

Bury Council

Moorfield Sheltered Housing, Wordsworth Avenue,

Manchester, M26 3QY

JP-S2 Energy and Carbon Statement

- New build • Repairs and maintenance • Housing monitoring • Retrofit
- Hidden homes • Building information modelling (BIM)
- Sustainability • Offsite construction

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1.0 INTRODUCTION

PROPERTY

Property address	Moorfield Sheltered Housing, Wordsworth Avenue, Manchester, Greater Manchester, M26 3QY.
Brief description	Moorfield Sheltered Accommodation is a residential complex that comprises 35 individual flats with individually monitored gas and electric meters spread across seven interlink blocks. The project at hand is to replace all existing roofs and upgrade the insulation to meet current Building Regulations. The complex's communal areas and residential properties have vaulted ceilings, which require upgrading the existing roofing rafters to achieve the current insulation depth. Moreover, the seven blocks currently have an existing polycarbonate roof section, which is to be removed. The rafters will be extended to a new ridge beam and fully tiled with automated Velux windows to meet current lighting and thermal comfort requirements. They will also reduce the energy consumption for the building, including solar PV panels.
Year built	1989
Accommodation	Sheltered Accommodation
Tenure	We understand that Bury Council are the registered Landlord of the property.

2.0 Carbon and Energy Statement

2.1 Introduction

PfE Places for Everyone JP-S2: Carbon and Energy Statement Places for Everyone (PfE) The Places for Everyone Joint Development Plan Document has been adopted and now forms a part of the development plan for Bury from 21st March 2024.. Planning law requires that applications for planning permission be determined in accordance with the development plan unless material considerations indicate otherwise. The policies of the PfE are therefore applicable to the assessment and determination of all planning applications from 21st March 2024.

Policy JP-S 2 Carbon and Energy States 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. This energy and Carbon Statement outlines the key findings and objectives of the roof replacement program for Moorfield Sheltered Housing. It aims to demonstrate how the roof replacement project will contribute to carbon and energy savings and enhance the overall sustainability of the building.

Construction activities are significant contributors to carbon emissions and energy consumption globally. The extraction, manufacturing, transportation, and installation of construction materials and the operation of buildings require substantial amounts of energy and result in greenhouse gas emissions. By addressing energy consumption and carbon emissions, construction projects can play a crucial role in mitigating climate change and reducing environmental harm.

Construction projects consume vast amounts of natural resources, including timber, minerals, water, and energy. By optimising energy use and reducing carbon emissions, construction projects can contribute to resource conservation and promote more sustainable resource management practices.

Improving energy efficiency in construction projects can lead to significant cost savings over the project lifecycle. Energy-efficient buildings require less heating, cooling, and lighting energy, resulting in lower utility bills for occupants. Additionally, sustainable construction practices can minimise waste generation and disposal costs, reducing project expenses.

Sustainable construction practices not only benefit the environment and society in the short term but also contribute to long-term sustainability and resilience. Energy-efficient buildings are less vulnerable to energy price fluctuations and supply disruptions, making them more economically and environmentally sustainable over time. Additionally, reducing carbon emissions helps mitigate the impacts of climate change, such as extreme weather events, sea-level rise, and ecosystem disruption, thereby safeguarding the long-term viability of built infrastructure.

Addressing energy consumption and carbon emissions in construction projects is essential for promoting environmental stewardship, achieving cost savings, ensuring regulatory compliance, meeting market demand, and fostering long-term sustainability and resilience.

2.2 Baseline Assessment

The EPC detailed below provides a rating for the building's energy efficiency on a scale from A to G, with A being the most energy-efficient and G being the least. This rating gives an overview of the property's overall energy performance, which is currently a D and has the potential to become a B rating.

The EPC details the building's energy consumption, measured in kilowatt-hours per square meter per year (kWh/m²/year). This data indicates how much energy the building uses for heating, hot water, lighting, and other purposes, which is currently 6,273 kWh for heating.

In addition to energy consumption, the EPC provide data on the building's carbon emissions, measured in kilograms of CO₂ per square meter per year (kgCO₂/m²/year). This information quantifies the environmental impact of the building's energy use, which currently is 2.3 tonnes of CO₂, but the potential production is 1.2 tonnes of CO₂.

The EPC includes recommendations for improving the building's energy efficiency and reducing its carbon footprint. These recommendations may range from simple, low-cost measures to more extensive refurbishment options, such as insulation upgrades, heating system replacements, or renewable energy installations upgrading the insulation to current Building Regulations and adding Solar PV will significantly contribute to the reduction in monetary savings and carbon emissions.

2.3 Existing Roof

The primary roofing material is Grey concrete pantiles, selected for their durability, traditional aesthetic appeal, and ability to integrate seamlessly into the surrounding environment with mortar-bedded hips and valleys, chosen to blend in with the current surroundings.

The roof structure is constructed using a robust framework of timber roofing rafters, ensuring stability and adherence to safety standards. The roof pitch is 25 degrees, chosen to facilitate efficient rainwater drainage. Polycarbonate Roof Sections: Integrated into the design are sections of polycarbonate roofing positioned to allow natural light penetration. These transparent or translucent panels contribute to a well-lit interior but do not provide thermal comfort as they are inoperable to allow passive ventilation.

The existing colour for the roofing elements is Grey concrete tile with Grey bedded hips and valleys, chosen to blend in with the current surroundings. The polycarbonate roof design consists of transparent sheeting with white joining strips. The apex of the roof additionally has a transparent finish with a metal trim detail, and along the ridgeline of the roof sits a brown vented capping retail, which spans the whole length of the polycarbonate roof.

2.4 Proposed Roof

Replacement of fascia (black) to all properties (no soffits). The rainwater pipe is to be a 75mm black PVC-U pipe. Half-round deep flow guttering is to be used on all blocks, and the Hedgehog Guttering System is to be installed on all seven blocks, front and rear. Should the cavity be open at the roof line, then cavity socks are to be fitted. Fire breaks are to be fitted to the top of the party wall and also within the soffit/facia area. - Sandtoft Concrete Grey Calderdale tile to main roofs to be as per specification from Sandtoft. Felt to be Sandtoft VPM Super. Sandtoft ventilated eaves system to be fitted to all roofs with additional rafter roll to extend beyond loft insulation.

Sandtoft dry verge to be the multi-verge dry verge system. Dry ridge to be profile ridge system. All roof slope terminals are to be Sandtoft concealed tile ventilators with pipe adaptors. Should the cavity be open at the roof line, then cavity socks are to be fitted. Fire breaks are to be fitted to the top of the party wall and also within the soffit/facia area. Low-Level Roofs above entrance doors. Remove the existing concrete tile and renew the concrete tile as above for the main roof. Renew facia in UPVC colour black to match the main roof.

The proposal is to install an automated Velux window where the current polycarbonate roof is situated. This will allow more natural light to enter the building, and the Velux technical team will design it to ensure sufficient lighting. The window will be equipped with temperature sensors that will help regulate the area's internal thermal comfort. Moreover, rain sensors will enable the windows to close automatically in case of rain.

2.5 Energy & Carbon Efficiency Measures

The new roofs will contribute to energy efficiency and carbon reduction through various design features, materials, and technologies aimed at minimising energy consumption and greenhouse gas emissions. Below are some ways in which the new roof design will achieve these goals:

Installing a dry ridge roofing system will reduce future maintenance needs and improve sustainability. The Dry ridge systems will eliminate the need for mortar, which tends to degrade over time, leading to potential maintenance issues. The Dry ridge systems will require minimal maintenance compared to traditional mortar ridge systems, which can crack and deteriorate over time. Many dry ridge systems incorporate ventilation, which helps regulate the roof's temperature and moisture levels, extending the roof covering's lifespan.

Dry ridge systems provide a more secure fixing for ridge tiles, making them less susceptible to wind damage and water ingress. By reducing the need for ongoing maintenance and increasing the roof's longevity, dry ridge systems contribute to the overall sustainability of the building.

Upgrading the insulation of the roofs will reduce heat loss during the winter and heat gain during the summer, thereby decreasing the need for heating and cooling energy. High-performance insulation materials, such as Rockwall HARDROCK and FLEXI Multi-fix will enhance thermal resistance and improve overall energy efficiency.

Table 1 shows the existing and proposed U-Values.

Existing and Proposed Insulation Rafter Line	U-Value
Existing 50mm Quilt insulation laid between rafters	0.60 W/mK
Proposed 230mm HARDROCK & FLEXI Rockwall Insulation	0.16 W/mK
Existing Polycarbonate Roof Covering	2.4 W/mK
Proposed Velux Solar Roof Window	1.3 W/mK

Integrating photovoltaic (PV) solar panels onto the roofs will generate renewable electricity onsite, reducing reliance on grid-supplied power and decreasing carbon emissions associated with electricity generation. Solar panels can offset energy consumption from lighting, appliances, further enhancing the overall energy efficiency of the building.

Integrating timers, and programmable thermostats into HVAC and lighting systems can optimise energy usage based on occupancy patterns and schedules. These controls can conserve energy and reduce operational costs by automatically adjusting temperature setpoints.

Incorporating Velux skylights, into the roof design will maximise natural light penetration into interior spaces, reducing the need for artificial lighting during daylight hours. By harnessing natural daylight, buildings can lower electricity consumption and carbon emissions from lighting fixtures.

Implementing passive ventilation techniques, such as ridge vents, soffit vents, or roof turbines, can facilitate airflow within the roof cavity, improving indoor air quality and reducing the demand for mechanical ventilation. Enhanced ventilation can lower energy consumption while promoting occupant comfort and well-being.

Choosing energy-efficient roofing materials with high solar reflectance and thermal emissivity properties can minimise heat absorption and reduce heat transfer into the building. Materials such as clay tiles can help maintain comfortable indoor temperatures and decrease energy demand for cooling.

By integrating these energy-efficient design features, materials, and technologies into the new roofs, they will enhance energy performance, lower operational costs, and mitigate carbon emissions, thereby contributing to sustainable development and the environment.

2.6 Monitoring and Reporting

Monitoring energy and carbon performance throughout the project lifecycle involves collecting, analysing, and evaluating data on energy consumption, carbon emissions, and associated factors over time. The Allume systems will have an online portal for each system, which can be viewed at any given time to view production and the history of the production. The Allume or standard systems will have a public display for each block/inverter.

Gathering baseline data on energy consumption and carbon emissions from the buildings or facilities included in the roof replacement project. This data may include utility bills, energy meter readings, fuel consumption records, and other relevant documentation.

Energy meters, submeters, and monitoring systems will be used to track energy usage and carbon emissions in real-time or at regular intervals. The systems can measure electricity consumed by the building and monitor indoor environmental conditions such as temperature, humidity, and air quality.

Bury Council will continuously monitor energy and carbon performance throughout the 12-month period and beyond, making adjustments as needed to optimise building operations and maximise savings. Regularly review of energy bills, meter readings, and performance metrics to ensure the building operates.

Conducting a demand assessment over a 12-month period and implementing continuous monitoring and optimisation strategies. This will effectively track energy and carbon performance throughout the project lifecycle, identify opportunities for efficiency gains, and ensure that the roof replacement project contributes to long-term sustainability and environmental stewardship.

2.7 Reducing carbon emissions during construction.

Prioritising the use of sustainable materials that have lower embodied carbon, such as recycled or locally sourced materials, whenever possible. Additionally, we will use materials that have high durability and longevity to reduce the need for frequent replacements. Finally, we plan to adopt lean construction practices to optimise resource use and minimise waste.

Bury Council are incorporating passive design strategies like natural ventilation and daylighting to reduce the need for mechanical heating and cooling with the Velux window system.

The main Contractor will optimise transportation routes to minimise the distance travelled by construction materials and equipment and consolidate deliveries to reduce the number of trips to and from the construction site. They will be encouraged to use low-emission vehicles and equipment during construction activities.

A construction waste management plan is needed to minimise the amount of waste sent to landfills. Implement recycling and reuse practices for construction materials, including concrete, wood, and metal will be implemented. This will consider deconstruction instead of demolition to salvage reusable materials and reduce waste.

2.8 Conclusion

In conclusion, the Energy and Carbon Statement for the Moorfield Sheltered Housing Roof Replacement Program highlights the significant potential for carbon and energy savings through targeted sustainability initiatives. By addressing energy efficiency, reducing carbon emissions, and integrating renewable energy technologies, the project will positively benefit both the environment and the residents of the sheltered accommodation. Moving forward, it is imperative to prioritise implementing energy-saving measures outlined in this statement to achieve the desired sustainability goals and ensure a brighter, more sustainable future for Moorfield Sheltered Housing.