DSSR | CONSULTING ENGINEERS

PROJECT | UoM The Limes FMC FFU

ENERGY STATEMENT

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Revision History

Revision	Date	Status and Purpose	Changes Overview
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1 INTRODUCTION

This report is provided to support the planning application of the proposed new laboratory building to be located at Fallowfield campus, University of Manchester, Manchester.

1.1 Development details

The proposed building is one storey and will provide office, workshop, storage and associated support facilities. The location for the building is on an existing carpark which is proposed to have new utility services to support the building from both existing university assets and new utilities connections. The below Figure 1 details the approximate site boundary:



Figure 1: Site boundary

2 PROPOSED ENERGY STRATEGY

The low carbon energy strategy for The Limes FMC ESU & RST development at the University of Manchester follows the Energy Hierarchy as demonstrated in Figure 2.

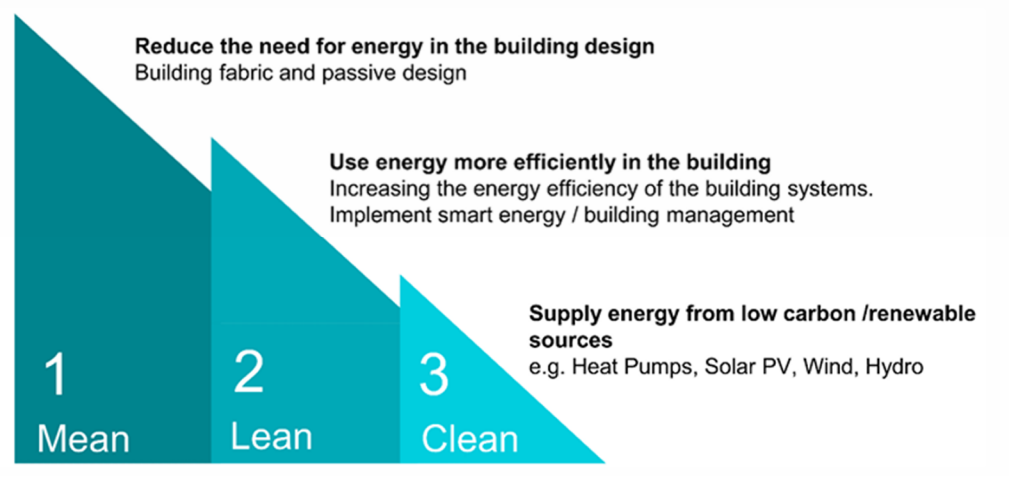


Figure 2: Energy Hierarchy

The methodology provided by the Energy Hierarchy considers the reduction of energy demand firstly through passive design, then by reducing active energy by using energy efficiency equipment before offsetting any remaining energy demand with on site or off-site renewable energy. The following section details the proposed strategy for the development and the approach that will be taken.

2.1 Mean Measures

To ensure the development is designed and constructed in such a way to maximise energy efficiency, reduce energy demand and reduce carbon dioxide emissions that are associated with energy use, the following 'mean' passive design measures have been considered and developed by the project delivery team:

• Building orientations to enhance useful passive solar gain whilst also limiting summertime overheating

• Solar control measures to limit the impact of solar gain

• Improved levels of building fabric performance

• Airtight construction through good design detailing to reduce heat loss through thermal bridging and air permeability

• Insulation of pipework, ductwork and equipment to reduce heat loss and increase energy efficiency

2.1.1 Limiting Heat Loss Through Building Fabric

The primary thermal envelope of the building will be designed in line with the requirement of the Building Regulations Part L Volume 2, Conservation of Fuel and Power in Buildings other than Dwellings, 2021, incorporating 2023 amendments. The proposed U-values are illustrated in the Table 1 below.

Table 1: Proposed U-values for building elements

Element	Maximum Area Weighted U value (W/m2K) Part L	Proposed Fabric Specification
Ground Floor U-value (W/m²K)	0.18	0.18

External Walls U-value (W/m²K)	0.26	0.26
Roof U-value (W/m²K)	0.16	0.16
Windows U-value (W/m²K)	1.6	1.6
Doors	1.6	1.6

Furthermore, the proposed development will achieve an improved air permeability of 5 m³/h·m² at 50 Pa, exceeding the minimum regulatory requirement of 8 m³/h·m² at 50 Pa. In addition, glazing with a solar g-value of 0.4 will be utilised to minimise solar gains, thereby reducing the risk of overheating and lowering cooling energy consumption.

2.2 Lean Measures

Once all viable passive design measures have been implemented, active systems 'Lean' design measures shall be adopted to ensure energy demands are met in the most efficiency manner. The building services will be designed to minimise energy consumption as far as practical possible given the controls required for the function of the building. The building services systems will be installed to comply with the minimum energy performance required under Part L, Volume 2 of the Building Regulations and where possible will improve upon the minimum standards.

The building will be electrified from the outset, and no fossil fuels will be used to provide heating and domestic hot water services.

Measures proposed to be taken include:

• Low energy LED lighting

• Daylight linked lighting controls

• Occupancy detection control for lighting

• Heat recovery ventilation

• Thermostatic heating controls

• Energy metering and display monitors

2.2.1 Space Heating, Cooling and ventilation

The proposed development will be served by air source heat pumps (ASHPs) to provide low-carbon heating and cooling throughout the building. By utilising electrically driven plant, the building will be well positioned to benefit from both on-site renewable electricity generation and the ongoing decarbonisation of the UK electricity grid.

Heating water generated by the ASHP system will be used to serve the ventilation system heating coils and domestic hot water generation. In addition, space heating and cooling will be provided through a combination of Variable Refrigerant Flow (VRF) heat pump systems and local electric radiant heating where appropriate. As these systems are electrically powered, they further support the building's low-carbon energy strategy by maximising the use of renewable electricity generated on site and supplied via the grid.

To minimise energy demand, air handling units will incorporate heat recovery systems, where feasible. These systems will transfer heat energy from exhaust air streams to incoming fresh air through high-

efficiency recuperators, reducing heating energy requirements while maintaining complete separation of supply and extract air streams to preserve indoor air quality.

2.2.2 Lighting

The building lighting systems will be LED throughout. These fittings will be provided with daylight and dimming controls to reduce the electric lighting output around perimeter spaces when there are good levels of external daylighting available. Further automatic lighting control in the form of absence detection will be utilised to further reduce the energy and carbon consumption by limiting the on time of lighting systems.

2.3 Clean Measures

Once all viable passive and active design measures have been implemented, the proposed development shall incorporate low and zero carbon technologies.

2.3.1 On-Site Renewable Energy Generation

The building electrical power supply will be supported via photovoltaic panels to be located on the roof of the building. The proposed design details of the PV panels are shown in the Table 2 below.

Table 2: Details of PV panels

Type	Area (m²)	Azimuth (° clockwise from north)	Inclination (° from horizontal)	Shading Factor	Rated Power (kWdc)
Monocrystalline Silicon	120.0	180.0	15.0	1.000	24.120

3 SUMMARY

This Energy Statement demonstrates how the proposed The Limes FMC ESU & RST development at the University of Manchester has been designed in accordance with the principles of the Energy Hierarchy – Be Lean, Be Clean and Be Green. The statement outlines the energy-efficient design measures incorporated within the development and demonstrates compliance with relevant national and local planning policies, including the National Planning Policy Framework (NPPF), the Building Regulations Approved Document Part L 2021, and the Manchester City Council planning requirements relating to sustainable design and carbon reduction.

An initial energy assessment has been undertaken by DSSR to evaluate the energy performance of the proposed development. The assessment demonstrates that the building is expected to achieve compliance with the energy efficiency requirements of Part L of the Building Regulations and deliver a reduction in regulated carbon emissions through the implementation of energy-efficient design measures and on-site renewable energy generation.