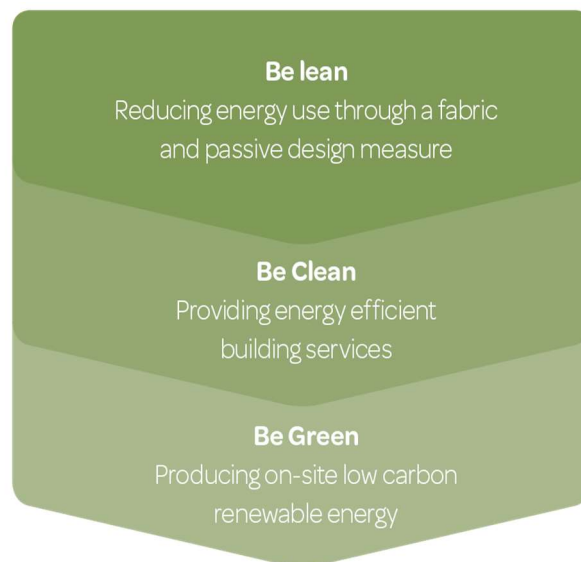
Minimising GHG emissions is key to mitigating the effects of development on climate change.

A key aspect of the recently introduced and future regulations is the continuing decarbonisation of the national electricity network. The phasing out of coal fired power stations and increasing generation of energy from renewable sources is rapidly reducing the carbon intensity of the electricity network.

Through decarbonisation of the national electricity grid and introduction of the new SAP10 carbon factors, electric heating systems deliver a higher carbon saving than gas alternatives.

Taking these considerations into account the development aims to reduce energy consumption and carbon emissions in accordance with the energy hierarchy (**Figure 5**) and anticipated future energy and carbon standards.

Figure 5: The Energy Hierarchy



Energy modelling against Part L 2021 has been undertaken by Amber Management and Engineering Services Ltd to determine the most suitable and efficient building services strategy. The following sections set out the proposed measures incorporated within the design to deliver an energy efficient, low carbon development.

3.2.1 Be Lean – Reducing Energy Use

Central to the delivery of low carbon and energy efficient buildings is the ‘fabric first’ principle which recognises the most effective way of minimising carbon emissions is to reduce the demand for heat and power through a well-insulated, energy efficient building fabric and services.

Reducing the primary energy demand of a building through the use of an efficient fabric and services is widely regarded as best practice and is therefore the first and most important step to reducing carbon emissions.

This ‘fabric first’ approach has a number of distinct benefits including:

- Carbon savings delivered are ‘locked-in’ for the lifetime of the building (60 years or more) rather than the much shorter lifespan (around 25 years) of a renewable energy technology;
- Virtually no maintenance and/or replacement costs to maintain carbon reductions through improved fabric;
- No reliance on an occupier’s behaviour to deliver carbon reductions. Achieving carbon savings from renewable energy technologies require education, awareness and often, behavioural changes from occupants.

As part of the energy strategy, a Passive Design Analysis has been undertaken to determine ways to reduce energy demand through the building fabric. The analysis outlines the following measures implemented within the design of the PBSA to reduce energy use and carbon emissions:

- Specification of thermal insulation and air permeability standards to exceed the minimum standards contained within Part L 2021;
- Specification of performance glazing with solar control and manual blinds (where necessary) to limit summertime solar gains and overheating;
- Incorporating high efficiency LED lighting throughout the building, with PIR control;
- Use of local heating to limit heat loss and overheating occurring from circulation;
- Use of a Building Energy Management System (BEMS) to monitor energy usage and reduce the performance gap through detection of high energy usage and targeted improvements.

The design of the proposed development will exceed the requirements of the current Building Regulations through a range of enhanced fabric and energy efficiency measures.

3.2.2 Be Clean – Efficient Energy

The next stage of the energy hierarchy is the provision of energy efficiently, i.e. from a decentralised energy system such as a Heat Network.

District Heating Networks (DHN) comprise a centralised heat generator, typically a gas fired Combined Heat and Power (CHP) engine. CHP systems generate electricity and waste heat which can be fed into a network of insulated pipes which deliver low carbon heat to buildings to provide heating and hot water via individual heat transfer units.

As summarised earlier, the continued decarbonisation of the national electricity network and anticipated changes to the Building Regulations mean that the carbon emission benefits of traditional CHP systems will diminish during their lifecycle.

Furthermore, an all-electric building services strategy as proposed will not adversely affect the local air quality in Manchester, as there will be no on site combustion.

CHP and DHN are therefore not considered further as carbon emissions associated with electricity are expected to continue to reduce as the grid decarbonises, leading to greater savings in carbon emissions over the lifetime of the development.

3.2.3 Be Green – Low Carbon Renewable Energy

The final stage of the energy hierarchy is the generation of on-site low carbon renewable energy.

A review of potential low carbon renewable energy technologies which may be suitable for inclusion in the building’s design has been completed within the Energy Statement. A review of these technologies is provided below.

Wind Turbines

The site location and proximity to other buildings would be likely to affect the local wind patterns and therefore the performance of wind turbines, meaning any contribution to overall generation would be limited. There are also implications with respect to noise emissions and visual impact. Therefore this technology is not currently considered appropriate for the development.

Solar Photovoltaics (PV)

Solar photovoltaic (PV) systems generate zero carbon electricity from sunlight and are well suited to PBSA due to consistent electrical base load. Furthermore, they require minimal maintenance once installed.

Solar PV is appropriate for this development and space has been allocated for a potential PV array at the roof level. The inclusion of this technology will be decided at future work stages.



Solar Thermal

Solar thermal systems generate zero carbon hot water from sunlight in a similar manner to Solar PV. They require insulated tanks to store the hot water and have greater maintenance demands than solar PV given the need to ensure anti-freeze in the pipework is topped up every few years.

This technology is likely to be feasible for the PBSA, however roof space is better suited to solar PV which can meet a consistent electricity demand and require less maintenance.

Heat Pumps

Heat pumps provide low carbon heat sourced either from the ground (Ground Source Heat Pumps - GSHP) or air (Air Source Heat Pumps - ASHP). They require main electricity to operate but typically generate around three units of heat for every unit of electricity that is consumed. Because the heat generated is at a lower temperature than that produced by a gas boiler, heat pumps typically

require underfloor heating or over-sized radiators to ensure the heat is distributed efficiently.

The limited footprint of the site means that GSHP are not feasible, however ASHPs are proposed as part of the all-electric building services strategy and will contribute to a reduction in operational carbon emissions. It is also proposed that Variable Refrigerant Flow heat pump comfort cooling and heating systems would be provided to offices and social spaces.

Biomass

Biomass provides useable heat from a range of solid fuels including wood and straw. The installation of a biomass boiler, flue and associated fuel store require significant space and regular deliveries, and is therefore not considered appropriate for the development.

Furthermore, the impact of onsite combustion on the air quality within an urban environment is not favourable.

3.2.4 Energy Strategy Summary

Table 2 overleaf demonstrates the anticipated energy performance of the development, and carbon reduction achieved, as modelled by Amber Management.

Table 2: Energy Modelling Results (Source: Part L 2021, Amberman Management)

Parameter	Performance
Part L 2021 Target Emission Rate (TER) (kgCO ₂ /m ² /year)	4.07
Part L 2021 Building Emission Rate (BER) (kgCO ₂ /m ² /year)	3.86
CO ₂ Improvement (%)	5.16%

As shown within **Table 2**, Booth Street achieves a 5.16% reduction in carbon emissions against Part L 2021 requirements through building fabric improvements and the implementation of low carbon technology. The results set out in the Energy Statement demonstrate that all heating and hot water demand will be provided by the ASHP, this means 56% of the total energy demand is met by low/zero carbon technologies. This satisfies the Manchester planning validation checklist, requiring low/zero carbon technologies to provide at least 20% of the site energy demand.

The proposed energy strategy is further future proofed by being 'all electric' and will benefit from the significant further decarbonisation of the UK electricity grid that is forecast by the Government. The combination of an all-electric building services strategy and the use of ASHPs will deliver a low carbon heating strategy with the decarbonisation of the national grid. Therefore, the development will contribute to Manchester City Council's ambition to become carbon neutral by 2038.

In addition to the low carbon energy strategy, the location of the site provides an opportunity to maximise sustainable travel options including walking / cycling and public transport in preference to the private car. This approach will deliver further carbon emission reductions whilst promoting the health and wellbeing of building occupants through active travel.

Please refer to the Energy Statement (**Appendix 2**) for further details.

3.3 Environmental Design

Manchester City Council seeks BREEAM 'Very Good' certification as a minimum, however the applicant is targeting a BREEAM 'Excellent' rating for the development to ensure high levels of sustainability performance. This commitment supports Manchester's declaration of a climate emergency and journey to net zero carbon.

Chapter 4 of this Statement reports the proposed BREEAM strategy as established via BREEAM Pre-assessment and team workshops that have been undertaken to establish how 'Excellent' performance may be achieved.

3.4 Water Management & Weather Resilience

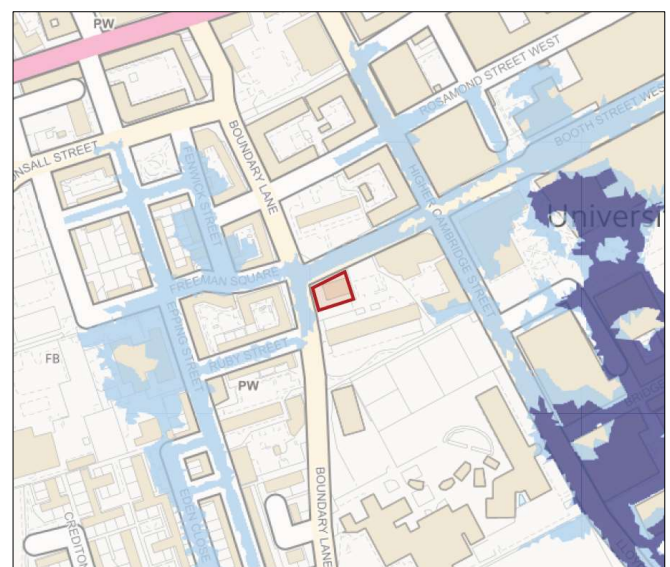
Water management and weather resilience issues in new developments are becoming increasingly important as a result of climate change, with effects such as increased winter rainfall, decreased summer rainfall and increased summer temperatures already being experienced.

The Met Office's latest UK Climate Projections (UKCP18)¹⁵ include significant changes to climatic conditions in Manchester by the 2050s, including increased summer and annual temperatures, increased winter rainfall and reduced summer rainfall.

3.4.1 Flood Risk & Drainage

The Flood Risk Assessment (FRA) completed by Shear Design confirms that the site is within Flood Zone 1 according to the Environment Agency Flood Map (**Figure 6**). Some surrounding areas such as Boundary Lane and Booth Street West are within Flood Zone 2.

Figure 6: EA Flood Map for Planning [Shear Design FRA]



¹⁵ <https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf>

Flooding from other sources such as groundwater and the sewer network is also considered to be low risk. Nonetheless, proposed finished floor levels at ground level are set at +35.85m so that gradients fall away from the building, thus reducing risk of surface water pooling.

To manage surface water run-off risks at the proposed development and to surrounding areas, a 50% betterment over existing run-off rates is targeted post-development. This betterment is equivalent to approximately 5l/s when rounded up, as agreed with United Utilities. By retaining a significant proportion of rainfall on site, this discharge will ensure that the development will not flood for the 1 in 100 year storm event with a 40% allowance for climate change.

To achieve a run-off rate of 5l/s, a Sustainable Drainage System (SuDS) strategy has been developed. The SuDS strategy incorporates the following:

- blue roof;
- green roof; and,
- Permeable paving at ground level.

The green roof in particular will provide multi-purpose benefits in addition to attenuation, including visual amenity and biodiversity net gain.

Further details regarding the flood risk and drainage strategy are provided within the FRA submitted as part of the planning application.

3.4.2 Potable Water Efficiency

Potable water is an increasingly important natural resource and with the majority of the UK classed as being in an area of moderate or severe water stress the conservation of water is becoming a more significant sustainability metric.

In order to ensure water efficiency, the development will be designed to achieve a 25% reduction in mains water consumption which equates to achieving two credits under BREEAM issue Wat 01 Water Consumption (see **Section**

4.3.5). Water saving measures will be incorporated into the design of the PBSA to achieve these credits, and will be confirmed at detailed design.

Furthermore, the landscaping will be reliant on rainwater or manual watering only.

These measures will help ensure the development reduces demand on local potable water supplies and therefore promote resilience to potential water constraints such as summer droughts.

3.4.3 Building Overheating Risk

An overheating analysis in line with CIBSE TM59 and BREEAM Heb 04 Thermal Comfort credit requirements for both current and future climatic scenarios has been undertaken for both current and future climatic scenarios to ensure the student halls will be resilient to climate change.

These results demonstrate that each of the occupied spaces assessed have a very low probability of experiencing overheating.

3.5 Waste Management

Regarding operational waste, sufficient storage for recyclable and non-recyclable waste will be provided in accordance with Manchester City Council's Waste Storage & Collection Guidance for New Developments GD04 (Version 6, September 2017)¹⁶. This guidance provides minimum standards for the storage and collection of refuse and for recycling facilities in new domestic and commercial development.

Waste storage facilities provided at Booth Street will reflect the various waste streams that are generated, and collected by the local waste authority. By making it clear and convenient for building users to separate waste at source, a reduction of waste sent to landfill will be encouraged.

Construction waste is discussed further in **Section 3.6** below.

¹⁶ https://www.manchester.gov.uk/downloads/download/6048/waste_management_strategy

3.6 Construction Management

The proposed development will ensure that construction is undertaken in a way which minimises waste and impact on the surrounding area.

The development will also be registered with the Considerate Constructors Scheme and achieve certification against the Code of Considerate Practice.

3.6.1 Use of Materials

The use of responsible sourced materials with low environmental impact is central to the design of the PBSA.

The demolition of the former Gamecock pub provides opportunity for the reuse of materials on site. Reusable materials are likely to include concrete which can be crushed for use as aggregate, and any high-quality steel. Where materials are unsuitable for reuse, they will be recycled in the first instance at appropriate licensed facilities. An audit of existing materials will be undertaken to ascertain whether any can be used within the construction of the proposed development.

As part of the BREEAM strategy, a Life Cycle Assessment (LCA) of the building's superstructure, sub structure, hard landscaping and core services has been undertaken.

LCA is an evaluation of the environmental effects of a product, service or process over its entire life cycle. The assessment considers all the steps that lead from raw material to manufactured product, including extraction of the materials, energy consumption, manufacture, transportation, use, recycling, and final disposal or end of life.

The assessment was undertaken using 'One Click LCA' software to estimate embodied carbon of various design scenarios.

Following a review of the superstructure, substructure, hard landscaping and core services, the team attended a workshop with an aim to find ways to reduced embodied carbon. Various

materials were considered for the hard landscaping such as granite, tarmac and concrete pavers. Following a review of the embodied carbon of each of these materials, concrete pavers were chosen as they had the lowest embodied carbon over the building's lifetime. Furthermore, the team will seek to procure concrete pavers which incorporate recycled material such as cement alternatives.

During detailed design, the LCA will be revisited to consider further measures to reduce construction carbon. At this stage, the supply chain will be further progressed and options open to the team will be better known. Such measures could include incorporation of recycled materials such as ground-granulated blast-furnace slag (GGBS) as a cement alternative within the foundations, slab and frame of the building.

3.6.2 Construction Waste

A Site Waste Management Plan (SWMP) will be developed prior to the demolition, providing details on how waste will be segregated and processed where not re-usable on site. These proposed measures will help incorporate principles of circular economy and reduce the embodied carbon associated with 'end-of-life' of the previous buildings, and also the emissions associated with construction stage where they can be re-used.

The reduction, reuse and recycling of demolition and construction waste is to be prioritised through measures such as avoidance of over-ordering, supervision of deliveries, use of secure materials storage facilities and reuse of materials onsite where feasible.

3.7 Biodiversity

Middlemarch Environmental Ltd has undertaken a Preliminary Ecological Appraisal (PEA) at the proposed development site. The appraisal incorporated a desk study and walkover survey. The PEA identified no European statutory sites within 5 km of the survey area, no UK statutory sites within 2 km and no non-statutory sites within 1 km.

The survey found the site to be predominantly building and hard standing, with small areas of grassland, bare ground, scrub and tall ruderal vegetation. Scattered trees were also identified along the western boundary of the site.

Generally the habitats present on site are species poor and therefore their loss is not a notable consideration. However, the trees on site are of ecological value and can provide habitat for nesting birds and invertebrate.

As the loss of these trees cannot be avoided, due to tight site constraints, replacement tree planting will be incorporated into the planting scheme. This planting will mitigate any proposed loss.

The PEA found no evidence of badger, amphibians or reptiles on site. Evidence of hedgehog were found on the desk study approximately 500m from the site, but no evidence was found during the walkover. Due to the habitats present, it is likely that nesting birds, hedgehog and invertebrate would use the site.

Due to the nature of the existing building on site, a Preliminary Bat Roost Assessment has been undertaken. The assessment found that the former pub had several potential ingress points and roosting opportunities for bats. No evidence of bats was found during the assessment, however many of the roosting features could not be fully assessed during the survey. Middlemarch has therefore identified the pub as having high potential to support roosting bats and has recommended that bat emergence and re-entry surveys be undertaken.

The PEA has provided appropriate mitigation measures to protect birds, hedgehogs and bats should they be present on site.

Enhancement measures which will be incorporated into the site include:

- Planting of fruit bearing and/or wildlife attracting trees;
- Planting of nectar-rich flowering species that will be of benefit to pollinating invertebrates;

- Provision of nesting and/or roosting habitat for bats and birds; and,
- Provision of a green roof

The landscaping proposals will therefore enhance biodiversity on site, provide green infrastructure and priority species will be protected with appropriate mitigation measures.

3.8 Waterways

The closest watercourse to the site is the River Medlock, which is located approximately 690m to the north of the site. It is therefore unlikely that there will be a risk of waterway pollution from construction. Regardless, a Demolition and Environmental Management Plan will be developed to ensure that measures are in place to reduce dust, air and water pollution in line with best practice.

4. BREEAM Strategy

4.1 Introduction

Manchester City Council requires a minimum BREEAM 'Very Good' rating for all new non-domestic development. This chapter introduces BREEAM and sets out the strategy proposed by the applicant to achieve an 'Excellent' rating under the latest 2018 New Construction Scheme, exceeding local policy requirements.

4.2 BREEAM

BREEAM is the world's leading sustainability assessment tool for new buildings. The scheme is scheme operated by the Building Research Establishment (BRE) and includes a range of criteria against which the sustainability performance of new buildings are assessed.



Since its launch in 1990, BREEAM has been used to certify over 560,000 assessments of buildings across 82 countries.

BREEAM has a number of schemes which can be applied to new buildings, refurbishments and existing buildings. Additionally, each scheme regularly updated to ensure it continues to recognise and reward developments that go beyond minimum practice and requirements, for example those set out by Building Regulations.

4.3 BREEAM Strategy

The proposed development at Booth Street West is targeting BREEAM 'Excellent' certification, beyond Manchester City Council's minimum 'Very Good' standard as a key means of ensuring high levels of sustainability performance throughout construction and operation.

Turley Sustainability has undertaken a BREEAM 'Excellent' Pre-assessment (see **Appendix 1**) using the New Construction 2018 'Multi-Residential' methodology. **Table 4** sets out a potential route to BREEAM 'Excellent' and targeted credits.

Turley has provided BREEAM support throughout the design process and as such, a number of the early-stage credits requirements have already been met.

Table 4: BREEAM 'Excellent' Pre-assessment Results

Category	Percentage Targeted
Management	11.00%
Health & Wellbeing	8.56%
Energy	10.43%
Transport	10.00%
Water	4.67%
Materials	11.79%
Waste	4.80%
Land Use & Ecology	6.00%
Pollution	6.00%
Exemplary	2.00%
Score	75.24% (Excellent)

The current anticipated BREEAM score of 75.24% goes beyond the minimum 70% score required for BREEAM 'Excellent' with a margin of security and includes relevant mandatory and early RIBA stage evidence requirements.

Please note that the route to BREEAM Excellent compliance, as set out in the BREEAM Pre-assessment, may be subject to change during ongoing detailed design and construction.

A summary of credits targeted within each category, and the value that meeting the criteria brings to the development, is discussed in the following sections.

4.3.1 Management

The management category encourages the adoption of sustainable management practices in connection with design, construction, commissioning, handover and aftercare.

The credits within this category are awarded to project and design teams who consider and incorporate sustainability measures, involving key stakeholders from project brief through to occupation.

Relevant practices which will be undertaken include stakeholder consultation, life cycle costing seasonal commissioning, responsible construction, and post occupancy evaluation.

4.3.2 Health & Wellbeing

The Health and Wellbeing category of the BREEAM schemes has been aligned with the 'WELL' Standard, bringing the comfort of building occupiers to the forefront of the design.

Summertime overheating within buildings is likely to be an increasing risk from climate change and will be considered within the design for both current and future climate scenarios.

The indoor air quality, visual comfort, acoustic performance and safety and security of the proposed development will also be considered.

4.3.3 Energy

The building services strategy incorporates low carbon technology as all heating and hot water demand will be provided by the ASHP, this means 56% of the total energy demand is met by low/zero carbon technologies.

Unregulated energy will also be reduced through careful specification of large energy consuming systems such as lifts, and domestic scale white goods.

Sub-metering of energy uses will allow the building user to monitor and close the performance gap between 'as designed' and 'in use' energy performance.

4.3.4 Transport

A Transport Statement has been produced to assess the effect of the development on local transport infrastructure. A Travel Plan will also be produced to communicate proposed sustainable transport measures to reduce private car travel to and from site.

Credits are awarded on the basis of number of transport options available to the site pre-development and improvements made as a result of the development.

The site benefits from excellent local amenities and transport links. Cycle storage spaces will be provided for building users with associated shower facilities for staff. A gym will be provided for residents to reduce the need to travel off site.

4.3.5 Water

The aim of the Water category is to reduce the consumption of internal and external potable water over the lifetime of the building and minimising losses through leakage.

To reduce water consumption through sanitary uses and achieve a minimum 25% reduction of the baseline water use defined by the BRE, the following measures will be implemented:

- Low flush WCs; and

- Flow restricted showers and taps.

Water usage will also be monitored through water meters and a leak detection system.



4.3.6 Materials

The Materials category encourages development to take a 'whole life cycle' approach to construction products, considering impacts of the supply chain from raw material, to end-of-life.

The proposed development has considered and reduced its environmental impact, including carbon emissions, associated with construction and materials through a life cycle assessment (LCA). A further review of embodied carbon will be undertaken at technical design.

To reduce material wastage associated with maintenance and replacement, protection measures will be incorporated into the design to protect from damage that may arise from building users and visitors, such as protecting internal areas from trolley movement, pedestrian traffic or external areas from parking and/or delivery vehicles.

The design team has also considered the effect of environmental factors such as water ingress, solar radiation and temperature variation on the building.

Manufacturers with responsible sourcing accreditation, for example, BES6001, ISO14001, FSC and CARES certification will be prioritised. Sisk has implemented a Sustainable Procurement Plan which sets out targets to reduce environmental and social impacts through the supply chain.

4.3.7 Waste

The Waste category encourages the reduction of waste associated with construction methods through measures implemented during the design and on-site management. The category also rewards design measures encouraging the building users to recycle waste during building operation.

The proposed development will minimise construction and operational waste in line with the measures set out within the waste section (3.5) of this report.

The design is flexible by being adaptable to climate change, change in use, and refurbishment to reduce the environmental impacts of excess material usage and waste in the future.

4.3.8 Land Use & Ecology

The aim of the Land Use and Ecology category is to encourage sustainable land use, habitat protection and creation and improvement of long-term biodiversity.

As discussed within **Section 3.7**, a PEA has been undertaken by Middlemarch to assess the ecological value of the site. Additionally, the project team held an ecology workshop to run through the BREEAM requirements and determine the optimum ecological outcome for the site in terms of enhancement.

4.3.9 Pollution

The aim of the Pollution category is to address the prevention and control of pollution, and surface waste run-off associated with the building's location and use.

Pollution issues covered within the credit requirements include light, noise, flooding and emissions to air, land and water.

As the building services strategy is all-electric and there will be no fossil fuels combusted on site, there will be no adverse impact on local air quality.

Furthermore, pollution impacts associated with light and noise will be reduced and managed appropriately.

The site is within an area at low risk of flood (Flood Zone 1) and surface water run-off will be managed to ensure risk to the proposed development and neighbouring areas does not increase.

4.4 Summary

The above sections summarise the credits targeted by the proposed building. The credits targeted equate to a score of 75.24% which would achieve

BREEAM 'Excellent' (70%) with a significant margin of safety.

It should be noted that the route to the targeted BREEAM an 'Excellent' rating set out in this chapter may potentially be subject to change as part of detailed design and construction.

5. Conclusions

This Environmental Standards Statement demonstrates how the Booth Street West development meets or exceeds national and local planning policy in relation to sustainability, energy and climate change.

The proposed development at Booth Street West incorporates a range of measures to ensure high levels of environmental sustainability performance in accordance with relevant national and Manchester City Council policy and guidance.

A BREEAM 'Excellent' rating is targeted, beyond the minimum 'Very Good' rating sought by Manchester City Council planning policy. This voluntary uplift will ensure higher performance across a range of sustainability issues during both construction and operation.

Energy Efficiency

The proposed energy strategy comprises a 'fabric first' approach in accordance with the energy hierarchy, together with low carbon technology to deliver low carbon heating and reduce carbon emissions.

As shown within **Table 2**, Booth Street achieves a 5.16% reduction in carbon emissions against Part L 2021 requirements through building fabric improvements and implementation of low carbon space heating and hot water.

The results set out in the Energy Statement demonstrate that all heating and hot water demand will be provided by the ASHP, this means 56% of the total energy demand is met by low/zero carbon technologies. This satisfies the Manchester planning validation checklist, requiring low/zero carbon technologies to provide at least 20% of the site energy demand.

The proposed energy strategy is further future proofed by being 'all electric' and will benefit from the significant further decarbonisation of the UK electricity grid that is forecast by the Government. The combination of an all-electric building services strategy and the use of ASHPs will deliver a low carbon heating strategy with the decarbonisation of the national grid. Therefore, the development will contribute to Manchester City Council's ambition to become carbon neutral by 2038.

Environmental Design

The PBSA seeks to achieve a BREEAM 'Excellent' rating, and the pre-assessment provided within Appendix 1 demonstrates how this can be achieved.

Several early-stage credits have already been signed off, demonstrating the applicant's commitment to BREEAM and understanding that incorporating sustainability at Concept Design is an integral part of the design process.

Water Management and Weather Resilience

The application site is at low risk of flooding and the development will make use of SuDS to ensure that risk of flooding is not increased.

The development is resilient to the impacts of climate change and will reduce overheating through measures such as a green roof and blue roof. These

features will also contribute to the SuDS strategy by reducing surface water run-off during storm events.

Water efficiency will be managed through limiting sanitary fittings and ensuring that no mechanical irrigation will be provided within the development.

Construction and Waste Management

An LCA has been undertaken as part of the BREEAM assessment to measure the environmental impacts and embodied carbon of the proposed development. Measures to reduce embodied carbon over the building's life have been implemented, including the use of concrete pavers to minimise impacts associated with replacement. Further measures will be considered at detailed design, including the use of GGBS and other cement alternatives.

Furthermore, a pre-demolition audit will be undertaken to ascertain whether any materials from the former Gamecock pub can be re-used on site. Where this is not possible, the waste hierarchy will be followed to re-use off site and recycled before going to landfill.

Construction phase waste management and appropriate operational waste storage will help ensure the development contributes to waste recycling targets and minimises the amount of waste sent to landfill.

Biodiversity

The proposed development site is predominantly building and hard standing, with small areas vegetation, therefore the habitats present on site are species poor. There will be some loss of trees on site which cannot be avoided, therefore enhancement measures are proposed, including replacement planting of wildlife attracting trees, provision of nesting / roosting habitats for bats and birds, and provision of a green roof.

The landscaping proposals will therefore enhance biodiversity on site, and provide habitats for priority species where possible.

Waterways

The closest waterway is 690m away and therefore unlikely to be at risk of water pollution. However, the project team will ensure that construction is undertaken in a way which minimises pollution and impact on the surrounding area. The contractor will implement best practice pollution prevention policies and procedures on-site, in accordance with Pollution Prevention Guidelines.

Appendix 1: BREEAM Pre-assessment



Former Gamecock Pub, Booth Street West, Manchester

BREEAM New Construction 2018 (Multi-Residential - Student Halls)

07/06/2023

PLANNING

Key

Mandatory Credit for 'Excellent'

Credit not targeted

TARGET (>70%)	75.24%	Excellent			
Credit Summary BREEAM 2018: Multi-Residential			Credit Ref.	Credits Available	Excellent Target
MANAGEMENT					
Credit Value 0.52%	Project Brief and Design	Project Delivery Planning	Man 01	1	1
		Stakeholder Consultation		1	1
		BREEAM Advisory Professional		1	1
				1	1
	Life Cycle Costing (LCC) and Service Life Planning	Elemental Life Cycle Cost	Man 02	2	2
		Component Life Cycle Cost		1	1
		Capital Cost Reporting		1	1
	Responsible Construction Practices	Legally harvested and traded timber - Pre-requisite	Man 03	-	Y
		Environmental Management		1	1
		Sustainability Champion		1	1
		Responsible Construction Management (1 credit mandatory)		2	2
		Monitoring of Construction Site Impacts		2	2

	Commissioning and Handover	Commissioning and Testing Schedule and Responsibilities	Man 04	1	1
		Commissioning Building Services		1	1
		Testing and Inspecting Building Fabric		1	1
		Handover (Building User Guide mandatory)		1	1
	Aftercare	Aftercare Support	Man 05	1	1
		Commissioning - Implementation		1	1
		Post Occupancy Evaluation		1	1
Section Credit Total				21	21
Weighted Section Total				11%	11.00%
HEALTH & WELLBEING					
Credit Value 0.78%	Visual Comfort	Glare control	Hea 01	1	1
		Daylight factors		1	0
		View Out		1	0
		Internal and External Lighting Levels		1	1
	Indoor Air Quality	Indoor Air Quality Pre-Requisite	Hea 02	-	Y
		Ventilation		1	0
		Emissions from Construction Products		2	0
		Post Construction Indoor Air Quality Management		1	1
	Thermal Comfort	Thermal modelling	Hea 04	1	1
		Adaptability for projected climate change scenario		1	1
		Thermal Zoning and Controls		1	1

	Acoustic Performance	Sound Insulation	Hea 05	2	1
		Indoor Ambient Noise Levels		1	1
		Room Acoustics		1	1
	Security		Hea 06	1	1
	Safe and Healthy Surroundings	Safe access	Hea 07	1	1
		Outside Space		1	0
	Section Credit Total				18
Weighted Section Total				14%	8.56%
ENERGY					
Credit Value 0.70%	Reduction of Energy Use and CO2 Emissions	Energy Performance Ratio (4 credits mandatory)	Ene 01	9	6
		Prediction of Operational Energy Consumption		4	0
	Energy Monitoring	Sub-metering End-Use Categories	Ene 02	2	1
		Sub-metering of High Energy Load and Tenancy Areas			1
	External Lighting		Ene 03	1	1
	Low Carbon Design	Passive Design Analysis (PDA)	Ene 04	1	1
		Free Cooling		1	0
		Low and Zero Carbon Feasibility Study		1	1

	Energy Efficient Transportation Systems	Energy Consumption	Ene 06	1	1
		Energy Efficient Features		1	1
	Energy Efficient Equipment		Ene 08	2	2
Section Credit Total				23	15
Weighted Section Total				16%	10.43%
TRANSPORT					
Credit Value 0.83%	Transport Assessment and Travel Plan		Tra 01	2	2
	Sustainable Transport Measures		Tra 02	10	10
Section Credit Total				12	12
Weighted Section Total				10.0%	10.00%
WATER					
Credit Value 0.78%	Water Consumption (1 credit mandatory)		Wat 01	5	2
	Water Monitoring		Wat 02	1	1
	Water Leak Detection & Prevention	Leak Detection System	Wat 03	1	1
		Flow Control Devices		1	1
	Water Efficient Equipment		Wat 04	1	1
Section Credit Total				9	6
Weighted Section Total				7%	4.67%

MATERIALS					
Credit Value 1.07%	Environmental Impacts from Construction Products - Building Life Cycle Assessment (LCA)		Mat 01	7	7
	Environmental Impacts from Construction Products - Environmental Product Declarations (EPD)		Mat 02	1	0
	Responsible Sourcing of Construction Products	Pre-requisite - Legal and Sustainable Timber	Mat 03	-	Y
		Enabling Sustainable Procurement		1	1
		Measuring Responsible Sourcing		3	2
	Designing for Durability and Resilience		Mat 05	1	1
	Material Efficiency		Mat 06	1	0
Section Credit Total				14	11
Weighted Section Total				15.0%	11.79%
WASTE					
Credit Value 0.60%	Construction Waste Management	Pre-Demolition Audit	Wst 01	1	1
		Construction Resource Efficiency		3	2
		Diversion of Resources from Landfill		1	1
	Use of Recycled and Sustainably Sourced Aggregates		Wst 02	1	0
	Operational Waste		Wst 03	1	1

	Adaptation to Climate Change		Wst 05	1	1
	Design for Disassembly and Adaptability		Wst 06	2	2
Section Credit Total				10	8
Weighted Section Total				6.0%	4.80%
LAND USE & ECOLOGY					
Credit Value 1.00%	Site Selection	Previously Developed Land	LE 01	1	1
		Contaminated Land		1	0
	Ecological Risks and Opportunities	Survey and evaluation	LE 02	1	1
		Determining Ecological Outcomes		1	1
	Managing Negative Impacts on Ecology	Prerequisite - Ecological risks and Opportunities	LE 03	-	Y
		Planning and Measures On-site		1	1
		Managing Negative Impacts		2	1

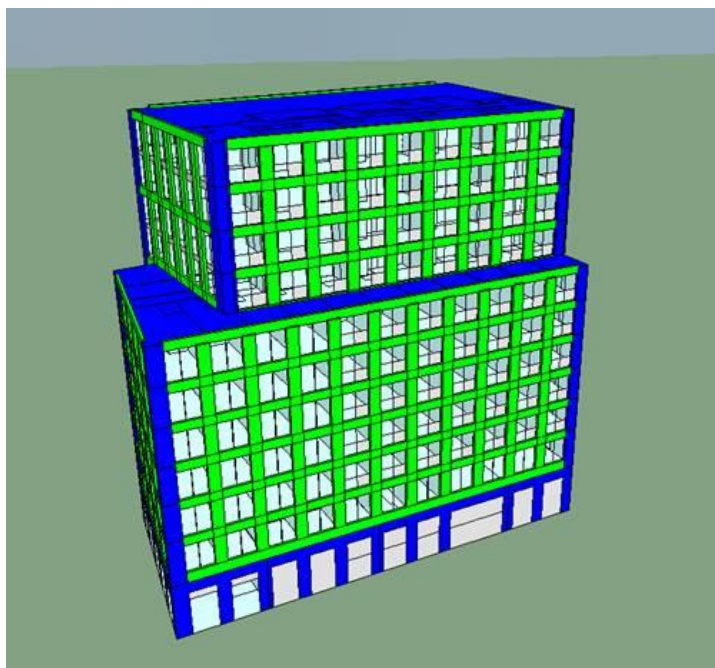
	Ecological Change and Enhancement	Prerequisite - Managing Negative Impacts on Ecology	LE 04	-	Y
		Ecological Enhancement		1	1
		Change and Enhancement of Ecology		3	0
	Long Term Ecological Management and Maintenance	Prerequisite - Statutory obligations, planning and site implementation	LE 05	-	N
		Management and Maintenance throughout the Project		1	0
		Landscape and Ecology Management Plan		1	0
Section Credit Total				13	6
Weighted Section Total				13%	6.00%
POLLUTION					
Credit Value 0.67%	Impact of Refrigerants	Prerequisite	Pol 01	-	Y
		Impact of Refrigerants		2	0
		Leak Detection		1	1
	Local Air Quality		Pol 02	2	2
	Surface Water Run Off	Low Flood Risk	Pol 03	2	2
		Surface Water Run-Off - Rate		1	1
		Surface water Run-Off - Volume		1	1
		Minimise watercourse pollution		1	0
	Reduction of Night Time Light Pollution		Pol 04	1	1
	Reduction of Noise Pollution		Pol 05	1	1
Section Credit Total				12	9
Weighted Section Total				8%	6.00%

INNOVATION			
Credit Value 1.00%	Man 03 Responsible Construction Practices	1	0
	Hea 01 Visual Comfort	1	0
	Hea 06 Security	1	0
	Ene 01 Beyond Zero Net Regulated Carbon	3	0
	Ene 01 Post Occupancy Stage	2	0
	Wat 01 Water Consumption	1	0
	Mat 01 Life Cycle Impacts	3	2
	Mat 03 Responsible Sourcing of Materials	1	0
	Wst 01 Construction Waste Management	1	0
	Wst 02 Recycled Aggregates	1	0
	Wst 05 Adaptation to climate change	1	0
	LE 02 Ecological Risks and Opportunities	1	0
	LE 04 Ecological Change and Enhancement	1	0
Section Credit Total		18	2
Weighted Section Total		18%	2%
Disclaimer	It should be noted therefore that this score is indicative only at this stage and must be reviewed throughout design development as well as audited by the BRE to confirm the final rating.	TARGET RATING	75.24%

Appendix 2: Energy Statement



**Management
and
Engineering
Services Ltd**



**GAMECOCK
BOOTH STREET WEST STUDENT ACCOMMODATION
MANCHESTER**

ENERGY STATEMENT

Project No: B2798
Date: May 2023
Client: Curlew Alternatives Eighth Property LLP
Document Reference: BSW-AMES-00-XX-RP-ME-FI40-0002

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PROJECT REVISION SHEET

Version	Details	Comments	Prepared by	Checked by	Issued
1.0	First Issue	First Issue	CC	ALH	08.04.21
2.0	Second Issue	Updated following comments and further review of current UK grid electricity carbon factors.	CC	ALH	16.04.21
3.0	Third Issue	Updated in accordance with building geometry and design changes	DLM	CC	30.05.23
4.0	Fourth Issue	Updated to show % contribution from ASHP. And updated U-Values.	DLM	CC	10.07.23
5.0	Fifth Issue	Updated to reflect change in amount of rooms	DLM	CC	29.08.23

Executive Summary

This Energy Statement outlines the proposed development's energy efficiency and renewable energy strategies. The proposed redevelopment involves the demolition of existing building and structure and redevelopment of site for Purpose Built Student Accommodation (PBSA) uses (Sui Generis use class) comprising 146 bedroom units with ancillary amenity space, a ground floor 'community hub' (proposed for Use Classes F2(b), E(b), E(3), E(f)) associated landscape works and infrastructure.

Passive design measures will be implemented to reduce the energy demand of the building. These include improving the thermal performance of the building fabric and achieving an air permeability in excess of the requirements of Building Regulations Approved Document L2A 2021 Edition. Cooling and ventilation loads will be reduced by providing performance glazing to reduce the solar gain.

Energy efficient plant will then be used to ensure that the energy consumed in the operation of the building is consumed on the most efficient manner possible. This includes the use of heating and ventilation equipment with efficiencies equal to, or in excess of that required by the Non-Domestic Building Services Compliance Guide 2021 Edition.

An energy demand assessment for the proposed development was carried out, using an SBEM calculation, carried out using IES dynamic simulation software.

Energy Demand	Baseline	
	Energy Demand (kWh/yr)	CO ₂ Emissions (kg/yr)
Heating	53,978	10,418
Hot Water	39,300	7,585
Lighting	50,683	28,116
Auxiliary (Fans, pumps etc.)	20,728	4,001
Cooling (to Social Spaces only)	839	162
Equipment (not included with Part L calculation)	188,653	36,410
Total	354,182	68,357

Table 1.0 Carbon Emissions and Energy Demand

Based on this energy assessment, the feasibility of various renewable and low/zero carbon technologies was assessed. Air source heat pumps can be used to provide low/zero carbon electrical and heat energy for the development.

Technologies such as wind turbines, biomass heating, ground source heat pump and solar hot water have been deemed inappropriate for this development due to local site constraints and conflicts with other, more appropriate, technologies.

1.0 Introduction

This Energy Statement has been prepared for Curlew Alternatives Eighth Property LLP to inform the design development process for the proposed new Purpose Built Student Accommodation development at the former Gamecock public house, Booth Street West, Manchester.

The project involves the demolition of existing building and structure and redevelopment of site for Purpose Built Student Accommodation (PBSA) uses (Sui Generis use class) comprising bedroom units with ancillary amenity space, a ground floor 'community hub' (proposed for Use Classes F2(b), E(b), E(3), E(f)) associated landscape works and infrastructure.

It has been developed by Amber Management and Engineering Services Limited.

1.1 Statement Intent

This Energy Statement has been produced to address issues associated with the need to reduce the CO₂ emissions for the development and includes a number of concerns related to energy efficiency and the reduction of carbon dioxide emissions.

1.2 Key Information

The key information identified is:

- How much CO₂ will the development emit annually in operation?
- Reference to how these emissions have been calculated?
- Which technology has (or technologies have) been chosen to deliver a reduction in annual carbon emissions?

This Energy Statement will demonstrate how carbon dioxide emissions have been minimised in accordance with the following energy hierarchy:

- a) Using less energy through energy efficient building design and construction, including thermal insulation, passive ventilation and cooling.
- b) Ensuring all energy consuming equipment is as efficient as possible, and well managed.
- c) Maximising use of renewable and low carbon energy generation systems within the constraints of the development.

These issues will be discussed in the section of this Energy Statement on Passive Design Principles, Energy Efficient Design Principles and Renewable and Low/Zero Carbon Technologies.

1.3 Building Description

The site currently consists of a derelict public house. The proposed Student Accommodation building will replace the existing building on the site while also providing suitable external amenity space and ground floor community space.

1.4 Development Proposal

The proposed development provides bed spaces for students over a mix of accommodation types including; cluster flats and studios.

2.0 Design Principles

The design intent of the development is to reduce the annual energy consumption, whilst ensuring that the energy that is consumed, is consumed in the most efficient manner possible, minimising CO₂ emissions. To achieve this, the following process will be applied:

- Incorporate passive design measures into the building design to reduce the energy requirement.
- Incorporate energy efficiency design measures into the services design to ensure energy is consumed as efficiently as possible.
- Assess the viability of renewable and low/zero carbon technologies to reduce the requirement for grid supplied energy.

2.1 Passive Design Measures

2.1.1 Building Fabric

The thermal insulation standards will be specified to exceed the minimum standards contained within Approved Document L2A 2021 to limit the heat loss through the building fabric. This will reduce the heat energy required to maintain internal comfort levels and so reducing the CO₂ emissions associated with space heating.

The building will also be designed to achieve air permeability standards in excess of the requirements of Approved Document L2A. This will reduce the infiltration of external ambient air and so reduce the heating requirement of the building.

2.1.2 Solar Gain

Performance glazing will be provided to the windows, as deemed necessary together with internal blinds to limit summertime solar gains and overheating, so reducing the requirement for mechanical cooling systems and increased mechanical ventilation rates.

2.1.3 U-Values

The table below shows that U-values better than the minimum part L standard will be used on this development.

Parameter	Part L Minimum Standard	Design Proposal
Ground Floor U-Vales (W/m ² K)	0.18	0.14
Roof U-Value (W/m ² K)	0.18	0.12
Wall U-Value (W/m ² K)	0.26	0.18
Window U-Value (average including frame) (W/m ² K)	1.6	1.4
Glazing G-Value	-	0.4
Glazing Visible Light Transmission	-	0.71
Air Permeability (m ³ /hr/m ² @50 Pa)	8.0	3.0

Table 2.0 U-Values

2.2 Energy Efficiency Design Measures

2.2.1 Heating Plant

Heating and hot water will be provided by centralised high efficiency Air Source Heat Pumps (ASHP). These will be selected to have an efficiency that exceeds the minimum standards required by the the Non-Domestic Building Services Compliance Guide 2021 Edition. Heating will be supplied to each room via a central distribution network feeding high efficiency radiators. TRV's will be provided to each radiator, with weather compensated controls varying the boiler flow temperatures. All controls will be linked to the Building Management System to provide central monitoring and control.

2.2.2 Domestic Hot Water

As discussed further in this report, air source heat pumps (ASHP) are deemed a suitable low carbon technology that could be employed on this development to generate domestic hot water for all draw-offs. Recently, manufacturers have developed ASHP specifically suited to the higher temperature requirements of domestic hot water generation using refrigerants that are suitable for that range whilst also having low Global Warming Potential (GWP).

It is therefore proposed to utilise ASHP on this project by creating a compound at roof level for the units and then have storage vessels located within the first floor plant room.

Hot water distribution losses in such buildings can be a major source of energy consumption, as well as leading to overheating risk, particularly in corridor areas. To combat this, the design has been optimized to minimise hot water distribution pipework, as well as complying with the requirements to minimise the risk of legionella proliferation.

2.2.3 Mechanical Ventilation

The majority of areas are proposed to be naturally ventilated, with extract only ventilation provided to bathroom pods, kitchen areas and courtyard facing bedrooms. These systems will be selected to have a specific fan power (SFP) equal to or in excess of the requirements of the Non-Domestic Building Services Compliance Guide 2021 Edition. Some areas, such as perimeter facing bedrooms, shall require Mechanical Ventilation with Heat Recovery (MVHR), these shall incorporate high efficiency heat exchangers to minimise the CO₂ emissions related to heating the incoming fresh air to the room temperature.

2.2.4 Internal Lighting

Internal lighting contributes to a significant proportion of the operational energy requirements of buildings of this type, and so offers significant scope for the reduction of annual CO₂ emissions. The energy consumption associated with internal lighting will be minimised by using efficient LED luminaires throughout.

Automatic lighting controls will be provided, via presence detectors, throughout all communal and circulation spaces to ensure lighting is not left on unnecessarily.

2.2.5 External Lighting

The external areas of the development will be lit via high efficiency luminaires controlled via a combination of 7-day programmable time clock and photocell to ensure the lighting is only on when required.

2.2.6 Energy Metering

All main incoming utilities, major energy consuming plant, and individual electrical distribution boards will be metered to enable the end use to be identified. All meters will be linked to a Building Energy Management

System (BEMS) to provide central monitoring. This will allow high energy consumption to be identified and targeted for improvements.

3.0 Renewable and Low/Zero Carbon Technologies

As part of the proposed development, it is intended to implement a range of renewable and low/zero carbon technologies to further reduce CO₂ emissions.

The provision of these technologies will be selected to meet the reduction in CO₂ emissions.

Each of the following technologies has been assessed for the potential implementation within the development.

3.1 Wind Turbines

Wind turbines in city centre locations experience poor yields for electricity generation as the obstruction caused by similar height buildings, and natural variations in topography, inevitably lead to turbulent air flow around the building.

In reaction to this, the invention and development of Vertical-Axis Wind Turbines (VAWTs) has arisen. They require far less space than their horizontal-axis (HAWTs) counterparts, are unaffected by changes in wind direction and are much more quiet making them perfect for residential/urban areas. VAWTs are also cheaper and easier to maintain as they only have 2 main components, HAWTs have 4. The drawback is that the technology is still relatively new and commercial availability is currently scarce. On average, wind turbines harness 60% of the energy that passes through them, a far greater efficiency than solar panels, which average 18-22% energy capture.

The British Wind Energy Association recommends that a site be monitored over the course of a year to assess the potential efficacy of a wind turbine.

Wind turbines are generally considered to have a negative visual impact, and therefore wind turbines are not considered to be viable for this development.

3.2 Solar Photovoltaic Panels

Roof mounted photovoltaic panels have been identified as a possible means of generating zero carbon electrical energy. Due to the wide variation in occupancy of student accommodation, the electrical base load is generally constant throughout the day. This can be, in part, covered by the output of the photovoltaic system.

Once the photovoltaic panels are installed, there are minimal maintenance requirements. However, access will be needed to roof level for annual cleaning of the panels and to enable panel replacement should any fail.

Space has been allocated for a potential PV array at the roof level. The inclusion of this technology will be decided at future work stages.

3.3 Combined Heat and Power (CHP)

A CHP unit generates electricity on-site, and recovers the waste heat from this process to be used for heating or domestic hot water generation. This means the electricity is generated in a much more efficient manner than grid supplied electricity which is subject to significant transmission losses. This in turn leads to a reduction in CO₂ emissions.

To ensure that a CHP is running as efficiently as possible, a steady, continuous heat demand is required. The large quantity of domestic hot water required for high density student residential developments satisfies this requirement. The electricity generated will also contribute to the building base load.

A gas-fired CHP unit burns natural gas to generate electricity, with waste heat being recovered for space/hot water heating. They typically have an overall efficiency of circa 94% and are available on a wide range of sizes from a few kilowatts up to megawatt outputs.

CHP is deemed to be a highly effective low carbon energy source for high occupancy developments but due to the ever decreasing carbon intensity of grid-supplied electricity their effectiveness has now been overtaken by air or ground source heat pumps and therefore shall not be considered further for this development.

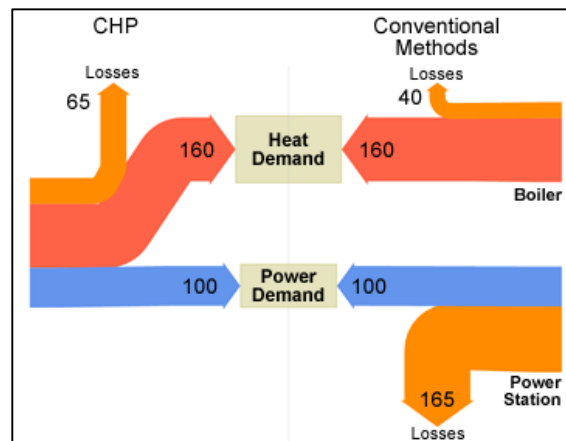


Figure 1.0 Sankey diagram illustrating CHP energy flows

3.4 Solar Hot Water

Roof mounted solar thermal collectors are used to provide a pre-heat to the domestic hot water requirements from solar energy. The proposed development will have a high domestic hot water demand and so a solar hot water system has the potential to provide a significant reduction in CO₂ emissions.

However, a solar hot water system would reduce the roof space available for photovoltaic panels. Additionally, when the building may be experiencing periods of low occupancy due to student summer holidays, this aligns with the highest yields which are very difficult to manage once all hot water storage requirements are satisfied and therefore complicated and expensive heat rejection plant is required which in theory 'wastes' the energy. Solar thermal systems used on other projects within the UK have generally had very low outputs so deemed not worth the capital cost of the system. For these reasons, solar hot water is not deemed suitable for this development.

3.5 Air Source Heat Pump

An air source heat pump (ASHP) extracts heat energy from the ambient air and uses this to provide space heating and/or domestic hot water, via either an air system or a wet system with radiators/underfloor heating and calorifiers for domestic hot water generation. The cool refrigerant enters the compressor which decreases the volume, thus raising the temperature. The hot refrigerant is then circulated through the internal heat exchanger for space heating, as seen in Figure 2.0. The process can also be reversed during summer months to remove heat from the building.

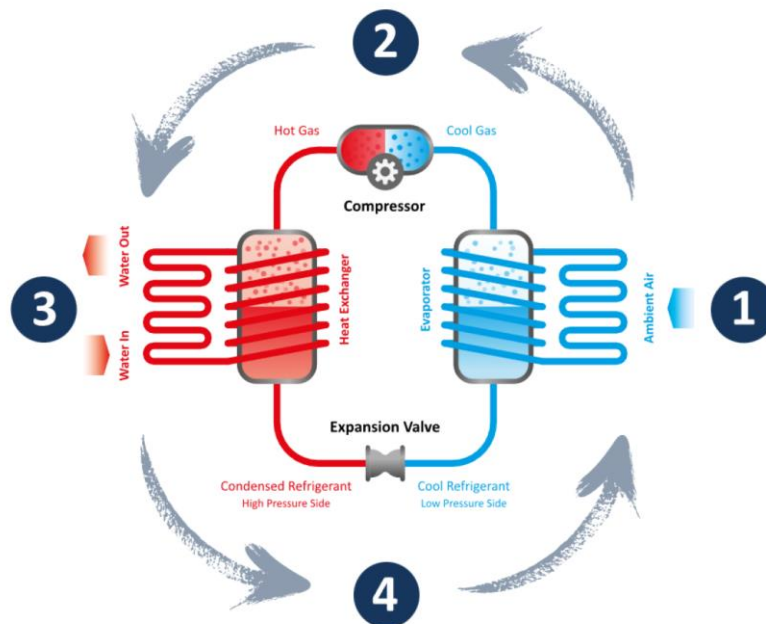


Figure 2.0 Air Source Heat Pump Diagram

The heat pumps operate on grid-supplied electricity and often have seasonal coefficients of performance (SCoP) in the order of 3. This efficiency coupled with the decarbonised electricity grid means that ASHP can provide a highly energy efficient means of supplying heat energy.

Further recent developments with ASHP technology has optimised designs to better suit the higher temperature requirements of domestic hot water generation which generally requires storing water over 60°C. Additionally, the refrigerant used in modern heat pumps have lower a Global Warming Potential (GWP) than they have previously. With the rise in commercial availability of the refrigerant known as R32, heat pumps have become even more of an eco-friendly option. R32 is now the most used refrigerant with a GWP of 675 replacing the former most popular refrigerant of R410A which had a GWP of 2088. Another benefit of R32 is that it can deliver improved efficiency, meaning the heat pump is able to recharge and recycle heat more with less losses, saving energy and making the heat pump greener in its operation.

Therefore, it is proposed that ASHP technology would be extremely suitable for space heating and domestic hot water production on this development. It is also proposed that Variable Refrigerant Flow heat pump comfort cooling and heating systems would be provided to offices and social spaces.

3.6 Ground Source Heat Pump

Due to the fact that the ground remains at a stable temperature of between 10-12°C, a ground source heat pump can be used to extract heat energy from the ground in winter and reject unwanted heat energy into the ground during summer.

The proposed development site has a small footprint which does not have the potential to provide the required space to install the necessary ground collector arrays. Also, due to the high cost of installation and internal plant space requirements, this system has been deemed inappropriate for the development.

3.7 Biomass Heating

Biomass in the form of logs, wood pellets or wood chips is classified as a renewable energy source because the CO₂ emitted during burning has been taken out of the atmosphere by the plant while it was growing. Therefore, locally sourced biomass fuel has the potential to significantly reduce the CO₂ emissions related to heating and hot water generation.

However, due to the city centre location of the development site, a number of difficulties exist in relation to the delivery and storage of the fuels and operation of the boiler. A large fuel store will be needed, requiring regular deliveries to keep the building operational. The Clean Air Act would also require a detailed analysis of the dispersal of the flue emissions to be carried out to ensure there are no air quality issues. Therefore, this technology is not proposed to form part of the development.

3.8 Geothermal

Geothermal technology uses deep geothermal boreholes in the Earth's surface, along with a thermodynamic refrigeration cycle to generate hot water. This technology requires a lot of capital expenditure, time and space to drill the boreholes. Space is not a commodity in this development due to its location in the city centre and thus this technology is not recommended for the development.

4.0 Water Sustainability

The proposed student accommodation development will seek to be efficient with its potable water demands. Throughout the development, low water consuming fittings shall be used to all sanitary ware to lower demand of the fresh water supply and the associated foul drainage. It is proposed that the typical CIBSE daily allocation per person will be reduced from 110 litres per day to 77 litres per day.

5.0 Energy Demand Assessment

The annual energy consumption for the proposed development has been estimated based on an SBEM calculation, carried out using IES dynamic simulation software. The calculation at this early stage of design development has made a number of conservative assumptions but reflect the servicing strategy for the proposed development. The calculation results below include the following:

1. Heat provided via ASHP.
2. Domestic hot water generated via ASHP.
3. Continuous background ventilation provided by MVHR or hybrid mechanical-natural ventilation.
4. High efficiency LED lighting.
5. VRF comfort cooling & heating to offices and social spaces.
6. U-values as described above in Table 2.0.

Energy Demand	Baseline	
	Energy Demand (kWh/yr)	CO ₂ Emissions (kg/yr)
Heating	53,978	10,418
Hot Water	39,300	7,585
Lighting	50,683	28,116
Auxiliary (Fans, pumps etc.)	20,728	4,001
Cooling (to Social Spaces only)	839	162
Equipment (not included with Part L calculation)	188,653	36,410
Total	354,182	68,357

Table 1.0 Energy demand and Carbon Emissions

As all heating and hot water demand will be provided by the ASHP, this means **56%** of the total energy demand is met by low/zero carbon technologies. This satisfies the Manchester planning validation checklist, requiring low/zero carbon technologies to provide at least 20% of the site energy demand.

For Part L 2021, this gives a Building Emission Rate (BER) of **3.89kgCO₂/m²/yr** against a Target Emission Rate (TER) of **4.07kgCO₂/m²/yr**. This is an improvement of 5% over Part L 2021 compliance.

Target CO ₂ emission rate (TER), kgCO ₂ /m ² :annum	4.07
Building CO ₂ emission rate (BER), kgCO ₂ /m ² :annum	3.89
Target primary energy rate (TPER), kWh _{pe} /m ² :annum	43.41
Building primary energy rate (BPER), kWh _{pe} /m ² :annum	41.46
Do the building's emission and primary energy rates exceed the targets?	BER =< TER BPER =< TPER

Figure 3.0 Emission and Primary Energy rates

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