



**ELEMENT
SUSTAINABILITY**

TESCO CAR PARK, PARRS WOOD LANE, EAST DIDSBURY

ENVIRONMENTAL STANDARDS STATEMENT

APRIL 2022

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Appendix A – Home Quality Mark One Pre-Assessment

Appendix B – SAP Output Report (Block Compliance)



1. INTRODUCTION

Element Sustainability have been commissioned by Dandara Living to review the sustainability performance of the proposed residential development at Tesco Car Park, Parrs Wood Lane, East Didsbury, Manchester M20 5NP.

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.

The potential HQM One rating for the domestic elements of the scheme will also be reviewed. Details of the design attributes, energy strategy, specifications and characteristics of the scheme are appraised in order to demonstrate how the proposals contribute to sustainable development in Manchester and seek to mitigate the environmental impacts of the scheme.

This Statement is to support the planning application for the erection of a 6-storey residential building (Use Class C3) comprising 75 new homes together with ground floor flexible community space, car parking, cycle parking as well as landscaping, highways and other associated works.



2. DEVELOPMENT PROPOSALS

2.1 Development Site Description

The application site is located in the Didsbury area of Manchester and is currently occupied by a hardstanding car park, belonging to the Tesco Superstore that sits adjacent to the site.

The triangular parcel of land is bound by car parking facilities associated with the Tesco store to the north, the A34 Kingsway to the east, the A5145 Parrs Wood Lane to the south and to the west is the access road into the Tesco Superstore and Styal Railway Line (see Figure 2.1).

The wider area is also characterised by mostly residential properties with some commercial uses. The application site is not located within a conservation area.

Figure 2.1 – Pre-development Site



2.2 Development Proposals

The proposals include for the Erection of a 6-storey residential building (Use Class C3) comprising 75 new homes together with ground floor flexible community space, car parking, cycle parking as well as landscaping, highways and other associated works.

The proposed floor plans and elevations are displayed in the figures below.



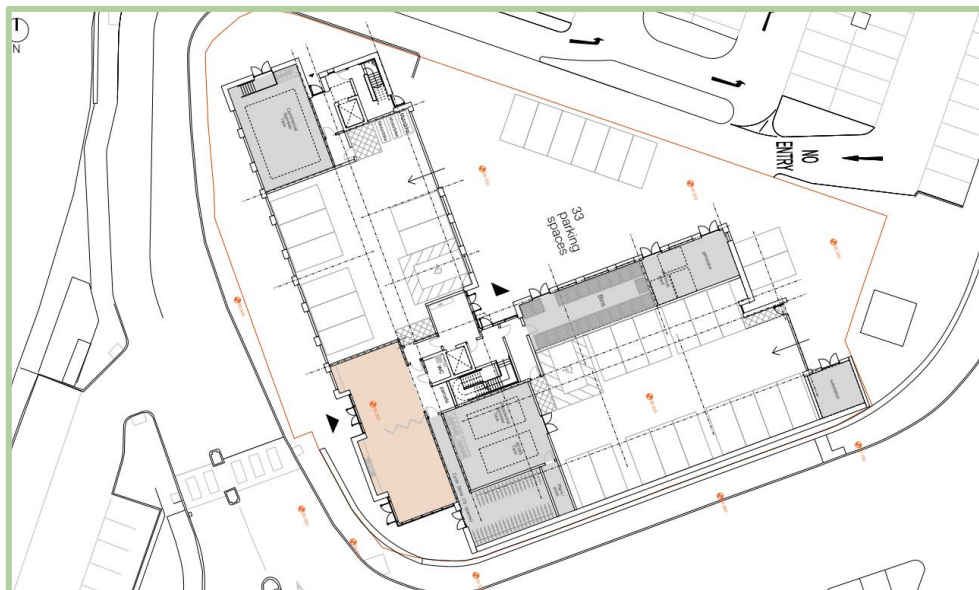
Figure 2.2 – Proposed Typical Floor Plan*Figure 2.3 – Proposed Ground Floor Plan*

Figure 2.6 – Proposed North Elevation*Figure 2.7 – Proposed East Elevation**Figure 2.8 – Proposed West Elevation*

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 principles 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.

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

CS Policy EN 5 - Strategic Areas for low and zero carbon decentralised energy infrastructure include:

- The Regional Centre, which also includes the Oxford Road Corridor and Eastlands;
- District Centres and associated major development sites;
- Airport Strategic Site;
- Strategic housing locations; and,
- Strategic employment locations.

Within these areas new development, regeneration and retrofit projects, will be expected to take place in the context of more detailed proposals for decentralised low and zero carbon energy infrastructure in the form of energy proposals plans.

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

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.



Developments smaller than the above threshold but involving the erection of a building or substantial improvement to an existing building will also be expected to meet the minimum target, where viable.

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

Table 3.2 – Policy EN6 CO₂ Emissions Reduction Targets; Non-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	+10% increase on Part L 2010
Target Three: Micro generation area	+15% increase on Part L 2010

The proposed development site is deemed to be **located within Target 3: Micro generation area** and must comply with Part L1A and 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 scheme is presented below:

- Residential - 9% dwelling emission rate reduction over Part L 2013.

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

CS Policy EN 8 – Adaption to Climate Change requires all new development to be adaptable to climate change in terms of the design, layout, siting and function of both buildings and associated external spaces. In achieving developments which are adaptable to climate change developers should have regard to the following, although this is not an exhaustive list:

- Minimisation of flood risk by appropriate siting, drainage, and treatment of surface areas to ensure rainwater permeability;
- Reduction in urban heat island effect through the use of Green Infrastructure such as green roofs, green walls, increased tree cover and waterways;
- The need to control overheating of buildings through passive design; and,
- The opportunity to provide linked and diverse green space to enhance natural habitats which will assist species adaptation.



CS Policy T 1 – Sustainable Transport aims to deliver a sustainable, high quality, integrated transport system to encourage modal shift away from car travel to public transport, cycling and walking, to support the needs of residents and businesses and to prepare for carbon free modes of transport, the Council will support proposals that:

- Improve choice by developing alternatives to the car;
- Promote regeneration and economic vitality by relieving traffic congestion and improving access to jobs and services, particularly for those most in need and for those without a car;
- Improve access to transport services and facilities in order to enable disabled people and people with mobility impairments to participate fully in public life;
- Improve pedestrian routes and the pedestrian environment;
- Improve and develop further Manchester's cycle network (for example the Manchester Cycleway and the Trans Pennine Trail); and,
- Facilitate modes of transport that reduce carbon emissions e.g by incorporating charging points for electric vehicles, subject to their appropriate design and location.

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; | • Waste management; |
| • Renewable energy; | • Construction management; |
| • Environmental design; | • Biodiversity; and, |
| • Water management and weather resilience; | • 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, sets minimum space standards, and ensures high environmental standards. The guidance includes 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 it 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 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.

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 contains the following relevant objectives:



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.

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

- Adapt the city’s built and natural environment and prepare 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.
- Improve the energy efficiency of the city’s homes and provide access to affordable, secure supplies of renewable energy, which are essential to 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 objectives and include:

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 Climate Change Framework 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 buildings as far as possible to reduce the demand for gas.
 - Replace 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 previous **Draft Greater Manchester Spatial Framework 2020** is currently on hold following Stockport Council's decision to withdraw from the GMSF in December 2020. The **Draft 'Places for Everyone' Plan** is a new long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been prepared by the GMCA on behalf of the nine districts.

The Draft Plan will determine the kind of development that takes place across the city-region, maximising the use of brownfield land and urban spaces while protecting green belt land from the risk of unplanned development.

It will also ensure all new developments are sustainably integrated into Greater Manchester's transport network or supported by new infrastructure.

A final period of public consultation is taking place with regards to the Draft 'Places for Everyone' Plan between 9 August 2021 and 3 October 2021. Following this there is an intention to submit the Plan to the Secretary of State. It is therefore considered that the Plan is in an advanced stage of preparation and will hold some weight in the determination of planning applications within Greater Manchester.

3.3 National Planning Policy

In addition to the local planning policies, the **National Planning Policy Framework (NPPF) 2021** is a material consideration. The NPPF (amended July 2021) 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. Guidance on how to meet the requirements of this regulation is provided within approved documents that relate to change of use buildings such as this, as follows:

New Build Dwellings

Approved Document L1A addresses the conservation of fuel and power in new dwellings. The proposed development *may* be 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 L1A (2021) standards will come into effect in June 2022. It is understood that all energy efficiency targets stipulated under local planning policy will still apply to the proposed development under the prevailing Building Regulations (subject to transitional arrangements). Key dates in the implementation of upcoming Building Regulations are as follows:

- December 2021 – Interim uplift Part L, F and Overheating Regulations are published
- June 2022 – Interim uplift Part L, F and Overheating Regulations come into legislation
- Spring 2023 – Consultation on Future Homes Standard
- 2024 – Future Buildings Standard published
- 2025 – Future Buildings Standard comes into force

3.4.2 Home Quality Mark

Home Quality Mark (HQM) is developed and operated by BRE (Building Research Establishment) and it is part of the BREEAM (Building Research Establishment's Environmental Assessment Method) family of quality and sustainability standards.

The HQM ONE (the latest edition of the methodology) scheme is a performance-based assessment method and certification scheme for new domestic buildings. HQM ONE recognises new homes where performance meets best-practice standards that are often significantly above those required by regulation. It defines a rigorous, evidence-based, relevant and independent voluntary standard for new homes, and is built on tried and tested processes commonly used in the UK and the rest of the world. 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 across wide range of financial, wellbeing, environmental and social issues, including:

- | | |
|--------------------------|------------------------------|
| • Transport; | • Space; |
| • Outdoors; | • Water; |
| • Safety and resilience; | • Quality assurance; |
| • Comfort; | • Construction impacts; and, |
| • Energy; | • Customer experience. |
| • Materials; | |

The HQM rating benchmarks for HQM projects assessed using the ONE version of methodology are presented in Table 3.3. The target HQM rating for this scheme is 4* (refer to Section 5).



Table 3.3 – HQM Rating Benchmarks

HQM Rating	% Score Required
1 Star	Minimum requirements only
1.5 Star	≥ 18
2 Star	≥ 20
2.5 Star	≥ 24
3 Star	≥ 30
3.5 Star	≥ 38
4 Star	≥ 48
4.5 Star	≥ 60
5 Star	≥ 80

To make sure all HQM certified homes consistently deliver on some important issues, the scheme sets out minimum performance levels in several key areas. These requirements establish a standard that consumers can expect from all homes which have achieved the HQM ONE certificate. The minimum performance standards are displayed in Table 3.4.

Table 3.4 – HQM Rating Benchmarks

HQM Issue	Summary of Minimum Requirements
3.1: Flood Risk	Carry out an assessment of the site's risk of flooding
3.3: Security	The home meets Approved Document Q
4.5 Temperature	1. Thermal analysis has been carried out. 2. The result of the analysis is included in the home information with guidance on how to manage high temperatures
4.6 Ventilation	1. A securely fixed sign providing information on the location, design intent, operation and maintenance of all ventilation systems and controls has been installed in the home. 2. The home achieves the minimum ventilation rates set for systems 3 and 4. 3. Ventilation systems are capable of boosting the rates during instances of increased humidity.
9.1 Project Preparation	1. A project delivery plan is in place, which sets out roles, responsibilities, target, requirements for handing over the home to the occupier after construction is complete, strategy to manage quality, carry out commissioning and testing. 2. The project has a product procurement and substitution policy in place. 3. Processes are in place to communicate project requirements and key considerations to all trades and site workers



9.2 Commissioning and Testing	Commissioning of building systems is carried out according to best practice guidance, by people not involved in installations
9.3 Inspections and Completion	1. A visual defects inspection is carried out for the assessed home when construction is complete to make sure any defects identified are put right and that the home is finished and habitable (suitable to live in) in line with the specifications 2. Inspection details are agreed and carried out at key stages to ensure the home complies with required performance characteristics. Any design variations or material substitutions are appropriately managed and approved. 3. Throughout the construction stage, a record is kept of all the quality assurance measures carried out
11.1 Aftercare	1. The home is covered by a building warranty, recognised by the Consumer Code for Home Builders or the Trading Standards Institute. 2. The developer has committed to provide demonstrations to occupants when they move in to make sure they know how to operate and maintain their home.
11.2 Home Information	The developer gives occupants key information in an accessible way, to help them get the most from their home.

3.5 Key Drivers and Targets for this Development

Based upon a review of relevant planning policy requirements, legislative drivers and client priorities, the following list provides a brief overview of the key criteria that should be targeted for this development:

- **CS Policy EN 4** – Following the principles of the Energy Hierarchy to reducing CO₂ Emissions;
- **CS Policy EN 6** - Target Framework For CO₂ Reductions From Low or Zero Carbon Energy Supplies;
 - Residential - 9% dwelling emission rate reduction over Part L 2013;
- **CS Policy EN 8** – Adaption to Climate Change;
- **CS Policy T 1** – Sustainable Transport;
- **HQM** – Level 4* Design Stage certification;
- **Approved Document L1A** will guide the compliance standards for energy demand and carbon dioxide emissions from this building; and,
- **Upcoming, Approved Document L1A (2021)** – it is acknowledged that the proposed development could be assessed against the emerging Part L1A and L2A (2021) Building Regulations, subject to the development programme and progression.



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 residential development. This section outlines those commitments that have been made by the client to ensure this development contributes to sustainable development, meets the council's current 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 new dwellings, the following design features will be integrated within the scheme. These will enable the occupants to lead a low-impact lifestyle:

4.1.1 Energy Efficiency Strategy

- 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 proposed energy strategy will incorporate the following energy saving measures:
 - A thermally efficient and enhanced building fabric specification;
 - Mechanical ventilation with heat recovery systems; and,
 - Zero-carbon technology.

Further details of the proposed approach to reducing the energy demand and associated carbon dioxide emissions of these dwellings are presented in the Sections 5 (Energy Strategy) and Section 6 (Climate Emergency).

4.1.2 General Principles

- White goods are graded on a scale from G (the least efficient) up to A++ (the most efficient) under the EU energy efficiency labelling scheme. There will be the 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 white goods;
- 100% low energy and/or LED internal lighting;
- All external space lighting to be provided by dedicated energy efficient fittings and controls; and,
- To encourage the use of sustainable modes of transport:
 - On-site, secure cycle storage will be provided at ground floor level; and,
 - There will also be capacity for at least 20% of parking bays to feature active, electric vehicle (EV) fast charging points, and 80% passive parking bays for future provision.

4.2 Water management and weather resilience

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

- A water efficiency strategy will be determined for the development. This 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 sanitary fixtures will be specified to achieve a calculated daily consumption of <110litres/person/day; and,
- It is anticipated that the landscaped areas of the development will be irrigated by precipitation and plant species will be selected accordingly to reduce demand for potable water consumption.

4.3 Resource Management and Pollution

4.3.1 Efficient Use of Land

- The proposals include for the redevelopment of a previously developed, brownfield site in a highly accessible, urban location as promoted by national and local planning policy; and,
- Apartments are an inherently efficient form of construction, and the proposals make effective use of land in meeting the urgent need for homes to help support a growing, sustainable community.

4.3.2 Pollution Control

Sound

The impact of sound associated with nearby road traffic, Tesco's car park, and the occupied development, will be mitigated by the design and specification of the dwellings. Excess noise can have a significant impact on local ecology as well as human physical and psychological health, therefore a Noise Impact Assessment has been



prepared by E3P Limited. The report confirms that noise need not be a material consideration in the granting of planning permission as long as the recommendations of the report are followed and included within the design stage. The mitigation measures are as follows:

- Higher specification double glazing for outward facing apartments. The glazing specification will be designed to meet the acoustic standards as per the recommendations of E3P Ltd as well as the thermal standards specified for the glazing in Section 6.2 of this statement; and,
- In order to meet the required internal ambient noise levels, mechanical ventilation systems that provide the option to mitigate overheating without the need to open windows, are required in the north east and west facing flats. As such, the Vent Axia Sentinel Kinetic mechanical ventilation with heat recovery system that features an automatic summer bypass mode has been specified for use within specific residential dwellings (see Section 6.3 for further detail on ventilation).

Acoustic Ventilation and Overheating (AVO)

Issues surrounding AVO have been assessed to ensure that all necessary targets are reached while ensuring occupant comfort is achieved. An overheating assessment has been undertaken by E3P as per the methodology set out by Good Homes Alliance and determined a high risk of overheating. The assessment has recommended higher specification glazing for outward facing apartments and a whole dwelling ventilation system is recommended for all plots due to the impact of sound internally due to road and rail traffic sound.

Additional Measures

To reduce emissions of gases with high global warming potential (GWP) and nitrogen oxide (NOx) into the atmosphere, the new building 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;
- Where necessary, temporary drainage and pollution prevention measures will be in place on site, this may include, for example, bunded areas and spill kits to prevent harmful chemicals/materials from draining to natural watercourses; and silt traps to ensure that suspended solids are removed from the drainage water;
- Dust suppression measures will also be put in place as part of the contractor's Environmental Management Plan and in line with the mitigation measures outlined in the Redmore Environmental Air Quality Report, 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.

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:

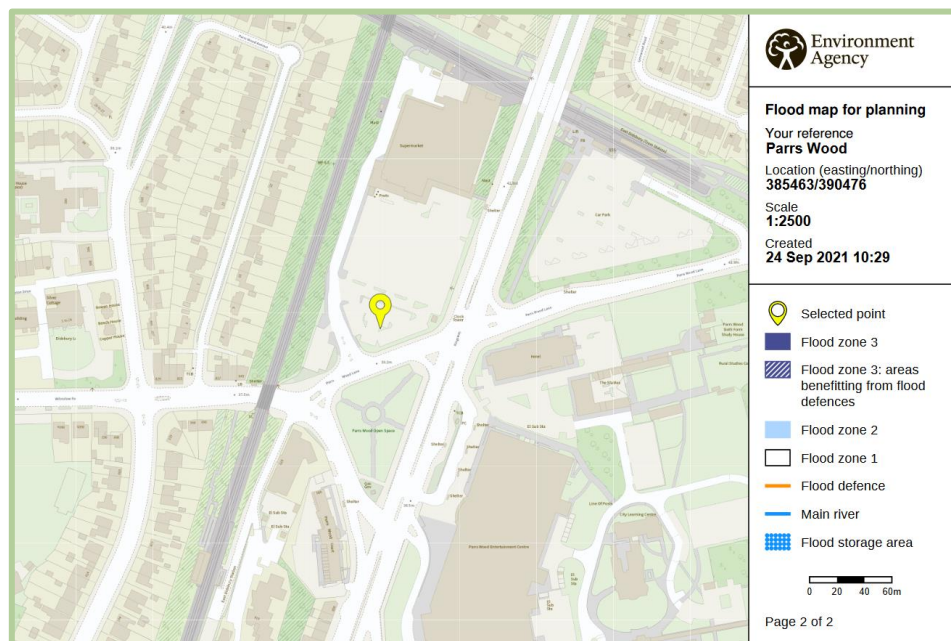
- Materials with low environmental impact throughout their lifecycle will be selected;
- Materials responsibly sourced from suppliers operating an Environmental Management System or procuring timber verified by either the Forest Stewardship Council (FSC) or Programme for the Endorsement of Forest Certification standard (PEFC) will be prioritised;
- There is no dominant architectural style within the vicinity of the application site, therefore, the construction materials will be locally sourced where feasible. Proposed cladding materials have been chosen to enhance the aesthetics of the local area and provide the development with a modern/contemporary touch; and,
- Robust materials will be utilised for hard landscaping to minimise the frequency of replacement.

4.4 Surface Water Run-off

4.4.1 Flood Risk

The proposed site is located within Flood Risk Zone 1 and therefore has a low probability of flooding. Data provided on the Environment Agency website confirms the Flood Risk Zone classification for the site (see Figure 4.1).

Figure 4.1 – Flood Risk Map



4.4.2 On Site Surface Water Management -

To minimise the risk and impact of localised flooding on and off-site, watercourse pollution and other environmental damage, the proposed development site will accord with the following measures:

- The drainage strategy will be designed to withstand a 1 in a 100-year storm event plus an allowance for climate change; and,
- The drainage strategy will incorporate the use of Sustainable Drainage Systems (SuDS) where appropriate throughout the site so that the post development surface water run-off rate is at least 50% better than existing surface-water brownfield runoff rates.

4.4.3 Construction Waste

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

- A target of >85% of waste to be diverted away from landfill will be established for the construction phase of the development; and,
- This scheme will promote the minimisation of waste on site and seek to maximise the use of recycled materials in construction.

4.4.4 Domestic Waste

The development will provide infrastructure and facilities that meet the need of the residents and building users for segregated waste storage, thereby optimising the ability to recycle waste:

- A waste management strategy will be developed, ensuring that adequately sized bin storage areas for the dwellings will be designed into the development at an early stage of the design; and,
- Private bin storage provisions will enable residents to make full use of Local Authority recycling services. The strategy will allow for storage of general waste, recyclable materials and food waste in order to optimise the recycling rates achieved by Manchester City Council.

4.5 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 daylighting will be achieved within the dwellings through the provision of floor to ceiling glazing. This will reduce the need for energy to artificially light the dwelling;
- All residents have access to a private or Juliette balcony and a selected number have a private terrace at ground level, which will allow the residents to access outdoor space and natural ventilation;



- All dwellings will comply with the Manchester Residential Quality Guidance and National Space Standards to ensure that all dwellings are of a sufficient size and provide more flexibility and comfort for the future occupants; and,
- Home Quality Mark principles are embedded into the design to ensure the new dwellings are well designed and are integrated well into the neighbourhood.

4.6 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, and crime prevention measures adopted to assist in reducing the opportunity for, and fear of crime; and,
- Construction site impacts will be minimised, and measures implemented to protect water courses, as well as to prevent impacts upon the local area in terms of dust and noise pollution during construction works. This will be facilitated through registration with the Considerate Constructors Scheme.

4.7 Biodiversity and Land Use

Land Use -

The proposal includes the redevelopment of a previously developed site and represents a very efficient use of land. Furthermore, apartments are an inherently efficient form of construction, and the proposed development makes effective use of land in meeting the urgent need for homes.

Biodiversity -

The existing, mostly hardstanding development site holds little ecological value for local wildlife. A preliminary Ecological Appraisal has been prepared by E3P Limited in order to identify any major habitats, ascertain the presence or potential presence of any legally protected species and habitats, and recommend any further surveys or mitigation that may be required. As per the results of the appraisal, the following mitigation measures are recommended:

- Vegetation clearance to be undertaken outside of bird breeding season (March to September);
- Precautionary working methods for badgers; and,
- Eradication of wall cotoneaster and small-leaved cotoneaster prior to works commencing on-site.

The Chartered Institute of Ecology and Environmental Management (CIEEM), Institute of Environmental Management (IEMA) and the Construction Industry Research and Information Association (CIRIA) have established a framework of good practice principles for Biodiversity Net Gain. In line with the recommendations of the Ecological Appraisal prepared by E3P Ltd and the Biodiversity Mitigation Hierarchy, the scheme will:

- Incorporate ecology enhancing features and measures within the development footprint; and,
- Seek to achieve biodiversity net gain - If this cannot be achieved on-site, a conservation offset payment, or off-site compensation may be required.



4.8 Transport

The proposed development is located within a short train journey of Manchester city centre, which is one of the most sustainable locations in the northwest, particularly in relation to key pedestrian, rail, Metrolink and bus transport routes. The site is well located in terms of non-car modes of transport with basic facilities all within easy walking distance of the site. Hence the excellent GMAL rating of 8.

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 – The nearest bus stop is located directly adjacent to the development site along the A5145. This bus stop provides regular services (approximately every fifteen minutes) to the Trafford Centre as well as Manchester airport and Altrincham. There are further bus stops located within 270m of the site along Kingsway that provide services to Manchester city centre, Woodford, and Handforth Dean, among other regional destinations.
- Rail - The nearest station is East Didsbury which is located approximately 600m south-west of the site. This station provides regular services to both local and regional destinations including Crewe, Liverpool, Manchester airport, Chester and Llandudno.
- Metrolink – East Didsbury Metrolink is located within close proximity to the site, just a 3.5-minute walk away and provides services to Rochdale Town Centre and Shaw and Crompton.
- Cycle and pedestrians - The area is accessible by bike with particularly strong links to employment opportunities in the city centre areas such as Salford and Manchester. The whole of Manchester City Centre and beyond is accessible within a 6-mile cycle journey (29-minutes) and the high-quality pedestrian and cycle infrastructure close to the site, including footways, cycle lanes, street lighting and signalised pedestrian crossings provides a safe and realistic opportunity for future users of the site to walk or cycle to and from the site. Cycle storage will also be provided in a secure, accessible location.
- The proposals include for parking provisions to provide a total of 33 car parking spaces. With a 20% provision for electric vehicle charging units (as well as an additional 80% passive parking bays) for future provision to facilitate the increasing, widespread transition to electric car usage and ultimately help to support a growing sustainable community.

Local Amenity Access -

- Residents are able to walk to local amenities and shops along Kingsway and Wilmslow Road; and,
- Local amenity space and recreational facilities are located close to the site, such as:
 - Recreational Space – Fletcher Moss Park and gardens is located 1.2km southwest of the development site, providing access to significant green space;
 - Education – There are a range of education facilities surrounding the proposed development site including The Barlow RC High School, Parrs Wood High School and Sixth Form, and St. Catherine's RC Primary School. All of these institutions are within 650m of the site and the



various Universities homed within Manchester and Salford can be easily accessed via public transport links; and,

- Cultural – The site is positioned only a short bus journey away from of a multiplicity of cultural institutions such as the Science and Industry Museum, numerous theatre and art venues and Manchester's City Library.



5. POTENTIAL HQM RATING

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

A review of the current development proposals and agreed specifications has been carried out against the HQM One assessment methodology. It is anticipated that the scheme's design with respect to the residential units, in principle, can achieve the following score:

- Indicative HQM One pre-assessment score = **Level 4**** 51.80%**
 - Minimum required = 48% for **Level 4******.

The full pre-assessment report is displayed in Appendix A.

5.1.1 Minimum Standards

Following an initial review of the proposals, the HQM pre-assessment reports demonstrate that the domestic elements of the scheme are able, in principle, to meet all mandatory credit requirements (see Table 5.1) associated with the HQM certification.

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 HQM rating may, therefore, be subject to change further into the development cycle.

Table 5.1 – Minimum Standards Achieved

HQM Issue	Summary of Minimum Requirements	Minimum Standards Achieved
3.1: Flood Risk	Carry out an assessment of the site's risk of flooding	✓
3.3: Security	The home meets Approved Document Q	✓
4.5 Temperature	1. Thermal analysis has been carried out. 2. The result of the analysis is included in the home information with guidance on how to manage high temperatures	✓
4.6 Ventilation	1. A securely fixed sign providing information on the location, design intent, operation and maintenance of all ventilation systems and controls has been installed in the home. 2. The home achieves the minimum ventilation rates set for systems 3 and 4. 3. Ventilation systems are capable of boosting the rates during instances of increased humidity.	✓
9.1 Project Preparation	1. A project delivery plan is in place, which sets out roles, responsibilities, target, requirements for handing over the home to	✓



	the occupier after construction is complete, strategy to manage quality, carry out commissioning and testing. 2. The project has a product procurement and substitution policy in place. 3. Processes are in place to communicate project requirements and key considerations to all trades and site workers	
9.2 Commissioning and Testing	Commissioning of building systems is carried out according to best practice guidance, by people not involved in installations	✓
9.3 Inspections and Completion	1. A visual defects inspection is carried out for the assessed home when construction is complete to make sure any defects identified are put right and that the home is finished and habitable (suitable to live in) in line with the specifications 2. Inspection details are agreed and carried out at key stages to ensure the home complies with required performance characteristics. Any design variations or material substitutions are appropriately managed and approved. 3. Throughout the construction stage, a record is kept of all the quality assurance measures carried out	✓
11.1 Aftercare	1. The home is covered by a building warranty, recognised by the Consumer Code for Home Builders or the Trading Standards Institute. 2. The developer has committed to provide demonstrations to occupants when they move in to make sure they know how to operate and maintain their home.	✓
11.2 Home Information	The developer gives occupants key information in an accessible way, to help them get the most from their home.	✓



6. ENERGY STRATEGY

Details of the proposed energy strategy for the Parrs Wood development are reviewed below.

6.1 Local Planning Policy Targets

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 requires applications for residential development of ten or more units and all other development over 1,000m² to meet, as a minimum, the targets shown in the tables below, unless unviable.

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 scheme is presented below:

- Residential - 9% dwelling emission rate reduction over Part L 2013.

6.2 Build Fabric and Thermal Performance

A combination of enhanced building fabric specification (significantly beyond the regulatory compliance standard), efficient mechanical and electrical systems, and controls, will achieve compliance with the emission reduction targets stipulated by Building Regulations Parts L1A and L2A (2013).

The standard measurement of heat transfer through a given building material or construction type is the U-value (W/m²K). In buildings, heat loss generally occurs through the following areas and elements of the construction:

- Ground Floor;
- External Walls;
- Roofs;
- Doors and Windows;
- Thermal (cold) Bridging (heat loss through construction joints); and,
- Uncontrolled Ventilation.



The lower the U-value, the more slowly heat transfers and is lost out of a building. Table 6.1 presents the proposed material specification that will be incorporated to limit heat loss and ensure efficient operation of the dwellings.

Table 6.1 – Proposed Residential Building Specification

Item	Residential Specification
External Wall	$U=0.19\text{W/m}^2\text{K}$
Wall to Circulation	$U=0.19\text{W/m}^2\text{K}$
Party wall	$U=0.0\text{W/m}^2\text{K}$ (Full fill and seal)
Ground Floor	-
Exposed Floor over Car Park	$U=0.20\text{W/m}^2\text{K}$
Exposed Floor Other	$U=0.20\text{W/m}^2\text{K}$ (Plus shelter factor)
Flat Roof	$U=0.13\text{W/m}^2\text{K}$
Windows	$U=1.3\text{W/m}^2\text{K}$; $g=0.63$ (Metal Frame, double glazed, low-E)
Solid Doors	$U=1.4\text{W/m}^2\text{K}$;
Air Permeability	$4.0\text{m}^3/\text{hm}^2$ (@50Pa.)
Cold Bridge	Bespoke values, assessed for each plot for concrete frame construction ²

These specifications and design attributes will provide the following benefits:

- **High performance thermal insulation** will ensure low U-values for all heat loss elements;
- **Thermally efficient, 'A' rated, double glazed windows** will be specified with argon gas fill and low emissivity coatings to limit heat loss through the panes. The glazing will also be specified in order to meet the required acoustic standards as discussed in Section 4.3.2. Thermal breaks will be incorporated within the frame to further limit heat loss. The glazing g-value has been specified to optimise beneficial solar gains but limit the propensity for the dwellings to overheat;
- **Very low air permeability** of $4.0\text{m}^3/\text{hm}^2$ (@50Pa.) is targeted for the entire development in order to minimise uncontrolled ventilation. This will reduce heat losses and provide high levels of occupant comfort (in combination with the proposed mechanical ventilation strategy). Focus on the quality of the build is vital to deliver airtight buildings;
- **Attention to cold bridging junctions** including the provision of insulation to reduce heat and limit heat losses that occur at the junctions between building elements and around openings and will significantly improve the emission rate of the building;

² The energy models have been calculated based on the assumption that appropriate bespoke psi values will be calculated for the concrete frame construction further into the development cycle – without these bespoke psi values the plots would not pass the DER:TER with respect to 2013 regs and therefore, compliance with 2021 regs would also not be possible. We have used a set of bespoke psi values that have been previously calculated for a concrete frame development to better reflect the actual Psi values that will be calculated at a later date.



- **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 layouts which enhance the energy efficiency of the dwellings and guarantees low energy demand throughout their occupation; and,
- **Thermal mass** (associated with this type of concrete frame construction) helps stabilise the internal temperature and provides a largely self-regulating environment, reducing the risk of overheating and the need for mechanical cooling in summer. Furthermore, this daily cycle of absorbing and releasing heat continues on a year-round basis and can reduce the energy needed to keep a building warm during the heating season. This works through the ability of thermal mass to capture and recycle heat solar and incidental heat gains.

This specification will help to deliver an energy efficient development that achieves an emission rate reduction and fabric energy efficiency performance beyond the requirements set by Building Regulation Part L (2013).

6.3 Building Services Specification

Table 6.2 presents the current proposed mechanical and electrical specification that is anticipated to be part of the design to ensure efficient and comfortable operation of the dwellings.

Table 6.2 – Proposed Mechanical and Electrical Specification

Item	Residential Specification
Ventilation	High efficiency MVHR, insulated ductwork (<i>Vent Axia Sentinel Kinetic B: SFP 0.88 or better / 91% efficiency</i>)
	The northern flank dwellings (flats x.10-x.15), MEV (Nuaire MEVDC2)
Lighting	100% 'Low E' or LED
Space Heating	Electric panel heaters
Heating Controls	Programmer and appliance thermostat
Water Heating	High efficiency immersion heaters (<i>180l. / 1.23 kWh/day standing losses</i>)
Renewables	55.67kWp photovoltaic array, connected to each dwelling (<i>south-east facing, 30° tilt</i>)

The specification will provide the following benefits:

- **No mechanical cooling required for the dwellings.** It is anticipated that dynamic simulation energy model (DSM) calculations (applying the CIBSE TM59 assessment procedure) for this building will be completed further into the development cycle to demonstrate that the dwellings are not considered to be at risk from overheating. This is due to optimisation of the glazing's solar transmission (g value) which (currently applied as g=0.63) limits unwanted, excess solar gain whilst allowing useful heat from the sun to enter the dwellings, coupled with the proposed MVHR systems which incorporate a summer by-pass function to provide cool air within the dwelling during warm days.



- **Mechanical ventilation with heat recovery (MVHR) and Mechanical Extract Ventilation (MEV) systems** will be specified in the following dwellings (refer to figure 2.2 apartment numbers):
 - **MVHR system** - Will be specified in the north east and north west facing properties (apartments 2.01-2.09 across each floor); and
 - **MEV System** - Will be specified in the south east and south west facing properties (apartments 2.10 – 2.15 across each floor).

This will maintain a healthy living environment and further reduce the heat losses and the energy demand of the dwellings. The proposed MVHR system can recover over 90% of heat from the extracted stale air from the dwelling by using a counter flow heat exchanger which ‘pre-heats’ cool incoming fresh air. The outgoing and incoming air pass next to each other, but do not mix. Mechanical Extract Ventilation is specified in each dwelling on the northern flank of the building, ensuring the maintenance of a healthy living environment. The design air permeability of $4.0\text{m}^3/\text{hm}^2$ (@50Pa.) for the dwellings will minimise uncontrolled ventilation and ensure that the majority of the expelled stale air will pass across the heat exchanger (where MVHR is present), thereby boosting the energy reduction potential of these systems.

- **Low energy and LED lighting** will be specified throughout the site 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. Common areas will also benefit from PIR control and photocell dimming controls.
- **Sophisticated heating controls** including appliance programmer and room thermostats will ensure the efficient delivery of heat from electric panel heaters to further reduce the dwellings’ energy demand.
- **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 <110 liters per person per day.
- **PV panels** harness solar energy and convert it into zero carbon electricity which can then be used within the building to reduce the (CO₂) emission rates of the apartments.

6.3.1 Heating Strategy Rationale

- The residential units will improve upon the current Building Regulation Part L 2013 criteria in terms of carbon dioxide emission rate and fabric energy efficiency;
- 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 overheating in the dwellings 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 dwellings at the Parrs Wood development, 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.

6.4 Renewable Energy Feasibility

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

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

A review of the Parrs Wood proposals and site location has been completed to determine the appropriate option(s) for this development, as detailed in Table 6.3 below.



Table 6.3 – Renewable Energy Feasibility Study

Technology	Description	Advantages	Limitations	Feasibility
Combined Heat and Power (CHP)	CHP is effectively an on-site, mini power plant providing both electrical power and thermal heat energy. It is an energy efficient, low carbon measure rather than a renewable energy technology.	✓ Buildings with high heat / hot water demands and constant power demands lend themselves to CHP. ✓ Can be linked to a district heating scheme. ✓ Efficient use of fuel and excess electricity can be exported to the grid.	✗ Only viable for buildings with high heat / hot water demands and constant power. ✗ Plant space required. ✗ Maintenance intensive.	No - Given there will be low space heating for around half of the year the contribution from CHP will be limited to a proportion of the hot water load only, therefore the commercial viability of this type of system cannot be proven.
District Heating	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 to each dwelling.	✓ Efficient use of fuel. ✓ Eliminates the need for gas to be installed.	✗ Relies upon the installation of nearby heat networks.	No - It has been determined that there are no existing or proposed heat networks/energy centres within a moderate radius from the development and there are no existing networks local to the site.
Solar Hot Water	The solar collector absorbs the radiant energy of the sun and converts it to heat energy for use as hot water in buildings.	✓ Feasible for small scale developments. ✓ Low maintenance.	✗ Panels ideally facing south at 30° tilt for optimum efficiency.	Potentially - Solar thermal is considered to be a technically feasible option for the residential buildings but is discounted on the grounds of viability. Available roof space would be better utilised for PV panels which offer a better energy yield and emissions reduction per pound (£) of capital expenditure. Furthermore, there are potential problems associated with routing the pipework through the dwellings in the multi-storey building.



Photovoltaics (PV)	PV panels harness solar thermal energy and convert it into electricity which can then be used within a building. The panels may be roof or floor mounted.	✓ Low maintenance. ✓ Easy to integrate into building design. ✓ Cost of PV is constantly dropping.	✗ Panels ideally facing south at 30° tilt for optimum efficiency. ✗ Overshadowing will reduce performance. ✗ Can require significant roof space.	Yes – This technology is considered to be a feasible option for this site and will be considered in more detail below.
Biomass Heating	Biomass boilers typically burn wood chips or pellets as fuel to provide space heating and hot water.	✓ Almost a carbon neutral technology.	✗ Frequent and large fuel deliveries. ✗ Large fuel store required. ✗ Regular maintenance. ✗ Air quality issues in urban areas.	No – This technology would be capable of delivering the target CO ₂ emission reductions but is considered inappropriate for this type of development due to the need for a large fuel storage facility and frequent, large fuel deliveries combined with regular maintenance.
Wind	Wind generation equipment harness the wind to turn a propeller and in doing so, drive an alternator to generate electricity. The turbines may be pole or roof mounted.	✓ Low maintenance. ✓ Excess electricity can be exported to the grid. ✓ Vertical Axis Turbines able to operate at wind speeds as low as 2m/s.	✗ A wind speed of at least 6m/s is typically required for traditional turbines to operate efficiently. ✗ Visual and noise impact risk.	No – The NOABL wind speed database records a wind speed of approximately 4.4m/s at 10m above ground level for this site. In order to operate efficiently a wind speed of at least 6m/s is typically required. Furthermore, there are potential planning issues and perceived safety concerns with this technology.
Ground Source Heat Pumps (GSHP)	GSHPs 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).	✓ Flexible installation methods - vertical ground collector boreholes can be used when space is more limited. ✓ Can provide both heating and cooling as well as hot water.	✗ Full ground survey required to determine suitability/ geology. ✗ Large area required for horizontal ground collector loops. ✗ Prohibitive costs.	No – Such technology is considered unsuitable for this site due to prohibitive costs and technical complexity of installing the vertical ground collector boreholes within the site boundary.
Air Source Heat Pumps (ASHP)	ASHPs collect low-grade heat from the air to supply useful heat for space and water heating requirements by applying additional energy input (in the form of electricity).	✓ Highly efficient method of producing heat. ✓ Can provide both heating and cooling as well as hot water.	✗ Prohibitive costs. ✗ Internal and external unit space required. ✗ Potential noise issues from external plant.	No – This technology is technically feasible for this site and would ensure significant energy demand and emissions reductions for the dwellings. This technology has however been discounted on viability grounds.



6.5 Proposed Renewable Energy Solution

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

Photovoltaic Array

Photovoltaic (PV) arrays are selected as an appropriate renewable energy technology to contribute towards the reduction of CO₂ emissions. 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 at this site would provide the following benefits:

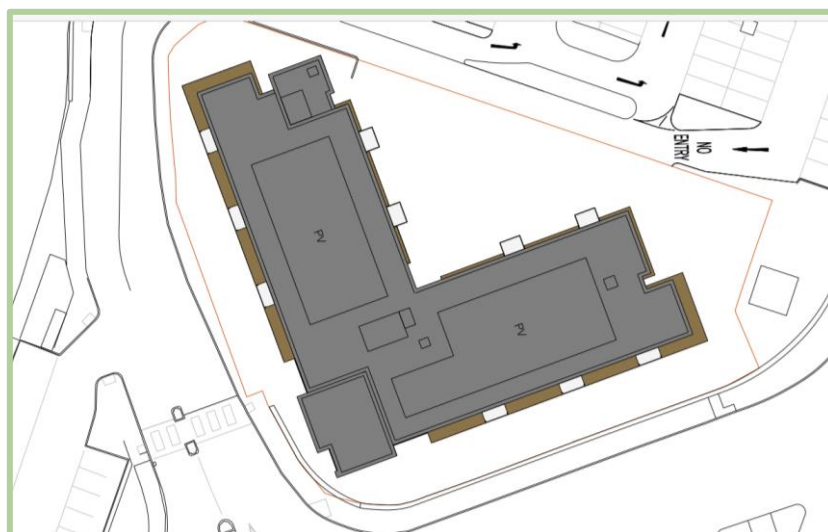
- Reducing the building's electrical energy grid load;
- Simple installation and commissioning;
- Low maintenance; and,
- Reliable, proven technology.

Proposed System Details -

It is proposed that PV panels be shallow mounted in arrays tilted at 30° and ideally orientated due south in order to optimise the installed capacity of the system. On average, east or westerly facing buildings will be provisioned with a marginally higher capacity of photovoltaics to compensate for their orientations. It is proposed that the PV is arranged as follows:

- A total installed capacity of approximately 65.4kWp photovoltaic modules will be allocated onto the flat roof and shallow mounted in arrays tilted at 30°;
- The PV modules will be connected via diverters to each dwelling in line with the energy criteria of the HQM assessment; and,
- The proposed 65.4kWp PV array will require approximately 378m² of total roof area, plus additional space for access and avoidance of over shading. An array of this capacity may be accommodated within the available flat roof area.

Figure 6.5 – Proposed Roof Layout



PV arrays will be more fully reviewed in the following Energy Demand Calculation section to demonstrate how these may contribute to reducing carbon emissions arising from this development.

Land use -

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

Local Planning -

- 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 -

- 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.
- Energy payback estimates for rooftop PV systems are between 4 to 2 years for systems using current multi-crystalline, silicon PV modules.
- With energy paybacks of 2 to 4 years and assumed life expectancies of 30 years, 87% to 97% of the energy that PV systems generate will be 'clean' zero carbon energy.

6.6 Energy Performance Calculations

6.6.1 Methodology – Residential

Approved SAP 2012 software (Design SAP 2012 4.14r16) has been used to calculate *representative* energy demand models for all dwellings within the scheme, based on the available plans. The calculations demonstrate the environmental benefits associated with the 'fabric led' approach to energy demand and emissions reduction, which has been implemented in conjunction with efficient mechanical and electrical systems and on-site micro generation.

SAP software 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. A block compliance (multi dwelling) SAP report has been applied to demonstrate that the building in its entirety, meets Part L1A (2013) compliance requirements within one collective report (see Appendix A).

Representative SAP models have been calculated for each apartment type to provide a complete data set for all 75 residential units within the proposed scheme.



6.6.2 Regulated Energy Demand and Emission Calculations

The calculated Dwelling Emission Rate over Part L1A (2013) and thermal envelope Fabric Energy Efficiency performance associated with the proposed specification are presented in Tables 6.4 and 6.5 respectively.

Table 6.4 – Average Regulated Dwelling Emission Rate

Average Dwelling DER (kgCO ₂ /m ² /yr.)	22.45
Average Dwelling TER (kgCO ₂ /m ² /yr.)	24.67
% DER Reduction over Part L 2013	9

The above calculation demonstrates that the Dwelling Emission Rate (DER; carbon dioxide emissions) for the residential elements of the scheme will secure an approximate 9% betterment over Part L1A (2013) standards.

Table 6.5 – Average Fabric Energy Efficiency

Average Dwelling DFEE (kWh/m ² /yr.)	35.20
Average Dwelling TFEE (kWh/m ² /yr.)	39.55
% DFEE Reduction over Part L 2013	11

The residential dwellings are expected to achieve a Dwelling Fabric Energy Efficiency betterment of at least 11% relative to the Part L compliance criterion.

These indicative SAP calculations demonstrates that the DER reduction for Parrs Wood scheme will provide an improvement over the Part L1A (2013) compliance standard as a consequence of the proposed enhanced fabric specification, efficient mechanical and electrical systems coupled with onsite micro generation.

6.6.3 Revised Carbon Factors

SAP 10.1 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 6.6.

Table 6.6 - 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)	0.136



- It can be seen that the revised carbon factors to be applied in the forthcoming SAP 10.1 software are c.74% 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 36% 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 10.1 emission factors in this context are used to demonstrate performance against planning policy targets only and, as such, are 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 SAP 10.1 may be applied to these results, using the outputs from current compliance calculations which are then manually converted for the revised SAP 10.1 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 10.1 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 6.7 – Calculated Regulated Dwelling Emission Rates – SAP 2012 and SAP 10.1 Data

	SAP 2012 Data	SAP 10.1 Data
Dwelling DER (kgCO ₂ /m ² /yr.)	22.66	5.9

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 5.9kgCO₂/m².

In line with the MCC Climate Change Framework, this development has the capability to take maximum advantage of the de-carbonised 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.

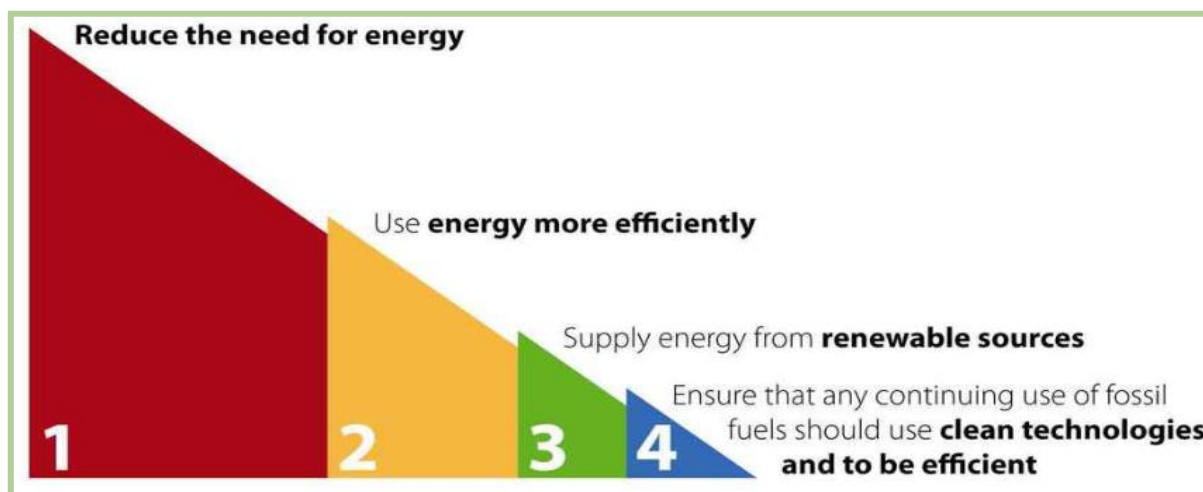
6.7 Energy Hierarchy

The scheme will incorporate an enhanced material specification along with high quality design and construction standards in order to improve energy efficiency through a 'fabric led' energy strategy. The proposed construction, design and specification will deliver a scheme that is 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 reduction strategies. The hierarchy prioritises demand-side activities to reduce wastage and improve efficiency (see Figure 6.1).



Figure 6.1 – The Energy Hierarchy



First Principle

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

- The entire building will be constructed 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, including good levels of insulation and low u values;
- The insulated distribution pipework will minimise energy losses from the hot water systems, often referred to as 'standing losses' within the dwellings. Furthermore, the dwellings are designed to not require active cooling;
- The design air permeability target for the scheme is $4.0\text{m}^3/\text{hm}^2$ (@50Pa.). This low air permeability target will minimise any uncontrolled ventilation and assist to limit heat loss through the structure of the build; and,
- The g value of the glazing within the development will be optimised 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 '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.

Second Principle

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 development is used efficiently. Heat emitters within the dwellings will be provided allowing occupants to control the heating system within their flats independently for maximum flexibility;
- Hot water in the dwellings will be separately programmable and high efficiency cylinders with low standing losses will be specified;
- The apartments will be designed to not require active cooling;



- Mechanical ventilation with heat recovery or Mechanical Extract Ventilation systems are specified within each dwelling to further reduce energy demand; and,
- 100% LED provision and sophisticated control systems will be incorporated throughout the development. 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

As per the third principle of the Energy Hierarchy:

- Photovoltaic arrays will be integrated on the flat roof of the Building to reduce the carbon dioxide emissions associated with the occupied development.

Fourth Principle

The remaining space and water heating demand of the dwellings will be met by electric panel and immersion heaters (100% efficient). This will ensure that fossil fuels consumed by the National Grid 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.

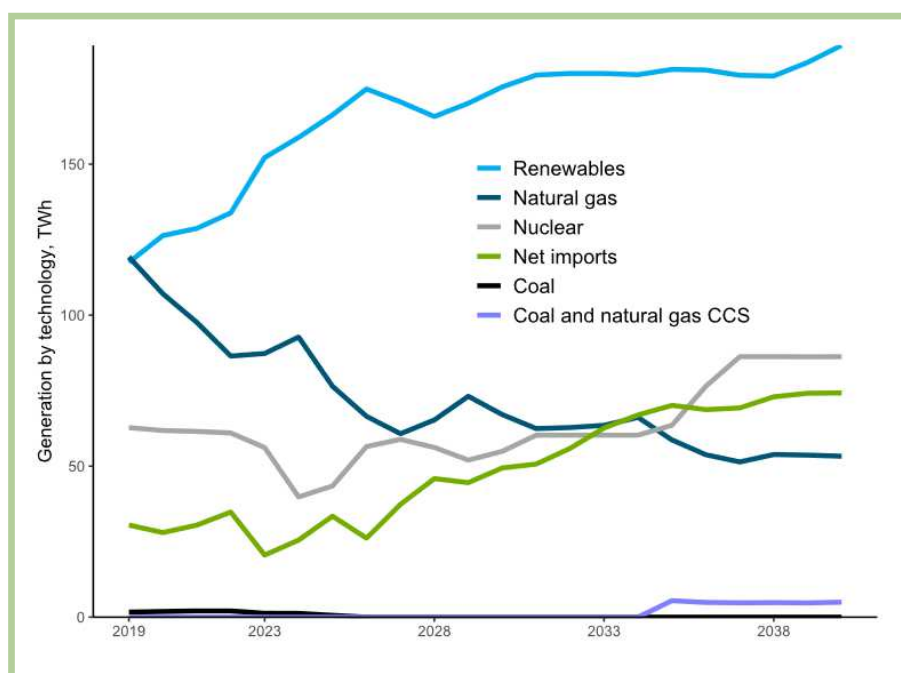


7. CLIMATE CHANGE EMERGENCY

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 carbon dioxide emission reductions and renewable energy generation in line with the Energy Hierarchy:
 - In securing compliance with the current, 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;
 - A commitment is made to achieving at least **9% 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 to 83% by 2040. As the UK electricity grid CO₂ footprint continues to reduce (see Figure 7.1 sourced from BEIS Energy and Emissions Projections 2019), 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); and,

Figure 7.1 - Energy and Emissions Projections 2019 (BEIS)



- Calculations to demonstrate the benefits associated with decarbonisation of the grid have been prepared (see Section 6.6.3), with specific reference to the revised SAP10.1 carbon factors. This proves that the fully electric strategy will, in reality, improve upon Manchester’s GMSF emerging policy, interim emissions target of -19% relative to Part L 2013.
- Unregulated energy demand (that is, the energy demand associated with 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 limit to fabric enhancements such as increased insulation and improved air tightness as this generates a higher overheating risk and, as a consequence, the building would generate cooling loads. The design of the residential elements will balance both requirements and incorporates a building specification intended to avoid cooling requirement and the associated wasted energy in producing cooled air. Thus, through the integration of passive design measures such as the specification of the window g-value, the dwellings will not require active cooling, which further limits the energy demand of the development.
- Waste is a misuse of natural resources and also contributes a large proportion of the UK's carbon footprint;
 - Waste minimisation during construction will reduce raw materials demand, thereby reducing the building's embodied carbon footprint; and,
 - During occupation, the building will benefit from recycling facilities to enable the local authority to achieve waste reduction targets, diverting more materials away from landfill and reducing the occupant's carbon footprint further.
- The site's location will enable low carbon, sustainable lifestyles. Located minutes away from several bus stops, a train station and Metrolink stop, the residents have the option to utilise various sustainable modes of transport. This is facilitated by:
 - Basic infrastructure provided such as secure cycle storage on site in addition to a number of EV charging ports;
 - Travel options, including local access to transport nodes for bus, rail and Metrolink; and,
 - Local amenities that are within easy walking distance of the site, enabling residents to live local with a reduced need to travel.
- The dwellings 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 will include active sensors;
 - Heating controls will allow residents more flexibility in controlling their heating, helping to keep heating costs down, and thus carbon emissions to a minimum;
 - The fit-out specification of the dwelling 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 to <110litres/person/day. This will reduce water heating energy loads and also cut the process energy required to supply clean drinking water; and,
 - Mechanical ventilation with heat recovery systems will passively recover waste heat energy from the expelled stale air, reducing heating energy loads in the dwellings.

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.



8. CONCLUSION

This statement has reviewed the environmental performance of the proposed development site at Tesco Car Park, Parrs Wood Lane, East Didsbury, Manchester M20 5NP, against national and local policies. The material specification and servicing strategy for the scheme and the building (carbon dioxide) emission rates have also been reviewed.

Energy Strategy –

Full compliance with the key criteria of the Manchester Core Strategy have been achieved by the proposed energy strategy while responding to MCC's declaration of a Climate Emergency, as follows:

- These proposals will deliver a scheme that accords with the adopted Core Strategy Policy EN 4, EN 6 and the Supplementary Planning Document (SPD) criteria. The development will be designed and specified in accordance with the principles of the energy hierarchy and will achieve the following:
 - The indicative SAP calculations show that building specification is expected to achieve an approximately 9% betterment in dwelling emissions over Building Regulation Part L1A (2013); and,
 - The Dwelling Fabric Energy Efficiency (DFEE) reduction for the dwellings is at least 11% better than the Part L1A (2013) compliance standard through enhanced fabric measures.
- In accordance with CS Policy EN 8, minimising the impacts of climate change is a key element of the proposed design. Further reducing the carbon emissions that arise as a consequence of the occupied development, the proposals include for:
 - An array of PV panels for on-site micro-generation;
 - Heat recovery systems to further reduce energy demand; and,
 - As a consequence of the decarbonised status of the UK's electricity grid, the actual emissions are 74% lower than the current out-of-date carbon factors used for building regulation compliance purposes. In line with Manchester City Council's Climate Change Framework, this development will take advantage of the decarbonating status of the electricity grid with its full electric heating strategy, ultimately facilitating a 'near-zero' or zero carbon scheme, as the grid mix electricity supply is decarbonised over time.

This approach to reducing energy demand responds positively to the council's climate emergency objectives and will help to deliver a scheme that is inherently efficient and cost-effective during occupation.

Sustainability Performance -

The key issues of Manchester City Council's Supplementary Planning Document (Environmental Standards) in accordance with the Core Strategy Policies, and specifically Core Strategy Policy DM 1, have been achieved by the proposals. These are as follows:

- Water consumption of the development will be minimised. The internal water strategy will exceed the regulatory standard specified to achieve a calculated daily consumption of <110litres/person/day through the specification of efficient water fixtures.
- The development site is located within Flood Risk Zone 1. The site drainage strategy will be designed to withstand a 1 in a 100-year storm event plus an allowance for climate change. Post development surface



water run-off rates will be limited to at least 50% of the existing surface-water brownfield runoff rates through SuDs and/or onsite attenuation. This accords with CS Policy EN 8.

- Waste arising during construction and occupation/operation will be minimised. A site waste management plan will be adopted during construction and a comprehensive waste management plan for the site will accord with the local authority recycling scheme ensuring that adequately sized bin storage areas for the site are provided.
- 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. A commitment will be made to minimise waste and pollution.
- The impact of sound upon the development will be mitigated by the design/specification of the buildings including; enhanced levels of double glazing for specific road-facing facades plus mechanical ventilation with heat recovery systems for all apartments coupled with purge venting. Sound insulation will be specified to comply with acoustic performance compliance standards and mitigation measures will be implemented, where required, to reduce the noise arising from the residential development. Issues surrounding AVO have been assessed to ensure that all necessary targets are reached while ensuring occupant comfort is achieved.
- Materials are proposed to be responsibly sourced, 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 declared Climate Emergency.
- Enhancing the health and wellbeing of residents, all apartments are provisioned with private balconies.
- The development proposals are on a pre-developed site that currently has little ecological value. The proposals will include soft landscaping to provide an enhancement to both the ecological and aesthetic value of the site to secure a measurable, net gain in biodiversity.
- In accordance with CS Policy T1, the highly sustainable location of the scheme in combination with the development proposals will encourage the use of more sustainable forms of transport. The development will be provided with a significant number of cycle storage spaces and up to 33 car parking spaces to support the residential development. There will be capacity to provide 20% of all parking spaces (and an additional 80% passive parking spaces for future use) with electrical vehicle charging points to facilitate the increasing, widespread transition to electric car usage.

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

- The proposal includes the redevelopment of a previously developed site and represents a very efficient use of land; and,
- Exceeding the regulatory compliance criteria (Part L1A and L2A) will assist in lessening the impact of this development on the environment by the way of reducing carbon emissions.

In conclusion, the proposals reviewed within this statement for the scheme at Tesco Car Park, Parrs Wood Lane, East Didsbury, Manchester M20 5NP, will deliver a high-quality and efficient development that accords with the guidance provided within the Manchester City Council's adopted policies.



Appendix A – Home Quality Mark One Pre-Assessment



Parrs Wood, East Didsbury

Home Quality Mark

Initial Pre-Assessment Strategy

23rd September 2021



Introduction

The below table provides a provisional strategy such that a HQM Level 4 rating can be achieved for the residential properties at Parrs Wood - equivalent of BREEAM Excellent. A minimum of 48% of credits are required to meet the Level 4**** HQM rating.

Key	RIBA sensitive credits
	Credits scoped out

Potential Score	Credits Targeted
51.80%	259 / 500
Level 4* (>48%)	

Risks / Modifications

Some credits present a level of risk, as performance objectives are set that can only be met following detailed design, or are awarded based on performance on site. Some credits require modifications or changes to current project specifications that have costs associated with them.

Where issues of this nature are identified, they have been assigned **MEDIUM** or **HIGH** risk / impact status. All other credits are assigned as **LOW** risk.

Risk status will be up / downgraded as detailed design and construction progresses such that evidence is provided to confirm compliance or otherwise.

Issue					Comments
OUR SURROUNDINGS					
Transport and Movement					
Public Transport Availability					
01 - Accessibility Index	Assessor	12	12	L	It is assumed that following a full review of all buses local to the development, an accessibility index (AI) of up to 16.41 will be achieved. This will depend on the location of each dwelling within the development, in relation to existing / new public transport nodes. The site benefits from excellent sustainable access opportunities and is located minutes away from bus, rail and tram public transport nodes.

Issue					Comments
02 - Improved local service	Transport Consultant	3	0	n/a	It is assumed that Transport Companies will be contacted and an increase in the local service provision for the development will be negotiated, which results in an increase in the existing AI score of at least 1.00. Contracts will be put in place to ensure that the increased service provision will be in place for a minimum of 5 years following occupation of all homes.
Sustainable Transport Options					
01 - Home information	Architect / Developer	Pre-req	Pre-req	L	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.
02 - Cycle Storage	Architect / Developer	6	3	L	Where cycle storage is provided for individual homes or in a communal setting, credits can be awarded based upon the size of the home and the number of cycle spaces provided. Accomodation schedule for Parrs Wood as follows: 1 bed = 28 Units (14 spaces required) 2/3 beds = 60 Units (60 spaces required) Requirement for 3 credits: Studios/ 1 Bed = 1 cycle space for every 2 homes 2/3 Bed = 1 cycle space per home 4 bed and above = 2 cycle spaces per home Requirement for 6 credits: Studios/ 1 Bed = 1 cycle space for every home 2/3 Bed = 2 cycle spaces per home 4 bed and above = 2 cycle spaces per home 88 cycle parking spaces provided at Parrs Wood. A total of 74 cycle parking spaces is needed to secure 3 credits.
03 - Cycle networks	Architect / Developer	4	0	M	During preparation of the brief, the design team consult with the local authority on the state of the local cycling network and identifies improvements the development could make. The design team has agreed to and will implement one improvement chosen with the local authority. The improvement chosen is additional to existing local plans. The home is connected to a safe cycle route via a safe pedestrian route. A compliant cycle route should meet one or more of the following: 1. Cyclists can share the road with vehicles on single track roads. 2. Cyclists can share the road with vehicles on roads with low traffic volumes and speeds (20mph). 3. Shared cyclist and pedestrian routes need to be a minimum of 3m wide. 4. Dedicated cycle lanes (segregated or unsegregated from roads), with one-way cycle lanes being a minimum of 2.2m wide and two-way cycle lanes a minimum of 3m wide)

Issue					Comments
04 - Electric vehicle charging points	Architect / Developer	4	1	M	Up to 4 credits can be awarded where electric vehicle charging points (EVCs) are provided for private parking or there is charging infrastructure in place in Communal Parking - communal EVC score and associated credits spaces. Minimum of 10% of parking spaces must have EVCP installed, additional EV charging points and/or infrastructure for fast charging must be installed to gain any credits here Assuming that a 10% EV charging provision will be provided, infrastructure for fast charging ports would need to be provided for the following credits: All EV ports must be a minimum capacity of 7kW (1 credit awarded)
05 - Car Clubs	Architect / Developer	3	0	M	It is assumed that a Car Club / Lift Sharing Scheme will be set up on a website, with information on this provided in the introductory pack. Two credits can be awarded where a compliant Car Club is within 650m of the home via a safe pedestrian route. Car clubs should have the following features: –Cars can be rented by the hour and day. –Fuel and insurance are included. –They benefit from self-service reservation, pick-up, and return. –Available 24hr. –Dedicated parking space. –Have, or will have by the time the development is complete, sufficient provision of cars to cater for the expected demands of the whole development. Potential uplift credits (1No.) - One further credit can be awarded where at least 60% of the vehicles available from the compliant Car Club are hybrid or electric vehicles.
Local Amenities					
01 - Key Local Amenities	Assessor	11	11	L	The following amenities are located within 650m of the homes via safe pedestrian routes: - Supermarket - ATM - Pharmacy
02 - Beneficial Local Amenities	Assessor	5	5	L	Assuming criteria 1 above has been achieved, the following amenities are located within 1.5miles of the homes via safe pedestrian routes: - School - Large scale retail
Outdoors					
Identifying Ecological Risks and Opportunities					

Issue					Comments
01 - 04 - Identifying Ecological Risks and Opportunities	Ecologist	7	6	M	It is assumed that a suitably qualified ecologist will be appointed before the design brief (typically RIBA Stage 1 or equivalent), to provide advice to ensure that at least 6 of the 7 available credits are achieved in this area. Survey and evaluation must be carried out to determine the ecological baseline of the site taking account of the zone of influence. - E3P Limited have carried out a Preliminary Ecological Appraisal of the site as a baseline assessment and has responded to the criteria, as follows: 1. Current and potential ecological value, and condition of the site and related areas within the zone of influence - Partially, the ecologist would need to provided an addendum to the report to provide a measurable current and potential ecological value 2. Direct and indirect risks to current ecological value - Yes 3. Capacity and feasibility to enhance the ecological value of the site and, where relevant, areas within the zone of influence. - Yes This will require the incorporation of all high priority and desirable recommendations agreed with the Ecologist. Project team and stakeholders must identify, appraise and agree actions for the project that will achieve optimal ecological outcomes in line with the minigation hierarchy of action. Wider site sustainability related activities and the potential for ecosystem service related benefits will also be considered but credits hvae been awarded for this last criteria.
Managing Impacts on Ecology					
01 - 03 - Managing Impacts on Ecology	Ecologist	9	9	M	Roles and responsibilities must be clearly defined, allocated and implemented, at an early stage (typically RIBA Stage 2) in order to influence the concept design. Site preparation and construction works must be planned for and implemented early enough to deliver the actions for achieving optimal ecological outcomes agreed in issue - Identifying Ecological Risks and Opportunities. The project team must have liaised and collaborated with representative stakeholders, taking into consideration data collated and shared, have implemented actions. It is assumed that there will be no overall loss of ecological value to achieve 9 credits.
Ecological Change and Enhancement					
01 - 04 - Ecological Change and Enhancement	Ecologist	12	10	M	2 credits can be awarded if at least 75% of the proposed development's footprint is on an area of land which has previously been occupied. 2 credits can be awarded where the project team must liaise with representative stakeholders, and implemented actions to enhance the site's ecological value as per the recommendations of the SQE. <u>Data collated must be provided to the local environmental records centres nearest to or relevant for the site.</u> It is assumed that the project team liaised with representative stakeholders, and implemented actions to enhance the site's ecological value and that there was a net gain in ecology (as per the recommendations of E3P) - 6 further credits awarded.

Issue					Comments
Long Term Ecological Management and Maintenance					
01 - 05 - Long Term Ecological Management and Maintenance	Ecologist	8	4	M	To continue to monitor, manage and maintain the site and its biodiversity and ecological features to achieve the intended outcomes for the long term, an appropriate management plan will be put in place for the landscape and ecology accessible to the assessed home. The plan must cover at least the first five years after project completion in accordance with BS 42020:20131 Section 11.1.
Recreational Space					
01 - Home information	Architect / Developer	Pre-req	Pre-req	L	It is assumed that home information will be provided to residents
02 - Accessible Recreational Space	Architect / Developer	4	4	L	All homes need to be within within 1km of a green park space / woodland over 1ha in area - Fletcher Moss Park is within radius and is compliant with this criteria.
03 - Private Space	Architect / Developer	6	0	n/a	All dwellings to have suitably sized private balconies / gardens, as follows: - One bed flats 5m2 area, at least 1.5m deep; - Add an extra 1 m2 per extra bedroom in dwelling.
04 - Communal Space	Architect / Developer	7	7	M	The homes must be within close proximity to communal space (50m or less) to achieve these credits. Credits are awarded based on the following: Total GDA at Parrs Wood = 2,722m2 Communal space = 434m2 (communal landscaped courtyard) plus community use space (65m2) = 499m2 (18.3% of total GDA) 4 credits = 5% of the total GDA 7 credits = 7.5% of the total GDA (7 credits awarded)
05 - Growing Space	Architect / Developer	5	0	n/a	It is assumed that growing space will not be provided
Safety and Resilience					
Flood Risk					
01 - Flood Risk Assessment	Civil Engineer	minimum requirement	minimum requirement	L	It is assumed that a site-specific Flood Risk Assessment and Drainage Strategy Report has been prepared detailing the methods for removal of surface water in accordance with the hierarchy outlined in Building Regulations Part H. According to data provided by the Environmental Agency, the site is located within a low flood risk zone (zones 1) . <i>It is assumed that the flood risk of the new home is communicated to the purchaser of the home before they make a decision on whether to buy the home.</i>
02 - Flood Risk	Civil Engineer	19	19	L	According to data provided by the Environmental Agency, the site is in a LOW Flood Risk Area therefore maximum of 19 credits can be awarded. The flood risk assessment or flood consequence assessment must take all current and future sources of flooding into consideration . The ground level of all habitable parts of the home and access to both the site and homes, are designed so that they are at least a 600mm threshold above the design flood level of the flood zone.

Issue					Comments
Managing the Impact of Rainfall					
02 - Managing the rate and volume of run-off (Comprehensive route)	Civil Engineer	14	9	M	A site-specific Flood Risk Assessment and Drainage Strategy Report has been prepared. The maximum peak surface water runoff rates from the buildings have been calculated using the modified rationale method and it is assumed that a 50% reduction has been applied. Therefore, drainage measures are specified to ensure that the peak rate of run-off from the site to the watercourses is no greater for the developed site than it was for either the pre-development site for 3 credits. (3 credits awarded). Drainage has been designed to ensure that surface water runoff for storm events up to and including the 100 year storm plus a 40% allowance for climate change. It is assumed that drainage design measures are specified to ensure that the post development volume of run-off, for the 100-year 6-hour storm event is no greater than it was for either the the pre-development site (6 credits awarded).
03 - Water Quality	Civil Engineer	3	0	n/a	Appropriate pollution prevention and treatment measures are designed and installed in surface water drainage systems in accordance with C753 The SuDS Manual.
04 - Designing for maintenance and operation	Civil Engineer/ developer	2	2	L	It has been assumed that agreements are to be put in place for the ownership, long term operation and maintenance of all SuDS for the design life of the development.
Security					
03 - Security needs assessment	Architect / Security Specialist	Pre-req & Minimum Requirement	Pre-req & Minimum Requirement	M	A Suitably Qualified Security Specialist (SQSS) conducts an evidence-based Security Needs Assessment (SNA) during or prior to early design stages (typically RIBA Stage 2 or equivalent). The homes must be compliant with Approved Document Q
04 - Security needs assessment	Architect / Security Specialist	9	4	M	A suitably qualified Security Specialist is being consulted, to develop a set of recommendations during the Concept Design Stage, based on a Security Needs Assessment. These recommendations will ensure that the design of buildings, public and private car parks have been planned, designed and specified to address the issues identified. It is assumed that 50% of the recommendations or solutions proposed by the SQSS will be implemented (4 credits awarded)

Issue					Comments
MY HOME					
Comfort					
Indoor Pollutants					
03 - Minimising the effects of cooking	Architect / Main Contractor	2	2	L	It is assumed that: For naturally ventilated homes - in each kitchen, a cooker hood is provided that is extractive (discharge air outdoors) OR For mechanically ventilated homes - in each kitchen, a cooker hood is provided that is re-circulating It is also assumed that only cooking appliances with zero emissions from the fuel are specified (for example electric appliances).
04 - Minimising emissions from building product types	Architect / Main Contractor	4	0	n/a	Developer specification to include requirement that all paints, varnishes, wood based products, flooring materials, ceiling, wall and insulation materials, as well as interior adhesives and sealants to meet best emission limits, testing requirements and additional requirements listed in Table 17 of HQM manual. <u>This would require careful specification prior to tender, and enforcement of product choices, excluding 'or similar approved' substations.</u> 1 building product type = 1 credit 3 building product types = 2 credits All building product types = 4 credits
05 - Minimising airborne formaldehyde from all sources	Architect / Main Contractor	3	0	n/a	Formaldehyde sampling and lab analysis carried out by a ISO/IEC 17025 accredited organisation, in order to confirm best-practice VOC levels. The formaldehyde concentration in indoor air is measured post construction (but pre-occupancy) and does not exceed 0.1 mg/m ³ (100 µg/m ³), averaged over 30 minute. Where the building fails a test, remedial action followed by further testing would be required .
06 - Minimising airborne TVOCs from all sources	Architect / Main Contractor	3	0	n/a	Total volatile organic compounds sampling and lab analysis carried out by a ISO/IEC 17025 accredited organisation, in order to confirm best-practice VOC levels. Where the building fails a test, remedial action followed by further testing would be required.
Daylight					
01 - Average daylight factor (kitchens)	Architect	5	0	n/a	Targets to be set such that that daylight calculations will be carried out in accordance with BS8206-2 for all dwellings, to confirm that all kitchens achieve a 2% daylight factor. - Assumed to be non-compliant for majority of apartments but would require calculation procedure
02 - Average daylight factor (Living space)	Architect	5	0	n/a	Targets to be set such that that daylight calculations will be carried out in accordance with BS8206-2 for all dwellings, to confirm that all living rooms achieve at least 1.5% daylight factor. Would require calculation procedure for verification. Expected cost £3,500 to £4,000.
03 - View of sky	Architect	3	0	n/a	It is assumed that 80% of the working plane in each kitchen, living room, dining room and study receives direct light from the sky - worst case dwellings assumed to be non-compliant however requires calculation procedure.
Noise Sources					

Issue					Comments
01 - Internal Noise	Architect / Acoustician	2	0	n/a	Developer specification to include requirements for design and testing compliant with HQM to ensure credits are achieved for internal noise levels. Daytime: Habitable rooms and kitchens = 35dB / open plan kitchen/living room = 45dB Nighttime: Bedrooms = 30dB / kitchen & open plan kitchen and living room = 35dB
02 - External Noise	Architect / Acoustician	2	0	n/a	Criteria 1 must be met. Developer specification to include requirements for design and testing compliant with HQM to ensure credits are achieved for external noise levels. 55dB - 1 credit 50dB - 2 credits (currently sought)
Sound Insulation					
01 - Sound Insulation between homes and Sound Insulation levels for internal walls and floors	Architect / Acoustician	9	0	n/a	It must be demonstrated that the home achieves the targets set out in Table 22 for airborne sound insulation (both requirements 1 and 2) and impact sound insulation taking into account both separating walls and floors between homes either through: A programme of pre-completion testing by a Compliant Test Body in accordance with Methodology OR Where all relevant building elements have been registered with Robust Details Limited

Issue					Comments
Temperature					
01 - Home information	Architect / Developer	Pre-req	Pre-req	L	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.
02 - Temperature analysis	M&E	Minimum requirement	Minimum requirement	M	Thermal analysis must be carried out - A summary of the thermal analysis results and recommendations on the control of internal temperatures is provided for the use of the home occupant in line with the requirements in the home information issue.
03 - Temperature analysis route	M&E	17	11	H	Assumed that comprehensive route will be followed. It is assumed that the home is designed to limit the risk of overheating, in accordance with Section 4.3 of CIBSE TM59.
Ventilation					
01 - Information Sign	M&E	Minimum requirement	Minimum requirement	L	It is assumed that an information sign (written in plain English) is securely fixed to the rear of a boiler, meter or airing cupboard door (or another door of similar permanence) which meets the HQM requirements.
02 - Ventilation air intakes	M&E	4	0	n/a	It is assumed that the home's ventilation air intakes should avoid drawing in pollution in accordance with CIBSE TM21.

Issue					Comments
03 - Ventilation air intakes	M&E	5	Minimum requirement	n/a	No credits are targeted for this issue but it is assumed that the minimum requirements are met, as follows: Minimum requirement for MVHR ventilation rate = $0.35 \times \text{TFA}$ OR (which ever is the larger number) 1 bed (assumed occupancy of 2) = 15l/s 2 bed (assumed occupancy of 4) = 21l/s Minimum requirement for boost ventilaton rate = Kitchen - 14l/s Bathroom/utility - 9l/s WC - 7l/s To achieve 5 credits, the following fresh air rates will need to be achieved: - 1 bed, assumed occupancy 2, 15 l/s min. ventilation rate; - 2 bed, assumed occupancy 4, 21 l/s - 3 bed, assumed occupancy 6, 29 l/s - 4 bed+, assumed occupancy 8 + 2 additional occupants per additional bedroom, 37 + 8l/s per additional bedroom Plus, the following boost ventilation rates must be achieved for 5 credits: Kitchen - 15l/s Bathroom/utility - 10l/s WC - 8l/s
04 - Maintenance and controls	M&E	4	Minimum requirement	n/a	These credits can only be secured if mechanical ventilation systems are specified. If so, it is assumed that: a) Any required maintenance of any part of the ventilation system can be completed safely by the occupant. b) For mechanical continuous ventilation systems (e.g. MVHR, MEV), controls are provided that enable sufficient control of the background continuous ventilation rate to meet varying occupancy levels without having to enable 'boost' mode. Minimum requirements: A ventilation system that has the ability to be manually boosted in wet rooms by the home occupant when required OR A ventilation system that has the ability to automatically activate boost mode when there are increased humidity levels in wet rooms

Issue					Comments
Energy					
Energy and Cost					
01 - Home information	Architect / Developer	Pre-req	Pre-req	L	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.
02 - Energy Performance	Energy Assessor	40	22	M	Energy performance ratio generated via online assessment tool. HEPR of 0.5 has been achieved therefore 22 credits can be awarded - this is based on a typical mid-floor compliant dwelling within the scheme applying current Part L regs (2013) Assumptions made in energy assessment and reporting tool for appliances (as per guidance note 28): A/A+ rates white goods specified with at least the following energy consumptions: Washing machines: 166kWh/year Fridge: 162kWh/year Freezer: 362kWh/year Dishwasher: 294kWh/yr
03 - Towards carbon negative	Energy Assessor	6	0	n/a	The home must achieve a HEPR ≥ 0.9 and zero net regulated CO ₂ emissions therefore no credits can be awarded.
04 - Cost	Energy Assessor	14	1	M	This is the total cost of running the home, calculated using SAP 2012 default fuel costs, and with adjustments for annual inflation and the floor area of the home. It also takes into account energy generated by onsite renewables. The ECF of the actual home is compared to that of the notional equivalent, and this ratio is used as an input into the cost output. The credits are automatically awarded according to the outputs scored for cost. The home achieves 1 credit for this issue.
Decentralised Energy					
01 - Home information	Architect / Developer	Pre-req	Pre-req	L	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.
02 - Feasibility Study	Architect / Developer	Pre-req	Pre-req	L	It is assumed that a feasibility study is to be prepared by an appropriately qualified professional (AQP) to establish the most feasible recognised local (on-site LZCT or near-site LZCT) low or zero carbon (LZC) energy sources for the home or development, as well as any suitable infrastructure for future retrofit.
03 - Implimentation of Feasibility Study Findings - Infrastructure	Architect / Developer	4	0	n/a	Where the feasibility study confirms the installation of LZCTs is not currently a viable option, appropriate infrastructure is installed to allow the future retrofit of at least one LZCT, in accordance with the feasibility study recommendations.

Issue					Comments
03 - Implimentation of Feasibility Study Findings - Installation	Architect / Developer	8	8	L	PV are to be installed currently - energy has to be supplied to the individual homes NOT landlord areas
Impact on Local Air Quality					
01 - Impact on Local Air Quality	M&E	15	15	L	All heating and hot water within a home is supplied by non-combustion appliances such as appliances powered by electricity therefore 15 credits can be awarded.
Materials					
Responsible Sourcing					
01 - Responsible Sourcing of Construction Products	Developer / Main Architect / Contractor	Pre-req	Pre-req	L	It is assumed that all timber and timber-based products used in the buildings meet the definition of Legally harvested and traded timber
02 - Product procurement policy	Developer / Architect / Main Contractor	2	2	M	By the end of early design stage (typically RIBA stage 2 or equivalent) , the client or developer has a documented policy and procedure that : -Sets out procurement requirements for all suppliers and trades to adhere to relating to the responsible sourcing of construction products. - Is disseminated to all relevant internal and external personnel. - Is included within the construction contract to ensure that they are enforceable on the assessed project. - Encourages the specification of products with responsible sourcing certification over similar products without certification. This may be prepared and adopted at an organisational level or be site or project specific. It is recommended (but not a requirement) that the documented policy follows the principles of BS 8900-1:2013 (106) Managing sustainable development of organisations – Guide or BS ISO 20400:2017 (107) Sustainable procurement – Guidance. This policy may form a part of a broader Sustainable Procurement Plan or be in the form of a standalone document.

Issue					Comments
03 - Responsible Sourcing of Construction Products Assessment	Developer / Architect / Main Contractor	23	9	M	The Main Contractor will be required to achieve at least 15% of Responsible Sourcing points available under the HQM methodology to achieve 9 out of a possible 23 credits. This would limit the supply chain to suppliers who can provide the highest possible level of certification for their products e.g.: - Metals to CARES or BES6001 standards; - Concrete products to BES6001; - Aggregates, stone to BES6001; - Timber to FSC / PEFC; - Gypsum to BES6001; - Glass to ISO14001 for production AND extraction; - Foam insulation to BES6001; - Glass / stone wool insulation: ISO14001 for manufacture PLUS over 50% recycled content OR ISO14001 for extraction of any mineral over 20% of total raw material used; - Other materials: ISO14001 for manufacture PLUS ISO14001 for the main two raw materials.

Issue					Comments
Environmental Impact of Materials					
02 - Product procurement policy	Developer / Architect / Main Contractor	2	2	L	It is assumed that the Developer/Developer has a documented Sustainable Procurement Policy in accordance with BS 8900-1:2013 Managing sustainable development of organizations – Guide and/or BS 8903:20102 Principles and framework for procuring sustainably – Guide. This must be set out by the end of early design stage (typically RIBA stage 2 or equivalent). The policy must set out procurement requirements for all suppliers and trades to adhere to relating to the responsible sourcing of construction products ; to be disseminated to all relevant internal and external personnel.
02 - Product environmental information	Developer / Architect / Main Contractor	4	1	H	Where a range of products specified at the Design Stage (DS) and installed by the Post Construction Stage (PCS) are covered by verified EPD . Credits are awarded on the basis of the number of products covered across product categories. It has been assumed that at 4 (out of a possible 10) products specified will have verified Environmental Product Declarations (EPD).
03 - Building Life Cycle	Developer / Architect / Main Contractor	19	0	n/a	The home is assessed using the HQM Environmental Impact of Construction products tool . It is assumed that of the 7 credits available under the foundation route, at least 3 will be achieved (this equates to a homes impact benchmark of 150 per occupant).
Life Cycle Costing					
01 - Occupant's life cycle cost report	QS / Cost Consultant	6	6	M	1) A strategic level PD 156865:2008 compliant Life Cycle Cost Analysis at RIBA Stage 2 , updated at RIBA Stage 4 ; 2) A homeowners report, based on the most up-to-date LCC available to be provided prior to purchase of all dwellings to review costs / maintenance burdens. 3) A final homeowners report based on the final, Stage 4 LCC.
02 - Component level life cycle cost optimisation	QS / Cost Consultant	6	6	M	By the end of process stage 4/ RIBA stage 4 , a component level LCC appraisal (to PD 156865:2008)2 is carried out and appropriate examples are provided by the design team to demonstrate how the component level LCC optimisation has been used to influence building and systems design/specification .
Durability					
01 - Integral elements	Architect / Structural Engineer / Main Contractor	5	5	M	It is assumed that a detailed materials degradation report will be compiled to confirm the measures taken to protect the integral building elements This must be in accordance with the methodology section of HQM issue 21.
02 - Finishing elements	Architect / Structural Engineer / Main Contractor	2	2	M	It is assumed that a detailed materials degradation report will be compiled to confirm the measures taken to protect surface building elements at risk of cosmetic material degradation This must be in accordance with the methodology section of HQM issue 21. Criteria 01 must also be achieved

Issue					Comments
Space					
Drying Space					
01 - External Drying	Architect	1	0	n/a	No external drying facilities are provided.
02 - Internal Drying	Architect	2	1	L	Installation of tumble drier prior to handover (At least A+ rated EEC and B rated Condensation Efficiency Class) = 2 credits Installation of washer dryer prior to handover (At least A rated) = 1 credit (currently assumed)
Access and Space					
01 - Home information	Architect / Developer	Pre-req	Pre-req	n/a	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.
02 - Nationally described space standards	Architect	5	5	M	The development meets the nationally described space standards - All dwelling meet these standards AND Where the built in storage provided shows an improvement over the requirement stated in Technical Housing Standards – Nationally Described Space Standards by 0.5m² - All dwelling meet these standards
03 - Accessible and adaptable design	Architect	3	0	n/a	The internal functional space and external space associated with the home meet the requirements of the Building Regulations in Approved Document M - Access to and use of buildings Category 2 OR Approved Document M, Category 3 - Wheelchair user dwellings, where required by the local authority. An Accredited Access Consultant is appointed prior to early design stages (typically RIBA Stage 2 or equivalent). The Accredited Access Consultant advises on Nationally recognised design guidance relating to accessible and inclusive design (that meet every day needs and long term demands) with regard to the Internal functional space and External space aspects of the home. They: - Conduct an assessment and provide advice on the concept AND detailed design stages (typically RIBA Stage 2 and 3 or equivalent). - Communicate and agree necessary changes within the design team where the assessment shows requirements are not fulfilled.
04 - Accredited access consultant confirmation	Architect	3	0	n/a	The Accredited Access Consultant confirms that the homes have been built following the advice given in criteria 03 - Accessible and adaptable design according to the level of assurance they deem required based on the nature of the development

Issue					Comments
Recyclable Waste					
01 - Home information	Architect / Developer	Pre-req	Pre-req	L	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.
02 - Consultation with the waste collection authority	Architect	2	2	L	It has been assumed that the waste facilities provided have been designed in consultation with the waste collection authority for the scheme, identifying: 1. number of recyclable streams (including composting) 2. type and size of waste collection containers (e.g. dedicated wheelie bins, boxes, communal bins etc.)
03 - Internal waste storage	Architect	5	5	L	It is assumed that: 1) Internal storage of a total of 30 litres will be provided for recyclable waste in homes with one and two bed. Three or more bed homes will be provided with 40 litres. 2) Internal food waste storage will also be provided with a minimum 10 litre storage volume, and the waste collection authority will provide a food waste collection service.
4 - Internal waste storage	Architect	3	0	n/a	It is assumed that no composting facilities are provided
Water					
01 - Water efficient fittings	M&E / Architect	11	8	L	It is assumed that the development meets the optional fittings standard set by the optional water efficiency requirement in the water efficiency standards in the Building Regulations Approved Document Part G to achieve a modelled water consumption of less than or equal to 110 litres per person per day. It is confirmed that at all of the following requirements to apply to sanitary ware and kitchen equipment: - WCs ≤ 4/2.6 litres dual flush - Showers ≤ 8L/min - Baths ≤ 170 litres - Basin taps ≤ 5L/min - Kitchen Sink taps ≤ 6L/min - Dishwashers ≤ 1.25L/place setting - Washing machines ≤ 8.17L/kilogram
02 - Water Recycling	M&E / Architect	6	0	n/a	Criteria 1 must be met. No rainwater or greywater recycling systems specified.
Delivery					
Quality Assurance					
Project Preparation					

Issue					Comments
01 - Feedback from previous projects	M&E / Main Contractor	4	4	M	Where it is demonstrated that lessons learnt from previous projects have been incorporated into the assessed home following the process set out in the Methodology. During design brief (typically RIBA stage 1 or equivalent) an outline delivery plan has been developed which is kept up to date as the project progresses.
02 - Project delivery plan	M&E / Main Contractor	Minimum Requirement	Minimum Requirement	M	Before detailed design has started (typically RIBA stage 3 or equivalent) the Project delivery stakeholders have met to discuss: 1. Project design and client requirements with regards to meeting HQM compliance. 2. Roles responsibilities and roles and the contribution of each member of the project delivery team to meet the above. 3. HQM performance targets to be achieved
03 - Product procurement and substitution policy	M&E / Main Contractor	Minimum Requirement	Minimum Requirement	L	The client or the principal contractor has a product procurement policy that sets out performance requirements for products and specifications to be procured for the assessed project. The procurement policy should also set out instances where substitutions will be allowed and what should be taken into account when considering substitutions.
04 - Dissemination of information	M&E / Main Contractor	Minimum Requirement	Minimum Requirement	L	Processes are in place to ensure communication of the project delivery plan and Key considerations to all relevant trades (for example via toolbox talks, briefings, meetings, BIM, graphic examples of good workmanship on-site) as appropriate for their specific involvement
05 - Site worker feedback	M&E / Main Contractor	2	2	L	It is assumed that the client or the principal contractor has a documented policy and procedure in place to enable staff to make protected disclosures.

Issue					Comments
Commissioning and Testing					
01 - Commissioning building services and control systems	M&E / Main Contractor	Minimum Requirement	Minimum Requirement	n/a	It is assumed that a specialist commissioning manager will be appointed to manage commissioning in accordance with best practice for the following systems: a. Hot water b. Heating c. Ventilation (e.g. MVHR) d. Comfort cooling e. Low and zero carbon technologies.
02 - Fabric pre-testing	Developer / Masterplan Design Team / Project Design Team	4	0	n/a	A member of an appropriate body has been appointed to: 1. Determine the appropriate inspection and pre-testing methods for the site, using their professional discretion in line with the Methodology section and their professional body best practice guidance. 2. Provide quality assurance of the assessed home's fabric performance, including continuity of insulation, through inspection and air permeability testing, after the Primary air barrier is complete and while it is still accessible 3. Outline recommendations to help meet the designed fabric performance standards at post-construction. 4. Broaden the sample size and carry out additional pre-testing of more homes if there is evidence of potential causes for the air test targets not being met for other dwelling types, which may affect other units not tested. Credits awarded depending on the proportion of homes that are inspected and tested. <u>10% of the homes are inspected and tested therefore no credits can be awarded.</u>
03 - Post-construction testing	Developer / Masterplan Design Team / Project Design Team	7	0	n/a	A thermographic survey to ATTMA standards will be carried out by a Level 2 qualified thermographer, pre-completion, to provide quality assurance in the following areas: a. Air leakage paths (3 credits) b. Continuity of insulation and avoidance of thermal bridging (4 credits) c. Air leakage paths, continuity of insulation and thermal bridging (7 credits)
Inspections and Completion					
01 - Visual defects inspection	Developer / Masterplan Design Team / Project Design Team	Minimum Requirement	Minimum Requirement	L	An appropriately qualified person, who is independent from site activities has: 1. carried out a visual defects inspection of all the aspects in the visual defects inspection table 2. Identified, monitored and reported on any remedial work that is needed, to the developer or client. 3. Ensured the home is finished and habitable in line with the HQM requirements <i>The results of the visual defects inspection and any outstanding remedial work are reported and given to occupants before they move in as part of their home information.</i>

Issue					Comments
02 - Construction inspections	Developer / Masterplan Design Team / Project Design Team	Minimum Requirement	Minimum Requirement	L	An appropriately qualified person is based on-site and has done the following, as a main part of their role: 1. Outlined and agreed the strategy, roles and responsibilities for meeting the 02 Construction inspections criteria, as part of the activities in the 'project delivery plan' criteria. 2. Carried out systematic and scheduled inspections of build quality for all assessed homes at key stages throughout construction and ensured they comply with the home's required performance characteristics 3. Ensured any design variations or materials substitutions are appropriately managed and approved by an appropriate member of the design team or the client.
03 - Construction record	Developer / Masterplan Design Team / Project Design Team	Minimum Requirement	Minimum Requirement	L	Where an Appropriately qualified person has been appointed to ensure a Construction record is kept throughout the construction stage that demonstrates the quality assurance measures taken to meet the home's required performance characteristics.
04 - Right to inspect	Developer / Masterplan Design Team / Project Design Team	2	2	L	Potential owners of the home are given the right for them, or their own independent representative (not provided or recommended by the developer), to carry out their own, non-invasive, visual inspection or snagging check. The home's specification and construction record is available to the potential owner or their representative carrying out the inspection. Any snagging issues, defects or inconsistencies with the home's specification that are identified by the visual defects inspection are resolved within 28 days after completion of the property purchase.
05 - Feedback dissemination	Developer / Masterplan Design Team / Project Design Team	1	1	L	The Appropriately qualified person for the 02 Construction inspections criteria provides feedback on any lessons learnt and examples of good practice, regarding quality assurance from activities on the assessed site, to the developer, client, consultants and designers, to inform future projects.
06 - Third party verification	Developer / Masterplan Design Team / Project Design Team	5	5	L	The appropriately qualified person appointed to carry out the role in the 02 Construction inspections criteria is an Independent third party.
07 - Early inspection visit	Developer / Masterplan Design Team / Project Design Team	4	4	L	A contracted commitment is in place for a visit to be made, between four and six weeks after occupants have moved in to inspect the active systems, rectify any problems and adapt any systems to reflect occupant usage patterns and individual preferences as appropriate.

Issue					Comments
08 - Seasonal inspection visit	Developer / Masterplan Design Team / Project Design Team	4	0	n/a	A contracted commitment is in place for a visit to be made, between 8 and 12 months after occupants have moved in to inspect the active systems, rectify any problems and adapt any systems to reflect occupant usage patterns and make any adjustments or provide occupants with guidance to ensure the home and its systems are performing as expected throughout the year, allowing for seasonal variation. Furthermore, residents must be offered to check heating bills and take action to investigate and ensure homes are performing in line with their design intent as well as offered to align any inspection visits with visits required for meeting criteria for the 11.4 Post Occupancy Evaluation issue, as appropriate.

Issue					Comments
Construction Impacts					
Responsible Construction Practices					
01 - Responsible Construction Management	Main Contractor	5	5	L	The Main Contractor will be required to evaluate the risks (on site and off site), plans and implements actions to minimise the identified risks, covering the following, where appropriate: - Vehicle movement - Pollution management - Health and wellbeing - Security processes - Training, awareness and feedback - Monitoring and reporting <u>This could be verified via certification with the Considerate Constructors Scheme - The Main Contractor will be required to achieve a score of at least 35 under the CCS, with no section below a score of 7.</u>
Construction Energy Use					
01 - Contractor's energy efficiency checklist	Main Contractor	2	2	L	The Main Contractor will be required to complete the HQM Contractor's Energy Efficiency Checklist with a full record of decisions actions or justifications for all points.
02 - Energy monitoring and reporting	Main Contractor	2	2	L	The Main Contractor will be required to complete monitor and report on the following energy uses: - Plant and Equipment - Site Cabins. This will include both electricity and fuel.
03 - Weekly detailed monitoring and reporting of metered energy use	Main Contractor	1	1	L	Conduct the monitoring and reporting of data in criteria 02 - Energy monitoring and reporting on a weekly basis.
Construction Water Use					
01 - Contractor's water efficiency checklist	Main Contractor	2	2	L	The Main Contractor will be required to complete the HQM Contractor's Water Efficiency Checklist with a full record of decisions actions or justifications for all points.

Issue					Comments
02 - Water monitoring and reporting	Main Contractor	2	2	L	The Main Contractor will be required to complete monitor and report on potable water consumption with regards to the following:: - Plant and Equipment - Site Cabins.
03 - Weekly detailed monitoring and reporting of metered water use	Main Contractor	1	1	L	Conduct the monitoring and reporting of data in criteria 02 - Water monitoring and reporting on a weekly basis.
Site Waste Management					
01 - Product procurement policy	Main Contractor	1	1	L	It is assumed that the Project Procurement Policy will set requirements for waste minimisation.
02 - Construction resource efficiency	Main Contractor	8	0	n/a	A pre-demolition audit of any existing buildings, structures or hard surfaces to be demolished is completed, if feasible The Main Contractor will be required to meet the following targets, demonstrated via a formal Resource Management Plan. Credits can be awarded where construction waste related to on-site construction and dedicated off-site manufacture or fabrication (excluding demolition and excavation waste) meets, or is lower than, the following benchmarks: -8.5 tonnes per 100m2 = 2 credits -4.9 tonnes per 100m2 = 4 credits -2.9 tonnes per 100m2 = 6 credits -1.9 tonnes per 100m2 = 8 credits
03 - Diversion of construction waste from landfill	Main Contractor	4	2	M	The Main Contractor will be required to meet the following targets, demonstrated via a formal Site Waste Management Plan : - 2 credits = 80% by weight of construction waste diverted from landfill and 90% by weight of demolition waste diverted from landfill (currently assumed waste diversion) - 4 credits = 90% by weight of construction waste diverted from landfill and 95% by weight of demolition waste diverted from landfill;
04 - Diversion of excavation waste from landfill	Main Contractor	3	0	n/a	Maximum credits have been achieved from crit 8 and at least 95% (either by volume or tonnage) of excavation waste is diverted from landfill.

Issue					Comments
Customer Experience					
Aftercare					
01 - Building warranty	Main Contractor / Developer	Minimum requirement	Minimum requirement	L	The Building must be covered by a Building Warranty, from a provider who is a member and fully complies with 'The Consumer Code for Home Builders.'
02 - Handover Visit	Developer / Main Contractor	Minimum requirement	Minimum requirement	L	Where a contracted commitment is in place for the following to be met, as agreed with the first occupants before or after they move in (within 4 weeks):
03 - On-call support	Developer / Main Contractor	4	3	M	Where a contracted commitment has been made to provide on-call support, to the occupants of the home being assessed, which meets the following: 1. Covers all parts of the home (i.e. all building fabric, systems and services). 2. Is available for the whole duration of time specified in the criteria. 3. Is free for occupants to use. Credits are not available where aftercare support is offered as an optional feature of the home at an additional cost to occupants. 4. Is available to whoever occupies the home, during the time the support is specified as being available for. This means that in the event that a home changes occupancy before the arranged aftercare support is due to finish, the support must still be available to any new occupants for the time originally agreed to. <u>It is assumed that on-call support will be provided up to 2 years.</u>
Home Information					
01 - Home information	Architect / Developer	Minimum requirement	Minimum requirement	L	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.
Smart Homes					
01 - Home information	Architect / Developer	Minimum requirement	Minimum requirement	L	All applicable home information will be provided to occupants of all homes from the first day of moving in and the home information meets the following: crit1.a: Available in an accessible format crit1.b: Available in both a hard and soft copy.

Issue					Comments
02 - Connectivity to the home	Architect / Developer	2	1	M	A network infrastructure provider is contacted during the planning stage and the following is achieved: 1. Connections from the street for broadband, telecommunications and cable TV are installed in duct work provided by the service provider, overhead from the street or via direct burial cable, to support future changes, as defined in PAS 35491 2017 Section 5.2.2. 2. Any other appropriate infrastructure is implemented on-site during construction, in line with the network infrastructure provider's guidance (for example, in terms of layout, installation of inspection chambers, joint boxes, or distribution units). 3. Connection to the broader network via network terminating equipment (such as a master socket for copper or an optical network termination unit for fibre) by post-construction stage. 4. Cabled connection is available to occupants when they move in (for example, cabling installed during construction or pulled through before occupancy). superfast broadband (24Mbit/s) = 1 credit (internet speed achieved has been assumed) ultra-fast broadband (100Mbit/s).= 2 credits
03 - Connectivity within the home	Architect / Developer	1	0	n/a	1. There is a primary home distribution space (PHDS) containing a patching panel which together provides a central location for all wiring to be run, including connections from incoming services and distribution of cabling around the home, in accordance with PAS 35491 2017. 2. Ethernet (Cat 5e) is routed to all principal rooms in the home, within routing ducts, and with the provision for pulling through new cables in the future. 3. Cable ducting is provided in secondary rooms in the home for future upgrades or to resolve poor wireless broadband in any secondary rooms. 4. Cable ducting must either have curved inside and outer corners if they have 90 degree angles, or must be greater than 90 degrees. Both installation and commissioning are done in accordance with PAS 35491 2017 <i>Installed devices relating to this issue (such as visual display units, sensors, transmitters, signal repeaters, or hubs) must not reduce the minimum number of electrical sockets available to occupants that are required legally or by the design or impede the access or functioning of any other switches or control devices.</i>
04 - Basic smart heating	Architect / Developer	1	0	n/a	Accessible smart home devices or systems have been installed at no additional cost to the occupant that: 1. Provide a smart heating functionality by monitoring internal temperature levels in the main living room, as a minimum, and keep it within a fixed range for energy savings and comfort, and 2. Has a 12-month warranty on the smart heating devices. This includes smart thermostat, temperature sensors, boiler transceiver unit and any communications hub provided specifically with the smart heating system. 3. Use a smartphone application interface for the smart devices that: 4. Displays internal temperature levels over a weekly, monthly and yearly basis. 5. Provides remote control of heating with the ability to change schedules. 6. Provides instant on/off override.
05 - Advanced smart heating	M&E	1	0	n/a	Provide additional smart heating functionality that: 1. Uses multi-zone heating; the ability to independently measure and control the internal temperature of multiple zones for all principal rooms within the home. 2. Uses external temperature sensing. 3. Allows 'away from home' or geo-location control. 4. Allows active frost protection. 5. Uses stored environmental and behavioural data to tailor experience. 6. Occupancy sensing that can be used to trigger heating schedules (such as 'away from home' modes). Potential uplift credit (1No.) - Criteria 02 - 04 must be achieved

Issue					Comments
06 - Basic smart lighting	M&E	1	0	n/a	Accessible smart home devices or systems have been installed at no additional cost to the occupant (such as subscription fees) that: 1. Monitor and control the internal lighting in principal rooms, using pre-set lighting controls for energy savings and comfort, and have the ability to be controlled remotely via a smart phone app. 2. Allow for remote dimming control of individual lights in principal rooms. 3. Occupancy sensing that is used to trigger lighting schedules (for example 'away from home' modes).

Issue					Comments
07 - Smart energy management	M&E	1	0	n/a	Accessible smart home devices or systems have been installed at no additional cost to the occupant (such as subscription fees) that: 1. Monitor, control and report energy use of individual devices via a smartphone app in at least the principle rooms, using smart plugs or sufficient energy disaggregation methods. 2. Provide additional lighting functionality that automatically senses ambient light levels and adjusts light levels to meet pre-set requirements (for example, by altering brightness or temperature of the light). 3. Monitor and display the operational status and availability of LZCTs where these are installed (such as where solar PVs are installed).
08 - Additional smart solutions	M&E	1	0	n/a	Accessible smart home devices or systems have been installed at no additional cost to the occupant (for example, subscription fees) for at least three of the following: 1. Monitor air quality in all principle rooms and either report information to a smart phone app or to an in-home display. 2. Enable voice control of the smart heating and smart lighting devices, independent from a smartphone. 3. Monitor and report humidity in the kitchen, bathroom and a main bedroom. 4. Smart ventilation or filtering, linked with an air quality sensor that measures at least three of the following: Carbon monoxide, Carbon dioxide, humidity, particulates, volatile organic compounds (VOCs). 5. Gesture control for smart devices. 6. Geofencing; ability to control devices based on the location of the user (for example, where they are within a set radius of the home).
Post Occupancy Evaluation					
01 - Occupant satisfaction feedback and bill data	Developer / Main Contractor	2	2	n/a	Within 6 weeks of occupation, occupants are formally offered to be involved with the POE. It is assumed that a member of the Developer / Main Contractor Team who was not involved in the design process will carry out a Post Occupancy Evaluation between 12 and 18 months post-occupation. The results of the POE will form a basic overview for occupants, and a more detailed report for other stakeholders. The POE will be based on occupant feedback plus the following: - Energy Audit; - Water Audit;
02 - Energy and temperature monitoring	Developer / Main Contractor	3	0	n/a	Where an appropriately qualified professional has also been appointed to do the following: 1. Collect and monitor the following data for at least one year, recorded hourly: 2. Energy consumption data in kWh/person or kWh/m². 3. Internal temperature in °C, recorded in the main bedroom and living room as a minimum. 4. Compare actual and predicted energy costs using the home's Energy Performance Certificate (EPC). 5. Analyse results and outline future lessons, as part of criteria 01 to improve the performance of future projects.
03 - Advanced POE	Developer / Main Contractor	2	0	n/a	Where the appropriately qualified professional will also undertake at least one other POE method as part of the data being collected and analysed

Issue					Comments
04 - Independent third party	Developer / Main Contractor	3	0	n/a	Where an independent third party has been appointed as the appropriately qualified professional and is contractually obliged to fulfil any POE commitments Criteria 01 must be achieved

Appendix B – SAP Block Compliance



BLOCK COMPLIANCE

Calculation Type: New Build (As Designed)

Block Reference	East Didsbury Replan	Issued on Date	
Block Name	Consolux v2		
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: East Didsbury Replan		Block Name: Consolux v2			
Property-Assessment Reference	Multiplier	Floor Area (m ²)	DER (kgCO ₂ /m ²)	TER (kgCO ₂ /m ²)	% DER/TER
V2 East Didsbury - Plot 1.01-V1	1	74.94	30.76	26.52	-15.98 %
V2 East Didsbury - Plot 1.02-V1	1	65.2	28.13	25.07	-12.18 %
V2 East Didsbury - Plot 1.03-V1	1	65.2	28.13	25.07	-12.18 %
V2 East Didsbury - Plot 1.04-V1	1	50.1	28.61	27.97	-2.30 %
V2 East Didsbury - Plot 1.05-V1	1	62.5	27.87	26.52	-5.07 %
V2 East Didsbury - Plot 1.06-V1	1	50.1	28.54	27.97	-2.05 %
V2 East Didsbury - Plot 1.07-V1	1	61.5	27.33	26.42	-3.46 %
V2 East Didsbury - Plot 1.10-V1	1	61.6	37.21	28.45	-30.78 %
V2 East Didsbury - Plot 1.14-V1	1	61.6	36.57	27.99	-30.64 %
V2 East Didsbury - Plot 1.08-V1	1	61.5	27.33	26.42	-3.46 %
V2 East Didsbury - Plot 1.09-V1	1	74.94	29.45	25.82	-14.07 %
V2 East Didsbury - Plot 1.11-V1	1	50.65	35.83	30.28	-18.32 %
V2 East Didsbury - Plot 1.12-V1	1	40.57	42.21	34.97	-20.69 %
V2 East Didsbury - Plot 1.13-V1	1	50.48	37.65	31.46	-19.69 %
V2 East Didsbury - Plot 1.15-V1	1	61.6	39.97	30.20	-32.35 %
V2 East Didsbury - Plot 3.01-V1	4	74.94	23.13	22.04	-4.94 %
V2 East Didsbury - Plot 3.02-V1	4	65.2	21.57	21.20	-1.74 %
V2 East Didsbury - Plot 3.03-V1	4	65.2	21.57	21.20	-1.74 %
V2 East Didsbury - Plot 3.04-V1	4	50.1	23.59	23.29	-1.30 %
V2 East Didsbury - Plot 3.05-V1	4	62.5	22.76	21.96	-3.67 %
V2 East Didsbury - Plot 3.06-V1	4	50.1	23.53	23.29	-1.03 %
V2 East Didsbury - Plot 3.07-V1	4	61.5	22.21	21.75	-2.11 %
V2 East Didsbury - Plot 3.08-V1	4	61.5	22.22	21.76	-2.10 %
V2 East Didsbury - Plot 3.09-V1	4	74.94	22.49	21.69	-3.70 %
V2 East Didsbury - Plot 3.10-V1	4	61.6	30.53	24.96	-22.30 %
V2 East Didsbury - Plot 3.11-V1	4	50.65	29.53	25.27	-16.84 %
V2 East Didsbury - Plot 3.12-V1	4	40.57	35.41	29.42	-20.37 %
V2 East Didsbury - Plot 3.13-V1	4	50.48	32.05	26.81	-19.54 %
V2 East Didsbury - Plot 3.14-V1	4	61.6	28.58	23.74	-20.39 %
V2 East Didsbury - Plot 3.15-V1	4	61.6	36.98	27.88	-32.66 %
V2 East Didsbury - Plot 6.01-V1	1	74.94	27.42	25.24	-8.65 %
V2 East Didsbury - Plot 6.02-V1	1	65.2	25.61	24.29	-5.42 %
V2 East Didsbury - Plot 6.03-V1	1	65.2	25.61	24.29	-5.42 %
V2 East Didsbury - Plot 6.04-V1	1	50.1	27.64	26.49	-4.34 %
V2 East Didsbury - Plot 6.05-V1	1	62.5	26.83	25.04	-7.17 %
V2 East Didsbury - Plot 6.06-V1	1	50.1	24.27	23.72	-2.32 %
V2 East Didsbury - Plot 6.07-V1	1	61.5	26.24	24.88	-5.47 %

BLOCK COMPLIANCE

Calculation Type: New Build (As Designed)

V2 East Didsbury - Plot 6.08-V1	1	61.5	26.26	24.89	-5.49 %
V2 East Didsbury - Plot 6.09-V1	1	74.94	23.06	22.01	-4.77 %
V2 East Didsbury - Plot 6.10-V1	1	61.6	34.79	27.87	-24.81 %
V2 East Didsbury - Plot 6.11-V1	1	50.65	34.87	28.85	-20.87 %
V2 East Didsbury - Plot 6.12-V1	1	40.57	40.74	33.07	-23.18 %
V2 East Didsbury - Plot 6.13-V1	1	50.48	37.35	30.38	-22.94 %
V2 East Didsbury - Plot 6.14-V1	1	61.6	33.20	26.89	-23.46 %
V2 East Didsbury - Plot 6.15-V1	1	61.6	-411.95	31.20	1420.24 %
Totals:	90	5354.88	883.68	1,176.51	
Average DER = 22.45 kgCO ₂ /m ²		% DER/TER	PASS		
Average TER = 24.67 kgCO ₂ /m ²		9.00 %			

Block Compliance Report - DFEE

Block Reference: East Didsbury Replan		Block Name: Consolux v2			
Property-Assessment Reference	Multiplier	Floor Area (m ²)	DFEE (kWh/m ² /yr)	TFEE (kWh/m ² /yr)	% DFEE/TFEE
V2 East Didsbury - Plot 1.01-V1	1	74.94	47.04	51.14	8.02 %
V2 East Didsbury - Plot 1.02-V1	1	65.2	39.32	42.90	8.34 %
V2 East Didsbury - Plot 1.03-V1	1	65.2	39.32	42.90	8.34 %
V2 East Didsbury - Plot 1.04-V1	1	50.1	38.63	46.40	16.73 %
V2 East Didsbury - Plot 1.05-V1	1	62.5	38.03	46.65	18.49 %
V2 East Didsbury - Plot 1.06-V1	1	50.1	38.48	46.39	17.04 %
V2 East Didsbury - Plot 1.07-V1	1	61.5	37.11	45.84	19.05 %
V2 East Didsbury - Plot 1.10-V1	1	61.6	49.89	52.72	5.38 %
V2 East Didsbury - Plot 1.14-V1	1	61.6	48.66	51.19	4.95 %
V2 East Didsbury - Plot 1.08-V1	1	61.5	37.11	45.84	19.05 %
V2 East Didsbury - Plot 1.09-V1	1	74.94	44.40	48.83	9.06 %
V2 East Didsbury - Plot 1.11-V1	1	50.65	44.72	54.16	17.45 %
V2 East Didsbury - Plot 1.12-V1	1	40.57	54.68	62.71	12.80 %
V2 East Didsbury - Plot 1.13-V1	1	50.48	48.35	58.13	16.83 %
V2 East Didsbury - Plot 1.15-V1	1	61.6	56.10	58.57	4.22 %
V2 East Didsbury - Plot 3.01-V1	4	74.94	31.81	36.28	12.31 %
V2 East Didsbury - Plot 3.02-V1	4	65.2	25.61	29.84	14.18 %
V2 East Didsbury - Plot 3.03-V1	4	65.2	25.61	29.84	14.18 %
V2 East Didsbury - Plot 3.04-V1	4	50.1	28.11	30.55	7.99 %
V2 East Didsbury - Plot 3.05-V1	4	62.5	27.40	31.27	12.36 %
V2 East Didsbury - Plot 3.06-V1	4	50.1	27.97	30.55	8.43 %
V2 East Didsbury - Plot 3.07-V1	4	61.5	26.31	30.11	12.60 %
V2 East Didsbury - Plot 3.08-V1	4	61.5	26.35	30.14	12.60 %
V2 East Didsbury - Plot 3.09-V1	4	74.94	30.32	35.10	13.61 %
V2 East Didsbury - Plot 3.10-V1	4	61.6	37.06	41.11	9.86 %
V2 East Didsbury - Plot 3.11-V1	4	50.65	32.81	37.66	12.89 %
V2 East Didsbury - Plot 3.12-V1	4	40.57	41.75	44.17	5.47 %
V2 East Didsbury - Plot 3.13-V1	4	50.48	37.69	42.78	11.88 %
V2 East Didsbury - Plot 3.14-V1	4	61.6	33.35	37.04	9.96 %
V2 East Didsbury - Plot 3.15-V1	4	61.6	50.31	50.81	0.98 %
V2 East Didsbury - Plot 6.01-V1	1	74.94	40.48	46.88	13.64 %

BLOCK COMPLIANCE

Calculation Type: New Build (As Designed)

V2 East Didsbury - Plot 6.02-V1	1	65.2	34.23	40.27	15.01 %
V2 East Didsbury - Plot 6.03-V1	1	65.2	34.23	40.27	15.01 %
V2 East Didsbury - Plot 6.04-V1	1	50.1	36.67	41.42	11.47 %
V2 East Didsbury - Plot 6.05-V1	1	62.5	35.92	41.66	13.78 %
V2 East Didsbury - Plot 6.06-V1	1	50.1	29.60	32.02	7.57 %
V2 East Didsbury - Plot 6.07-V1	1	61.5	34.89	40.68	14.24 %
V2 East Didsbury - Plot 6.08-V1	1	61.5	34.93	40.73	14.24 %
V2 East Didsbury - Plot 6.09-V1	1	74.94	31.53	36.17	12.83 %
V2 East Didsbury - Plot 6.10-V1	1	61.6	45.22	50.80	10.99 %
V2 East Didsbury - Plot 6.11-V1	1	50.65	42.90	49.45	13.25 %
V2 East Didsbury - Plot 6.12-V1	1	40.57	51.88	56.38	7.99 %
V2 East Didsbury - Plot 6.13-V1	1	50.48	47.77	54.57	12.47 %
V2 East Didsbury - Plot 6.14-V1	1	61.6	42.17	47.52	11.26 %
V2 East Didsbury - Plot 6.15-V1	1	61.6	59.52	61.93	3.88 %
Totals:	90	5354.88	1,746.24	1,972.38	
Average DFEE = 35.20 kWh/m ² /yr		% DFEE/TFEE	PASS		
Average TFEE = 39.55 kWh/m ² /yr		11.00 %			