
McCarthy Stone

Prestwich

Energy & Sustainability Statement

March 2024



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1.0 Introduction

1.1 Purpose of the Report

Instructions were received from McCarthy Stone to produce an Energy and Sustainability Statement for the proposed development at Prestwich. This report has been produced to support the planning application to be submitted for the proposed development, which is situated within the boundaries of Bury Council.

This statement provides a response to the relevant Bury Council documents and policies:

Adopted Bury Unitary Development Plan.

Places for Everyone Joint Development Plan Document.

Supplementary Planning Document (SPD) 16: Design and layout of New Development.

1.2 Site and Building Description

The development will be located at George Street, Prestwich. The application seeks approval for the construction of a retirement living complex consisting of 52 apartment dwellings, as well as associated parking space, landscaping and communal areas. The communal areas comprise of Circulation Spaces, a Guest Suite, a Residents Lounge, Reception, Office, Buggy Store, Refuse and Staff Facilities. A proposed site layout has been included in Appendix 1.

1.3 Methodology

The proposed specifications, representative floor plans and site plan were reviewed to gain a good understanding of the development; following this, SAP and SBEM calculations for the proposed development have been completed to determine the As Designed performance. The application will be considered under the new Part L1A 2022 regulations. Therefore, the new Elmhurst SAP 10 and SBEM software have been used to conduct the above calculations.

An assessment has been completed to review the potential connection of the proposed development to an existing district heat network. Up to date map data has been provided by the Association of Decentralised Energy, to enable the suitability and distance in relation to the location of the proposed development from a district heating network be reviewed.

2.0 Planning Policy

2.1 Adopted Bury Unitary Development Plan

Policy EN4 – Energy Conservation

The Council will encourage development which contributes to energy conservation in the Borough. The use of renewable energy resources and the incorporation of energy efficiency measures in built development and the transport system will be encouraged.

Justification

PPG12 "Development Plans and Regional Planning Guidance" acknowledges that the conservation of energy is a key issue to which local authorities should have particular regard when producing development plans. This involves the development of environmentally acceptable renewable energy resources and the corresponding reduction in processes which increase the levels of "greenhouse gases". It also involves the promotion of greater energy efficiency in built developments, including their location, design, and relationship to the transport system. Without prejudice to other policies and proposals in the Plan, the Council will therefore be keen to see a greater emphasis on developments which accord with these principles.

EN4/1 - Renewable Energy

The Council will encourage proposals for the provision of renewable energy sources, subject to compliance with other policies and proposals of the Plan. In particular, the Council will seek to ensure that proposals:

- *do not involve an unacceptable loss of amenity, for example through visual intrusion and noise;*
- *would not have an unacceptable adverse impact on the setting of scheduled ancient monuments, Conservation Areas, Listed Buildings and archaeological remains;*
- *would not have an unacceptable adverse impact on areas of Green Belt, Special Landscape Areas and areas of ecological importance;*
- *would not result in a health or safety risk, or nuisance to the public;*
- *where necessary, include an environmental assessment as part of the planning application;*
- *would not have an unacceptable adverse impact on the Borough's natural environment.*

Justification

Renewable energy is the term used to cover those energy flows that occur naturally and repeatedly in the environment - energy from the sun, the wind and water. Such energy sources offer the hope of reducing harmful emissions to the environment, especially the so called "greenhouse gases", and their use is consistent with the principle of sustainability. However, no form of energy production is without its environmental and amenity implications.

Accordingly, it is important that developers of renewable energy sources carefully assess the impact of proposals on the environment and the local population. PPG22 "Renewable Energy" indicates that where the impact of a renewable energy proposal is uncertain, the Council may consider granting a temporary planning permission in order to give the proposal a "trial run". Further, the Council will wish to ensure that as soon as the whole or part of any site approved under this policy becomes permanently inoperative, the associated structures are removed and the site fully restored in a manner acceptable to the Council; either under the terms of a Section 106 agreement or under the terms of a planning condition.

EN4/2 - Energy Efficiency

The Council will encourage energy efficiency in development proposals through:

- the promotion of energy efficient modes of transport such as walking, cycling and public transport;*
- seeking the location of new development in areas easily accessible to public transport and local facilities;*
- promoting the efficient use of energy in the design and layout of development.*

Justification

Land use planning has an important role to play in encouraging energy efficiency by guiding and controlling the location and form of development that takes place.

A main aim of Government advice is to control the level of harmful gas emissions generated by motor vehicles. This policy therefore aims to guide new development to locations which reduce the need for car journeys, and the distances driven, whilst being accessible to public transport. This will involve ensuring that developments make full and effective use of land within the existing urban area, whilst avoiding town cramming, and are located close to the public transport network, including the Metrolink system and bus services. Other forms of transport, such as cycling, are also to be encouraged.

Planning policies can also encourage energy efficiency through the way in which development is designed and built, for example through the orientation of dwellings, the use of energy saving measures in the lighting, heating and insulation of buildings, and the use of environmentally friendly and non-pollutant materials. Whilst the Council is keen to encourage measures which increase energy efficiency, it will also be important to ensure that their design and appearance does not detract from the visual amenity of the surrounding area.

2.2 Places for Everyone

Policy JP-S2: Carbon and Energy

The aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions, will be supported through a range of measures including:

- 8. An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;*
 - a. Be net zero carbon (32) from 2028 by following the energy hierarchy (with any residual carbon emissions offset), which applies:*
 - from adoption – to regulated operational carbon emissions;*
 - from 2028 - to all emissions ‘in construction’.*

From 2025 development should also calculate and minimise carbon emissions from unregulated emissions alongside regulated emissions.

Development proposals should set out how this has been achieved in an energy statement in accordance with the energy hierarchy, which in order of importance seeks to:

- i. Minimise energy demand;*
- ii. Maximise energy efficiency;*
- iii. Utilise Use renewable energy;*
- iv. Utilise Use low carbon energy; and*
- iv. Utilise other energy sources.*

From 2025 any residual carbon emissions that cannot be fully mitigated onsite should be offset, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund. With an interim requirement that all new dwellings should seek a minimum 19% carbon reduction against Part L of the 2013 Building Regulations.³³

As an interim measure, development should be consistent with the 2022 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies.

- b. Incorporate adequate electric vehicle charging points, in line with Part S of the Building Regulations, unless superseded by relevant Local Plan policies, to future proof for the likely long-term demand, taking account of the potential maximum energy demand for the site;*
- c. Where practicable, prioritise connection to a renewable energy/heating/cooling network in the first instance or a low carbon energy/heating/cooling network that is adaptable to non-fossil fuels at a later date;*

- d. In residential developments, achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation, in accordance with Table 5.1.

Table 5.1	Space Heat Demand	Hot Water Energy Demand	Renewable Energy Generation Targets
2021-2025	Houses (30kWh/m2) Flats (25kWh/m2)	20% energy demand reduction in the total heat required for water heating	*Photovoltaic installation: 20% ground floorspace
2025 - onwards	Houses (20kWh/m2) Flats (15kWh/m2)	^20% energy demand reduction in the total heat required for water heating	*Photovoltaic installation: 40% ground floorspace
*Ground floorspace used as a proxy for available roof area			
^ will need to be reviewed with Future Home Standard 2025 to determine if savings already embedded			

- e. For non-residential developments, achieve at least BREEAM excellent standard (or equivalent) for the 'Ene 01 - reduction of energy use and carbon emissions' category rising to 'BREEAM outstanding' equivalent for ENE 01 from 2028.
- f. Include a detailed energy statement to demonstrate via site relevant evidence how the development has sought to maximise reductions in carbon emissions in line with relevant policy targets, including the minimisation of overheating risks and appropriate measures for post occupancy evaluation. Whole life cycle emissions should be considered where possible.

2.3 SPD 16: Design and Layout of New Development

5. Environmental Performance - ensuring new development contributes to an improvement in sustainable and environmental practices

All development impacts on the environment, both directly - in terms of generating carbon emissions and using natural resources and indirectly - by affecting the lifestyle decisions of its communities. Consequently, the buildings that are designed and built today will affect our ability to live in a sustainable way for years to come.

Development must therefore be designed and constructed in a sustainable way, as articulated through national codes for sustainable buildings. Developments should maximise the use of low and zero carbon technologies, increase energy and water efficiency and reduce levels of waste and environmental degradation.

New development should respect Bury's natural environment, diverse topography, distinctive views and large expanses of open space. The integration of existing habitats and wildlife corridors and the provision of adequate levels of planting and creation of watercourses should be a key design feature of new development.

5a. Development should ensure the highest environmental performance.

- *All new residential developments should aim to achieve at least Level 3 of the Code for Sustainable Homes;*
- *All new non-residential developments should aim to achieve at least a BREEAM rating of 'Very Good' with at least **25% reduction in CO₂ emissions** beyond the requirements of the 2006 Building Regulations Approved Document L (2006);*
- *Within these requirements, in new non-residential developments of 1,000sqm² or more and new residential developments of 10 units or more, developers should provide **10% of their predicted energy requirements** on site/near site or through connections to a low carbon decentralised energy supply, unless it can be demonstrated, having regard to the type of development and its design, that this is not feasible or viable;*
- *In non-residential schemes developers will be required to provide evidence of on-site energy provision within their BREEAM assessment (design and post construction review). In residential schemes, developers will be required to achieve 1.2 points or higher under the Code for Sustainable Homes energy requirements.*

5b. To achieve these ratings, development proposals must be designed improve their environmental performance, in particular they should:

- *Incorporate measures for the conservation of water resources and where relevant flood protection/flood resilient design techniques;*
- *Maximise passive solar gain by the orientation of buildings within 30 degrees due south and windows to these elevations, where feasible;*
- *Where appropriate, plant deciduous trees so homes are shaded in the summer but passive solar gain is allowed in winter;*
- *Building design should ensure thermal comfort in summer by using passive cooling and ventilation and preventing excess solar gain through techniques such as shutters, sun screens and photovoltaic shading. If air conditioning is necessary then this should be limited to low and zero carbon technologies;*
- *Design for natural day lighting and ventilation through consideration of the depth of buildings and the nature of light and air penetration;*
- *Group buildings in clusters or in higher densities (terraces/apartments) to minimise heat loss and share facilities; Locate buildings where they are least exposed to the chilling effect of prevailing winds, using topography, other buildings and tree belts to provide shelter where appropriate;*
- *Ensure that buildings are adequately insulated to minimise heat loss and energy wastage*
- *Incorporate facilities for segregation, storage & collection of recyclable waste such as paper, glass, metal & bio-degradable material;*
- *Ensure that facilities such as recycling bins, refuse storage & collection areas & composters are integrated into the design of areas & buildings in a non-intrusive & attractive manner;*

- *Incorporate appropriate provision for the sustainable management and discharge of waste*
- *Install as standard energy efficient fixtures and fittings;*
- *Contribute to the greening of the urban environment to support bio-diversity, improve air quality and reduce a heat island effect;*
- *Incorporate high quality appropriate on-site landscaping which create attractive environments and improve the setting of a development. Landscape schemes can also provide opportunities to retain, enhance or create wildlife habitats and reduce flood risk.*

2.4 Policy Response

This statement will respond to Policy EN4 of the Adopted Bury Unitary Development Plan, Policy JP-S2 of Places for Everyone, and Section 5 of SPD 16, which will be addressed in Section 3.0 – Policy Response.

This scheme at George Street, Prestwich is a residential development comprising of 52 dwellings, therefore BREEAM is not applicable to this scheme. The Code for Sustainable Homes environmental assessment methodology has been discontinued; therefore, this is not applicable.

3.0 Policy Response

3.1 EN4/2 & SPD 16 Section 5b – Energy Efficiency

Policy EN4 and Section 5 of SPD 16 outlines the requirement to improve and integrate energy efficiency in built developments, with EN4/2 and Section 5b of SPD 16 particularly specifying the promotion of efficient use of energy in the design and layout of the development, which in turn will reduce carbon emissions. In efforts to address EN4 and SPD 16, particularly EN4/2, and reduce the overall carbon emissions associated with the development and maximise the energy efficiency, McCarthy Stone have developed a robust ‘fabric first’ approach to the build specification, which allows it to comfortably achieve the TER, TPER and TFEE targets under ADL1 2021.

This has been achieved through building fabric improvements with an uplift on the minimum requirements of ADL1 2021, and also specification of efficient mechanical and electrical services, including a number of ‘add-on’ measures to improve efficiency and performance.

The table below demonstrates how the specification of the development at Prestwich compares to the limiting values and minimum efficiencies allowed within Part L 2021:

Table 1: Proposed Specification		
Building Element	Limiting Part L 2021 Specification	Proposed Specification Part L
External Walls U-Value	0.26	0.19
Roof U-Value	0.16	0.11
Ground Floor U-Value	0.18	0.11
Window U-Value	1.60	1.30
Party Wall U-Value	0.20	0.00
Space Heating Efficiency	100%	100%
Pressure Test	8.00	4.00
Lighting Lumens	75 lm/w	80 lm/w

The development is proposed to adopt a ‘fabric first’ approach to the specification and as detailed above, the proposed U-Values are a significant uplift on the minimum requirements under Part L 2021.

The proposed build-up for the external wall for the apartments is a traditional masonry construction containing a total insulation thickness of 150mm, that generates a U-value of 0.19W/m²K. Well insulated cavity walls, roof, floors and openings provide a comfortable environment within the development and reduce the buildings’ reliance on the main heating system. The air permeability target in the apartments is 4.00 m³/(h.m²), providing a significant improvement over the Notional Building target.

The use of bespoke calculated thermal bridge details also ensures that thermal performance is enhanced by minimising heat and energy losses through thermal bridges and air gaps. The simple form of the site layout and the apartments means that heat loss wall area and complex thermal bridges are minimal to most plots on the scheme, which again will minimise space heating demand.

McCarthy Stone utilise electric panel heating to all apartments, which achieve efficiencies up to 100%. Due to the continuing decarbonisation of the UK energy supply, electricity is increasingly becoming the low carbon choice for heating strategy, and it is expected this will continue as more renewable electricity sources become operational and fossil fuel sources are phased out.

Water Heating demand for the apartments will be serviced by an Air Source Heat Pump Hot Water Cylinder, currently proposed to be the Dimplex EDEL product, which can be classified as a low carbon technology. This is a stainless steel cylinder with a hot water heat pump mounted on the top of it.

The system works by extracting heat from external air, supplied through insulated ductwork. As such, it is able to provide hot water with a COP efficiency of up to 336%, which is significantly higher than the efficiency of a standard immersion cylinder powered by direct electricity.

Another key element to the specification of the proposed development is the utilisation of mechanical ventilation with heat recovery (MVHR) in the apartments. This system allows warm stale air produced by occupancy and internal activities to be extracted from the building; however, the heat within this air is retained and transferred to warm the fresh air being brought into the building from outside. The use of MVHR reduces the need to use the main heating system as it provides background heating through occupation (as well as improving comfort levels through the flow of fresh air).

In communal areas, lighting occupancy sensors will be utilised that switch off or dim the lighting when occupants are not present in areas such as circulation spaces, toilets or storage areas. This prevents lighting from being left on when it is not needed, therefore saving energy.

Metering and sub-metering equipment for the heating system will also be used that help identify areas where more energy than expected is being used, such as heaters being left on at times when they are not needed or where there are defective elements present. This helps improve the heating strategy and therefore save energy, addressing EN4/2.

McCarthy Stone have an effective site waste management system adopting waste hierarchy principles of reduce, reuse, or recycle. All waste will be handled by a licensed waste contractor who will segregate and process waste produced. Such waste will be separated into key waste groups and recycled at a waste processing plant to be refined into new products, or reused in other projects where they cannot be reformed.

Given the timescales of the proposed scheme, this will be assessed against the new Part O Overheating Building Regulations, using the Dynamic Thermal Modelling method, which follows the CIBSE TM59 methodology. It is currently expected that compliance will be achieved through a combination of passive measures, as outlined in Section 5b of SPD 16, and mechanical ventilation. Where further measures are required to ensure Part O Compliance, these will be installed in full by McCarthy Stone.

McCarthy Stone will also install sufficient Electric Vehicle (EV) Charging points to comply with Part S of the Building Regulations at a minimum.

While this is not directly connected to the energy performance of the building, it does demonstrate their commitment to low carbon technologies throughout the site and adaptability to future needs, as this will provide an easily accessible facility for the end user to operate an electric vehicle rather than a petrol fuelled vehicle.

To summarise, all of the main building elements outlined in Table 1 have been designed to provide a thermally efficient building envelope that achieves an improvement on the minimum requirements set out within Part L. The below tables detail the performance of the proposed scheme against all relevant assessment metrics of Part L 2021. The full outputs for the SAP and SBEM calculations used to derive these figures are available on request.

Table 2: Part L 2021 Carbon Emissions	
Domestic	Units (kg/CO ₂ /year/m ²)
Target Emission Rate (Block Compliance)	9.97
Dwelling Emission Rate (Block Compliance)	3.50
Percentage Reduction (%)	64.89
Non-Domestic	Units (kg/CO ₂ /year/m ²)
Target Emission Rate	7.39
Building Emission Rate	7.34
Percentage Reduction (%)	0.68

Table 3: Part L 2021 Primary Energy	
Domestic	Units (kwh/ m ² /year)
Target Primary Energy Rate (Block Compliance)	52.56
Dwelling Primary Energy Rate (Block Compliance)	36.77
Percentage Reduction (%)	30.03
Non-Domestic	Units (kwh/ m ² /year)
Target Primary Energy Rate	76.42
Building Primary Energy Rate	73.38
Percentage Reduction (%)	3.98

Table 4: Part L 2021 Fabric Efficiency	
Domestic	Units (kwh/ year/m ²)
Target Fabric Energy Efficiency (Block Compliance)	22.24
Dwelling Fabric Energy Efficiency (Block Compliance)	22.01
Percentage Reduction (%)	1.04

Based on the Design Stage SAP's produced, this scheme will demonstrate an average improvement over the TER of 64.89%, which is a significant improvement over the minimum standards and indeed goes beyond the expected target for the 2025 Future Homes Standard. The uplift to the TER for compliance under Part L 2021 exceeds 25% of the carbon target under Part L 2006. Therefore, by exceeding current TER standards under the updated *Building Regulations Part L 2021*, the development meets the target set out in SPD 16 Section 5a, that requires a 25% carbon reduction over Part L 2006.

Significant improvements in energy efficiency have contributed towards reducing carbon emissions, addressing Policy EN4, which encourages efficient use of energy in the design of the development, and the reduction of greenhouse gases such as carbon which this metric shows.

As Table 4 above illustrates, the scheme will also demonstrate an average improvement over the TFEE of 1.04% as a result of the 'fabric first' approach, therefore adhering to Policy EN4/2 and Section 5b of SPD 16, allowing for efficient use of energy as a result of improved building fabric and design.

The above tables also demonstrate Compliance with the 2021 Part L2A Regulations. These mandate a level of performance equivalent to a 27% improvement over the requirements of Part L2A 2013. Therefore, compliance with 2021 L2A can be seen to demonstrate a significant reduction in carbon emissions, addressing Policy EN4 and the 25% carbon reduction target under Part L 2006.

3.2 JP-S2 Carbon and Energy

In order to address Policy JP-S2, the development's space and water heating energy demand has been analysed to understand if the development will meet the targets in Table 5.1 under this policy. Table 5 below demonstrates the space heat demand for each apartment.

Table 5: JP-S2 Space Heat Demand Target	
Plot	Space Heat Demand (kWh/m2)
1	9.24
2	9.24
3	9.24
4	14.76
5	7.68
6	7.4
7	8.42
8	9.97
9	9.15
10	8.7
11	13.56
12	10.55
13	9.63
14	10.55
15	13.32
16	15.8
17	2.88
18	2.41
19	2.09
20	5.43
21	3.27
22	2.37

Table 5: JP-S2 Space Heat Demand Target	
Plot	Space Heat Demand (kWh/m2)
23	3.27
24	5.44
25	1.92
26	9.84
27	1.92
28	1.49
29	1.49
30	5.59
31	10.5
32	1.77
33	1.77
34	1.77
35	1.51
36	9.29
37	8.84
38	8.92
39	12.82
40	9.95
41	9.01
42	9.95
43	12.3
44	8.47
45	9.13
46	8.47
47	7.94
48	7.94
49	10.56
50	7.28
51	7.28
52	7.56

As is shown from Table 5 above, all flats achieve a space heat demand below the target of 25 kWh/m² shown in Table 5.1 under Policy JP-S2.

Table 6: JP-S2 Total Hot Water Energy Demand Target		
Hot Water Energy Demand (DER/Actual)	Hot Water Energy Demand (TER/Notional)	Hot Water Energy Demand Reduction from Notional (%)
36,896.29	120,809.13	30.54%

Table 6 shows that the apartments within the development achieve a 30.54% reduction in energy demand for heat required for hot water. This exceeds the target reduction of 20% required by Policy JP-S2, therefore meeting the policy requirements.

In relation to the renewable energy generation target in Table 5.1, the development is proposing to install 22,749.58 kWh/year. The area in m² that this covers would need to be confirmed by the PV supplier, to ensure this covers at least 20% of ground floorspace for residential areas (3,220.96m²).

3.3 EN4/1 & SPD 16 Section 5a – Renewable Energy

EN4/1 encourages the use of renewable energy resources within developments, which reduce the levels of carbon emissions. SPD 16 Section 5a requires residential developments of more than 10 units to provide 10% of their predicted energy requirements on site or from low carbon decentralised supply.

As a result, a review of different renewable technologies and decentralised energy options has been conducted to identify the most suitable technology to be used at this development in Prestwich to contribute towards predicted energy requirements.

District Heating

An exercise has been completed reviewing the potential for the proposed development at George Street, Prestwich to connect to an existing district heat network. The Association for Decentralised Energy's (ADE) District Heating connection map has been reviewed to confirm the closest possible connection point.

The closest connection point is the Granada Television Studios, which is approximately 2.94 miles from the proposed site location. Due to the extended distance between these two points, it is considered that this would not be a feasible application.

Small-Scale Wind Turbines

Wind turbines convert the power in the wind into electrical energy using rotating wing-like blades to drive a generator. Similar to Photovoltaic panels (PV), they can either be grid connected or used to charge batteries or for on-site use.

Wind turbines can range from small domestic turbines producing hundreds of watts to large offshore turbines with capacities of 3MW and diameters of 100m.

A detailed study for urban deployment should take into account wind speed and turbulence and potential noise pollution issues.

There are two main types of turbine available, horizontal or vertical axis. Horizontal axis turbines, (sometimes referred to a propeller type) range in scale from 0.5m to 100m diameter. Vertical-axis turbines rotate around a vertical axis, resulting in lower rotor tip speed and reduced noise and vibration issues.

As a general rule, horizontal turbines are better suited to less turbulent wind regimes, whilst vertical axis turbines offer potential for installation in urban environments. In either case, the turbine must be mounted at a reasonable height to ensure that it can 'see' the wind.

For urban deployment, this means that roof mounted turbines still require a mast and the structural design of the building must be developed to incorporate the additional loads and stresses.

Due to the likely issues associated with permissions required for such installation and the potential for nuisance noise in a residential area, the use of wind turbines has not been considered appropriate for the scheme.

Solar Thermal Heating

Solar thermal panels collect solar radiation to heat water that can then be used for either space heating or domestic hot water. There are two types of competing solar thermal technologies; flat-plate and evacuated tube.

The system consists of solar collectors that are often roof mounted. Liquid is passed through the solar collectors and then to a heat exchanger in a domestic hot water cylinder, which will also have a top-up heat source (gas, biomass, or electricity) to ensure reliability of supply.

A typical 3-4m² collector area system (area dependent on technology) is capable of providing 50% the annual domestic hot water demand for a typical 2-3 bed house. The proportion of hot water provided varies over the course of a year, with the system achieving 100% coverage during the summer months and 5% during the winter.

It is highly unlikely that solar thermal would be the most efficient or cost-effective renewable technology for use on this scheme. As such, the use of solar thermal has not been considered appropriate for this scheme.

Heat Pumps

While heat pumps are strictly a low carbon technology rather than a true renewable, their current prominence in discussions about the UK's future energy strategy means that their inclusion within this assessment can be considered relevant.

A ground source heat pump (GSHP) can harness the energy from the ground for use within buildings.

This makes it possible to use the heat in the ground during the winter months to meet our heating needs. In the summer months it is also possible to cool buildings using ground temperatures that are lower than ambient air. A typical ground system consists of a ground to water heat exchanger often called the 'ground loop' or 'ground coil', a heat pump and a distribution system.

Water (or other solution) is passed round the system 'absorbing' heat from the ground and upgrading this heat via the heat pump into the building.

The constraints and nature of the proposed site do not lend well to the use of ground source heat pumps and as a result, this technology has not been considered to be feasible.

Air source heat pumps (ASHP) work in a similar way to ground source and are able to extract heat from the outdoor air, even when the outside temperatures are very low, for use in space heating and hot water systems. ASHP are also available in air – air formats, in which the heat is emitted into the building through ductwork, in which instance can also provide the option for air conditioning or cooling in summer, however they cannot serve hot water systems.

Given site constraints (both in terms of space required and potential noise and visual nuisance) as well as financial viability reasons, currently heat pumps are not considered appropriate for the proposed development.

It should be noted, however, that hot water demand for the apartments will be serviced by an Air Source Heat Pump Hot Water Cylinder. This means that the apartments will be utilising hot water produced at an efficiency that is significantly higher than that of a standard immersion cylinder powered by direct electricity.

Combined Heat and Power

CHP is a technology that produces electricity and thermal energy at high efficiencies using a range of technologies and fuels. With on-site power production, losses are minimised and heat that would otherwise be wasted is applied to facility loads in the form of process heating, steam, hot water, or even chilled water. CHP can be located at an individual facility or building, or it can be a district energy, microgrid, and/or utility resource that provides power and thermal energy to multiple end-users. CHP equipment can provide resilient power 24/7 in the event of grid outages, and it can be paired with other distributed energy technologies like solar photovoltaics (PV) and energy storage.

By capturing and using heat that would otherwise be wasted and by avoiding distribution losses, CHP can achieve efficiencies of over 80 percent, compared to 50 percent for typical technologies (e.g., conventional electricity generation and an on-site boiler). Because of this increased efficiency, CHP systems can emit less carbon emissions than separate heat and grid power.

Full CHP systems are generally only suitable for sites where there is a constant load requirement for space heating and hot water demand with on-site power in order to maximise the cogeneration cost.

For larger scale systems heat and power demand need to remain fairly consistent for maximum efficiency and a good return on investment. This particularly applies to energy centre heating systems which are powered continuously via larger systems. As such a specific CHP system has been deemed unsuitable for space heating and hot water demand for a stand-alone retirement complex where the heating and water demand will fluctuate throughout the day.

Biomass

Biomass is an energy source where energy is generated by the burning of organic matter such as wood, plants or organic waste. Biomass can be considered a low carbon technology as the carbon emitted when these products are burned is the same amount that was absorbed while they were growing. It can theoretically also be classed as a renewable source if new plants are grown to replace those that have been burned. However, recent studies have associated the use of biomass heating (such as log burners) with an increase in emissions of dangerous substances such as carbon monoxide and other particulates.

Given the above issues, and the issues with getting sufficient biomass on site, it is not considered feasible that a biomass heating strategy could be employed at this site.

Solar Photovoltaics

Photovoltaic panels convert solar radiation into direct current electricity. In principle, they are an ideal source of renewable energy as they harness the most abundant source of energy on the Earth, the sun, and they produce electricity, which is the most useful form of energy.

PV's are silent in operation, have no moving parts and have a long life with low maintenance levels. PV systems can be connected to the grid or battery arrays in remote locations. Grid connected systems consist of PV arrays connected to the grid through a charge controller and an inverter.

PV cells are more efficient at lower temperatures so good ventilation should be allowed around the PV modules where possible.

McCarthy Stone put their customers at the heart of product choice, it is the attributes of PV's high performance by delivering real energy generation benefits to running costs, added to the low maintenance costs, which is vital to reduce whole life costs of a scheme for all residents. It is this that makes it their preferred renewable approach for CO₂ reduction and Energy contribution targets.

Based on the SBEM calculations, an output of 22,749.58 kWh / year is required, to ensure that Part L2A Compliance is achieved for the communal elements of the proposed scheme. In addition, this is required to ensure that renewable and low carbon energy production equipment contributes to the energy usage and carbon reduction of the development to address Policy EN4/1 and SPD Section 5a 10% energy requirement from onsite sources target.

The client has requested their chosen PV supplier to propose a suitably sized PV array in order to meet the output requirement of 22,749.58 kWh/year, which they are committed to applying to the scheme, and the PV figure will be updated where required as the scheme design develops.

In order to demonstrate the contribution of renewable technologies towards the total predicted energy requirement, the SAP and SBEM calculations undertaken for the scheme have been utilised to calculate this. These figures are detailed in Table 7 over the page.

Table 7: Total Energy Requirements	
Domestic	Units (kWh/yr)
Space Heating	24,594.81
Water Heating	36,896.29
Ventilation	5,825.96
Lighting	9,439.20
Total Domestic	76,756.38
Non-Domestic	Units (kWh/yr)
Space Heating	48,631.21
Water Heating	4,921.89
Auxiliary	348.01
Lighting	14,715.64
Solar Photovoltaic Panels	-22,749.58
Total Non-Domestic	45,867.17
Total	122,623.43

On the basis of the table above, we can see that the total predicted energy requirements of the development total 145,373.01 kWh/yr without PV, and 122,623.43 kWh/yr with PV included. The solar photovoltaic panels applied to the SBEM to achieve Part L2A compliance provide 22,749.58 kWh/yr, which accounts for 15.65% of the total energy consumption for the development. Therefore, PV is supplying and contributing towards a significant proportion of the energy demand of the development and exceeds the 10% target under Section 5a of SPD 16, therefore meeting this requirement. This reduces the amount of electricity that is drawn from the grid, which in turn reduces the associated carbon emissions of the development, addressing Policy EN4.

3.4 EN4 & SPD Section 5a – Carbon Emission Reductions

In order to understand the reduction in levels of ‘greenhouse gases’, as outlined under Policy EN4, and to understand if the 25% carbon reduction target against Part L 2006 for SPD 16 Section 5a has been met, outputs from the SAP and SBEM calculations for the proposed development have been utilised to demonstrate the overall proposed carbon reduction of the development. This is because of the energy efficiency measures incorporated into design, and the renewable technology installed.

Table 8 below demonstrates the development’s expected breakdown of carbon emissions, based on the dwellings modelled.

Table 8: Carbon Emissions Breakdown	
Target Carbon Emissions	Units (kg/CO ₂ /yr)
Domestic	32,123.45
Non-Domestic	7,347.88
Sub-Total	39,471.33
Predicted Carbon Emissions	Units (kg/CO ₂ /yr)
Domestic	16,479.02
Non-Domestic	7,298.16
Sub-Total	23,777.18
CO2 Reduction	15,694.15

Table 9 shows the Target CO₂ Emissions (TER) of the development to be 39,471.33 kg/CO₂/yr. The Predicted Carbon Emissions (DER/BER) are demonstrated to be below this amount, currently modelled to achieve 23,777.18 kg/CO₂/yr. Overall, this is a 15,694.15 kg/CO₂/yr reduction in carbon emissions, which is a 39.76% reduction under Part L 2021. This far exceeds the 25% carbon reduction target against Part L 2006, therefore meeting this requirement.

3.5 SPD Section 5b – Water Conservation

Section 5b under SPD 16 required measures to be incorporated to conserve water resources. The development at Prestwich will incorporate efficient, water saving sanitaryware to meet this policy requirement. Where this is not possible, flow restrictors will be installed to limit water use of sanitaryware items.

A representative specification is listed below, whilst the final flow rates of individual sanitaryware items may change as detailed design progresses, a 125 Litre limit will be maintained to comply with Approved Document G. A full breakdown of calculations is available in Appendix 2.

The specification outlined in Table 9 below achieves 94.7 litres/ per person/ per day, this therefore is comfortably below the 125 litres/per person/per day limit.

Table 9: Proposed Sanitaryware Specification Flow Rates	
Component	Water Usage
WC's	4.5 Litres (Full Flush Volume), 3 Litres (Part Flush Volume)
Showers	7 Litres/Minute
Wash-hand basin taps	5 Litres/Minute
Kitchen taps	5 Litres/Minute
Washing Machine	8.29 Litres/kg
Dishwasher	1.25 Litres/Place Setting

It is assumed that the measures required for maximising the use of water recycling, flood risk and sustainable urban drainage systems under Section 5b of SPD 16 will be confirmed in a separate statement.

4.0 Conclusion

This statement has reviewed the proposed development at George Street, Prestwich, a complex consisting of 52no apartments (mix of 1 & 2 bedroom) and associated communal areas, with supplementary parking and landscaping, and has provided an assessment of the proposed scheme against the relevant policy documents:

Adopted Bury Unitary Development Plan.

Places for Everyone Joint Development Plan Document.

SPD 16: Design and layout of New Development.

The statement has highlighted that the scheme currently proposes to utilise a high performing thermal envelope to minimise heat loss, as well as efficient heating and lighting systems, which will drive energy efficiency in the building to meet the targets for space and water heating demand laid out under Policy JP-S2. This is augmented by the use of an ASHP system to provide hot water, and an MVHR system for ventilation, both of which are high performing products that drive low carbon, efficient energy usage within the building design.

As such, supplemented by a photovoltaic array for the communal areas, the proposed specification allows the scheme to comfortably comply with all metrics under the new Part L 2022 Building Regulations, and demonstrate a level of predicted carbon emission performance for the apartments that is more in line with the expected 2025 Future Homes Standard requirements, far exceeding the 25% carbon reduction target under Part L 2006 target under Section 5a of SPD 16. As per Policy EN4/1 and SPD 16 Section 5a, it is encouraged that developments should incorporate renewable energy resources, which will contribute towards the supply of energy to the development and the reduction of carbon emissions.

A review has also been undertaken of the main potential decentralised low and zero carbon technologies available in the UK currently, and an assessment is provided as to the feasibility of their use at the Prestwich scheme.

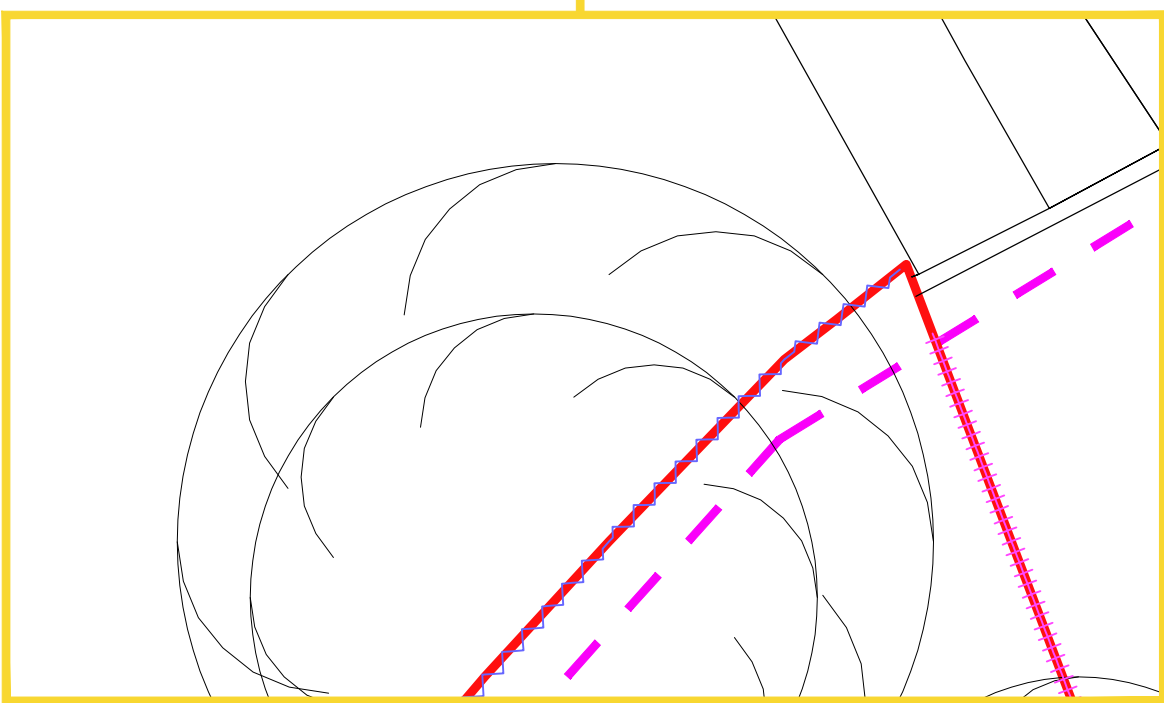
Having completed this review, it is concluded that a PV array with a total minimum output of 22,749.58 kWh/year will be installed at the scheme, to ensure that Part L2A Compliance is achieved for the communal element. This will provide at least 15.65% of predicted total energy requirements from renewables, exceeding SPD 16 Section 5a target of 10% of predicted energy requirements from on site generation. Carbon emissions are reduced by an overall total of 39.76% as a result of energy efficiency measures and the PV applied to the communal spaces, satisfying Policy EN4 and SPD 16 Section 5a target of 25% carbon reduction under Part L 2006.

Whilst the listed specification at this present time is the intended one at this time, the strategy and required PV contribution may be subject to change as design develops further. Nonetheless, it will be ensured that where any changes are made, compliance with the policy requirements listed will be maintained.

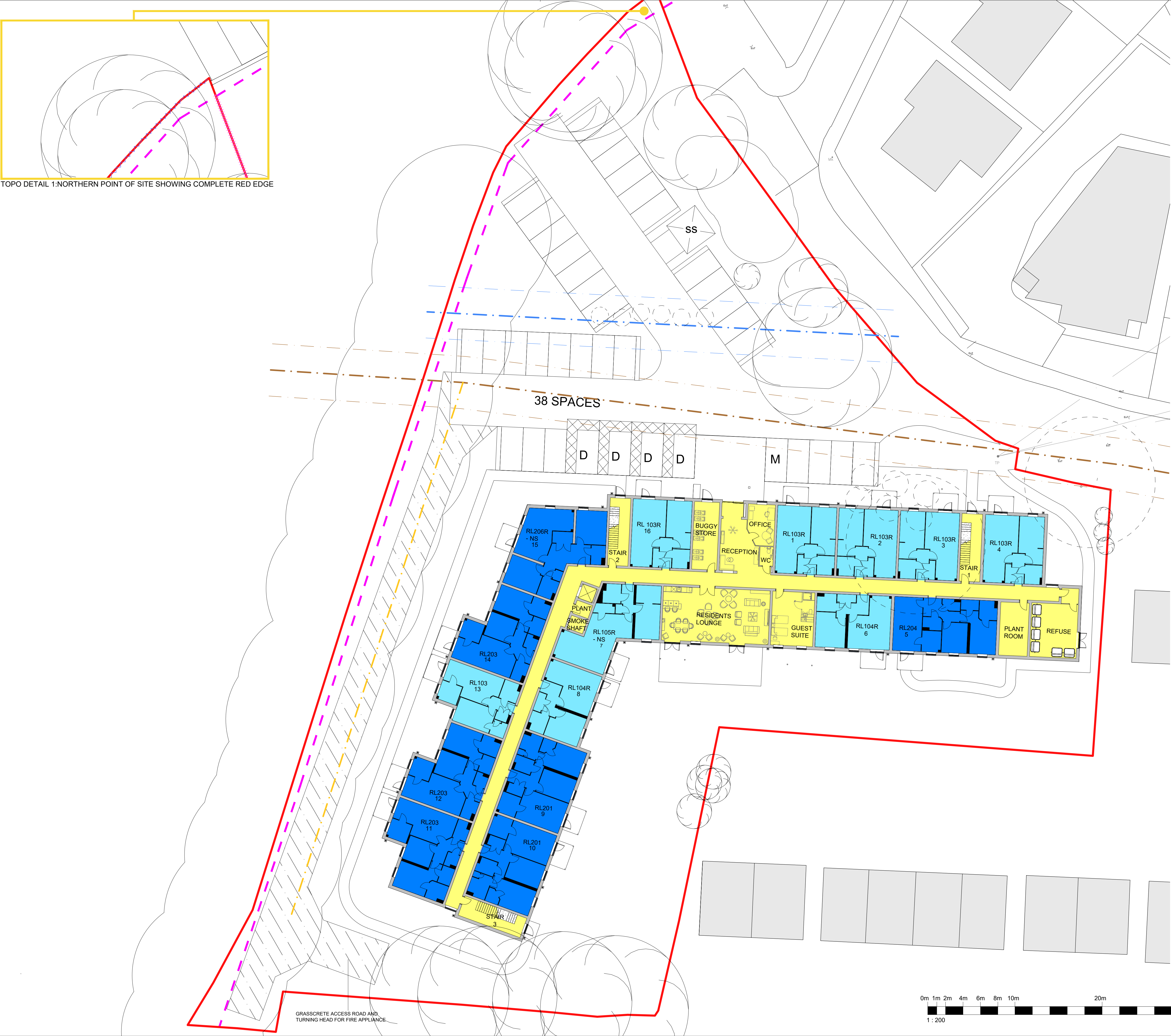


Appendix 1

Proposed Site Plan



TOPO DETAIL 1: NORTHERN POINT OF SITE SHOWING COMPLETE RED EDGE



REVISIONS

ACCOMMODATION SCHEDULE	MIX
GROUND FLOOR	1 BED 5
	2 BED 7
FIRST FLOOR	1 BED 11
	2 BED 6
SECOND FLOOR	1 BED 10
	2 BED 8
	TOTAL 62

KEY	
—	SITE BOUNDARY
- - -	PUBLIC RIGHT OF WAY
- - -	EXISTING FOUL WATER PIPE WITH 6M EASEMENT
- - -	EXISTING SURFACE WATER PIPE WITH 6M EASEMENT
- - -	EXISTING FOUL WATER PIPE TO BE CLOSED OFF AND ABANDONED
 	TREE'S TO BE REMOVED
 	GRASSCRETE ACCESS ROAD AND TURNING HEAD FOR FIRE APPLIANCE
 	EXISTING TREES

PRELIMINARY

mck

commercial design

architecture | building surveying | urban design

burnaby villa

48 walling street road

fulwood

preston

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Our Ref.

McCarthy Stone

Life, well lived

Project Title

FORMER FAIRWAYS LODGE

GEORGE STREET

PRESTWICH

Drawing Title

PROPOSED SITE PLAN

Scale@A1 1:200

Date 05/12/23

Drawn GO

Checked PS

Drawing No.

NO -2953 -03-AC -0010

Division

Project No.

Stage

Discipline

Number

Revision

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Appendix 2

Part G Water Calculations



Job no:	23/01/2024 Kate Pumphrey Prestwich
Date:	
Assessor name:	
Registration no:	
Development name:	Prestwich

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PRINTING: before printing please make sure that in "Page Setup" you have selected the page to be as "Landscape" and that the Scale has been set up to 70% (maximum)

WATER EFFICIENCY CALCULATOR FOR NEW DWELLINGS - (BASIC CALCULATOR)

House Type:		Type 1		Type 2		Type 3		Type 4		Type 5		Type 6		Type 7		Type 8		Type 9		Type 10	
Description:																					
Installation Type	Unit of measure	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day	Capacity/ flow rate	Litres/ person/ day
Is a dual or single flush WC specified?		Dual		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Click to Select		Click to Select		Click to Select	
WC	Full flush volume	4.5	6.57		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
	Part flush volume	3	8.88		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Taps (excluding kitchen and external taps)	Flow rate (litres / minute)	5	9.48		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Are both a Bath & Shower Present?		Shower only		Bath & Shower		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Bath	Capacity to overflow	0	0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Shower	Flow rate (litres / minute)	7	39.20		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Kitchen sink taps	Flow rate (litres / minute)	5	12.56		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a washing machine been specified?		Yes		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Washing Machine	Litres / kg	8.29	17.41		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a dishwasher been specified?		No		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:		Select option:	
Dishwasher	Litres / place setting	1.25	4.50		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Has a waste disposal unit been specified?		Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00	Select option:	0.00
Water Softener	Litres / person / day		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00
Calculated Use		98.6		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
Normalisation factor		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91		0.91	
Code for Sustainable Homes	Total Consumption	89.7		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	Mandatory level	Level 3/4		-		-		-		-		-		-		-		-		-	
Building Regulations 17.K	External use	5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0		5.0	
	Total Consumption	94.7		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0		0.0	
	17.K Compliance?	Yes		-		-		-		-		-		-		-		-		-	



Appendix 3

Energy Calculations (SAP Worksheets – available on request due to size)