



ELEMENT
SUSTAINABILITY

FORMER JUNCTION HOTEL, MANCHESTER

ENVIRONMENTAL STANDARDS STATEMENT

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1. INTRODUCTION

Element Sustainability has been commissioned by Roost Architects Ltd to review the sustainability performance of the Proposed Development at the Former Junction Hotel and adjacent site at Rolls Crescent in Hulme, Manchester.

The purpose of this Statement is to summarise the relevant policy background and requirements of Manchester City Council (hereafter referred to as the council) and demonstrate the ways in which the design team have sought to address these aims through the scheme proposals, ensuring measures have been taken in order to provide a sustainable development at this site.

This Statement reviews the sustainable design features and appraises the energy strategy of the proposed development. The potential BREEAM UK Non-domestic New Construction (2018) rating for the retail elements of the scheme are also reviewed. Details of the design attributes, specifications and building characteristics are appraised in order to demonstrate how the proposals contribute to sustainable development in Manchester, align with the adopted and emerging planning policy requirements and seek to mitigate the environmental impacts of the scheme.

2. DEVELOPMENT PROPOSALS

2.1 Development Site Description

The proposed development site is located on the corner of Rolls Crescent and Old Birley Street and is currently unoccupied and is utilised as a car park. The Former Junction Hotel site is bound by roads to the north, east and west of the site and a community garden centre to the south. The wider area comprises mostly residential homes as well as some community and educational facilities and commercial uses.

The two-storey, Victorian building is not situated within a conservation area although the building itself is classed as an unlisted heritage asset and is to be retained.

Figure 2.1 – Pre-development Site



2.2 Development Proposals

The proposals include the restoration of the Former Junction Hotel building back to its original three storeys by forming a semi-public space including community room on the ground floor with a sound-proofed, live-performance area in the basement. The original hotel rooms above this are to become private, residential apartments.

The development proposals also include the erection of private residential apartments situated within two sperate blocks above a ground floor car park and commercial units. Each apartment will have access to private amenity space in the form of balconies as well as semi-private green space between the apartment blocks that are provisioned with vertical greenery.

Table 2.1 details the proposed accommodation schedule for the entire development.



Table 2.1 – Accommodation Schedule

Dwelling Types	Number of Units
1 Bed Apartment (new build)	4
2 Bed Apartment (new build)	22
2 Bed Apartment (existing)	2
Total	28
Commercial Units	4no. (total 113.9 m ²)
Community Use	263 m ²

The typical floor plans and elevations are presented in Figure 2.2 to 2.7.

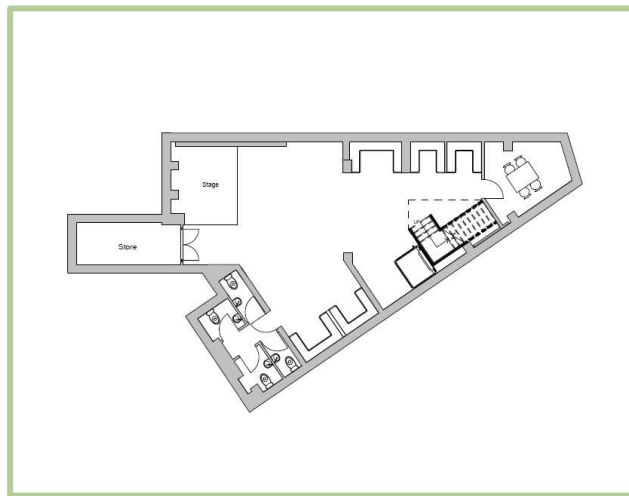
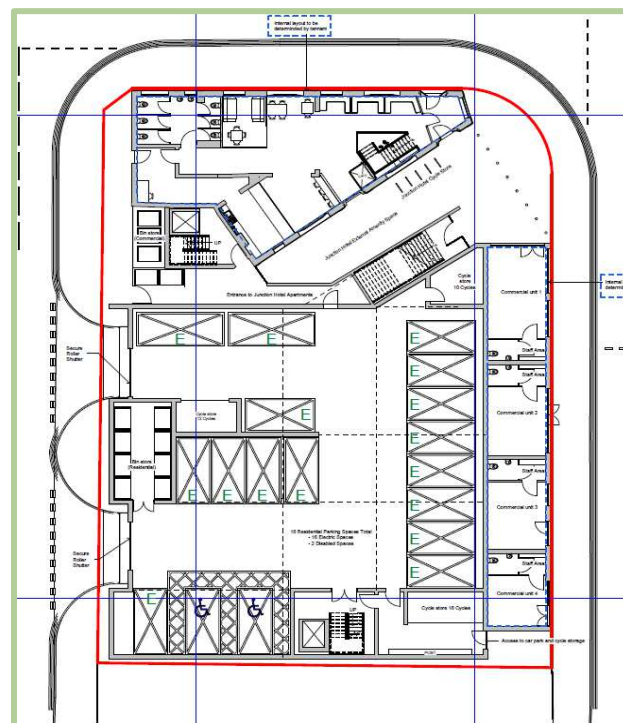
Figure 2.2 – Proposed Basement Layout*Figure 2.3 – Proposed Ground Floor Layout*

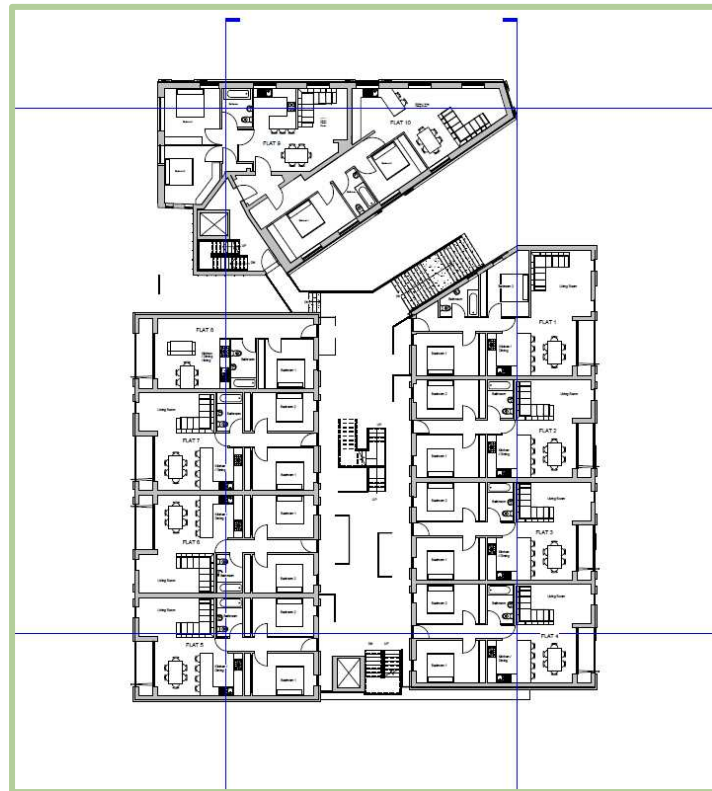
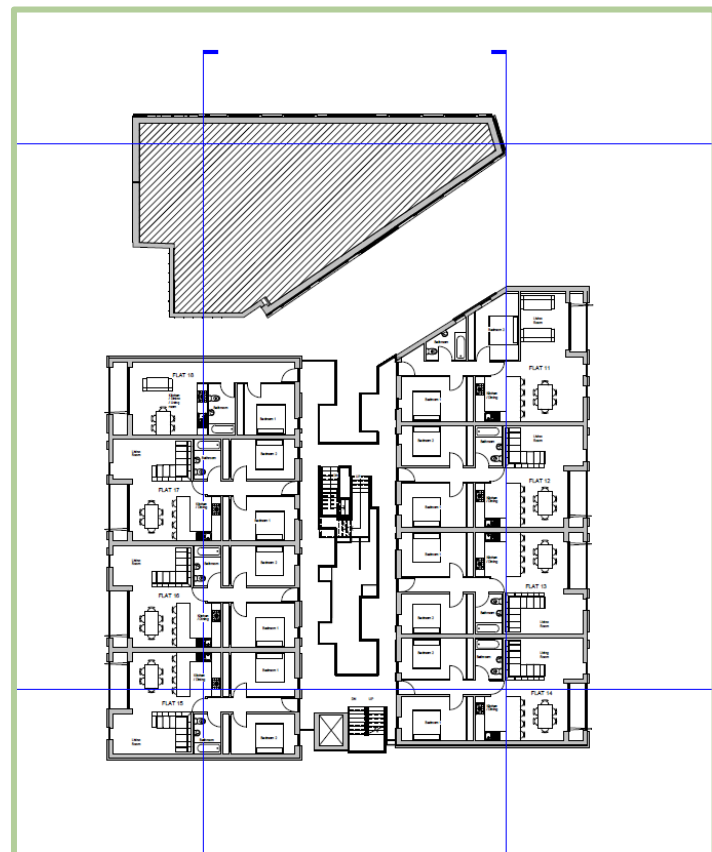
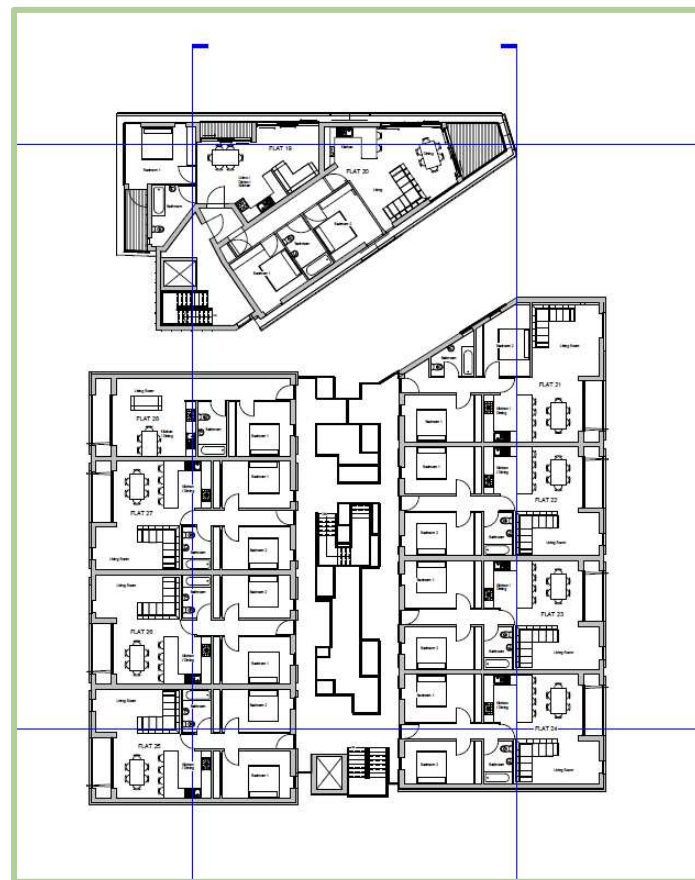
Figure 2.4 – Proposed First Floor Layout*Figure 2.5 – Proposed Second Floor Layout*

Figure 2.6 – Proposed Third Floor Layout*Figure 2.6 – Proposed East and North Elevations**Figure 2.7 – Proposed West and South Elevations*

3. POLICY REVIEW

3.1 Local Planning Policy

3.1.1 Manchester Core Strategy

Manchester's Core Strategy (CS) was adopted on 11th July 2012 and is the key Development Plan Document in the Local Development Framework (LDF).

CS Policy DM 1 - Development Management requires all development to have regard to a number of development principles. Subject to scheme viability, developers will be required to demonstrate that new non-domestic development to achieve a BREEAM Rating of 'Very Good' or for domestic development to achieve the Code for Sustainable Homes standard¹.

CS Policy EN 4 - Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development requires all development to follow the principle of the Energy Hierarchy, being designed:

- To reduce the need for energy through design features that provide passive heating, natural lighting and cooling;
- To reduce the need for energy through energy efficient features such as improved insulation and glazing; and,
- To meet residual energy requirements through the use of low or zero carbon energy generating technologies.

CS Policy EN 6 - Target Framework For CO₂ Reductions From Low or Zero Carbon Energy Supplies requires applications for residential development of 10 or more units and all other development over 1,000m² to meet, as a minimum, the targets shown in the tables below, unless unviable.

Table 3.1 – Policy EN6 CO₂ Emissions Reduction Targets; Domestic

Target	% Minimum Requirements
Target One: Network development area	CHP/District heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target Two: Electricity intense buildings	+15% increase on Part L 2010
Target Three: Micro generation area	+15% increase on Part L 2010

The residential elements of the proposed development are deemed to be **located within Target 2: Electricity intense buildings** area and must comply with Part L1A (2013).

¹ On the 25th March 2015 the Government issued a Written Ministerial Statement setting out the conclusion of the Housing Standards Review. The statement set out a new policy on the application of technical housing standards that applied immediately to all local planning authorities and qualifying bodies. This had a direct effect on the application of existing Code policies, and the setting of new Code policies. The Government elected to remove the Code for Sustainable Homes and incorporate new additional optional Building Regulations on water and access, and a new national space standard.



Table 3.2 – Policy EN6 CO₂ Emissions Reduction Targets; Non-Domestic

<i>Target</i>	<i>% Minimum Requirements</i>
<i>Target One: Network development area</i>	CHP/District heating anchor or connection or where not feasible a 15% increase on Part L 2010
<i>Target Two: Electricity intense buildings</i>	+10% increase on Part L 2010
<i>Target Three: Micro generation area</i>	+15% increase on Part L 2010

The non-domestic elements of the proposed development are deemed to be **located within a Target 2: Electricity intense buildings** area and must also comply with Part L2A (2013).

The emission reductions targeted within policy EN6 relate to Building Regulation Part L 2010. As a consequence of the reduction in emission rates required by current building regulations (Part L 2013) relative to Part L 2010, the revised equivalent target CO₂ emission reductions for the residential and non-domestic elements of this scheme are presented below:

- Residential - 9% dwelling emission rate reduction over Part L 2013; and,
- Non-domestic - 6% dwelling emission rate reduction over Part L 2013.

Further details of the building regulation requirements are provided in the section below.

3.1.2 Guide to Development in Manchester, Supplementary Planning Document

The Core Strategy requires that all new residential developments should accord with the design guidance set out in the Supplementary Planning Documents (SPD). The Guide to Development in Manchester SPD was adopted on 11th April 2007 and supports and enhances the ongoing shaping of the City by providing a set of reasoned principles which will guide developers, designers and residents. These principles include a number of environmental standards, and includes the following categories which are identified in the SPD:

- Energy efficiency;
- Renewable energy;
- Environmental design;
- Water management and weather resilience;
- Waste management;
- Construction management;
- Biodiversity; and,
- Waterways.



3.1.3 Manchester Residential Quality Guidance

This document provides guidance for building new build dwellings in Manchester. The residential quality guidance demands design excellence in all new housing built in the city, set minimum space standards, and ensure high environmental standards. The guidance includes the following nine components:

Make it Manchester – developers must understand the city’s unique character, heritage old and new, density and scale in various parts of the city and appreciate how new homes will fit in to what’s already there.

Make it bring people together – new homes must encourage a sense of community and neighbourliness, offering a mix of tenures to promote a mix of people.

Make it animate streets and spaces – understand the relationship between new homes and its environment and create public space.

Make it easy to get around - make sure developments have good transport links, along with good walking and cycling provision.

Make work with the landscape – development should improve the connection with the local environment with improved biodiversity, as well as greening and water schemes.

Make it practical – dealing with waste, car parking, bike storage and visitors should be made as easy as possible.

Make it future proof – design must anticipate the impacts of climate change and extreme weather with efficient design and adaptability.

Make it a home – sufficient space, natural light, privacy and storage are essential for people to settle down and flourish.

Make it happen – ensuring proposals are delivered, to a high quality, with high design standards and high sustainability.

3.1.4 Manchester’s Great Outdoors

A Green and Blue Infrastructure Strategy for Manchester aims to invest to date in the city’s Green and Blue infrastructure over the next 10 years (by 2025). Four objectives have been established to enable the vision to be achieved:

1. Improve the quality and function of existing green and blue Infrastructure, to maximise the benefits it delivers.
2. Use appropriate green and blue infrastructure as a key component of new developments to help create successful neighbourhoods and support the city’s growth.
3. Improve connectivity and accessibility to green and blue infrastructure within the city and beyond.



4. Improve and promote a wider understanding and awareness of the benefits that green and blue infrastructure provides to residents, the economy and the local environment.

3.1.5 Climate Emergency

A **Climate Emergency** was declared by Manchester City Council on the 10th July 2019 in response to the findings of the Intergovernmental Panel on Climate Change (IPCC) report. The City Council believe that there is serious risk to Manchester's people of climate change affecting economic, social and environmental well-being, supply chains – including food security, financial systems and local weather, among many others. Therefore, the target for becoming a zero-carbon city has been accelerated by 12 years, setting 2038 as the new target for the city. The council has agreed the following:

- To deliver the 2038 target and determine if an earlier target can be possible.
- Encourage involvement in all wards by April 2020 through meetings as part of the Our Manchester strategy.
- Review all policies, processes and procedures to ensure the council can become carbon neutral. Present an action plan by March 2020 detailing how the city can stay within its carbon budget.
- Make climate breakdown and the environment, an integral part of activity throughout the council, including all decision making, ensuring key decisions take into account the impact on achieving the zero-carbon target.
- Investigate measures to ensure future procurement is carbon neutral. Increase the percentage of social value with an additional environmental element.
- Work with suppliers to green their supply chains and support local production.
- Investigate and introduce measures to help reach domestic zero carbon levels including addressing fuel poverty and retrofitting existing homes.
- Investigate ways to ensure that future local plans place a mandatory requirement for all new development to be net zero carbon by the earliest possible date.

Manchester Climate change Framework 2020 – 25 is Manchester's high-level strategy for meeting their commitment on climate change that builds on the **Draft Manchester Zero Carbon Framework 2020-38**, which was published in February 2019 and Manchester City Council's declaration of a climate emergency in July 2019. This was endorsed by MCC at the Executive meeting in March 2020 and will develop over the next five years, in line with changes in policy, climate science, rate of progress and other factors. The framework has set out four objectives to facilitate this:

Objective 1 – Staying within our carbon budgets. This involves taking action in following relevant areas:

- Direct CO₂ emissions: staying within our 15 million tonne carbon budget for 2018-2100, including reducing the CO₂ emitted from our homes, workplaces and ground transport by at least 50% during 2020-25.
- Indirect CO₂ emissions: understanding and taking action on the things that we consume and which generate greenhouse gases through their production, transportation and disposal.



Objective 2 – Climate adaptation and resilience will require the adaption of the city's buildings, infrastructure and natural environment to the changing climate and increasing the climate resilience of our residents and organisations. This includes:

- Increase the amount of urban green infrastructure cover, aiming for a 10% increase by 2038 from 2018 levels, in line with the Greater Manchester aim.
- Respond to these risks by incorporating adaptation and resilience within our plans and strategies, and acting to make necessary changes to our buildings, infrastructure and our natural environment.

Objective 3 – Health and wellbeing aims to improve the health and wellbeing of everyone in Manchester through actions that also contribute to our objectives for CO₂ reduction and adaption and resilience:

- Adapt the city's built and natural environment and prepare our residents to become more resilient to these changes. Increasing the amount and quality of green space to enable residents to benefit from the improved physical and mental health that will come as a result.
- Improving the energy efficiency of the city's homes and providing access to affordable, secure supplies of renewable energy are essential help get 38,000 Manchester households out of fuel poverty.

Objective 4 – Inclusive, zero carbon and climate resilient economy looks to ensure that Manchester establishes an inclusive, zero carbon and climate resilient economy where everyone can benefit from playing an active role in decarbonising and adapting the city to the changing climate.

Priority Areas

Six priority areas have been established in order to help meet the above climate change objectives, including:

1. Buildings (existing and new)
2. Renewable energy
3. Transport and flying
4. Food
5. The things we buy and throw away
6. Green infrastructure and nature-based solutions

Urgent Actions Identified to Help Meet the Commitments:

- New Buildings – To ensure that new developments in the city don't eat into the limited carbon budgets and add to the already significant retrofit challenge. Developments need to be built and operated to zero carbon standards as soon as possible.
 - The ideal way to do this is through UK Government *establishing a national zero carbon definition* and methodology for its implementation, and for Manchester City Council to implement this standard as quickly as possible through the local planning system.
 - This should include applying zero carbon standards to all developments where the Council has additional influence, with a view to all new development needing *to be zero carbon from 2023 at the latest*.



- Renewable Energy – The National Grid has been decarbonising in recent years; we need this to continue but at an accelerated rate, with a view to being fully decarbonised as soon as possible.
 - At least 50% of all homes should have the equivalent of 16m² of solar PV panels by 2024.
- Gas – The following actions are needed to help reduce the reliance on natural gas:
 - Improve the energy efficiency of our buildings as far as possible to reduce our demand for gas.
 - Replace our natural gas-based heating systems with renewable energy-based heating technologies as soon as possible.
 - Work with Government to ensure that moving to electricity-based heating systems is affordable and doesn't push even more people into fuel poverty.

3.2 Emerging Policies

The Greater Manchester Spatial Framework 2019 (Draft) will set out how Greater Manchester should develop up until 2037 and is currently on hold. However, it contains the following relevant emerging policies:

Policy GM-S 2 Carbon and Energy aims to deliver a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions. There is an expectation that new development will:

- a) Be zero net carbon from 2038 by following the energy hierarchy (with any residual carbon emissions offset), which in order of importance seeks to:
 - I. Minimise energy demand;
 - II. Maximise energy efficiency;
 - III. Utilise renewable energy;
 - IV. Utilise low carbon energy; and
 - V. Utilise other energy sources.

With an interim requirement that all new dwellings should seek a 19% carbon reduction against Part L of the 2013 Building Regulations.

- b) Incorporate adequate electric vehicle charging points to meet likely long-term demand;
- c) Where practicable, connect to a renewable/low carbon heat and energy network;
- d) Achieve a minimum 20% reduction in carbon emissions (based on the dwelling emission or building missions rates) through the use of on Site or nearby renewable and / or low carbon technologies; and,
- e) Include a carbon assessment to demonstrate how the design and layout of the development sought to maximise reductions in whole life CO₂ equivalent carbon emissions.



3.3 National Planning Policy

In addition to the local planning policies, the National Planning Policy Framework 2018 is a material consideration. The National Planning Policy Framework (amended June 2019) replaces all previous PPSs and PPGs.

The NPPF states that the planning system should play an active role in guiding development to sustainable solutions. There are three dimensions to sustainable development, as stated within the NPPF: economic, social and environmental. These dimensions give rise to the need for the planning system to perform a number of roles:

An economic role – 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 and innovation; and by identifying and coordinating development requirements, including the provision of infrastructure;

A social role – 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; and

An environmental role – 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 roles should not be undertaken in isolation, because they are mutually dependent. Economic growth can secure higher social and environmental standards, and well-designed buildings and places can improve the lives of people and communities. Therefore, to achieve sustainable development, economic, social and environmental gains should be sought jointly and simultaneously through the planning system.

Pursuing sustainable development requires careful attention to viability and costs in plan-making and decision-taking. To ensure viability, the costs of any requirements likely to be applied to development, such as requirements for affordable housing, standards, infrastructure contributions or other requirements should, when taking account of the normal cost of development and mitigation, enable the development to be deliverable. At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development - for decision-taking this means approving development proposals that accord with the development plan without delay.

3.4 Regulatory Framework

3.4.1 Building Regulations

Building Regulations, Part L - Conservation of Fuel and Power sets the compliance standards for energy demand and carbon dioxide emissions from buildings.

Approved Document L1A addresses the conservation of fuel and power in new dwellings. The proposed development is registered against Building Regulations, Part L (2013) which requires all newly constructed dwellings need to comply with 5 criteria set out in Approved Document L1A unless exempted through the transitional provisions:



- I. The predicted rate of carbon dioxide emissions from the dwelling (the Dwellings Emission Rate DER) is not greater than the Target Emissions Rate (TER). Additionally, the Dwelling Fabric Energy Efficiency (DFEE) is not greater than the Target Fabric Energy Efficiency (TFEE);
- II. The performance of the building fabric and fixed building services should be no worse than the design limits set out in Table 2 of the Approved Document;
- III. The dwelling has appropriate passive control measures to limit the effect of solar gains on indoor temperatures in summer;
- IV. The performance of the dwelling as built, is consistent with the DER, including Site checking that the air permeability is within reasonable limits; and
- V. The necessary provisions for energy efficient operation of the dwelling are put in place including operating and maintenance instructions aimed at achieving economy in the use of fuel and power in a way that householders can understand.

Approved Document L2A addresses the conservation of fuel and power in new non-domestic buildings. The proposed development will also be registered against Building Regulations, Part L (2013) which requires all newly constructed buildings to comply with the 5 criteria set out in Approved Document L2A:

- I. Achievement of an acceptable Building CO₂ Emission Rate. i.e. the BER is less than the TER (target emission rate for a notional building);
- II. Limits on design flexibility – including U-values, air permeability, air handling plant efficiency, duct leakage, insulation, lighting system efficiency;
- III. Limiting solar gains in summer;
- IV. Construction quality and commissioning - The BER must be recalculated as constructed; and
- V. Provision of information - Information must be provided to the building operator.

The change of use class from a hotel (use Class B1) to residential (use Class C3) constitutes a material change of use which triggers the requirement for compliance with Building Regulation, Part L1B.

Approved Document L1B (ADL1B) specifically addresses the conservation of fuel and power in refurbished dwellings. It is anticipated that the proposed development will be registered against Building Regulations, Part L (2013). Approved Document L1B (2013) provides guidance on the minimum 'reasonable provision' in regard to thermal elements within the structure of the building.

Approved Document L2B specifically addresses the conservation of fuel and power in existing non-domestic buildings and provides minimum efficiency standards for building services and thermal elements. The work undertaken to refurbish the existing Former Junction Hotel into a community use building will be guided by this building regulation.

The Future Homes Standard seeks to introduce an uplift in standards for Part L of the Building Regulations for new buildings, with the intention of making new homes more energy efficient and to future-proof them in readiness for low carbon heating systems.



SAP 10 revised carbon factors for grid-mix electricity reflect the improved status of the UK grid that has significantly decarbonised since the last update of Part L in April 2014. In July 2018 the Government published updated carbon emission factors (SAP 10) demonstrating this. These new emission factors will however not be incorporated into Part L of the Building Regulations until the Government has consulted on new Building Regulations.

3.4.2 BREEAM

BREEAM (Building Research Establishment's Environmental Assessment Method) is the world's leading and most widely used environmental assessment method for buildings.

BREEAM UK New Construction scheme is a performance-based assessment method and certification scheme for new non-domestic buildings. The primary aim of BREEAM UK New Construction is to mitigate the life cycle impact of new buildings on the environment in a robust and cost-effective manner. This is achieved through integration and the use of the scheme by clients and their project team at key stages in the design and construction process.

The building's performance is assessed under a number of categories, including:

- Energy;
- Water;
- Transport;
- Materials;
- Land Use;
- Pollution;
- Health and wellbeing;
- Management;

The BREEAM rating benchmarks for BREEAM UK new construction projects assessed using the 2018 version of BREEAM are presented in Table 3.1.

Table 3.1 – BREEAM Rating Benchmarks

BREEAM Rating	% Score Required
Outstanding	≥ 85
Excellent	≥ 70
Very Good	≥ 55
Good	≥ 45
Pass	≥ 30

There are no minimum standards associated with the BREEAM 'Very Good' standard in terms of the building's energy and emission performance. However, to ensure that performance against fundamental environmental issues are not over-looked in pursuit of a particular rating, BREEAM sets minimum standards of performance in key areas e.g. energy, water, materials etc. A BREEAM 'Very Good' rating requires the following minimum performance standards, see Table 3.2.



Table 3.2 – Minimum 'Very Good' Standards

Minimum Standards for BREEAM for 'Very Good' rating	Credits
ENE 02: Energy Monitoring	One credit (First sub metering credit)
Man 04: Commissioning and Handover	One credit
Man 04: Building User Guide	One credit
WAT 01: Water Consumption	One credit
WAT 02: Water Monitoring	Criterion 1 only
MAT 03: Responsible Sourcing of Materials	Criterion 1 only

The target BREEAM rating for this scheme is BREEAM 'Very Good' (refer to Section 5). This broadly represents the top 25% of UK new non-domestic buildings (advanced good practice).



4. ENVIRONMENTAL PERFORMANCE

This section provides an appraisal of the development proposals and details the specific approach, design features and specifications which will contribute to reducing the environmental impact of the proposed development.

This section outlines those commitments that have been made by Roost Architects to ensure this proposed development contributes to sustainable development, meets the council's current planning policies and examines the following categories identified in the Guide to Development in Manchester, Supplementary Planning Document (SPD):

- Energy efficiency;
- Renewable energy;
- Environmental design;
- Water management and weather resilience;
- Waste management;
- Construction management;
- Biodiversity; and,
- Waterways.

The key specifications, site characteristics and design measures of the proposed development are considered below. They will mitigate the environmental impact of the scheme throughout both the construction stage and the future occupation of the development.

4.1 Energy

In order to limit energy demand and carbon dioxide (CO₂) emissions from the operation of the development, the following design features will be integrated within the scheme to enable the residents and building users to lead a low impact lifestyle:

4.1.1 Energy Efficiency Strategy

Energy Strategy -

The proposed approach to emissions reduction for the new build elements will be through a fabric led energy strategy, in accordance with the principles of the energy hierarchy:

- The energy efficiency of the new build apartments and common areas will be improved with the application of enhanced material specification through an offsite volumetric construction technique, exceeding Approved Document L1A (2013) criteria;
- The specification of the build fabric will be optimised to benefit from beneficial solar gains whilst mitigating the propensity to overheat. This will be achieved through a balance of high-performance u-values, appropriate g values and glazing ratios allied to low air permeability of 3.0m³/hm² (@50Pa.) which will reduce uncontrolled ventilation;
- The proposed space and water heating strategy for the development will be provided by a high efficiency, full electric systems to meet the limited energy loads generated by the apartments and non-domestic areas; and,



- A 36.5kWp photovoltaic array will supply on-site renewable energy for the new build residential apartment blocks.

The existing change of use residential apartments and a community-use space will be designed as such to optimise the operational efficiency of the existing building at this site and will be allied with efficient servicing strategies.

Further details of the proposed approach to reducing the energy demand and associated carbon dioxide emissions of these apartments and non-domestic areas are presented in the Sections 6 (Energy Strategy) and Section 7 (Emissions Performance Calculations).

4.1.2 General Principles

- Provision of A and A+ rated white goods (where applicable);
- Provision of EU energy efficiency labelling scheme details to assist in the purchasing of energy efficient electrical goods;
- Space and equipment provided for drying of clothes;
- 100% LED internal lighting;
- All external space lighting to be provided by dedicated energy efficient fittings and controls; and,
- The provision of thirty-eight cycle, secure and covered cycle storage spaces (at least 1 space per apartment) in addition to sixteen electric vehicle charging points to encourage the use of sustainable modes of transport.

4.2 Water

The development will be designed to reduce mains/potable water consumption and will include water efficient devices and equipment.

- A water efficiency strategy will be determined and will include 'A' rated appliances (where provided);
- Specification of efficient water fixtures throughout the scheme (low flow taps and showers, dual flush WCs and low volume baths). In order to reduce the demand, the residential sanitary fixtures will be specified to achieve a calculated daily consumption of <105litres/person/day, exceeding regulatory standards; and,
- The vertical urban gardens will be irrigated solely through rainwater harvesting systems.



4.3 Resource Management and Pollution

4.3.1 Efficient Use of Land

- The Former Junction Hotel proposals include for the redevelopment of an unlisted heritage asset into a community-use building in order to re-invigorate the site into a cultural social hub;
- The proposed modular construction of the new build apartments can be manufactured quickly and will help to address the urgent need for homes, making efficient use of the available land; and,
- Furthermore, the development of previously developed, brownfield land is also promoted by national and local planning policy and represents an efficient use of this land within this community.

4.3.2 Pollution Control

To reduce emissions of gases with high global warming potential (GWP) and nitrogen oxide (NOx) into the atmosphere, the development will be specified with:

- Insulating materials that have a GWP of less than 5 throughout the development to reduce the construction phase impact of this scheme upon climate change.

Additionally, the following measures will be implemented:

- Pollution Prevention Guidance will be adhered to in respects of air (dust) and water (ground and surface) pollution during the demolition and construction phase;
- External light fittings will be controlled through a time switch, or daylight sensor, to prevent operation during daylight hours to limit the impact of artificial lighting for the development's residents and surrounding environment;
- Dust suppression measures will also be put in place as part of the Main Contractor's Environmental Management Plan, such that any potential risks to watercourses or the neighbouring properties are minimised; and,
- Sound insulation will be specified to achieve Building Regulation Part E compliance standard (this will be verified by pre-completion testing) in addition to meeting the requirements of the council. This will reduce the impact of sound pollution for the occupants within adjoining dwellings and above the community room.

4.3.3 Materials

This development will contribute towards making more efficient use of non-renewable material resources and to reducing the lifecycle impact of materials used in construction. This is demonstrated by the selection of:

- Materials with low environmental impact throughout their lifecycle;



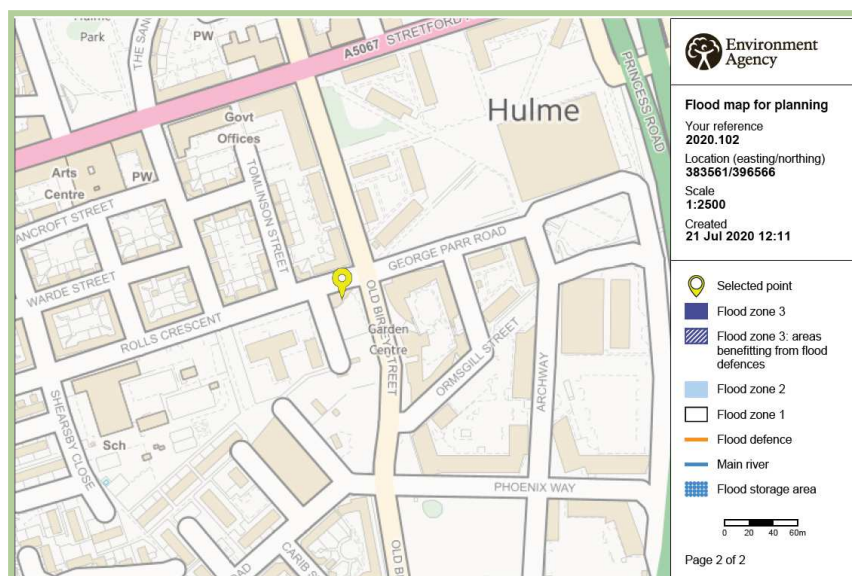
- Materials responsibly sourced from suppliers operating an Environmental Management System or procuring timber from FSC and PEFC sources, for example will be prioritised; and,
- Consideration will be given to local sourcing of construction materials where feasible and viable, which will minimise the impact of carbon dioxide emissions associated with the transportation of materials; and,
- Robust materials will be utilised for hard landscaping therefore, minimising the frequency of replacement and maximising materials optimisation. Furthermore, materials such as white stone and brick will be used in the construction to reflect the local vernacular in appearance and to tie in the new build apartments with the existing Junction Hotel building.

4.4 Surface Water Run-off

4.4.1 Flood Risk

The proposed development benefits from being located in a Low Flood Risk Zone. Data provided on the Environment Agency website confirms the development has a low probability of flooding and lies within Zone 1 (see Figure 4.1).

Figure 4.1 – Flood Risk Map



4.4.2 On Site Surface Water Management

The pre-developed site comprises an existing building and car park, and as a consequence consists of 100% impermeable surfacing. To minimise the risk and impact of localised flooding on and off-site, watercourse pollution and other environmental damage, the developer will ensure the following:

- The drainage strategy will incorporate the use of Sustainable Drainage Systems (SuDS) where appropriate throughout the site and the peak rate of discharge will be reduced through the provision of flow control techniques and surface water attenuation. The proposed development will be designed in order to reduce the post development surface water run-off to at least 50% of the existing surface-water brownfield runoff rates; and,



- The development will also be designed to ensure that run off from a 1 in 100-year flood event level (plus an allowance for climate change) is managed so as to not damage property.

4.5 Waste Management

4.5.1 Construction Waste

Best practice techniques to prevent and minimise waste during the design and construction phases of the development will be adopted, as follows:

- The proposed offsite volumetric construction of the apartments has the potential to reduce on site waste by 90% (relative to traditional construction methods) therefore, this scheme will promote the minimisation of waste in site development and seek to maximise the use of recycled materials in construction.
- Prior to commencement of the above ground construction phase, a site waste management plan (SWMP) will be produced by the developer to limit the on and off-site environmental impacts of construction. The SWMP will detail:
 - Recycled and secondary materials;
 - Waste reduction;
 - Waste segregation;
 - Waste recovery; and,
 - Waste disposal.
- A site waste management plan will identify opportunities to minimise waste generation and divert at least 85% of total construction waste from landfill; and,

4.5.2 Domestic Waste

- The dwellings will provide infrastructure and facilities that meet the need of the residents for segregated storage, thereby optimising the ability to recycle waste. Communal bin storage provision will enable residents and building users to make full use of Local Authority recycling services; and,
- A waste management strategy will be developed, ensuring that adequately sized bin storage areas for each residential block and commercial units, access for collection personnel and vehicles has been established and other aspects of waste management is designed into the development at an early stage. The strategy allows for storage of recyclable materials in order to optimise the recycling rates achieved by Manchester City Council.



4.6 Health and Wellbeing

To enable the occupants of the proposed development to lead lower impact lifestyles and enhance their quality of life, the following measures will be delivered at the proposed development:

- Good levels of natural day lighting will be achieved within the dwellings. This will provide a good quality of life for the occupants and reduce the need for energy to light the dwellings;
- Landscaped, vertical gardens (see Figure 4.2 as an example) will form part of the design around the external circulation zone for the apartments in order to connect all floors together while providing a good level of privacy;

Figure 4.1 – Flood Risk Map



- The proposals to redevelop the site partly into community-use space could help to alleviate prevailing social issues that the area may suffer from by promoting a more sustainable and inclusive community; and,
- All dwellings will comply with the Manchester Residential Quality Guidance to ensure that all dwellings are of a sufficient size and provide more flexibility and comfort for the future occupants.

4.7 Construction Management

In order to minimise the impact of the development during construction and operation whilst providing a safe place to live, the proposals include for the following provision:

- The security needs of the development will be considered crime prevention measures adopted to assist in reducing the opportunity for, and fear of crime; and,
- Construction site impacts will be minimised and best practice policies will be adopted in respect of air and water pollution.



4.8 Biodiversity

This brown field site has low ecological value in its current state and the proposed development presents an opportunity to increase biodiversity. Potential enhancement measures identified are as follows:

- Post development landscape planting will be selected to strengthen and improve the ecological value of the site for example, planting of native or wildlife friendly species within the vertical landscaping;
- Inclusion of a range of bird boxes to accommodate typical urban bird species; and,
- Inclusion of integrated or external bat roost features such as bat slates, tiles and bricks or bat boxes increase opportunities for roosting bats, coupled with a suitable lighting strategy to avoid unnecessary illumination of roost features.

4.9 Transport

To further enhance the sustainable credentials of the proposals, a Transport Statement has been prepared by SK Limited. The Statement concludes that future residents will have a variety of sustainable travel options that will reduce reliance on the car.

The proposed development is a highly sustainable location in terms of transport connections with basic facilities all within easy walking distance of the site.

Transport Links –

- The site benefits from excellent sustainable access opportunities and is well connected by existing walking and cycling routes to key trip attractors. Bus, Metrolink and train can also be used to easily access the site;
 - Bus – The nearest bus stop is located along Old Birley Street, approximately 120m walk from the site and provides regular services into Manchester city centre.
 - Rail – The nearest railway stations are Manchester Oxford Road and Manchester Deansgate which are approximately 1.7km from the development site. These stations provide services to Blackpool North; Huddersfield, Leeds, Buxton, Liverpool Lime Street, Wigan North Western, Bolton, Wigan, Southport and London Euston.
 - Metrolink - The nearest Metrolink station can be accessed from the Deansgate railway station serving destinations across the wider Greater Manchester area.
- The proposed layout and cycle storage provision acknowledge the excellent, sustainable location of the site and current car ownership levels of residents in Manchester by providing 18 car parking spaces, 16 of which will have electric vehicle charging points.



- The proposed development is well suited for cyclists and pedestrians with measures included to enhance cycle and pedestrian facilities and access to and from the site. Furthermore, destinations such as Old Trafford, Gorse Hill, Moss Side and Whalley Range are all within a 15-minute cycle ride of the site.

Local Amenity Access -

- Residents are able to walk to local amenities and shops along Stretford Road, 250m north of the site; and,
- The site benefits from very good links to local amenity space and recreational facilities, such as:
 - Recreational Space – Hulme Park is located to the north of the site (approximately 550m) and St George's park is situated 1.1km to the north west of the site. These are areas where residents can easily access green space for exercise and enjoyment;
 - Education – Parts of Manchester Metropolitan University and Manchester University are located within 1km of the site. There are also numerous primary schools within a 1km radius of the site making the development well suited to families;
 - Local Amenities – There are a range of retail and leisure facilities located within close proximity of the site and city centre attractions can be easily reached via public transport nodes and by foot.

Disability Access -

- Disabled access provision within the scheme itself will be in accordance with Building Regulation, Part M criteria as far as possible; and,
- Lift access will be provided to all floors.

4.10 Green and Blue Infrastructure Strategy

The River Irwell is located just under 2km from the development site and will provide an opportunity to encourage access to part of the city centre's blue infrastructure.

The redevelopment of this brownfield site will only serve to enhance biodiversity within the development with the inclusion of vertical gardens. This will provide a number of additional environmental benefits, such as improved air quality, whilst also creating an aesthetically enhanced environment and improving occupant's general wellbeing. The formation of vertical greenery within the development will be a key component helping to create successful neighbourhood while supporting the city's growth.

Pollution Prevention Guidance will be adhered to by the main contractor in respects to air (dust) and water (ground and surface) pollution during the demolition and construction phase to prevent any degradation of existing Blue Infrastructure. Pollution prevention measures may include, but are not limited to the following:

- Bunded tanks;
- Oil-water separators; and
- Gully traps





5. BREEAM ASSESSMENT (NON-DOMESTIC)

A BREEAM UK New Construction 2018 (shell only) Pre-Assessment report has been prepared by a qualified BREEAM Assessor. This is to determine the feasible credits and potential BREEAM rating for the new non-domestic retail space for the Former Junction Hotel development and demonstrates a commitment to the principles of good construction, design and sustainability.

5.1 BREEAM Assessment Classification

The BREEAM assessment methodology applicable to this development is as follows:

- BREEAM 2018 UK Non-Domestic New Construction Pre-Assessment (commercial building: retail) - shell only;

In reviewing and assessing the feasibility of the BREEAM credit award and the overall BREEAM performance of this scheme, constraints arising from the nature of the proposed development site and location have been considered. All credits allocated within this BREEAM Pre-Assessment will require further technical verification from the design team during the formal Design Stage and Post Construction BREEAM assessment.

5.2 BREEAM Credit Award Review

An overview of the BREEAM credit award for each issue is presented below. The BREEAM New Construction (2018) Pre-Assessment report is presented within Appendix A of this document and contains a full commentary on the individual credit award and specification requirements.

5.2.1 Management

Project Brief and Design –

- Stakeholder consultation covering project delivery and relevant third parties. This will ensure optimise final building design through recognising and encouraging an integrated design process and robust stakeholder engagement.

Life Cycle Cost and Service Life Planning –

- Reporting the capital cost of the building to promote economic sustainability.

Construction Site Impacts –

- All timber and timber-based products used throughout the project will be classified as 'legally harvested and traded timber';
- The principal contractor will demonstrate sound environmental management practices and consideration for neighbours across their activities on-site; and,
- Site related energy and water impacts are monitored and reported to ensure ongoing compliance during the Construction, Handover and Close Out stages and to improve awareness and understanding for future projects. Construction site impacts will be minimised as follows:



- o Monitor, report and set targets for carbon dioxide or energy arising from site activities;
- o Monitor, report and set targets for water consumption arising from site activities; and,
- o Monitor and record data from the transport movements and impacts resulting from delivery of construction materials to site and construction waste from site.

5.2.2 Commissioning and Handover –

The provision of the following processes and handover guidance will be provided to encourage a planned handover and commissioning process which will reflect the needs of the building occupants:

- Schedule of commissioning including optimal timescales and appropriate testing and commissioning of all building services systems and building fabric in line with best practice;
- Inspecting, testing, identifying and rectifying defects via an appropriate method; and,
- Provision of a non-technical Building User Guides timed appropriately around handover and proposed occupation.

5.2.3 Health and Wellbeing

Visual Comfort –

- Internal and external lighting systems are designed to avoid flicker and provide appropriate illuminance (lux) levels to ensure best practice in visual performance and comfort for building occupants.; and,
- The external lighting strategy will be designed to reduce unnecessary light pollution, energy consumption and nuisance to neighbouring properties;

Acoustic Performance –

- The building will meet appropriate acoustic performance standards and testing requirements in relation to sound insulation and indoor ambient noise level. This is to ensure the building's acoustic performance including sound insulation meet the appropriate standards for its purpose.

Safety and Security –

- Security needs will be understood and taken into account in the design and specification. To encourage effective measures that promote safe and secure use and access to and from the building.

5.2.4 Energy

Reduction of CO₂ Emissions –

- The proposed approach to emissions reduction at this site will be through a fabric led energy strategy and efficient servicing, in accordance with the principles of the Energy Hierarchy;



- The retail units will accord with current building regulation Part L, 2A criteria in accordance with the current and emerging local planning policies and the BREEAM mandatory 'very good' rating requirement.

External Lighting –

- All new external light fittings, where provided, within the construction zone will be dedicated low energy; and,
- External light fittings will be controlled through a time switch, or daylight sensor, to prevent operation during daylight hours.

Low Carbon Design –

- Reducing the building's energy consumption through the adoption of passive design solutions and low or zero carbon (LZC) energy sources. This is to ensure the adoption of design measures, which reduce building energy consumption and associated carbon emissions and minimise reliance on active building services systems.

5.2.5 Transport

- As previously discussed in Section 4.9 of this statement, The proposed development is a highly sustainable location in terms of transport connections with basic facilities and amenities all within easy walking distance of the site; and,
- A site-specific travel plan based on the needs of the site will be undertaken to promote sustainable reductions in transport burdens.

5.2.6 Water

Water Consumption and Monitoring –

- A water efficiency strategy will be determined for the site. This will include 'A' rated appliances;
- The buildings will be specified with efficient water fixtures and controls. This will result in a reduction in water consumption (litres/person/day); The mandatory minimum criteria for the BREEAM 'Very Good' rating will be achieved and a potential improvement targeted, which is a 40% improvement over the set BRE water consumption baseline;
- Leak detection would be incorporated, leakage especially in the case of water can be a drain on the resource and particularly difficult to establish without data collection; and,
- A water meter on the mains water supply to the building will be specified to monitor and manage consumption and sub- metered to tenant areas.

5.2.7 Materials

This development will contribute towards making more efficient use of non-renewable material resources and to reducing the lifecycle impact of materials used in construction. This is demonstrated by the selection of:



Materials Lifecycle Impacts –

- Materials with a low environmental impact throughout their lifecycle will be specified. The BRE's Green Guide to specification will be consulted to optimise the material selection and their associated environmental performance and life cycle impact; and,
- The specification of construction products and materials that have an Environmental Performance Declaration (EPD) to demonstrate the impact of construction products is a consideration in the design.

Responsible Sourcing of Materials –

- All timber used on the project will be responsibly sourced in accordance with the UK Government's Timber Procurement Policy (FSC sourced timber, for example);
- Materials will be selected which have a low environmental impact throughout their life cycle;
- Suppliers and manufacturers who operate Environmental Management Systems will be prioritised;
- Responsible sourcing of materials will be managed by the contractor. All timber used within the development will be responsibly sourced, verified by the FSC or PEFC standard; and,
- Consideration will be given to local sourcing of construction materials where feasible.

Insulation –

- The use of thermal insulation which has a low embodied environmental impact relative to its thermal properties will be specified throughout the development to reduce the construction phase impact of this scheme upon climate change.

Designing for Robustness –

- Adequate protection will be provided for exposed elements of the building and landscaped areas, therefore minimising the frequency of replacement materials.

5.2.8 Waste

Construction Waste –

Prior to commencement of the construction phase, a Construction Resource Management Plan will be produced by the developer to limit the on and off-site environmental impacts of construction. The waste management strategy will also include the following:

- Pre-demolition audit will be completed of all existing buildings, structures or hard surfaces within the scope of the development site will be undertaken. This promotes resource efficiency via the effective management and reduction of construction waste.
- Procedures to reduce construction waste related to on-site construction and off-site manufacture/fabrication; and,



- Diverting non-hazardous construction (on-site and dedicated off-site manufacture/fabrication), demolition and excavation waste (where applicable) generated by the project from landfill.

Operational Waste –

- Provision of suitable space and facilities to allow for segregation and storage of operational recyclable waste volumes generated by the building occupant(s) and activities will optimise recycling rates.

Adaptation to Climate Change –

- A climate change adaptation strategy appraisal will be carried out for structural and fabric resilience to encourage consideration and implementation of measures that will mitigate the impact of more extreme weather conditions arising from climate change over the lifespan of the building.

Functional Adaptability –

- A building-specific functional adaptation strategy will be undertaken by the design team, which includes recommendations for measures to be incorporated to facilitate future adaptation.

5.2.9 Biodiversity

Selection and Ecological Value of the Site –

- The proposed development is located on a previously occupied site;
- The land within the construction zone has been confirmed to be of low ecological value;

Minimising Impact on Existing Site Ecology and Enhancement –

- There will be no negative impact on the ecological value of the Site;
- Advice and recommendations will be sought from the suitably qualified; and,
- Any planting provision will be designed to provide an enhancement to both the ecological and aesthetic value of the site.

5.2.10 Pollution

Surface Water Management –

- The development site is located within Flood Risk Zone 1, low annual probability of flooding (see Section 4.4.1 Figure 4.1); and,
- The volume of surface water run-off will be limited such that the development will not result in an increased discharge from the Site and the peak rate of discharge will be reduced through the provision of flow control techniques and surface water attenuation.



Reduction of night-time light pollution –

- The external lighting strategy will be designed to reduce unnecessary light pollution through effective design, energy consumption and nuisance to neighbouring properties.

5.2.11 Potential BREEAM Score and Rating

Working alongside the qualified BREEAM assessor, the technical design team has reviewed the individual credit criteria and award of credits within the Pre-Assessment in order to optimise the building's BREEAM performance. All credits allocated within this BREEAM Pre-Assessment will require further technical verification and additional feasibility assessment during the formal Design Stage and Post Construction BREEAM assessment.

The BREEAM (shell only) Pre-Assessment (presented in the Appendix A of this Statement) shows that the building is expected to perform as follows:

- Indicative building BREEAM score = **57.60% (minimum required = 55% for BREEAM Very Good)**

Indicative BREEAM rating = Potential for **BREEAM 'Very Good' rating.**

5.2.12 Minimum 'Very Good' Standards

Following an initial review of the proposals the BREEAM New Construction Pre-Assessment report demonstrates that the new non-domestic retail space in the building are able, in principle, to meet all mandatory credit requirements (see Table 5.1) and achieve an overall BREEAM Very Good rating.

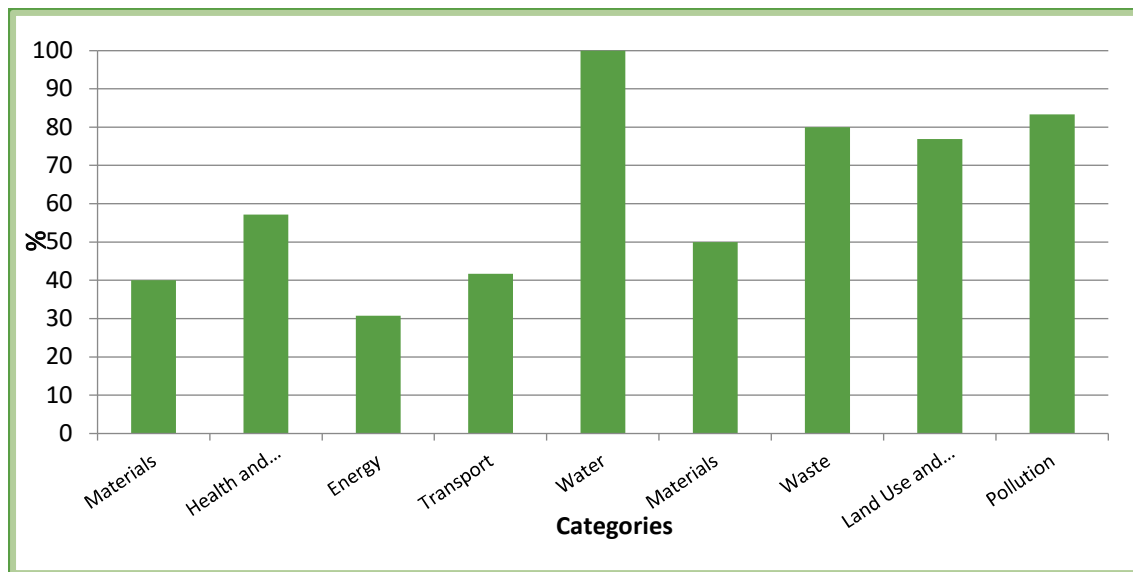
Note that a number of assumptions have been made within this initial appraisal process which will require confirmation by means of further technical input during the formal assessment, once the design and specifications are finalised. The approach to achieving the target BREEAM rating may therefore, be subject to change further into the development cycle.

Table 5.1 – Minimum Standards Achieved

Minimum Standards for BREEAM for 'Very Good' rating	Achieved
ENE 02: Energy Monitoring	not applicable to Shell only assessments
WAT 01: Water Consumption	not applicable to Shell only assessments
Man 04: Commissioning and Handover	not applicable to Shell only assessments
Man 04 Building User Guide	✓
WAT 02: Water Monitoring	✓
MAT 03: Responsible Sourcing of Materials	✓

Figure 5.1 shows the estimated relative performance in each of the BREEAM New Construction environmental sections of sustainability.



Figure 5.1 - Sustainability Performance Overview (Retail)

6. ENERGY STRATEGY

This section details of the proposed energy strategy for the Former Junction Hotel, mixed use scheme, which incorporates an enhanced 'fabric led' solution throughout the development. This is combined with efficient servicing and controls and will achieve compliance with the rigorous emission reduction and fabric energy efficiency targets stipulated by Building Regulation, Part L1A and L2A (2013).

6.1 Local Planning Policy Criteria

Manchester's Core Strategy (CS) includes the following relevant policies:

CS Policy EN 4 - Reducing CO₂ Emissions by Enabling Low and Zero Carbon Development requires all development to follow the principle of the Energy Hierarchy, being designed:

- To reduce the need for energy through design features that provide passive heating, natural lighting and cooling;
- To reduce the need for energy through energy efficient features such as improved insulation and glazing; and,
- To meet residual energy requirements through the use of low or zero carbon energy generating technologies.

CS Policy EN 6 - Target Framework for CO₂ Reductions From Low or Zero Carbon Energy Supplies includes emission reductions targets which relate to Building Regulation Part L 2010. As a consequence of the reduction in emission rates required by current building regulations (Part L 2013) relative to Part L 2010, the revised equivalent target CO₂ emission reductions for the residential and non-domestic elements of this scheme are presented below:

- Residential - 9% dwelling emission rate reduction over Part L 2013; and,
- Non-domestic - 6% dwelling emission rate reduction over Part L 2013.

Further to this, the **Greater Manchester Spatial Framework 2019 (Draft)** contains the following relevant emerging policies:

Policy GM-S 2 Carbon and Energy aims to deliver a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions. There is an expectation that new development will comply with the following:

- An interim requirement that all new dwellings should seek a 19% carbon reduction against Part L of the 2013 Building Regulations.



6.2 Build Fabric and Thermal Performance – New Build

In buildings, heat loss generally occurs through the following main areas and elements of the construction:

- Ground Floor;
- External Walls;
- Roofs;
- Doors and windows;
- Thermal bridging (heat loss through construction joints); and
- Uncontrolled ventilation.

The standard measurement of heat transfer through a given building material or construction type is the U-value ($\text{W/m}^2\text{K}$). The lower the U-value, the more slowly heat transfers and is lost out of a building.

6.2.1 Build Fabric and Thermal Performance

The residential blocks will be of an off-site volumetric, construction which are then transported to site. The proposed material specification that will be incorporated to limit heat loss and ensure efficient operation of the dwellings is presented in Table 6.1.

Table 6.1 – Proposed Dwelling Specification – New Build, Residential

Construction Element	Specification
Exposed Floor	$U=0.20 \text{ W/m}^2\text{K}$
External Wall	$U=0.18 \text{ W/m}^2\text{K}$
Flat Roof	$U=0.13 \text{ W/m}^2\text{K}$
Windows/ Doors	$U=0.4 \text{ W/m}^2\text{K}$ <i>Double Glazed, UPVC, Low-E</i>
Design Air Permeability	$3.0\text{m}^3/\text{hm}^2$ (@50Pa.)
Cold Bridging	Bespoke Psi Values (see appendix for details)

Table 6.2 presents the proposed material specification that will be incorporated to limit heat loss and ensure efficient operation of the non-domestic elements of the proposed scheme.

Table 6.2 – Proposed Build Fabric Specification – New Build, Non-domestic

Construction Element	Proposed Fabric Specification
Ground Floor	$U=0.13 \text{ W/m}^2\text{K}$
External Wall	$U=0.18 \text{ W/m}^2\text{K}$
Party Wall & Corridor (heated)	$U=0.00 \text{ W/m}^2\text{K}$ (fully filled & sealed)
Roof	$U=0.1 \text{ W/m}^2\text{K}$
Windows / Glazed Doors	$U=1.4 \text{ W/m}^2\text{K}$, $g=0.72$
Solid Doors	$U=1.2 \text{ W/m}^2\text{K}$
Air Permeability	$4.0\text{m}^3/\text{hm}^2$ (@50Pa.)

These material specifications and designs will deliver a Part L1A an L2A compliant solution and will provide the following benefits:



- **High performance thermal insulation** will ensure low U-values for all heat loss elements. Energy demand for space heating will be significantly reduced through the provision of an effective thermal envelope. A thermally efficient facade system will minimise heat loss through the building's thermal envelope;
- **Thermally efficient, 'A' rated, double glazed windows** will be specified with low emissivity coatings to limit heat loss through the pane. Thermal breaks will be incorporated within the frame to further limit heat loss. The glazing g value will be specified in the retail units to optimise beneficial solar gains but limit the propensity for the dwellings to overheat;
- **Very low air permeability** in all aspects of the build will minimise uncontrolled ventilation. This will reduce heat losses and provide high levels of occupant comfort;
- **Attention to cold bridging junctions** including the provision of insulation and thermal breaks to limit heat transfer. Bespoke Psi values will be calculated later into the development cycle however, for the purpose of this report, a set of Psi values have been used in the thermal bridging calculations from a similar volumetric build scheme to reflect how the dwellings will perform in terms of cold bridging. These values are set out in Appendix C; and,
- **Efficient Form** - apartments are an inherently efficient form of construction, both in terms of the materials required to build the dwellings and the ongoing heat energy demand. This is a result of relatively low areas of external heat loss elements associated with such layouts which enhance the energy efficiency of the dwellings and guarantees low energy demand throughout their occupation.

6.2.2 Building Services

The proposed mechanical and electrical specification that will be incorporated to ensure efficient servicing of the dwellings is presented in Table 6.3.

Table 6.3 – Proposed Mechanical and Electrical Specification – New Build, Residential

Item	Specification
Ventilation	Natural Ventilation
Lighting	100% 'Low E'
Space Heating	Electric panel heaters
Heating Control	Programmer and thermostat
Water Heating	High efficiency immersion heater
Lighting	100% Low Energy and LED
Renewables	Photovoltaic Panels (36.5kWp, south facing, 30° tilt)

The proposed mechanical and electrical specification that will be incorporated within the new-build, non-domestic areas of the scheme is presented in Table 6.4.



Table 6.4 – Proposed Mechanical and Electrical Specification – New Build, Non-domestic

Item	Proposed M&E Specification
Ventilation	Natural Ventilation
	Extract to WCs
Lighting	100% LED (100 Lumens/cW)
Space Heating and Cooling	Variable Refrigerant Flow (VRF) Air Source Heat Pumps (SCOP & SEER = 4.0)
Water Heating	Standalone water heater (electric instantaneous)
Heating Control	Time and temperature zone control

This mechanical and electrical specification will deliver a Building Regulation Part L1A and L2A (2013) compliant scheme, providing the following benefits:

- **No mechanical cooling** is required for the dwellings. The dwellings are not considered to be at risk from overheating due to the orientation of the building and openable windows allowing cross-ventilation therefore, natural intermittent extract fans are specified throughout.
- **LED lighting** will be specified throughout both the residential and non-domestic elements of the development in order to maximise operational efficiencies and lifespan of the fittings. LEDs operate with an estimated energy efficiency of up to 90% when compared to traditional lighting and conventional light bulbs. This means that about c.90% of the electrical energy is converted to light, rather than wasted heat as in conventional bulbs;
- **High efficiency hot water storage** will be specified within the apartments with immersion cylinders providing low standing losses to reduce energy demand from the systems. To further limit energy demand for hot water, dwellings would be provided with water-efficient fixtures and fittings, to limit overall water consumption to <105 liters per person per day;
- **Electric instantaneous hot water** systems will meet the commercial units' hot water load. The water flows immediately to the desired temperature therefore conserving water with little energy or circulation losses;
- **Sophisticated heating controls** including appliance programmer and room thermostats will ensuring the efficient delivery of heat from electric panel heaters to further reduce the dwellings' energy demand; and,
- **VRF heat pump systems** providing heating and cooling to the non-domestic areas benefit from high seasonal efficiencies for both heating and cooling modes. Additionally, these systems allow precise control of the necessary refrigerant circulation amount required according to the system load facilitating a comfortable environment by use of smooth capacity control.

6.2.3 Residential and Non-domestic Heating Strategy Rationale

- The residential dwellings and non-domestic units will exceed the current (stringent) Building Regulation Part L 2013 criteria in terms of dwelling emission rate and fabric energy efficiency;



- The systems specified above will also ensure high levels of occupant comfort coupled with low heating energy bills;
- There will be no local emissions associated with the proposed full electric heating strategy;
- Electrical panel heating generates a reduced overheating potential – electric space heating delivers virtually instantaneous heating at the location it is required. Unlike a ‘wet system’ associated with communal gas boilers which inherently have a long lag time for the heat to be generated and then dissipated when no longer needed. This lag time can lead to the dwellings overheating as the hot water remains in the radiators for a considerable time after the heat demand is required;
- A fully electric heating system is much more cost effective in terms of installation than communal gas and requires much lower maintenance. This will therefore keep service charges down for the building’s occupants; and,
- Electric heating as proposed for the Former Junction Hotel dwellings is 100% efficient at the point of consumption. The UK government is committed to reducing the country’s emissions and has legislated to do so within the Climate Change Act. As the UK’s electricity grid becomes less carbon intense over time the carbon emissions associated with full electric heating will become less.

6.3 Build Fabric and Thermal Performance – Existing Change of Use

The existing Former Junction Hotel heritage building is to be retained and restored to form a mixture of community-led space as well as two residential apartments on the existing second floor. These existing elements are not subject to specific CO₂ emission reduction policy targets however, best endeavours will be made to upgrade the fabric specification as far as feasibly possible in accordance with Part L1B (applicable to domestic existing elements of the scheme) and L2B (applicable to non-domestic existing elements of the scheme) of Building Regulations.

6.3.1 Build Fabric, Thermal Performance and Building Services

Table 6.5 presents the proposed material specification that will be incorporated into the apartments and non-domestic zones to limit heat loss and optimise the operational efficiency of the existing building at this site. These upgraded thermal elements have been designed to exceed the target improved U-values stipulated in Approved Documents L1B and L2B.

Table 6.5 – Proposed Refurbishment Specification – Residential and Non-domestic Zones

Construction Element	Enhanced Specification
Exposed Floor	U=0.2 W/m ² K
External Wall	U=0.24 W/m ² K
Windows	U=1.4 W/m ² K <i>Double Glazed, UPVC, Low-E</i>
Doors	U=1.5 W/m ² K <i>Solid</i>
Air Permeability	Target 4m ³ /hm ²



The proposed mechanical and electrical specification that will be incorporated to ensure efficient servicing of the existing building will mirror the servicing strategy proposed for the new build residential and non-domestic elements of the development (see Table 6.3 and Table 6.4).

It should be noted that due to the age of the building, the refurbishment proposals may be subject to various technical constraints during detailed design and construction phases, resulting in a need to revise the above proposed specifications further into the development cycle.

6.4 Renewable Energy Feasibility

A number of renewable energy technologies have been considered for this site, including:

- Combined Heat and Power (CHP);
- District Heating;
- Solar Hot Water;
- Photovoltaics (PV);
- Wind;
- Heat Pumps; and,
- Biomass heating

A review of the Former Junction Hotel proposals and site location concludes that two of these options are feasible for this development, as detailed below:

✖ **Combined Heat and Power (CHP)** is effectively an on-site mini power plant providing both electrical power and thermal heat energy. It is an energy efficient and low carbon measure rather than a renewable energy technology. A CHP system operates by burning a primary fuel (normally natural gas) by use of either a reciprocating engine or turbine, which in turn drives an alternator to generate electrical power. The heat emitted by the engine and exhaust gases is recovered and used to heat the building or to provide hot water.

The viability of CHP is dependent upon the building base load requirements for both heat and power. Buildings with high heat / hot water demands and constant power demands lend themselves to CHP. This proposed scheme at the Former Junction Hotel has neither of these. Given there will be a very low space heating and hot water demand at the development, the commercial viability of this type of system cannot be proven.

✖ **District Heating** systems provide multiple buildings or dwellings with heat and hot water from a central boiler house, or 'energy centre'. The system can provide heating or cooling which is transferred from the energy centre through a network of highly insulated pipes carrying the heated water to each dwelling. It has been determined that there are no existing heat networks / energy centres within a moderate radius from the development and there are no existing networks local to the site.

✖ **Solar Hot Water** utilises the energy in sunlight and diffuse daylight to heat water for use in buildings. The main component of any solar water heating system is the collector, which absorbs the radiant energy of the sun and converts it to heat energy. This technology is not considered to be a feasible option for this site because these solar thermal technologies make only a relatively limited contribution to reducing the building's energy demand and carbon dioxide emissions and would therefore, not meet the Council's carbon reduction targets. Furthermore, there are potential problems associated with routing the pipework through the apartments.



✓ **Photovoltaics (PV)** panels harness solar thermal energy and convert it into electricity which can then be used within a building. The panels are typically orientated in a southerly direction in tilted arrays, thereby enabling this technology to operate efficiently. This technology is a feasible option for the site.

✗ **Wind Turbines** are considered unsuitable for this site due to a poor wind resource. In order to operate efficiently a wind speed of at least 6m/s is typically required. The NOABL wind speed database records a wind speed of approximately 4.5m/s at 10m above ground level for this site (see Figure 6.2) for this site. Furthermore, there are potential planning issues and perceived safety concerns with this technology.

Figure 6.2 - Wind Speed Data for the Proposed Development Site

Wind speed at 10m above ground level (m/s)		
4.4	4.4	4.4
4.5	4.5	4.5
4.5	4.6	4.5

✗ **Ground Source Heat Pumps** collect low-grade heat from the ground to supply useful heat for space and water heating requirements. By applying additional energy input (in the form of electricity), it is possible to raise the temperature of the source heat to the temperature required. Such technology is considered unsuitable for this site due to an insufficient area (based upon the proposed densities) to install a horizontal ground collector and the prohibitive costs and technical constraint of installing vertical boreholes.

✓ **Air Source Heat Pumps** extracts heat from the outside air to supply useful heat for space and water heating requirements. By applying additional energy input (in the form of electricity), it is possible to raise the temperature of the source heat to the temperature required. Such technology is potentially technically feasible for this site and will be utilised in the commercial units.

✗ **Biomass heating** would be capable of delivering the target CO₂ emission reductions but are considered inappropriate for this type of development and location due to the requirement for a large fuel store and the high NO_x emissions associated with biomass combustion, typically rendering these systems technically unfeasible for city centre locations.

6.4.1 Proposed Renewable Energy Solutions

The combined energy strategy will provide a number of benefits in terms of energy efficiency, deliverability and viability of the scheme as a whole.

6.4.2 Residential

Photovoltaic Array

Photovoltaic (PV) arrays are therefore selected as an appropriate renewable energy technology to contribute to the CO₂ emission reduction target. PV arrays are relatively straightforward to install,



benefit from low maintenance costs and will reduce the operational cost of the building. The use of PV in general would provide the following benefits:

- Reducing the building's electrical energy grid load;
- Simple installation and commissioning;
- Low maintenance; and,
- Reliable, proven technology.

Proposed System Details -

It is proposed that PV panels be mounted upon the flat roof in tilted arrays and orientated due south in order to optimise the operating efficiency of the system.

- The residential apartments will be allocated with a total installed capacity of 36.5kWp, connected to the landlord supply;
- The non-domestic areas of the building will not be allocated any of the PV provision.

An array of this capacity will require approximately 260m² plus an allowance for access and avoidance of over shading. This size PV array may easily be accommodated within the available roof areas on the new build apartment blocks.

PV arrays will be more fully reviewed in the following Energy Demand Calculation section to demonstrate how these may contribute to meeting the carbon dioxide emissions reduction target for this development.

Land use -

- There are no land use issues associated with PV technology at this site.

Local Planning Issues -

- There are no planning policy issues associated with this technology. PV is covered under permitted development for existing dwellings and encouraged at all tiers of planning policy.

Noise Issues -

- PV is silent in operation.

Whole life cost and lifecycle impact -

- Current installed costs for PV are approximately £1,500 / kWp installed.
- Additional costs throughout the system's 30-year lifecycle are limited to:
 - Cleaning of the arrays;
 - Potential vandal damage to the arrays; and,
 - Replacement of the DC / AC inverter unit which typically have a lifespan of around 10 years.



6.4.3 Non-domestic

Air Source Heat Pumps

It is proposed that 'multi-split' variable refrigerant flow (VRF) systems be integrated within the retail units to meet the heating and cooling loads.

- This approach will ensure a highly energy efficient heating system is provided from heat pumps that are able to deliver both heating and cooling, dependent upon ambient temperatures. This technology benefits from a low 'carbon footprint' due to the inherent efficiency of the heat pump process. It is a well-established technology with an anticipated long lifespan - with proper care they can be operational for up to 20 years;
- Split systems consist of an outdoor unit and an indoor unit. The outdoor unit is typically installed on the roof or exterior wall of building and houses the compressor, condenser coil and the expansion coil or capillary tubing. The indoor unit contains the cooling coil, a long blower and an air filter;
- The 'multi-split' VRF system consists of one or several outdoor units and many indoor units. The modulation of the refrigerant flow in each indoor unit allows higher thermal comfort in separate zones and lower energy consumption via the matching of the cooling or heating load;
- VRF systems continually adjust the flow of refrigerant from the outdoor condenser to each indoor evaporator. The control is achieved by continually varying the flow of refrigerant which responds to the demand from the indoor units by varying its compressor speed to match the total cooling and/or heating requirements. VRF systems offer a highly energy-efficient, modular energy strategy; and,
- There are no fuel storage issues associated with heat pumps.



7. EMISSIONS PERFORMANCE CALCULATIONS

In order to demonstrate the environmental benefits associated with the 'fabric led' specification to energy demand and emission reduction at the site, SAP and SBEM software has been used to generate representative energy demand models for the new-build residential and non-domestic elements of the development respectively.

7.1 Regulated Energy Demand and Emission Calculations – New Build, Residential

Approved SAP 2012 software (Design SAP 2012) calculates the regulated energy demand of the dwellings and associated carbon dioxide emissions, in accordance with the requirements of Building Regulation, Part L1A (2013) that this development will be constructed in compliance with. These calculations determine the regulated energy demand and dwelling emission rate reductions achieved by the enhanced material specification and efficient mechanical and electrical servicing.

Representative SAP models have been calculated for 13 no. of apartments. These units have been selected for assessment as they constitute a typical group of dwellings within the scheme and are representative of the entire development in terms of their size, layout and orientation.

7.1.3 Energy Calculation Results

The calculated emission rate reduction over Part L1A (2013) and thermal envelope energy efficiency performance associated with the proposed 'fabric led' specification are presented in Tables 7.1 and 7.2 respectively. The proposed Former Junction Hotel development has therefore been demonstrated to provide a significant improvement beyond the building regulation compliance standard.

Table 7.1 – Calculated Regulated Dwelling Emission Rate

Dwelling DER (kgCO ₂ /m ² /yr.)	20.4
Dwelling TER (kgCO ₂ /m ² /yr.)	25.2
% DER Reduction over Part L 2013	19.2

The representative calculations demonstrate that the dwelling emission rate (DER) reduction for the residential element of the scheme is expected to be 19.2% better than the Part L1A 2013 compliance standard in accordance with Core Strategy policy EN 6 and GMSF Policy GM-S 2.

Table 7.2 – Calculated Fabric Energy Efficiency²

Dwelling DFEE (kWh/m ² /yr.)	36.3
Dwelling TFEE (kWh/m ² /yr.)	44.9
% FEE Reduction over Part L 2013	19.3

² DFEE is an acronym of Dwelling Fabric Energy Efficiency (kWh/m²/year).

TFEE is an acronym of Target Fabric Energy Efficiency (kWh/m²/year)



These representative calculations demonstrate that the dwelling fabric energy efficiency (DFEE) reduction for the residential element of the scheme provides a 19.3% improvement relative to the Part L compliance criterion with the provision of enhanced fabric plus renewable technology.

7.1.4 Revised Carbon Factors

SAP 10 will be used to demonstrate compliance with the forthcoming iteration of Building Regulation Part L. The current carbon factors applied in SAP 2012 for electricity are out of date, so these new factors better reflect the decarbonised status of the UK's electricity grid, as presented in Table 7.3

Table 7.3 - Carbon Factors for Grid Electricity

Fuel	Software Version	Fuel Carbon Factor (kgCO ₂ /kWh)
Natural Gas	SAP 2012 (current)	0.216
	SAP 10 (revised)	0.210
Grid Electricity	SAP 2012 (current)	0.519
	SAP 10 (revised)	0.233

- It can be seen that the revised carbon factors to be applied in the forthcoming SAP 10 software are c.45% lower than the out-of-date factors currently being applied for building regulation compliance purposes.
- Grid mix electricity has now been calculated to be less than 10% more carbon intense than natural gas, whereas the previous carbon factors show electricity to be more than twice as carbon intense as natural gas.
- It should be noted that the use of the SAP 10 emission factors in this context is for demonstrating performance against planning policy targets only and, as such, is separate to Building Regulation compliance. Applications should therefore ensure that compliance with Building Regulations is maintained.

To ensure that the assessment of new developments better reflects the actual carbon emissions associated with their expected operation, the latest carbon emission factors, derived from the SAP 10 may be applied to these results, using the outputs from current compliance calculations which are then manually converted for the revised SAP 10 CO₂ factors.

In addition to the building regulation compliance calculations (which are completed with current versions of the approved energy assessment software) we have provided a separate set of manual calculations which apply these reduced SAP 10 emission factors for grid electricity to the residential energy model results, which are not currently taken into account by Part L of the building regulations.

Table 7.3 – Calculated Regulated Dwelling Emission Rates – SAP 2012 & SAP 10 Data

	SAP 2012 Data	SAP 10 Data
Dwelling DER (kgCO ₂ /m ² /yr.)	20.40	9.16



Applying the revised carbon factors to the building's Dwelling Emission Rate (DER) shows that the 'full electric' energy strategy proposed for the dwellings will actually provide a DER of 9.16kgCO₂/m².

In line with the MCC Climate Change Framework, this development has the capability to take maximum advantage of the decarbonised status of the electricity grid with the full electric heating strategy. This offers a steppingstone towards zero-carbon standards whilst the UK government establish a national zero carbon definition and methodology for near-future implementation.

7.2 Regulated Energy and Emission Calculations – New Build, Non-domestic

To demonstrate the environmental benefits associated with the 'fabric led' plus efficient M&E servicing and renewable energy approach to energy demand, approved SBEM software has been used to calculate the energy demand model for the new-build commercial units under one BRUKL document (see Appendix D for details).

The BRUKL has been produced to demonstrate compliance with the performance the targets established within Manchester City councils Core Strategy Policy EN6 and Building Regulation, Part L2A.

The emissions and energy demand performance associated with the proposed specification for the building is presented in Table 7.4.

Table 7.4 – Calculated Regulated Building Emission Rate

Building Emission Rate (kgCO ₂ /m ² /yr.)	84.6
Target Emission Rate (kgCO ₂ /m ² /yr.)	94.6
% BER Reduction over Part L 2013	10.6

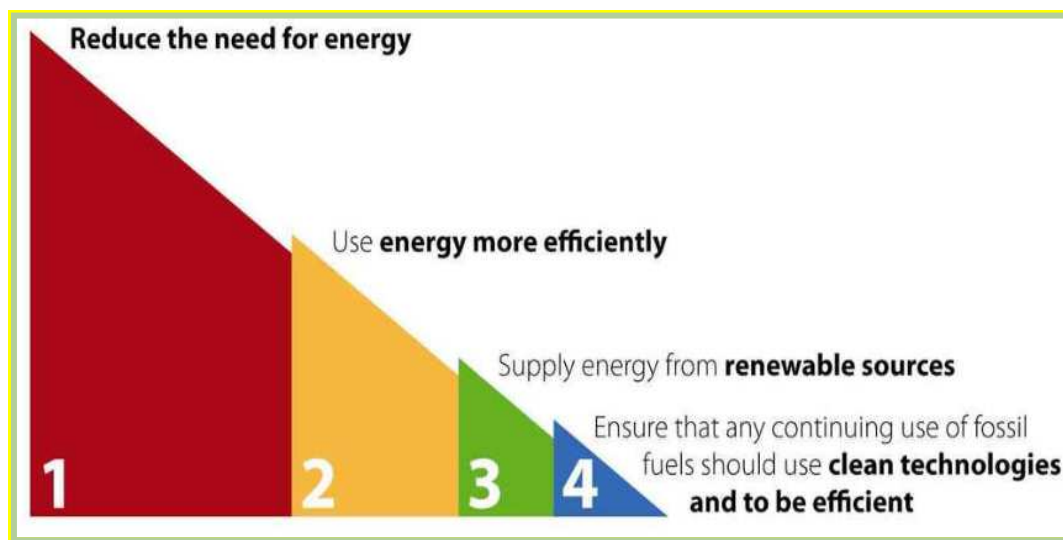
This indicative SBEM calculation demonstrates that the Building Emission Rate (BER) reduction for the new build, commercial units provides a 10.6% improvement over the Part L2A (2013) compliance standard as a consequence of the proposed enhanced fabric specifications, efficient mechanical and electrical systems and low-carbon technologies.



8. ENERGY HIERARCHY

As discussed in the previous sections of this report, the scheme will incorporate an enhanced material specification along with high quality design and construction standards to improve the energy efficiency of the whole building through a 'fabric led' energy strategy. The construction, design and specification proposed for this scheme will deliver buildings that are inherently efficient and cost-effective during occupation. The Energy Hierarchy provides a framework to guide energy policy and decision making to achieve practical and cost-effective carbon emission reductions. The hierarchy prioritises such demand-side activities to reduce wastage and improve efficiency (see Figure 8.1).

Figure 8.1 – The Energy Hierarchy



First Principle

The following efficiency measures are designed to reduce heat losses and minimise energy demand:

- This 'fabric led' approach to minimising energy demand and associated carbon dioxide emissions is aligned with the first principle of the energy hierarchy which states that reduction in energy demand should be achieved initially by energy efficiency.
- The buildings will be constructed and/or refurbished with a material and design specification which exceeds minimum Building Regulation standards and includes numerous efficiency measures designed to reduce heat losses and minimise energy demand.
- The design air permeability target for the new-build residential units is $3\text{m}^3/\text{hm}^2$ (@50Pa.). This low air permeability target will assist to limit the heat loss through the structure of the apartment blocks. The remainder of the development is designed with an air permeability target of $4\text{m}^3/\text{hm}^2$ (@50Pa.) to minimise any uncontrolled ventilation and further reduce heat losses.
- The g value of the glazing will be designed to control solar gain in the summer months and allow beneficial gains in the winter season so as to minimise the overheating risk and limit the heating energy demand within the properties.



This approach to minimising energy demand and associated carbon dioxide emissions is aligned with the first principle of the energy hierarchy which states that reduction in energy demand should be achieved initially by energy efficiency.

Second Principle

Combined heat and power technology does not form part of this energy strategy. As per the second principle of the Energy Hierarchy:

- Sophisticated control systems for the space and water heating will ensure that energy consumed by the dwellings, commercial units and community areas is used efficiently. Furthermore, the dwellings are designed to not require active cooling;
- Hot water in the dwellings will be separately programmable and high efficiency cylinders with low standing losses will be specified. Instantaneous hot water systems that avoid long water lines and reduce heat losses will service the commercial zones; and,
- 100% LED provision and sophisticated control systems. Photocell and automatic presence control of the lighting will be specified in order to further improve the efficiency of the lighting system within the communal zones.

Third Principle

Photovoltaic arrays will be integrated on the flat roofs of the new build residential buildings to reduce the carbon dioxide emissions associated with the proposed development, as per the third principle of the Energy Hierarchy.

High efficiency heat pumps will supply heating and cooling on demand to the non-domestic zones.

Fourth Principle

The remaining space and water heating demand of the dwellings will be met electric panel and immersion heaters (100% efficient). This will ensure that fossil fuels consumed for heating purposes will be burnt cleanly and efficiently.

The development proposals are therefore, aligned with the energy hierarchy promoted within the Manchester Guide to Development and Core Strategy Policy EN 4.

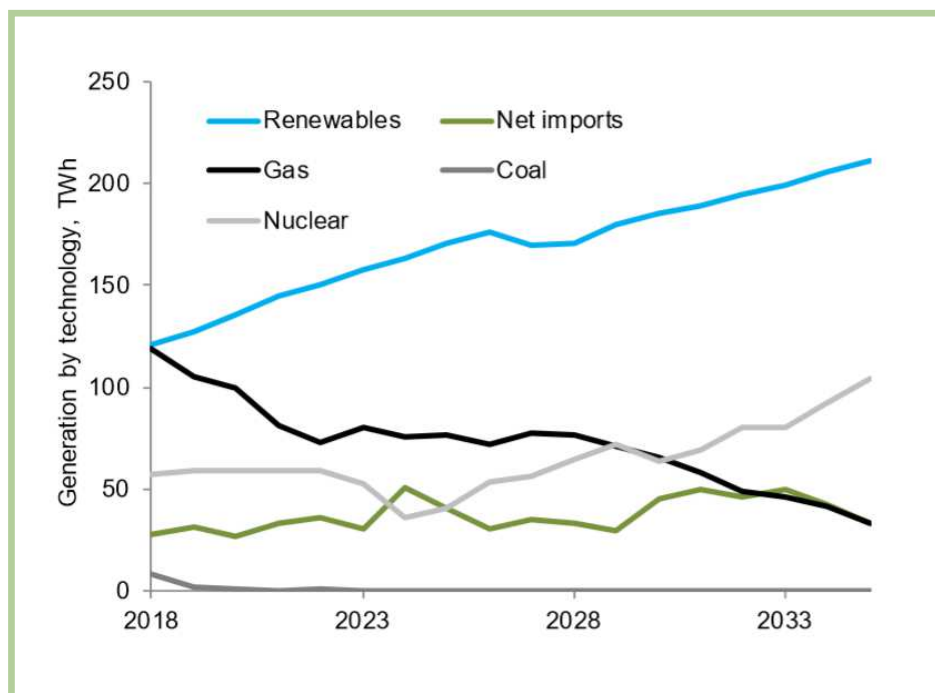


9. CLIMATE CHANGE EMERGENCY

A Climate Emergency was declared by Manchester City Council on 10th July 2019, with a target to make Manchester carbon neutral by 2038. In support of this, the developer wishes to highlight the following measures that will form part of the specification of this development:

- An energy strategy that delivers the current Core Strategy carbon dioxide emission reduction and renewable energy generation targets;
 - A commitment is made to achieving at least 19% improvement in the dwelling emission rate reduction relative to the current Part L1A (2013) compliance standard;
 - The low carbon share of electricity generation is projected to rise from 22% in 2010 to 65% in 2020. As the UK electricity grid CO₂ footprint continues to reduce (see Figure 9.1 sourced from BEIS Energy and Emissions Projections 2018), so too will the carbon dioxide emissions associated with this 'fully electric' building services energy strategy.
 - This would not be the case if the building were heated from fossil fuels (for example, gas boilers and/or CHP).

Figure 9.1 - Energy and Emissions Projections 2018 (BEIS)



- Calculations to demonstrate the benefits associated with decarbonisation of the grid have been prepared (see Section 7.1.4), with specific reference to the revised SAP10 carbon factors. This proves that the fully electric strategy will improve upon Manchester's GMSF emerging policy, interim emissions target of -19% relative to Part L 2013;



- ASHP will be utilised in the non-domestic zones delivering high efficiency heating. Furthermore, 'full electric' strategies such as this supply electric on demand, are 100% efficient and only uses what is required;
 - On-site renewable energy generation forms part of the proposals; and,
 - In securing compliance with the current, stringent building regulation Part L targets, a commitment is made to construct a high quality, energy efficient thermal envelope thereby minimising demand side energy loads – in accordance with the principles of the energy hierarchy; and,
- Unregulated energy demand (that is, the energy demand associated with 'plug in' appliances and cooking) typically accounts for over half of the total carbon dioxide emissions from modern residential developments such as this. To limit this:
 - The integrated white goods will have as a minimum an A+ energy rating; and,
 - A welcome pack will be provided to all residents to encourage selection of green energy providers to enable them to make informed decisions.
- There is a fine balance between the solar gain, overheating calculations which require an element of heat loss, to prevent overheating, and energy models that require heat insulation to achieve compliance with, at times, conflicting building compliance targets. In essence, there is therefore a limit to fabric enhancements such as increased insulation and improved air tightness as this yields a higher overheating risk and as a consequence, the building would generate increased cooling loads.
 - These components of the building design are not symbiotic however, the design of the residential development balances both requirements and incorporates a building specification intended to avoid cooling requirement and the associated wasted energy in producing cooled air. Thus, these dwellings do not require active cooling which further limits the energy demand of the development.
- The development will demonstrate resilience to potential climate change effects through the management of surface water:
 - This system will be designed such that the total peak run-off rates from the site will be reduced through the provision of flow control techniques and surface water attenuation. The volume of surface water run-off will be reduced to at least 50% of the existing surface-water brownfield runoff rates; and,
 - The system will also be designed to withstand a 1 in a 100-year storm event plus a 40% allowance for climate change.
- Waste is a misuse of natural resources and also contributes a large proportion of the UK's carbon footprint;
 - Waste minimisation during construction as a result of the off-site, volumetric construction method will reduce materials demand, thereby reducing the building's embodied carbon footprint; and,



- During occupation, the buildings will benefit from recycling facilities to enable the local authority waste reduction targets, diverting more materials away from landfill and reducing the occupants' carbon footprint further.
- The site's location will enable a low carbon, sustainable lifestyles. Located close to several major railway stations, the residents and building users have the option to utilise various sustainable modes of transport. This is facilitated by:
 - Basic infrastructure provided for future connections such as secure cycle storage on site;
 - Travel options, including local access to transport nodes for bus and Metrolink;
 - Local amenities that are within easy walking distance of the site, enabling residents to live local with a reduced need to travel; and,
 - The installation of sixteen electric vehicle charging points to facilitate the increasing, widespread transition to electric car usage.
- The buildings are designed to incorporate features that will serve to reduce energy demand, and in turn, carbon emissions arising from access to the dwellings:
 - The lighting provision within the common areas will include active sensors; and,
 - The fit-out specification of the dwellings will seek to minimise water demand. Water efficiency measures (such as dual flush toilets, flow restrictors and reduced volume baths) will limit potable water demand. This will reduce water heating energy loads and also cut the process energy required to supply clean drinking water.

These commitments, in combination, seek to work towards the carbon reduction target of no more than 1.5°C global temperature increase and assist Manchester City Council in meeting their Climate Change Emergency objectives.



10. CONCLUSION

This Statement has reviewed the environmental performance of the proposed development site at the Former Junction Hotel in Manchester against national and local policies. The material specification has also been reviewed and servicing strategy for the scheme and the building (carbon dioxide) emission rates for the various uses throughout the development have also been calculated.

Energy Strategy –

Full compliance with the key criteria of the Manchester Core Strategy have been achieved by the proposed energy strategy while also taking MCC's declaration of a Climate Emergency into consideration and responding positively to the emerging GMSF criteria, as follows:

- Minimising the impacts of climate change is a key element of the proposed design. The proposed energy strategy will incorporate an enhanced 'fabric led' material specification, along with high quality design and construction standards to improve the energy efficiency of the buildings.
- These proposals will deliver a scheme that is inherently efficient and cost-effective during occupation. As a consequence of the decarbonised status of the UK's electricity grid, the actual emissions are 45% lower than the current out-of-date carbon factors used for building regulation compliance purposes. In line with the MCC Climate Change Framework, this development has been proven to take maximum advantage of the decarbonating status of the electricity grid with its full electric heating strategy.
- The development will be designed and specified in accordance with the principles of the energy hierarchy in line with the adopted Core Strategy Policy EN 4.
- The proposed new build elements of the scheme has been demonstrated to a significantly improve upon the current stringent Part L1A (2013) compliance standard in accordance with adopted Core Strategy Policy EN 6 and GMSF Policy GM-S 2:
 - The Dwelling Emission Rate (DER) reduction for the residential element of the scheme is **over 19% relative to Part L 2013** through enhanced fabric measures, energy efficient mechanical and electrical systems plus renewable technology, based upon representative SAP calculations;
 - A **36.5kWp photovoltaic array** is proposed as a part of the design to provide **on-site renewable energy generation**;
 - The Dwelling Fabric Energy Efficiency (DFEE) reduction for the residential element of the scheme is **19.3% over Part L 2013** through enhanced fabric measures; and,
 - **High efficiency heat pumps** will supply space heating and cooling for all non-domestic areas (commercial units and community spaces) within the scheme. This strategy combined with a high-quality fabric and servicing design will secure **a 10.6% Building Emission Rate (BER) reduction** over Part L 2013 in the new-build commercial units.
- The redevelopment of the Former Junction Hotel into residential apartments and a community-use space will be designed as such to optimise the operational efficiency of the existing building



at this site. This strategy will include upgrading the thermal elements to exceed the target improved U-values stipulated in Approved Documents L1B and L2B by at least 20% and will be allied with efficient servicing strategies, as per the new build elements of the development.

Environmental Performance -

The key issues of Manchester City Council's Supplementary Planning Document (Environmental Standards) in accordance with the Core Strategy Policy DM 1 have been achieved by the proposals while taking Manchester's declaration of a Climate Emergency into consideration. These are as follows:

- The proposed retail units will be designed in accordance with the BREEAM criteria and achieve the required 'Very Good' rating. This represents 'good practice' for new non-domestic buildings in the UK and as detailed in Section 5, the scheme is expected to perform well in all areas of the assessments.
- Water management for the development will align with the regulatory standard specified to achieve a calculated daily consumption of <105litres/person/day through the specification of efficient water fixtures.
- The development site is located within Flood Zone 1. The site drainage strategy will be designed to manage the surface water runoff to ensure that the peak rate and volume of surface water run-off will be no greater post-development than pre-development with a target discharge rate of 50% less than the existing, brownfield conditions.
- Waste arising during construction and occupation/operation will be minimised. A site waste management plan will be adopted during construction. The dwellings will be provided with waste facilities and a comprehensive waste management plan for the site will accord with the local authority recycling scheme. The provision of suitable space and facilities will allow the commercial zones to segregate and store operational recyclable waste.
- Construction site management procedures will minimise adverse impacts on the environment and control pollution generated during the construction phase. These include a waste management strategy to reduce the quantity of waste generated, and to increase re-use and recycling of materials.
- The planting provision will be designed to provide an enhancement to the aesthetic value of the site and also planting will be selected to improve the biodiversity and strengthen the ecological value of the site.
- Materials are proposed to be responsibly sourced and materials with low environmental impact will be selected and local suppliers will be prioritised. In combination this procurement strategy will minimise, and conserve energy associated with transportation and waste generation. This meets the council's objectives in addressing the recently declared Climate Emergency.

Furthermore, the proposals accord with the aims of the National Planning Policy Framework, as follows:

- Apartments are an inherently efficient use of space and in addition, commercial units and community-use space are also incorporated within the scheme. The proposal includes the redevelopment of a previously developed site and therefore, represents a very efficient use of land;



- Construction practices that minimise adverse impacts on the environment will be adhered to including a waste management strategy to reduce the quantity of waste generated, and to increase re-use and recycling, a commitment will be made to minimise waste and pollution; and,
- Significantly exceeding the regulatory compliance criteria (Part L1A and L2A) will assist in mitigating the impact of climate change and its environmental impact.

In conclusion, the proposals reviewed within this statement for the scheme at the Former Junction Hotel Manchester will deliver a high-quality, sustainable development that accords with the guidance provided within the Manchester City Council's adopted and emerging policies.



APPENDIX A – BREEAM PRE-ASSESSMENT



Project: Former Junction Hotel, Manchester - Retail
 Project No: 2020.120
 Date: 22nd July 2020
 Revision: 1.0

BREEAM 2018 New Construction Criteria (NC)

New Construction 2018 - BREEAM Pre-Assessment Review

Overview Potential BREEAM Rating - Indicative BREEAM Pre-Assessment score = 57.06% (minimum required = 55% for BREEAM Very Good)

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Management					
Man 1 – Project Brief and Design					
Man 1a	Stakeholder Consultation (Project Delivery)	1	1	Design Team	A clear sustainability brief is developed prior to Concept Design AND prior to completion of the Concept Design (RIBA Stage 2 or equivalent), the project delivery stakeholders (see Relevant definitions) have met to identify and define their roles, responsibilities and contributions for each of the key phases of project delivery. The project team demonstrate how the project delivery stakeholder contributions and the outcomes of the consultation process have influenced or changed the Initial Project Brief, including if appropriate, the Project Execution Plan, Communication Strategy, and the Concept Design.
Man 2b	Stakeholder Consultation (Third Party)	1	1	Design Team	Prior to completion of the Concept Design, the design team consult with all interested parties on matters that cover the minimum consultation content. Demonstrate how the stakeholder contributions and consultation exercise outcomes influence the Initial Project Brief and Concept Design. Prior to completion of the detailed design (RIBA Stage 4, Technical Design or equivalent), all interested parties give and receive consultation feedback.
	Pre-requisite	-	-	Design Team	The project team, including the client, formally agree strategic performance targets early in the design process, (with the support of the BREEAM AP where appointed).
Man 2c	BREEAM AP (Concept Design)	1	0	BREEAM AP	Credit Not Sought
Man 2d	BREEAM AP (Developed Design)	1	0	BREEAM AP	Credit Not Sought
Man 2 - Life Cycle Cost and Service Life Planning					
Man 2a	Elemental LCC	2	0	Cost Consultant	Credit Not Sought



ELEMENT SUSTAINABILITY

Project: Former Junction Hotel, Manchester - Retail
Project No: 2020.120
Date: 22nd July 2020
Revision: 1.0

BREEAM 2018 New Construction Criteria (NC)

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 2b	Component LCC	1	0	Cost Consultant	Credit Not Sought
Man 2c	Capital Cost Reporting	1	1	Client or Project Manager	The capital cost to be reported for the refurbishment project £/m ² .
Man 3 - Responsible Construction Practices					
Man 3 (P)	Timber Procurement (M)	Pre-Req	Pre-Req	Main Contractor	Main contractor to ensure that all timber is legally harvested and trade timber.
Man 3a	Environmental Management	1	1	Main Contractor	Main Contractor to operates ISO 14001.
Man 3b	Sustainability Champion	1	1	Sustainability Champion	Involve a BREEAM AP in the project at an appropriate time and level to: - Work with the project team, including the client, to consider the links between BREEAM issues and assist them in achieving and if possible, going beyond the design intent, to maximise the project's performance against the agreed performance targets throughout the Construction, Handover and Close Out stages. - Monitor construction progress against the performance targets agreed under criterion 5 above throughout all stages where decisions critically impact BREEAM performance. - Proactively identify risks and opportunities related to the procurement and construction process and the achievement of the targets agreed under criterion 5 above. - Provide feedback to the constructors and the project team as appropriate, to support them in taking corrective actions and achieving their agreed performance targets. - Monitor and, where relevant, coordinate the generation of appropriate evidence by the project team and the provision to the assessor.
Man 3c	Responsible Construction Management	2	2	Main Contractor	The Main Contractor to register with CCS and achieve a score of beyond compliance.
Man 3d	Monitoring of Construction site impacts (Energy and Water)	1	1	Main Contractor	Main Contractor sets targets, monitors and reports on energy and water consumption each month, based on site activities.



Project: Former Junction Hotel, Manchester - Retail
Project No: 2020.120
Date: 22nd July 2020
Revision: 1.0

BREEAM 2018 New Construction Criteria (NC)

Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Man 3e	Monitoring of Construction Site Impacts (Transport)	1	1	Main Contractor	Main Contractor monitors transport of materials from the factory gate to the building site, including any transport, intermediate storage and distribution; as well as transport of construction waste from the construction gate to waste disposal processing/recovery centre gate.
Man 4 - Commissioning and Handover					
Man 4a	Commissioning and testing schedule and responsibilities	N/A	N/A	Client/ M&E	Credit Not Applicable to Shell Only Units
Man 4b	Commissioning building services	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units
Man 4c	Testing and inspecting building fabric	1	1	Main Contractor	Projects where the fabric of the building is being upgraded, the integrity of the building fabric, including continuity of insulation, avoidance of thermal bridging and air leakage paths is quality assured through completion of a thermographic survey as well as airtightness testing and visual inspection at appropriate times during the refurbishment. The survey/testing is undertaken by a Suitably Qualified Professional.
Man 4d	Handover	N/A	N/A	Design Team	Credit Not Applicable to Shell Only Units
Man 5 - Aftercare					
Man 5a	Aftercare Support	N/A	N/A	Developer	Credit Not Applicable to Shell Only Units
Man 5b	Seasonal Commissioning	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units
Man 5c	Post Occupancy Evaluation	N/A	N/A	End Occupier	Credit Not Applicable to Shell Only Units
Man 4 Ex	Exemplary Level	N/A	N/A	N/A	Credit Not Applicable to Shell Only Units



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Health and Wellbeing					
HEA 1 - Visual Comfort					
Hea 01a	Glare Control	N/A	N/A	N/A	Credit Not Applicable to Shell Only Units
Hea 01b	Daylighting	2	0	Daylight Consultant	Credit Not Sought
Hea 01c	View Out	1	1	Architect	95% of the floor area in 95% of spaces for each relevant building area provides an adequate view out.
Hea 1d	Internal and External Lighting	1	1	M&E	External Lighting - All external lighting located within the refurbishment or fit-out zone is designed in accordance with BS 5489-1:2013 Lighting of roads and public amenity areas ³ and BS EN 12464-2:2014 Light and lighting - Lighting of work places - Part 2: Outdoor work places.
Hea 2 Indoor Air Quality					
Hea 2a	Indoor Air Quality Plan	Pre-req	Pre-req	Design Team/ Indoor Air Quality Specialist	Credit Not Applicable to Shell Only Units
Hea 2b	Ventilation	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units
Hea 2c	Volatile Organic Compounds (VOCs)	N/A	N/A	Design Team and Main Contractor	Credit Not Applicable to Shell Only Units
Hea 2d	Volatile organic compound (VOC) emission levels (post construction)	N/A	N/A	Main Contractor/ Indoor Air Quality Specialist	Credit Not Applicable to Shell Only Units
Hea 2e	Potential for Natural Ventilation	N/A	N/A	M&E	Credit Not Applicable for Shell and Core Assessments
Hea 4 Thermal Comfort					
Hea 4a	Thermal modelling	N/A	N/A	Thermal Modeller/M&E	Credit Not Applicable to Shell Only Units



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Hea 4b	Designing for future thermal comfort	N/A	N/A	Thermal Modeller/M&E	Credit Not Applicable to Shell Only Units
Hea 4c	Thermal zoning and controls	N/A	N/A	Thermal Modeller/M&E	Credit Not Applicable to Shell Only Units
Hea 5 - Acoustic Performance					
Hea 5a	Performance Standard	1	1	Acoustician	Compliance with the Indoor Ambient Noise Levels is required for shell and core assessments. The basic built form has a large impact on the acoustic performance of the building and would be outside the control of the tenant. A suitably qualified acoustician (SQA) must carry out a quantifiable assessment of the specification of the build form, construction and any external factors likely to affect the indoor ambient noise levels. The SQA must then confirm the developer's works will enable a future tenant utilising a typical fit-out and specification to meet the levels required to demonstrate compliance.
Hea 6 - Safety and Security					
Hea 6a	Consultation with ALO	1	1	Architect/ALO	A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to Concept Design (RIBA Stage 2 or equivalent). The SQSS develops a set of recommendations or solutions during or prior to Concept Design (RIBA Stage 2 or equivalent). These recommendations or solutions aim to ensure that the design of buildings, public and private car parks and public or amenity space are planned, designed and specified to address the issues identified in the preceding SNA. The recommendations or solutions proposed by the SQSS are implemented. Any deviation from those recommendations or solutions will need to be justified, documented and agreed in advance with a suitably qualified security specialist.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Hea 7 – Safe and Healthy Surroundings					
Hea 7a	Safe Access	1	1	Architect/Landscape Architect	The safe access criteria apply only to developments that have areas external to the assessed building and within the boundary of the assessed development (regardless or not of whether that external area is or will be the responsibility of the future building occupant). This includes external parking areas. If the assessed building does not have any external areas and access to the building is direct from the public highway or footpath, then the criteria concerning safe access are not applicable and the credit can be awarded by default
Hea 7b	Outside Space	1	1	Architect/Landscape Architect	Credit Not Sought
Energy					
Ene 1 - Reduction of CO2 Emissions					
Ene 1a	Reduction of CO ₂ Emissions	9	6	Energy Assessor	6no. assumed credits – And EPR_{NC} of 0.6 a performance improvement better than the relevant national building regulations compliant standard.
Ene 1b	Prediction of operational energy consumption	N/A	N/A	Energy Assessor/Design Team	Credit Not Applicable to Shell Only Units
Ene 2 - Energy Monitoring					
Ene 2a	Sub-metering of major energy consuming systems	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units
Ene 2b	Sub-metering of high energy load and tenancy areas	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Ene 3 - External Lighting					
Ene 3	External Lighting	1	1	M&E	The average initial luminous efficacy of the external light fittings within the construction zone is not less than 70 luminaire lumens per circuit Watt. All external light fittings are automatically controlled for prevention of operation during daylight hours and presence detection in areas of intermittent pedestrian traffic.
Ene 4 - Low Carbon Design					
Ene 4a	Passive Design Analysis	1	1	M&E / Energy Assessor	Achieve the first credit Hea 04 Thermal comfort: One credit - Thermal modelling to demonstrate that the building design delivers appropriate thermal comfort levels in occupied spaces. The project team analyses the proposed building design and development during Concept Design to identify opportunities for the implementation of passive design measures Implement passive design measures to reduce the total heating, cooling, mechanical ventilation, lighting loads and energy consumption in line with the passive design analysis findings. Quantify the reduced total energy demand and carbon dioxide (CO ₂ -eq) emissions resulting from the passive design measures.
Ene 4b	Free Cooling	1	0	M&E / Energy Assessor	Credit Not Currently Sought
Ene 4b	LZC Technologies	1	1	M&E / Energy Assessor	An energy specialist (see Definitions on page 157) completes a feasibility study (see Low and zero carbon feasibility study on the next page) by the end of Concept Design. Establish the most appropriate recognised local (on-site or near-site) low and zero carbon (LZC) energy sources for the building or development based on the feasibility study. Specify local LZC technologies for the building or development in line with the feasibility study recommendations. Quantify the reduced regulated carbon dioxide (CO ₂ -eq) emissions resulting from the feasibility study.
Ene 6 - Energy Efficient Transportation Systems					
Ene 6	Lifts & Escalators	N/A	N/A	Lift Supplier	Credit Not Applicable



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Ene 8 - Energy Efficient Equipment					
Ene 8	Energy Efficient Equipment	N/A	N/A	M&E/End Occupier	Credit Not Applicable
Transport					
Tra 1 - Transport assessment and travel plan					
Tra 1	Transport assessment and travel plan	2	2	BREEAM Assessor	No later than Concept Design stage, undertake a site-specific transport assessment (or develop a travel statement) and draft travel plan, which can demonstrably be used to influence the site layout and built form; The site-specific travel assessment (or statement) shall cover as a minimum: - a: If relevant, travel patterns and attitudes of existing building or site users towards cycling, walking and public transport, to identify relevant constraints and opportunities. - b: Predicted travel patterns and transport impact of future building or site users. - c: Current local environment for pedestrians and cyclists, accounting for any age-related requirements of occupants and visitors. - d: Reporting of the number and type of existing accessible amenities, within 500m of the site. - e: Disabled access accounting for varying levels and types of disability, including visual impairment. - f: Calculation of the existing public transport Accessibility Index (AI), - g: Current facilities for cyclists. Following a transport assessment, a site-specific travel plan that provides a long-term management strategy which encourages more sustainable travel will be produced. The travel plan includes measures to increase or improve more sustainable modes of transport and movement of people and goods during the building's operation. If the occupier is known, involve them in the development of the travel plan. Demonstrate that the travel plan will be implemented and supported by the building's management in operation.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Tra 2 – Sustainable Transport Measures					
Tra 2	Sustainable Transport Measures	10	5	BREEAM Assessor	Identify the sustainable transport measures for the scheme, as follows: - Accessibility Index ≥ 8. - Cycle storage - At least three existing accessible amenities are present within 500m of the development site (cash machine, postal facilities, food outlet). - Enhance amenity created on site – Community Centre - Electric charging points
Water					
Wat 1 - Water Consumption					
Wat 1	Water Consumption	N/A	N/A	Architect/M&E	Credit Not Applicable to Shell Only Units
Wat 2 - Water Monitoring					
Wat 2 (P)	Water Monitoring (M)	1	1	M&E	The specification of a water meter on the mains water supply to the building Each meter (main and sub) has a pulsed or other open protocol communication output to enable connection to an appropriate utility monitoring and management system. Water-consuming plant or building areas, consuming 10% or more of the building's total water demand, are either fitted with easily accessible sub-meters or have water monitoring equipment integral to the plant or area.
Wat 3 - Water Leak Detection and Prevention					
Wat 3a	Leak detection system	1	1	M&E	A leak detection system which is capable of detecting a major water leak on the mains water supply within the building and between the building and the utilities water meter is installed. The leak detection system must be: - A permanent automated water leak detection system that alerts the building occupants to the leak OR an inbuilt automated diagnostic procedure for detecting leaks is installed. - Activated when the flow of water passing through the water meter/data logger is at a flow rate above a pre-set maximum for a pre-set period of time. - Able to identify different flow and therefore leakage rates, e.g. continuous, high and/or low level, over set time periods. - Programmable to suit the owner/occupiers' water consumption criteria. - Where applicable, designed to avoid false alarms caused by normal operation of large water-consuming plant such as chillers.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Wat 3b	Water Leak Prevention	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units
Wat 4 - Water Efficient Equipment					
Wat 4	Unregulated Water Use	N/A	N/A	Architect	N/A - To be watered solely by precipitation throughout all seasons of the year.
Materials					
Mat 1 Environmental impacts from construction products - Building life cycle assessment (LCA)					
Mat 1	Environmental impacts from construction products - Building life cycle assessment (LCA)	7	0	Architect/Structural Engineer	Credit Not Currently Sought
Mat 2 - Environmental impacts from construction products – Environmental Product Declarations (EPD)					
Mat 2	Environmental impacts from construction products – (EPD)	1	1	Architect/Structural Engineer	Specify construction products with EPD that achieve a total EPD points score of at least 20, according to the Methodology below.
Mat 3 - Responsible Sourcing of Materials					
Mat 3a	Timber Procurement	Pre-Req.	Pre-req.	Main Contractor	All timber used on site will be sourced in accordance with the UK Government's Timber Procurement Policy.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Mat 3b	Sustainable Procurement Plan	1	1	Main Contractor	The principal contractor sources materials for the project in accordance with a documented sustainable procurement plan
Mat 3c	Major Building Elements	3	2	Main Contractor	Key building materials are responsibly sourced to reduce environmental and socio-economic impacts. There will be a materials procurement workshop such that the Main Contractor achieves at least two of three available credits in this area.
Mat 5 - Designing for Robustness					
Mat 5	Designing for Robustness	1	1	Architect	Protecting vulnerable parts of the building from damage 1. The building incorporates suitable durability and protection measures or designed features/solutions to prevent damage to vulnerable parts of the internal and external building and landscaping elements. This must include, but is not necessarily limited to: a. Protection from the effects of high pedestrian traffic in main entrances, public areas and thoroughfares (corridors, lifts, stairs, doors etc.). b. Protection against any internal vehicular/trolley movement within 1m of the internal building fabric in storage, delivery, corridor and kitchen areas. Protecting exposed parts of the building from material degradation Environmental factors have been identified that are relevant to the site location. Existing applicable building elements that are exposed to any relevant environmental factors have been identified. Existing applicable building elements have been surveyed have been assessed to identify impacts of material degradation effects including an assessment to grade the severity of any degradation effects. Design and specification measures have to be developed to repair and protect existing elements according to the severity of any degradation affects, to limit degradation. Where it is not feasible to implement measures to limit material degradation for existing elements, justification should be provided. Newly specified materials or newly constructed elements (e.g. a new external wall) within the scope of refurbishment or fit-out works incorporate appropriate design and specification measures to limit material degradation due to environmental factors.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Mat 6 – Material Efficiency					
Mat 6	Material Efficiency	1	1	Design Team	Credit Not Sought
Waste					
Wst 1 - Construction Waste Management					
Wst 1b	Pre-Demolition Audit	1	1	Developer	The client shall ensure that a pre-demolition audit of all existing buildings, structures or hard surfaces within the scope of the refurbishment to be completed.
Wst 1c	Construction Resource Efficiency	3	2	Main Contractor	Resource Efficiency (up to three credits available) – Targeted 3 credits Targets will be set within the Site Waste Management Plan, and procedures put in place, to ensure that less than 7.5m ³ / 6.5T per 100 m ² (gross floor area) of non-hazardous construction waste will be produced on site.
Wst 1d	Diversion of waste from Landfill	1	1	Main Contractor	Diversion from landfill – Targeted one credit Targets and procedures will be put in place to ensure that over 85% by volume / 90% by weight of construction waste generated is diverted from landfill and that materials will be sorted into key waste groups.
Wst 2 -Recycled Aggregates					
Wst 2	Recycled Aggregates	-	-	N/A	Credit Not Applicable
Wst 3 - Recyclable Waste Storage					
Wst 3	Recyclable Waste Storage	1	1	Architect/ building Owner	Dedicated space(s) is provided for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities. This space must be: a. Clearly labelled, to assist with segregation, storage and collection of the recyclable waste streams b. Accessible to building occupants or facilities operators for the deposit of materials and collections by waste management contractors c. Of a capacity appropriate to the building type, size, number of units (if relevant) and predicted volumes of waste that will arise from daily/weekly operational activities and occupancy rates. Where food waste is to be generated a water outlet provided adjacent to or within the facility for cleaning and hygiene purposes where organic waste is to be stored or composted on site.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Wst 4 – Speculative Finishes					
Wst 4	Speculative Finishes	N/A	N/A	Architect / Occupant	Credit Not Applicable to Shell Only Units.
Wst 5 – Adaptability to Climate Change					
Wst 5	Adaptability to Climate Change	1	1	Architect / Structural Engineer	Conduct a climate change adaptation strategy appraisal for structural and fabric resilience by the end of Concept Design (RIBA Stage 2 or equivalent), in accordance with the following approach: Carry out a systematic (structural and fabric resilience specific) risk assessment to identify and evaluate the impact on the building over its projected life cycle from expected extreme weather conditions arising from climate change and, where feasible, mitigate against these impacts. The assessment should cover the following stages: • Hazard identification • Hazard assessment • Risk estimation • iv. Risk evaluation • Risk management.
Wst 6 – Design for disassembly and adaptability					
Wst 6	Functional Adaptability	2	2	Architect / Structural Engineer	A building-specific functional adaptation strategy study to be undertaken by the client. Functional adaptation measures have been adopted in the design by Technical Design stage (RIBA Stage 4 or equivalent) in accordance with the functional adaptation strategy recommendations, where practical and cost effective. Omissions have been justified in writing to the assessor.
Land Use and Ecology					
Le 1 – Site Selection					
Le 1a	Site Selection	1	1	Architect	Proposed development on a pre-developed site - At least 75% of the proposed development's footprint is on an area of land which has previously been occupied.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEM Criteria
Le1b	Contaminated Land	1	0	Contaminated Land Specialist	Credit Not Currently Sought – This is to be confirmed.
Le 2 - Identifying and understanding the risks and opportunities for the project					
Le 2	Identifying and understanding the risks and opportunities for the project	2	2	Ecologist / Design Team	Identifying and understanding the ecological risks and opportunities associated with the site to inform the determination of the strategic outcome for the site.
Le 3 - Managing negative impacts on ecology					
Le 3	Managing negative impacts on ecology	3	2	Ecologist / Design Team / Contractor	Recognition of steps taken to avoid impacts on existing site ecology as far as possible.
Le 4 - Change and enhancement of ecological value					
Le 4	Change and enhancement of ecological value	4	2	Ecologist / Design Team / Main Contractor	Recognition of steps taken to enhance site ecology.
LE 5 - Long term ecology management and maintenance					
Le 5	Long term ecology management and maintenance	2	2	Ecologist/ Main Contractor	Encouraging the long-term maintenance and management of ecology on site to ensure both new and existing ecological features continue to thrive.
Pollution					
Pol 1 – Impact of Refrigerants					
Pol 1	Impact of Refrigerants	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units.
		N/A	N/A		Credit Not Applicable to Shell Only Units.
Pol 2 – Local Air Quality					
Pol 2	Local Air Quality	N/A	N/A	M&E	Credit Not Applicable to Shell Only Units.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria
Pol 3 Surface Water Run-Off					
Pol 3a	Flood Risk	2	1	Flood Risk Specialist	Flood Risk Zone 2 – A flood risk assessment been completed for the development.
Pol 3b	Surface Water Run-off (Rate)	1	1	Drainage Consultant	For brownfield sites, drainage measures are specified so that the peak rate of run-off from the site to the watercourses (natural or municipal) shows a 30% improvement for the developed site compared with the pre-developed site. This should comply at the 1-year and 100-year return period events. Relevant maintenance agreements for the ownership, long term operation and maintenance of all specified Sustainable Drainage Systems (SuDS) are in place. Calculations include an allowance for climate change. This should be made in accordance with current best practice planning guidance.
Pol 3c	Surface Water Run-off (Volume)	1	1	Drainage Consultant	Drainage design measures are specified so that the post-development run-off volume, over the development lifetime, is no greater than it would have been prior to the assessed site's development. This must be for the 100-year 6-hour event, including an allowance for climate change. Any additional predicted volume of run-off for this event is prevented from leaving the site by using infiltration or other SuDS techniques.
Pol 3d	Minimising Watercourse Pollution	1	0	Drainage Consultant	Credit Not Currently Sought
Pol 4 – Reduction of Night-time Light Pollution					
Pol 4	Reduction of Night-time Light Pollution	1	1	M&E	The external lighting strategy has been designed in compliance with Table 2 (and its accompanying notes) of the Institution of Lighting Professionals (ILP) Guidance notes for the reduction of obtrusive light, 2011. All external lighting (except for safety and security lighting) can be automatically switched off between 23:00 and 07:00. If safety or security lighting is provided and will be used between 23:00 and 07:00, this part of the lighting system complies with the lower levels of lighting recommended during these hours in Table 2 of the ILP guidance notes. Where specified, illuminated advertisements are designed in compliance with ILP PLG05 The Brightness of Illuminated Advertisements.



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Issue		Available Credits	Targeted Credits	Responsibility	BREEAM Criteria			
Pol 05 – Noise Attenuation								
Pol 5	Noise Attenuation	N/A	N/A	Acoustician/M&E	Credit Not Applicable to Shell Only Units.			
Innovation Credit								
	Innovation Credits			N/A	10	0	0	



APPENDIX B – SAP, BUILDING REGULATIONS COMPLIANCE FOR MULTIPLE DWELLINGS



BLOCK COMPLIANCE

Calculation Type: New Build (As Designed)

Block Reference	Junction Hotel	Issued on Date	
Block Name	New Build Resi		
Assessor Details	Mr. Laurie Wills, Element Sustainability Limited, Tel: 01829 733444, laurie@elementsustainability.co.uk	Assessor ID	H367-0001
Client			

Block Compliance Report - DER

Block Reference: Junction Hotel		Block Name: New Build Resi		
Property-Assessment Reference	Multiplier	Floor Area (m²)	DER (kgCO₂/m²)	TER (kgCO₂/m²)
FJH - Flat 4-Flat 4	2	70.37	34.44	28.20
FJH - Flat 3-Flat 3	4	70.37	31.89	25.80
FJH - Flat 8-Flat 8	1	47.8	38.30	31.52
FJH - Flat 1-Flat 1	1	76.66	33.86	27.54
FJH - Flat 14-Flat 14	2	70.37	25.64	22.99
FJH - Flat 13-Flat 13	4	70.37	23.85	21.01
FJH - Flat 18-Flat 18	1	47.8	29.41	26.27
FJH - Flat 11-Flat 11	1	76.66	25.77	22.80
FJH - Flat 24-Flat 24	2	70.37	29.80	26.10
FJH - Flat 23-Flat 23	4	70.37	28.06	24.48
FJH - Flat 28-Flat 28	1	47.8	-308.67	29.39
FJH - Flat 21-Flat 21	1	76.66	29.76	25.78
FJH - Flat 20-Flat 20	2	72.15	33.50	28.35
Totals:	26	1784.34	55.61	340.23
Average DER = 20.40 kgCO₂/m²			PASS	
Average TER = 25.24 kgCO₂/m²				

BLOCK COMPLIANCE

Calculation Type: New Build (As Designed)

Block Compliance Report - DFEE

Block Reference: Junction Hotel		Block Name: New Build Resi		
Property-Assessment Reference	Multiplier	Floor Area (m²)	DFEE (kWh/m²/yr)	TFEE (kWh/m²/yr)
FJH - Flat 4-Flat 4	2	70.37	46.11	54.98
FJH - Flat 3-Flat 3	4	70.37	40.84	47.07
FJH - Flat 8-Flat 8	1	47.8	47.99	56.55
FJH - Flat 1-Flat 1	1	76.66	46.92	55.61
FJH - Flat 14-Flat 14	2	70.37	28.58	37.81
FJH - Flat 13-Flat 13	4	70.37	24.96	31.27
FJH - Flat 18-Flat 18	1	47.8	30.05	38.93
FJH - Flat 11-Flat 11	1	76.66	30.73	40.09
FJH - Flat 24-Flat 24	2	70.37	36.77	48.06
FJH - Flat 23-Flat 23	4	70.37	33.20	42.72
FJH - Flat 28-Flat 28	1	47.8	38.40	49.42
FJH - Flat 21-Flat 21	1	76.66	38.63	49.82
FJH - Flat 20-Flat 20	2	72.15	46.19	56.75
Totals:	26	1784.34	489.38	609.06
Average DFEE = 36.26 kWh/m²/yr			PASS	
Average TFEE = 44.93 kWh/m²/yr				

APPENDIX C – APPLIED COLD BRIDGING VALUES



Cold Bridge Type	Psi Value (WmK)
E2 Other Lintels	0.03
E3 Sill	0.03
E4 Jamb	0.03
E20 Exposed Floor	0.32 (Default)
E7 Party Floor Between Dwellings	0.01
E14 Flat Roof	0.08 (Default)
E16 Corner (normal)	0.06
E17 Corner (inverted)	-0.09 (Accredited)
E18 Party Wall Between Dwellings	0.1
P3 Party Wall – Intermediate Floor Between Dwellings	0.0
P4 Party Wall – Roof (insulation at ceiling level)	0.04
P7 Party Wall – Exposed Floor (normal)	0.16 (Default)



APPENDIX D – BRUKL REPORT



Project name

Shell and Core

Former Junction Hotel

As designed

Date: Mon Jul 20 15:49:50 2020

Administrative information

Building Details

Address: MANCHESTER,

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.6.a.1

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v6.1.0

BRUKL compliance check version: v5.6.a.1

Owner Details

Name:

Telephone number:

Address: , ,

Certifier details

Name: Colin Sowerbutts

Telephone number: 01829 733444

Address: 75A High Street, Tarvin, CH3 8JA

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	94.6
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	94.6
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	84.6
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _a -Limit	U _a -Calc	U _i -Calc	Surface where the maximum value occurs*
Wall**	0.35	0.18	0.18	Ground floor retail - Commercial unit 3_W_4
Floor	0.25	0.1	0.13	Ground floor retail - Toilet unit 1_S_3
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	1.4	1.4	Ground floor retail - Commercial unit 3_G_5
Personnel doors	2.2	1.2	1.2	Ground floor retail - Commercial unit 3_D_6
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.

** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

*** Display windows and similar glazing are excluded from the U-value check.

N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	4

Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Former Junction Hotel heating

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	4	-	-	-
Standard value	2.5*	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.					

1- Former Junction Hotel hot water

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

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1			
Ground floor retail - Toilet unit 1	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Ground floor retail - Toilet unit 2	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Ground floor retail - Toilet unit 4	0.3	-	-	-	-	-	-	-	-	-	-	N/A
Ground floor retail - Toilet unit 3	0.3	-	-	-	-	-	-	-	-	-	-	N/A

Shell and core configuration

Zone	Assumed shell?
Ground floor retail - Commercial unit 3	YES
Ground floor retail - Staff unit 1	YES
Ground floor retail - Toilet unit 1	YES
Ground floor retail - Staff unit 2	YES
Ground floor retail - Toilet unit 2	YES
Ground floor retail - Staff unit 4	YES
Ground floor retail - Toilet unit 4	YES
Ground floor retail - Commercial unit 4	YES
Ground floor retail - Staff unit 3	YES
Ground floor retail - Toilet unit 3	YES

Shell and core configuration

Zone	Assumed shell?
Ground floor retail - Commercial unit 2	YES
Ground floor retail - Commercial unit 1	YES

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	60	22	
Ground floor retail - Commercial unit 3		-	110	110	52
Ground floor retail - Staff unit 1		110	-	-	44
Ground floor retail - Toilet unit 1		-	110	-	24
Ground floor retail - Staff unit 2		110	-	-	45
Ground floor retail - Toilet unit 2		-	110	-	24
Ground floor retail - Staff unit 4		110	-	-	45
Ground floor retail - Toilet unit 4		-	110	-	24
Ground floor retail - Commercial unit 4		-	110	110	41
Ground floor retail - Staff unit 3		110	-	-	44
Ground floor retail - Toilet unit 3		-	110	-	24
Ground floor retail - Commercial unit 2		-	110	110	52
Ground floor retail - Commercial unit 1		-	110	110	66

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Ground floor retail - Commercial unit 3	NO (-52.4%)	NO
Ground floor retail - Staff unit 1	N/A	N/A
Ground floor retail - Toilet unit 1	N/A	N/A
Ground floor retail - Staff unit 2	N/A	N/A
Ground floor retail - Toilet unit 2	N/A	N/A
Ground floor retail - Staff unit 4	N/A	N/A
Ground floor retail - Toilet unit 4	N/A	N/A
Ground floor retail - Commercial unit 4	NO (-75.9%)	NO
Ground floor retail - Staff unit 3	N/A	N/A
Ground floor retail - Toilet unit 3	N/A	N/A
Ground floor retail - Commercial unit 2	NO (-68.5%)	NO
Ground floor retail - Commercial unit 1	NO (-44.7%)	NO

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Area [m ²]	113.9	113.9
External area [m ²]	223.8	223.8
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	4	5
Average conductance [W/K]	68.48	117.52
Average U-value [W/m ² K]	0.31	0.53
Alpha value* [%]	35.53	20.54

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	A1/A2 Retail/Financial and Professional services
100	A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
	B1 Offices and Workshop businesses
	B2 to B7 General Industrial and Special Industrial Groups
	B8 Storage or Distribution
	C1 Hotels
	C2 Residential Institutions: Hospitals and Care Homes
	C2 Residential Institutions: Residential schools
	C2 Residential Institutions: Universities and colleges
	C2A Secure Residential Institutions
	Residential spaces
	D1 Non-residential Institutions: Community/Day Centre
	D1 Non-residential Institutions: Libraries, Museums, and Galleries
	D1 Non-residential Institutions: Education
	D1 Non-residential Institutions: Primary Health Care Building
	D1 Non-residential Institutions: Crown and County Courts
	D2 General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger terminals
	Others: Emergency services
	Others: Miscellaneous 24hr activities
	Others: Car Parks 24 hrs
	Others: Stand alone utility block

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	21.15	39.36
Cooling	20.09	22.45
Auxiliary	2.8	3.74
Lighting	28.15	55.29
Hot water	90.77	104.99
Equipment*	95.84	95.84
TOTAL**	162.96	225.83

* Energy used by equipment does not count towards the total for consumption or calculating emissions.

** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m²]

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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	489.16	635.28
Primary energy* [kWh/m ²]	500.29	477.19
Total emissions [kg/m ²]	84.6	94.6

* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	283.7	205.4	21.1	20.1	2.8	3.73	2.84	4	4
Notional	344.3	291	39.4	22.4	3.7	2.43	3.6	----	----

Key to terms	
Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{i-Typ}	U _{i-Min}	Surface where the minimum value occurs*
Wall	0.23	0.18	Ground floor retail - Commercial unit 3_W_4
Floor	0.2	0.09	Ground floor retail - Commercial unit 3_S_3
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	1.4	Ground floor retail - Commercial unit 3_G_5
Personnel doors	1.5	1.2	Ground floor retail - Commercial unit 3_D_6
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U _{i-Typ} = Typical individual element U-values [W/(m²K)] U _{i-Min} = Minimum individual element U-values [W/(m²K)]			
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	4