Sustainability Report

Kingsway, Burnage
PA1712

Client
Triple jersey limited

Consulting Engineers

TACE Projects limited
Portland House
Oak Green
Earl Road
Cheadle Hulme
Cheshire
SK8 6QL

www.tace.co.uk

Ref: PA1712
Revision: C
Date: Oct 2023

CONTROLLED DOCUMENT			
The Associates Document No:	PA1712		
Status:		*Copy No:*	
	Name	*Signature*	*Date*
Prepared by:	James Rouen Stout		25/10/2023
Checked:	Nigel Griffiths		
TACE Approved:	James Massey		
Client Approved:			

Revision Record					
Rev.	*Date*	*By*	*Summary of Changes*	*Chkd*	*Aprd*
A	25/10/2023	JRS	Preliminary Issue		
B	16.09.24	NG	Update site plan		
C	17.10.24	NG	Name change on title	NT	JM

Contents

1.0 Sustainability and Energy Strategy Introduction 4
2.0 Planning Policy 4
3.0 Building Regulations Part L Volume 1 (New Domestic) 4
4.0 Energy Strategy 5
5.0 'LEAN' – Design Measures 5
6.0 Mean – High-Efficiency Systems, Plant and Controls 6
7.0 Green – LZC's & Renewable Technologies 6
8.0 Conclusion 7
Next Steps 8

1.0 Sustainability and Energy Strategy Introduction

This section sets out the approach to the sustainability and energy strategy for the proposed Kingsway, Burnage scheme. The following has been set out to indicate what can be achieved when sustainable design is incorporated. The following information has been developed for planning purposes only. The scheme shall be designed to reduce energy demand through passive design measures lowering energy bills for potential occupiers.

2.0 Planning Policy

The following Planning Policy and energy targets are applicable and have been targeted for the proposed development:

Building Regulations Part L Volume 1 2021 with 2023 amendments (31% reduction)
the 'Guide to Development in Manchester and policies EN4 and EN6 of the Core Strategy for the City of Manchester, confirm the proposals for the provision of onsite renewable energy to provide 20% of final site energy demand and CO2 reduction."

3.0 Building Regulations Part L1A (New Domestic)

Building Regulations Part L Volume 1: Dwellings sets out the energy and carbon requirements that need to be achieved to ensure compliance. This sets out the following;

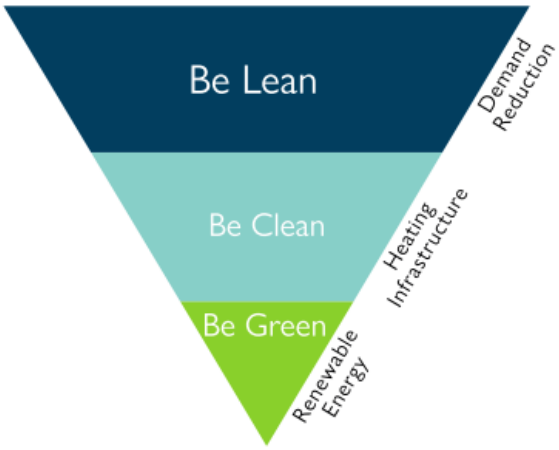
- Achieving the Dwelling Carbon Dioxide Emission Rate (DER)
- Achieving the Dwelling Primary Energy Efficiency Rate (DPER
- Limits on thermal fabric design
- Limiting the effects of solar gains in summer
- Building performance consistent with DER
- Provisions for energy efficient operation of the building

4.0 Energy Strategy

An Energy Strategy has been prepared by TACE on behalf of Triple jersey limited, in support of application for the residential development.

The development will be designed using a holistic approach. The strategy for achieving this is outlined as follows:

The Energy Hierarchy
The strategy for reducing carbon dioxide (CO_2) emissions and energy consumption within the buildings will be to embrace a lean, clean, and green approach as defined below noting that All proposals will be subject to financial viability assessment as the design progresses.



The Energy Hierarchy

5.0 'LEAN' – Design Measures

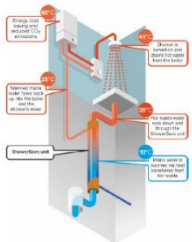
The design will take a fabric first approach. The performance of the thermal elements will be increased above Building Regulations minimum standards to minimise heat loss during the winter, and heat gains in the summer. This will lead to reduced heating loads and risk of overheating in the summer thus reducing the carbon emission footprint of the building's energy sources, to maintain the required indoor temperatures.

Construction	Building Regulation Limiting Value (W/m2K)	Target Values (W/m^{2}K)
Floor	0.18	0.11
External Wall	0.26	0.12
Party Wall	0.00	0.00
Cold Space Party Wall	0.26	0.26
Roof	0.16	0.09
Windows	1.6	1.0 (G-Value 0.44)
Doors	1.6	1.3
Rooflights	2.2	2.2
Air Permeability	8	3

6.0 Mean – High-Efficiency Systems, Plant and Controls

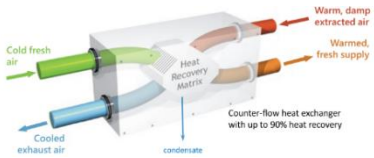
High-efficiency systems, plant, controls, and equipment will be incorporated. Set out below are a series of energy efficient options that may be considered once detailed energy calculations have been undertaken.

Waste Water Heat Recovery Systems (WWHRS)



WWHRS has been proven to provide a vital role in saving energy within both commercial and domestic properties. The principle is to recover heat from waste water before it enters the below ground drainage system. Compared to space heating that has many energy saving technologies in place, hot water has been an area where it has proven difficult to make substantial improvements. There are many significant benefits to using and running waste water heat recovery systems (WWHRS) in a building.

Mechanical Ventilation Heat Recovery (MHHR)



Mechanical Ventilation with Heat Recovery (MVHR) is a balanced and controlled forced air ventilation system commonly known to many as a heat recovery ventilation system. It is a whole house ventilation system that both supplies fresh and extracts stale air throughout a property and recycles the heat generated within it. The application provides a controlled ventilation system incorporating heat recovery, which provides good indoor air quality, whilst minimising the requirement to heat the incoming outside air.

Direct Electric Heating

Electric heating means production of heat energy from electrical energy. With the high thermal performance and airtightness levels proposed on this project heat losses will be minimised to around 20-35watt per m^2, to make this viable. This option will become more viable as the grid supply decarbonises. There is currently no district heating system within the vicinity of the site.

7.0 Green – LZC's & Renewable Technologies

The design of the apartments will place particular emphasis on passive energy saving by best practice design of the building and its services strategy.

To complement the energy savings previously detailed the following renewable, low carbon and sustainable measures will be considered for use within the scheme:

- Ground source heat pumps (GSHP)
- Air source heat pump (ASHP)
- Wind power
- Photovoltaics (PV)
- Solar thermal water heating

Air Source Heat Pump (Hot water only)

An air source heat pump (ASHP) works by transferring heat absorbed from the outside air to an indoor space**.** This proposal uses electrically driven heat pumps to efficiently provide domestic hot water. Heat pumps work similarly to a refrigerator: they absorb heat and transfer it to another medium.

Solar PV

Most PV systems are made up of panels that fit on top of the roof but can be installed in other locations. The electricity generated by the panels is direct current (DC), whereas the electricity required for household appliances is alternating current (AC). An inverter is therefore installed along with the system to convert DC electricity to AC.

8.0 Conclusion

Low Carbon buildings will play a significant role in the UK's goal to decarbonise by 2050.

This design note begins to identify how this scheme can meet the Low Carbon performance targets objectives through the Lean, Mean and Green approach to carbon emissions.

This design note concludes that the developments overarching design philosophy is in keeping with the principles of sustainable design. The buildings have been designed to utilise the optimal sustainability approach in line with the energy / carbon hierarchy, to maximise the reduction of carbon dioxide (CO2) emissions, whilst minimising energy consumption in line with the hierarchy's prioritised methodology.

Lean – the use of advanced building modelling software and passive construction techniques including enhanced insulation to the building envelope, windows with high thermal insulation, reduced air permeability, maximisation of daylight and optimisation of glazing solar energy transmittance.

Mean – Incorporation of high efficiency systems and effective controls including LED lighting, presence and absence detection, automated controls for heating.

Green – The report concludes that the most suitable LZC technologies for incorporation within the buildings would be Air Source Heat Pumps for the generation of hot water to all houses and apartments, waste water heat recovery and photovoltaics to generate electricity for a number of plots. This will achieve a minimum of 20% from on-site renewables.

The other renewable energy technologies investigated such as district heating, wind turbines, biomass boilers, are not considered to be viable options due to the development's location, space limitations, fiscal restraints, and technology payback period.

Typical result from a common house type with this design proposal

	Typical house type
Part L Version	2023
TER	9.61
DER	1.13
TFEE	30.62
DFEE	34.28

Space Heating & Hot Water	Elec Heating - Panel heaters with programmer and appliance thermostat.
DHW Efficiency / COP	Air source heat pump COP 3.36
Storage	120L % - 0.96kwh/day loss. Independent time Control. Located in heated space. Cylinder Stat.
Delivery	ASHP
PV	PV 2.5kW - SW
Shower HR?	Y - Zypho, PiPe 65 Effi. 59.7% connected to 2nr showers 11l/min each.
Ventilation	MHVR - System 500143 Zehnder Comfo Air550 (2 Wet Rooms) or equivalent min efficiency 85%

Next Steps

As part of ongoing detail design work post-planning the following actions will be taken:

- Development of RIBA Stages 3-4: Detailed review of design from a performance angle, feeding findings back into the loop before construction works commence.
- Appropriate energy modelling (i.e., modelling for reality as opposed to compliance) to ensure that energy performance is not significantly affected among the many trade-offs that must be made through the design process.
- All measures noted within this report are subject to financial viability assessments as the design progresses.