



Sustainability Starts With You

**9 Ansleigh Avenue
Crumpsall**

Environmental Standards Statement

Prepared by
Green Consulting (Preston) Ltd

1. INTRODUCTION

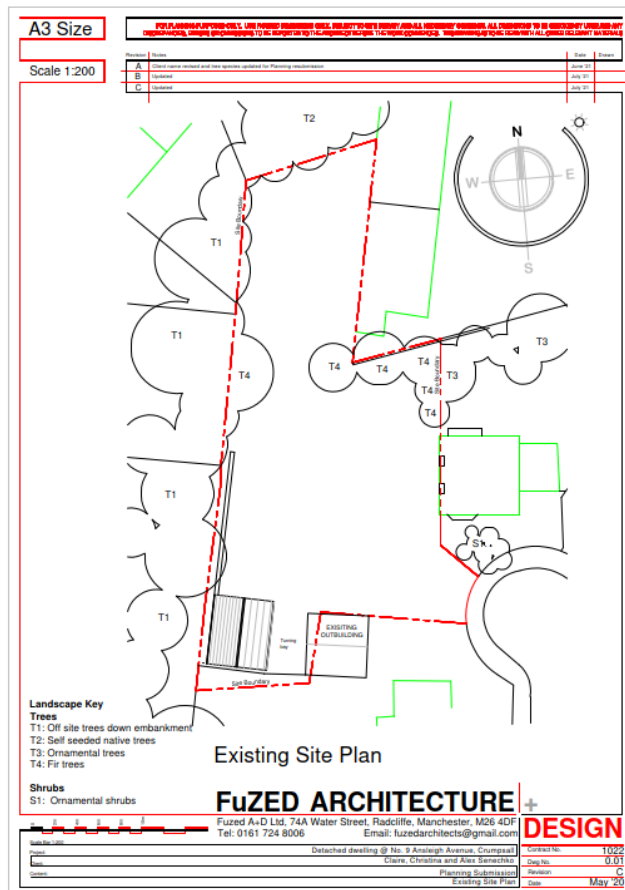
Green Consulting Ltd were commissioned by Fuzed Architecture to review the energy strategy of the proposed development at 9 Ansleigh Avenue, Crumpsall, Manchester. The purpose of this Statement is to summarise the relevant policy background and requirements of Manchester City Council (MCC) and demonstrate the ways in which developer has addressed these aims for the project.

This statement reviews the energy efficient design features of the building and appraises the energy strategy of the proposals in order to demonstrate how the scheme will contribute to sustainable development in Manchester and seek to mitigate the environmental impacts of the development.

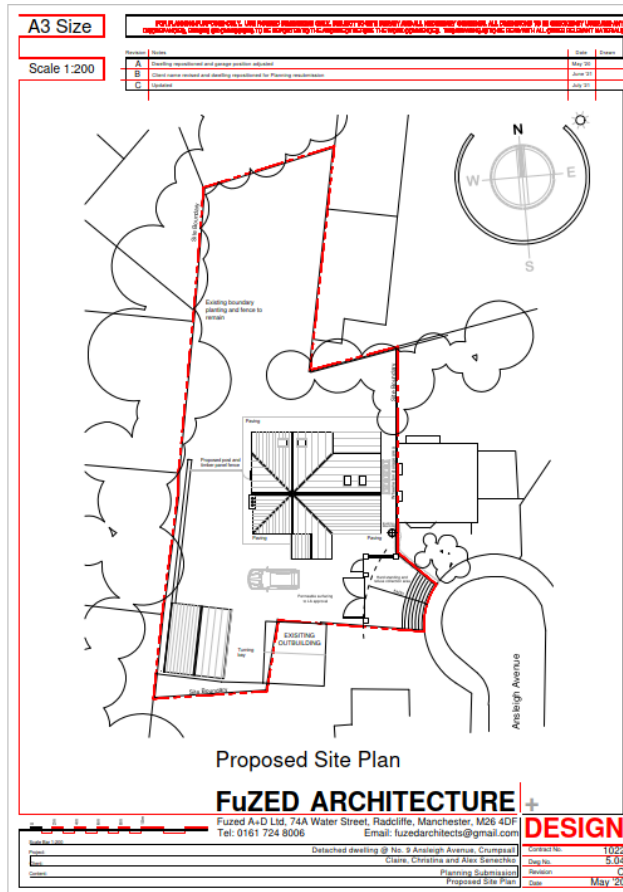
2. DEVELOPMENT PROPOSALS

2.1.1 Development Site Description

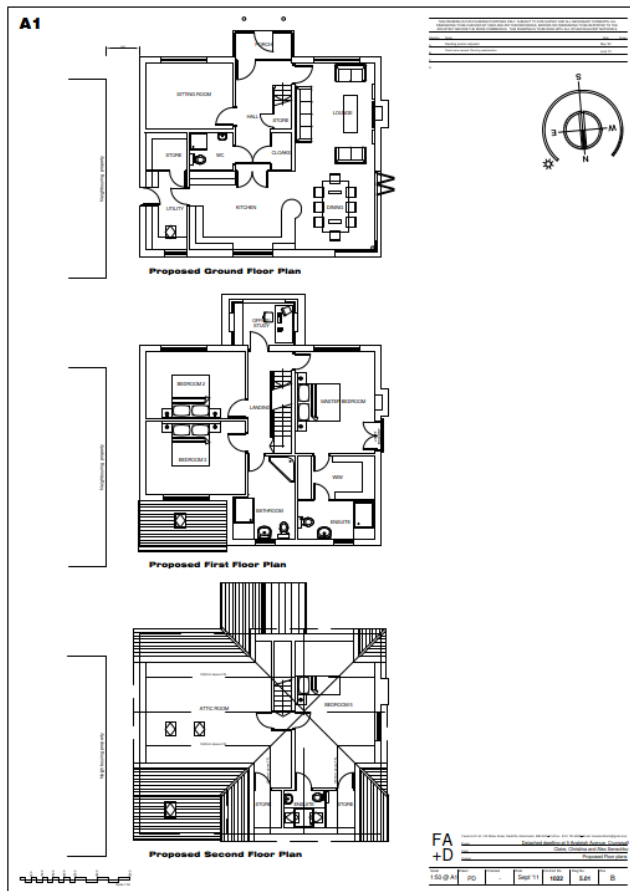
The proposed development site is at Ansleigh Avenue Crumpsall, Manchester. Residential properties border the site to the east, south and west. The remaining site boundary to the north of the plot is to a commercial builders yard site.



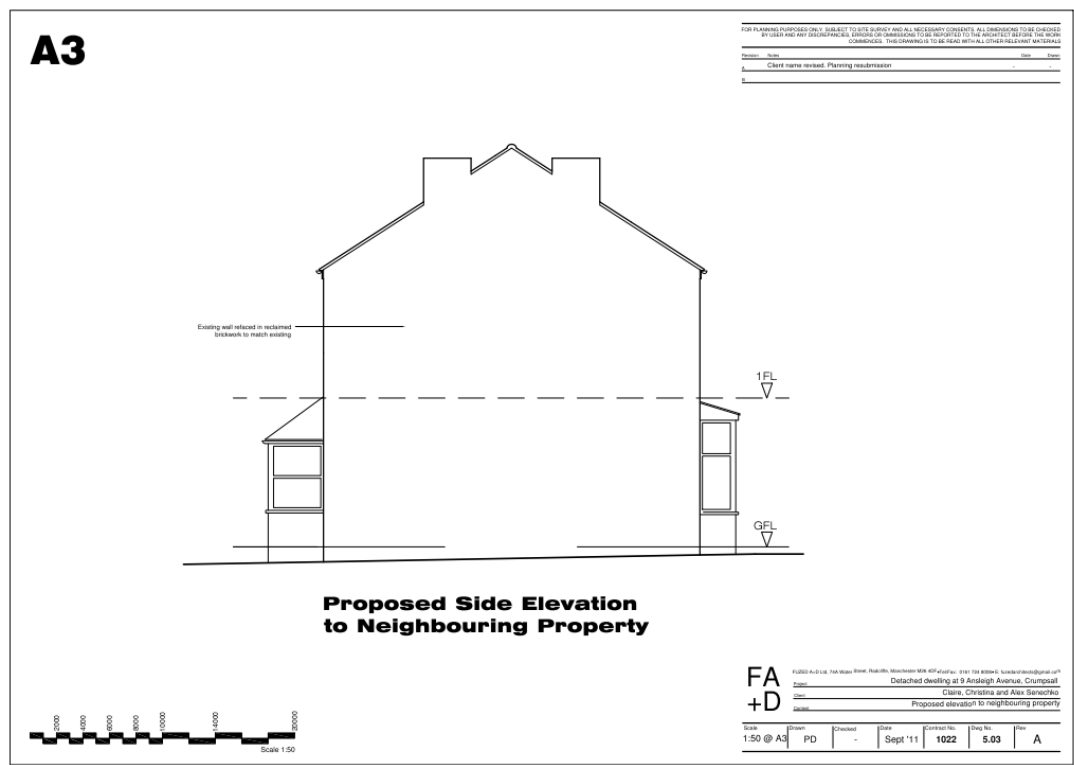
The proposed development will consist of a new detached dwelling house.



2.1.3 Proposed Building Plans



2.1.4 Proposed Building Elevations



3. POLICY REVIEW

This section reviews the planning policy requirements and sustainability targets that are relevant to the energy strategy for this scheme.

3.1.1 Local Planning Policy

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 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.

The Proposed Development is located within a : Micro Generation Area and must comply with Part L (2013).

The emission reductions targeted within policy EN6 relate to Building Regulation Part L 2010. As a consequence of the aggregate reduction in emission rates required by current building regulations (Part L 2013) relative to Part L 2010 (which the Policy EN6 targets are based upon), the revised equivalent target CO₂ emission reductions for the residential element of this scheme is presented below:

- Residential - 9% dwelling emission rate reduction over Part L1A (2013)

Further details of the building regulation requirements are provided in the section below. Guide to Development in Manchester, Supplementary Planning Document

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, including high standards of energy efficiency. The following categories which are identified in the SPD:

- Energy efficiency;
- Renewable energy;
- Environmental design;
- Water management and weather resilience.

3.1.3 Manchester Residential Quality Guidance

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

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

Make it bring people together – new homes must encourage a sense of community and neighbourliness, offering a mix of tenures to promote a mix of people. Make it animate streets and spaces – understand the relationship between new homes and its environment and create public space.

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

Make work with the landscape – development should improve the connection with the local environment with improved biodiversity, as well as greening and water schemes. Make it practical – dealing with waste, car parking, bike storage and visitors should be made as easy as possible.

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

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

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

3.1.4 Climate Emergency

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

- To deliver the 2038 target and determine if an earlier target can be possible.
- Encourage involvement in all wards by April 2020 through meetings as part of the Our Manchester strategy.
- Review all policies, processes and procedures to ensure the council can become carbon neutral. Present an action plan by March 2020 detailing how the city can stay within its carbon budget.
- Make climate breakdown and the environment, an integral part of activity throughout the council, including all decision making, ensuring key decisions take into account the impact on achieving the zero-carbon target.

- Investigate measures to ensure future procurement is carbon neutral. Increase the percentage of social value with an additional environmental element.
- Work with suppliers to green their supply chains and support local production.
- Investigate and introduce measures to help reach domestic zero carbon levels including addressing fuel poverty and retrofitting existing homes.
- Investigate ways to ensure that future local plans place a mandatory requirement for all new development to be net zero carbon by the earliest possible date.

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

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

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

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

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

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

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

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

Priority Areas Six priority areas have been established in order to help meet the above 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 Actions Identified to Help Meet the Commitments:

- New Buildings – To ensure that new developments in the city don't eat into the limited carbon budgets and add to the already significant retrofit challenge. Developments need to be built and operated to zero carbon standards as soon as possible.

The ideal way to do this is through UK Government establishing a national zero carbon definition and methodology for its implementation, and for Manchester City Council to implement this standard as quickly as possible through the local planning system.

This should include applying zero carbon standards to all developments where the Council has additional influence, with a view to all new development needing to be zero carbon from 2023 at the latest.

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

3.1.5 Emerging Policies

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

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

Be zero net carbon from 2038 by following the energy hierarchy (with any residual emissions offset), which in order of importance seeks to:

- Minimise energy demand;
- Maximise energy efficiency;

- Utilise renewable energy;
- Utilise low carbon energy;
- Utilise other energy sources.

With an interim requirement that all new dwellings should seek:

- 19% carbon reduction against Part L of the 2013 Building Regulations.
- Incorporate adequate electric vehicle charging points to meet likely long-term demand;
- Where practicable, connect to a renewable/low carbon heat and energy network;
- Achieve a minimum 20% reduction in carbon emissions (based on the dwelling emission or building missions rates) through the use of on Site or nearby renewable and / or low carbon technologies;
- Include a carbon assessment to demonstrate how the design and layout of the development sought to maximise reductions in whole life CO2 equivalent carbon emissions.

3.1.6 National Planning Policy

In addition to the local planning policies, the National Planning Policy Framework (NPPF) 2012 is a material consideration. The National Planning Policy Framework (originally published 27th March 2012) 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;

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.

3.2 Regulatory Framework

3.2.1 Building Regulations

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

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

- 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;
- iv. 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.

The 2013 revision to Part L of the Building Regulations was a key milestone towards the government's (now delayed) target for zero-carbon buildings. Following a long consultation period, new (carbon dioxide) emission rate targets were published in November 2013, as follows:

A 6% improvement on the 2010 Part L targets for housing on aggregate which means there is flexibility across different types of homes.

Domestic buildings are therefore deemed to be achieving a 6% emission reduction relative to Part L 2010 emission rate criteria, by virtue of complying with the current (Part L1A) regulatory standards.

4. ENERGY STRATEGY

Details of the proposed energy strategy for the Ansleigh Avenue development, which incorporates an enhanced 'fabric first' solution combined with an efficient mechanical and electrical design, are reviewed below.

An enhanced building fabric specification throughout the development aligned with efficient systems and controls will achieve compliance with the emission reduction and fabric energy efficiency targets stipulated by Building Regulation, Part L1A (2013) and Manchester City Council's emissions reduction targets. This strategy is aligned with the principles of the energy hierarchy which seeks to prioritise energy conservation (and therefore carbon dioxide emissions reductions) through energy efficiency measures.

4.1.1 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 includes emission reductions targets which relate to Building Regulation Part L 2010.

As a consequence of the reduction in emission rates required by current building regulations (Part L 2013) relative to Part L 2010, the revised equivalent target CO2 emission reductions for the residential elements of this scheme are now deemed to be - 9% dwelling emission rate reduction over Part L1A 2013.

4.1.2 Renewable Energy Feasibility

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

- Solar Hot Water;
- Photovoltaics (PV);
- Wind;
- Heat Pumps;
- Biomass heating

4.1.3 Solar Hot Water

Solar Hot Water utilises the energy in sunlight and diffuse daylight to heat water for use in buildings. The main component of any solar water heating system is the collector, which absorbs the radiant energy of the sun and converts it to heat energy.

This technology is not considered to be a feasible option for this site because, there is limited available roof space to accommodate the solar collector and the dwellings' roof orientation does not favour this solution. Furthermore, it is incompatible with the proposed gas fired, combination boilers.

4.1.4 Photovoltaics (PV)

Photovoltaic (PV) panels harness solar energy and convert it into electricity which can then be used to off-set imported electrical energy. The panels are typically orientated in a southerly direction in tilted arrays, thereby enabling this technology to operate efficiently. This technology is considered feasible given that a suitable roof area is available.

4.1.5 Wind Turbines Wind Turbines

Wind Turbines Wind Turbines are considered unsuitable for this site due to a poor wind speed at the site and lack of space to locate the turbines. Utilising a wind turbine is not considered feasible due the associated noise, vibration, visual and structural stresses upon the building is to be building mounted, there is also the risk of interference to satellite communications.

Furthermore, there are potential planning issues and perceived safety concerns with this technology. Given the site's urban location, the non-laminar wind flow will lead to inefficient operation of wind turbines. For these reasons this technology has been discounted.

4.1.6 Ground Source Heat Pumps

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

4.1.7 Air Source Heat Pumps

Air Source Heat Pumps extracts heat from the outside air to supply useful heat for space and water heating requirements. By applying additional energy input (in the form of electricity), it is possible to raise the temperature of the source heat to the temperature required. Such technology is technically feasible for this site however, the capital costs of installing this would prove unviable. It is also not considered a favoured system due the high running costs when compared with natural gas fired heating system.

4.1.8 Biomass heating

Biomass heating would be capable of delivering the target CO₂ emission reductions but are considered inappropriate for this type of development and location due to the requirement for a large fuel store and plant room.

Additionally, air quality concerns associated with the high NO_x emissions associated with biomass combustion and fuel deliveries typically render these systems technically unfeasible and undesirable. Within the Ansleigh Avenue proposals there is insufficient space to accommodate the equipment and fuel storage to facilitate a biomass boiler.

4.1.9 CHP

CHP utilises a combustion engine normally powered by natural gas and connected electrical generator. The system recovers heat from the combustion engine to use for hot water generation and the electrical energy generated to off-set imported electrical energy.

The operate satisfactorily a CHP needs to have near constant hot water electricity which a domestic house of the type planned for Ansleigh Avenue does not have. Therefore, a CHP system is not considered feasible for this development.

4.1.10 Build Fabric and Thermal Performance

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

- Ground Floor;
- External Walls;
- Roofs;
- Doors and windows;
- Thermal bridging;
- Uncontrolled ventilation.

The standard measurement of heat transfer through a given building material or construction type is the U-value (W/m²K). The lower the U-value, the more slowly heat transfers and is lost out of a building.

Proposed Dwelling Specification

Exposed Floor U=0.11 W/m²K

External Wall U=0.13 W/m²K

Roof U=0.11 W/m²K

Windows/ Rooflights U=1.3 W/m²K

Design Air Permeability 4.0 m³ /m²/hr @50Pa.

This material specification and design will deliver a Part L1A compliant solution and provide the following benefits:

- High performance thermal insulation will ensure low U-values for all heat loss elements. Energy demand for space heating will be significantly reduced through the provision of an effective thermal envelope. A thermally efficient facade system will minimise heat loss through the building's thermal envelope;
- Thermally efficient, 'A' rated, double glazed windows will be specified with argon gas fill and low emissivity coatings to limit heat loss through the pane. Thermal breaks will be incorporated within the frame to further limit heat loss. The glazing g value will be specified to optimise beneficial solar gains but limit the propensity for the dwellings to overheat;
- Thermal mass (associated with this type of masonry 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 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;
- Low air permeability will minimise uncontrolled ventilation. This will reduce heat losses and provide high levels of occupant comfort; and,
- Attention to cold bridging junctions including the provision of insulation and thermal breaks to limit heat transfer.

4.1.11 Building Services

The proposed mechanical and electrical specification for the development will include the appropriate the specification items and final details of manufacturers etc. confirmed during the detailed design stage.

Ventilation - High efficiency MVHR centralised mechanical supply and extract system.

Space Heating - High efficiency natural gas fired, boiler serving the space heating heat emitters.

Heating Control - Timed Zone control system c/w thermostatic/temperature room controls and hot water storage temperature control.

Hot water service – Hot water storage via a central HWS indirect storage vessel with primary heating from the heating boiler.

Artificial Lighting – All lighting will be highly efficient LED based with local controls.

Water usage – Water usage will be minimised to below the Building Regulation target rates to both save on fresh water usage but also discharged foul water and energy use for hot water generation. Water usage may be further reduced by the use of a rainwater collection system but this has yet to be verified as a feasible.

A PV system will be installation the assist with the carbon reduction and energy use reduction.

5. EMISSIONS PERFORMANCE CALCULATIONS

To demonstrate the environmental benefits associated with the ‘fabric first’ specification and mechanical and electrical services installations to reduce the energy demand and emission reduction at the site, SAP software will be used to quantify the reductions. The calculations will be carried out during the detailed design stage based on the final design arrangement that receives planning approval and the details of the proposed measures in in this statement.

5.1.1 Regulated Energy Demand and Emission Calculations

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

5.1.2 Emissions Reduction Targets

Manchester City Council’s Core Strategy policy EN6 targets a 15% carbon dioxide emission rate reduction over Building Regulation Part L (2010).

The 2013 revision to Part L of the Building Regulations includes a 6% improvement on the 2010 Part L targets for housing over Part L 2010 criteria. Domestic buildings are therefore achieving a 6% emission respectively over Part L1A 2010 emission rate criteria by virtue of simply complying with the current (Part L 2013) regulatory standards which the scheme has been designed to exceed.

Manchester City Council Revised Core Strategy policy EN6 required a 9% improvement on the (current) 2013 Part L1A compliance targets for housing. Further to this, the introduction of the Draft Greater Manchester Spatial Framework (GMSF) 2019 targets within Policy GM-S 2 Carbon and Energy an interim requirement that all new dwellings should seek a 19% carbon reduction against Part L1A (2013) of the Building Regulations.

The calculated emission rate reductions for the Ansleigh Avenue development, relative to building regulation Part L1A (2013), will be presented during the detailed design stage. Given the revised interim targets sought by Manchester City Council, the proposed development will therefore demonstrate compliance with the energy efficiency requirements and carbon dioxide emission reduction targets within the Core Strategy policies EN4 and EN6 and GMSF policy GM-S 2 by providing an emissions improvement significantly beyond the Part L (2013) compliance standard.

5.1.3 Energy Calculation Results

All calculation results will be provided for approval and Planning/Building Control sign off once planning approval has been granted and the detail designs are carried out. The calculations will confirm the proposed measures and compliance requirements as set out in this statement.

6. Conclusions

The development will be designed and constructed to achieve and exceed all the required statutory and Manchester City Council planning requirements as set out in this report.

The carbon reduction strategy will as noted previously be based on 'fabric first' approach with the following priority to ensure each measure is considered correctly and each having the benefit on the following. This is summarised as follows;

- Reduce the need for energy, e.g., improved U Values, controlled ventilation and heat recovery.
- Use energy efficiently e.g., High efficiency plant and effective controls.
- Use of renewable energy sources e.g., PV panels.
- Ensure the use of fossil fuels is further reduced as possible e.g., 100% renewable tariffs.

As previously mentioned, a number of the renewable and low carbon technologies are not feasible for this development and as such will not be implemented.

Solar PV will be implemented as the measure to be adopted to generate energy on site and cut carbon reductions and energy importation. The target amount of solar PV panel will be in the order of 5-6 kW to meet the targets and as can be physically accommodated on the roof of the development.