



CWC

crookes walker
consulting

27–33 King Street West

Energy & Environmental Standards Statement

Date: 13/09/2022

Ref: 2509-CWC-XX-RP-ME-0003

Revision Record

Date	Reference	Revision	Prepared By	Checked By	Authorised By
13/09/2022	2537-CWC-XX-RP-ME-0003	0	Laura Whatmough	Jordan Price	Mike Lloyd
			LW	JP	ML

Contents

1.0	Introduction.....	4
2.0	Proposed Development.....	5
3.0	Energy Targets	6
3.1	Building Regulations Part L: Volume 2	6
3.2	Manchester Core Strategy	6
3.3	Manchester Supplementary Planning Document.....	8
3.3.1	Energy Efficiency	8
3.3.2	Renewable Energy	8
4.0	Thermal Model.....	9
4.1	Site Location	9
4.2	Modelling Disclaimer	10
5.0	Energy Hierarchy	11
5.1	Be Lean - Proposed Fabric Parameters.....	11
5.2	Be Clean – Proposed System Parameters	11
5.3	Be Clean – Proposed Lighting Parameters.....	12
5.4	Be Green – Proposed Photovoltaic Panel Parameters.....	12
5.5	Be Green – Consideration of Low and Zero Carbon Technologies.....	13
6.0	Environmental Standards	14
6.1	Environmental Design	14
6.2	Water Management and Weather Resilience	14
6.3	Waste Management	15
6.4	Construction Management.....	16
6.5	Biodiversity	16
7.0	Results.....	17
	Appendix A – BRUKL	18
	Appendix B – EPC	19

1.0 Introduction

The purpose of this Energy Statement is to summarise the relevant energy targets for the proposed 27-33 King Street West development, located in Manchester City Centre.

In summary, the energy targets discussed within this report are as follows:

- Compliance with Approved Document Part L 2021: Volume 2 (Non-dwellings)
- Manchester City Council Core Strategy:
 - ENE 4 – The Energy Hierarchy
 - ENE 6 – Reduce energy by 15% over Part L 2010
- Manchester Supplementary Planning Document
 - Reduce CO₂ emissions by at least 25% over current Building Regulations
 - 20% of onsite energy to be from renewables
- Energy Performance Certificate – Target A rating.

Table 1 summarises the results of the assessments. It should be noted that 15% betterment over Part L 2010 is automatically attained upon achieving compliance with Part L 2021.

Target Emission Rate kgCO ₂ /m ² /year	Building Emission Rate kgCO ₂ /m ² /year	Target Primary Energy Rate kWh/m ² /year	Building Primary Energy Rate kWh/m ² /year	EPC Rating	% Energy from Renewables
3.44	2.09	36.73	22.47	A 15	47.10
PASS		PASS			

Table 1. Results Summary

2.0 Proposed Development

The proposed development comprises the construction of a new build 13 storey, mixed-use commercial development, with a retail unit and incorporated gym on the ground floor, 12 floors of office space, and 1 floor of amenity, with plant space to the roof. The development also incorporates the refurbishment of the existing Carriage Works building into 3 floors of new office space.

Adjoining the new build and refurbishment elements of the project will be a common basement level, with additional plant, cycle storage and shower/changing facilities.

For the purpose of the assessments contained within this report, the elements of the development will be treated as such:

- Part L Volume 2 compliance – New build section only
- EPC – whole building



Figure 1: Render of the proposed development

3.0 Energy Targets

3.1 Building Regulations Part L: Volume 2

The English Building Regulations Part L Volume 2: Buildings other than dwellings includes the following assessments:

- Building Primary Energy Rate < Target Primary Energy Rate (kWh/m²/year)
- Building Emissions Rate < Target Emissions Rate (kgCO₂/m²/year)
- Fabric and system efficiencies greater than minimum standards
- Limiting solar gain exceedances

To achieve compliance with Part L Volume 2, the actual building needs to perform better than the Notional Building, as demonstrated using the BRUKL document.

3.2 Manchester Core Strategy

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 using low or zero carbon energy generating technologies.

CS Policy EN 6 - Target Framework for CO₂ Reductions from Low or Zero Carbon Energy Supplies requires applications for non-residential development of 10 or more units and all other development over 1,000m² to meet, as a minimum, the targets shown in the tables below, unless unfeasible.

Target	% Minimum Requirement
Target 1: Network development areas	CHP/district heating anchor or connection or where not feasible a 15% increase on Part L 2010
Target 2: Electricity intense buildings (Electricity >45 kgCO ₂ /m ²)	+10% increase on Part L 2010
Target 3: Micro generation area	+15% increase on Part L 2010

Table 2. Non-domestic CO₂ emissions reductions targets

The proposed development falls under the Target 1 criteria and must therefore achieve 15% betterment over the Target Emission Rate of the Notional building, as a connection to district heating is not seen as viable.

As this development was submitted to Building Control after the 15th June 2022, compliance will be checked against the 2021 amendment to the Building Regulations. Compliance with Part L Volume 2 already equates to more than a 15% betterment over Part L 2010, therefore, no betterment over the current notional building is required.

3.3 Manchester Supplementary Planning Document

3.3.1 Energy Efficiency

Part 1 Policy E1.5 encourages high standards of energy efficiency in new development. In the Environmental Standards Statement, developers should show how they have considered the steps necessary to reduce energy demand at the earliest stages of design. Developers should aim to reduce CO₂ emissions by at least 25% more than the requirements of the current Building Regulations.

3.3.2 Renewable Energy

To reduce energy demand and the harmful impact of using energy from non-renewables, developers should aim for at least 20% of final site energy demand to be met by on-site renewable energy technologies.

4.0 Thermal Model

4.1 Site Location

The site is located in Manchester City Centre, therefore the Manchester Test Reference Year (TRY) weather file has been used in the assessments, as is required.

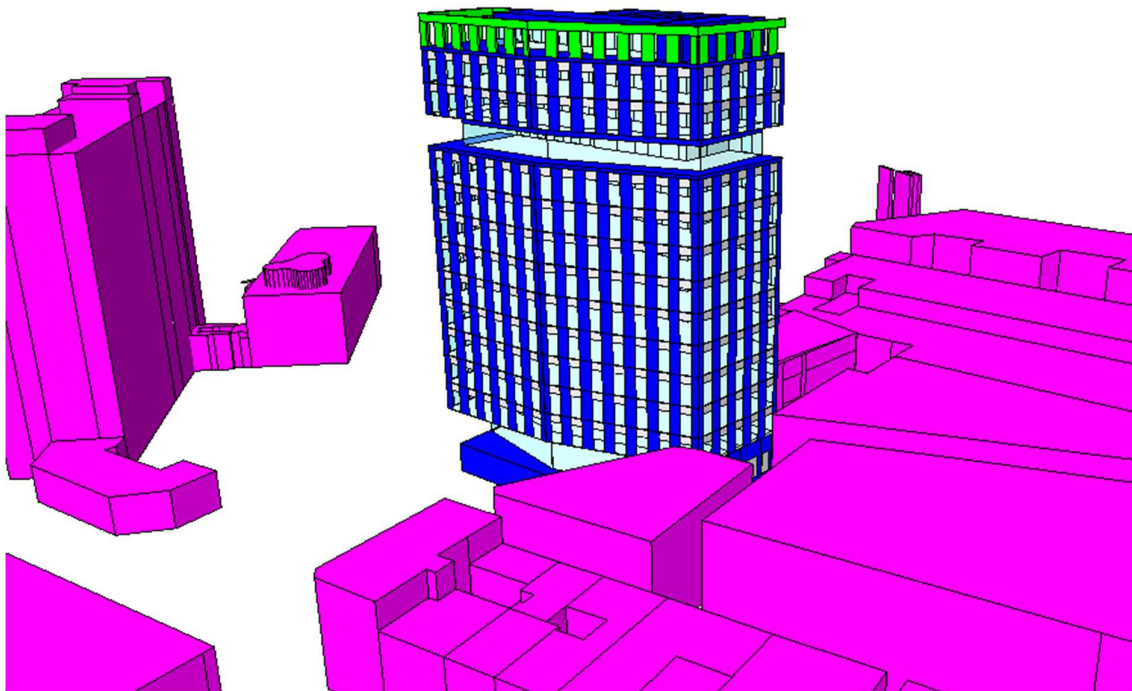


Figure 2. View of the thermal model

4.2 Modelling Disclaimer

The building has been modelled with accredited software package IESVE accredited software Version 2022.1.1.0 which is approved for the purpose of demonstrating compliance with the energy efficiency and carbon emission requirements of the building regulations.

These assessments were undertaken by an Energy Specialist; an individual who has acquired substantial expertise or a recognised qualification for undertaking assessments within the residential sector and is not professionally connected to a single technology or manufacturer.

It should be noted that the data generated by this work is obtained using computer calculations. These calculations are the best means of predicting the performance of the building at this stage. Full certainty can only be achieved by measuring the performance of the building and associated systems after a period of use.

Whilst the calculations have been undertaken in good faith using reasonable skill and care, Crookes Walker Consulting Limited can take no responsibility for differences between the computer calculations and the actual performance of the completed building due to the inherent complexity and variability of the physics in a building and its environment.

5.0 Energy Hierarchy

The proposed energy strategy for the 27-33 King Street West development follows the principles of the Energy Hierarchy, in such that it includes enhanced fabric parameters to limit heat losses, employs energy efficient lighting and controls throughout, includes for electrification of the systems and furthermore, incorporates renewable technologies to offset a portion of the outstanding energy consumption.

5.1 Be Lean - Proposed Fabric Parameters

Element	New Build	Existing
External Walls	0.15 W/m ² K	1.70 W/m ² K
Ground/ Exposed Floors	0.12 W/m ² K	1.00 W/m ² K
Windows	1.20 W/m ² K 0.35 g	5.70 W/m ² K
Doors	0.50 W/m ² K	2.00 W/m ² K
Air Permeability	3.00 m ³ /hr/m ² @ 50 Pa	25 m ³ /hr/m ² @ 50 Pa

Table 3. Fabric Parameters

5.2 Be Clean – Proposed System Parameters

System Type	Location	Efficiencies
Fan Coil Units & MVHR	Offices Reception Amenity	SCoP 4.01 SEER 4.22 HR 83% SFP 1.00 W/l/s
Radiators	Toilets & Circulation	SCoP 2.80
Electric Heaters	Plant Rooms	Direct
Domestic Hot Water	Throughout	SCoP 4.50

Table 4. System Parameters

5.3 Be Clean – Proposed Lighting Parameters

Location	Efficiencies
Throughout	120 lm/W PIR sensors Photoelectric Dimming Illuminance Control Time Switching Daylight Dimming

Table 5. Lighting Parameters

5.4 Be Green – Proposed Photovoltaic Panel Parameters

Efficiency	20.1%
Area	350m ²
Azimuth	180°
Inclination	37°

Table 6. Photovoltaic Panel Parameters

5.5 Be Green – Consideration of Low and Zero Carbon Technologies

Low or Zero Carbon Technology	Likelihood of Being Feasible	Main Reason for Dismissal	Feasible to Export Energy?	Cost For Carbon Emission Reduction
HYDRO-POWER	Unlikely	Whilst there is a running watercourse nearby the scale and technical considerations limit its applicability	Yes (if technology was feasible for development)	High
COMBINED HEAT & POWER	Unlikely	Not using gas on site	Yes (if the technology was cost effective for the development)	High
AIR SOURCE HEAT PUMPS	Likely	This technology is likely to be applicable to the development within the VRF systems	No - there is no existing network	Medium
WIND POWER	Unlikely	The strobing effect and noise issues from this technology are not acceptable in this location	Yes (if technology was feasible for development)	High
BIOMASS	Unlikely	Site location and logistics preclude this from viability	N/A	High
SOLAR PV	Likely	Solar panels will likely be employed to	No – all of this energy will be stored and used within the development	Medium
SOLAR THERMAL	Unlikely	The roof space is going to be required by the PV system	N/A	Medium

Table 7. Consideration of LZC Technologies

6.0 Environmental Standards

6.1 Environmental Design

To demonstrate energy efficiency in non-residential developments, the City Council would encourage developers to use the Building Research Establishment Environmental Assessment Method (BREEAM) or alternative modelling tools that enable the developer to exceed the requirements of BREEAM is also encouraged.

The proposed development was assessed using NABERS methodology throughout the early design stages; NABERS UK is an adaptation of the highly successful rating programme NABERS that operates in Australia. Launched in 1999, NABERS is widely considered to be a world leading environmental performance rating tool for commercial buildings. The highest achievable rating is 6-stars.

6.2 Water Management and Weather Resilience

The proposed development should be designed in order to reduce the post development surface water run-off to at least 50% of the existing surface-water brownfield runoff rates.

To achieve the restriction in peak rates of surface water run-off from the developed site, the existing drainage is likely to require localised diversion works and relocation of the attenuation tank due to revised extents of the building footprint.

The drainage strategy will incorporate the use of Sustainable Drainage Systems (SuDS) where appropriate throughout the site. The proposed surface water drainage strategy for the site currently includes below ground cellular attenuation tanks. This will reduce the volume of runoff discharging into the public sewer system.

Minimising the water consumption of the site is of utmost importance and this will be addressed through the use of flow restricted fittings and dual flush WCs.

6.3 Waste Management

Best practice techniques to prevent and minimise waste during the design and construction phases of the development will be adopted, as follows:

Prior to commencement of the above ground construction phase, a Site Waste Management Plan (SWMP) will be produced by the developer to limit the on and off-site environmental impacts of construction. The SWMP will detail:

- Recycled and secondary materials;
- Waste reduction;
- Waste recovery; and,
- Waste disposal.

Furthermore, a Waste Management Strategy will be prepared in order to consider the potential refuse and recyclable waste volumes at 27-33 King Street West, including organic waste and for all uses of this development. The operational waste strategy for the scheme focuses on the segregation of waste at source, in order to maximise the potential for individuals to recycle. All individuals will be informed on collection frequency, as well as guidance on recycling and health and safety practices related to the management and storage of waste.

The proposed strategy has been developed in compliance with the policies of Manchester City Council, stating that new developments and conversions must include a Waste Management Strategy that includes:

- An estimated storage area for the waste produced by the development, including office and retail uses;
- Details of internal and external stores for both waste and recycling; and
- Location of the proposed collection point and details of the route the collection will take.

6.4 Construction Management

To minimise the impact of the development during construction and operation whilst providing a safe place to work, the proposals include for the following provision:

- Construction site impacts will be minimised, measures to protect water courses, as well as to prevent impacts upon the local area in terms of dust and noise pollution during construction works. This will be formalised through the submission of a Construction Management Plan prepared by the contractor.

6.5 Biodiversity

The design proposals will ensure protection of wildlife, wildlife habitats, and where possible, the creation of new nature reserves and features which will sustain wildlife and existing trees. As the site sits on an existing building's footprint, no demolition of any existing vegetation shall be undertaken throughout the construction phase. No structures within the existing building can suitably support any local endangered species, such as roosting bats or nesting birds.

Overall, it is expected that the site will be assessed as having limited ecological value, however, there are opportunities to enhance the sites biodiversity:

- Integration of the landscaping scheme into the wider site soft landscaping to increase permeability of the site to wildlife,
- Use native or wildlife friendly tree, shrub and herbaceous species in any landscape planting,
- Inclusion of bird boxes to accommodate typical urban bird species, away from street and security lighting

7.0 Results

Table 7 summarises the percentage of the proposed development's energy demand which is provided by each technology included within the design. These calculations are based on the BRUKL outputs, which are formed from the regulated loads only within the building.

	kWh/m ² /year	% from renewables
Total Building	23.65	
Photovoltaics	8.36	35.34
Heating	2.00	8.46
DHW	0.78	3.29
Total	11.14	47.10

Table 7. Percentage of energy from renewables

Target Emission Rate kgCO ₂ /m ² /year	Building Emission Rate kgCO ₂ /m ² /year	Target Primary Energy Rate kWh/m ² /year	Building Primary Energy Rate kWh/m ² /year	EPC Rating	% Energy from Renewables
3.44	2.09	36.73	22.47	A 15	47.10
39.24% betterment		38.82% betterment			

Table 8. Results Summary

Appendix A – BRUKL

BRUKL Output Document



HM Government

Compliance with England Building Regulations Part L 2021

Project name

2509 Reedham House

As designed

Date: Thu Sep 08 13:20:22 2022

Administrative information

Building Details

Address: Reedham House, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.15

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.15

BRUKL compliance check version: v6.1.b.0

Certifier details

Name: Crookes Walker Consulting

Telephone number: Phone

Address: Street Address, City, Postcode

Foundation area [m²]: 469.43

The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	3.44
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	2.09
Target primary energy rate (TPER), kWh/m ² .annum	36.73
Building primary energy rate (BPER), kWh/m ² .annum	22.47
Do the building's emission and primary energy rates exceed the targets?	BER ≤ TER BPER ≤ TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	U _a -Limit	U _a -Calc	U _i -Calc	First surface with maximum value
Walls*	0.26	0.15	0.15	NW000000:Surf[2]
Floors	0.18	0.12	0.12	NW000000:Surf[0]
Pitched roofs	0.16	-	-	No Pitched roofs in building
Flat roofs	0.18	0.12	0.12	NW000000:Surf[1]
Windows** and roof windows	1.6	1.2	1.2	NW000000:Surf[8]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors ^Δ	1.6	0.5	0.5	NW000009:Surf[2]
Vehicle access & similar large doors	1.3	-	-	No Vehicle access doors in building
High usage entrance doors	3	-	-	No High usage entrance doors in building

U_a-Limit = Limiting area-weighted average U-values [W/(m²K)]
U_a-Calc = Calculated area-weighted average U-values [W/(m²K)]
U_i-Calc = Calculated maximum individual element U-values [W/(m²K)]
* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.
^Δ For fire doors, limiting U-value is 1.8 W/m²K
N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	3

Appendix B – EPC

