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Ducie Street Manchester

Energy and Environmental Standards Statement

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ENGINEERING POWERED BY THE PAST
BUILDING THE FUTURE

Document Revision Control

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1. Introduction

1.1. Context

This Energy and Environmental Standards Statement (EESS) has been prepared to demonstrate how the as-built Ducie Street development relates to the environmental standards defined in Manchester City Council's Core Strategy and Guide to Development Supplementary Planning Document (SPD), as well as the national Building Regulations. This version replaces pre-construction assumptions with verified post-construction data.

1.2. Site description

The development is located within the north-east of Manchester city centre, bounded by Lomax Street, Ducie Street, and Brock Street. The scheme comprises 41 residential apartments in a mix of 1-bed and 2-bed configurations.

2. Policy and legislation

Several statutory and non-statutory planning policies and guidance documents apply to the proposed development. These comprise guidance produced at the national, regional and local levels.

National Planning Guidance

- National Planning Policy Framework
- Planning Practice Guidance (including sections on Air Quality, Waste, and Climate Change)

Local Planning Guidance

- Manchester Core Strategy 2012-2017
- Guide to Development in Manchester SPD (April 2007)

Relevant Core Strategy Policies:

- EN1–EN3: Design, Tall Buildings, Heritage
- EN4–EN7: Low and Zero Carbon Development, Energy Infrastructure
- EN8–EN9: Climate Adaptation, Green Infrastructure
- EN14–EN19: Flood Risk, Biodiversity, Air & Water Quality, Contaminated Land, Waste
- DM1: Sustainable Construction

This policy framework sets out a comprehensive expectation for new developments to contribute positively to environmental and energy efficiency goals, supporting a transition toward low-carbon, climate-resilient communities.

3. Design-Stage Energy strategy overview

The energy strategy for the Ducie Street development was prepared in accordance with Manchester City Council's Core Strategy policies EN4 and EN6, as well as national Building Regulations Part L1A (2013). The strategy followed the energy hierarchy principle of 'Be Lean, Be Clean, Be Green':

- **Be Lean**: Reducing energy demand through a fabric-first approach
- **Be Clean**: Using energy-efficient services and controls
- **Be Green**: Generating energy through renewable technologies



3.1. Building Services Specification

The development was designed with enhanced building fabric and MEP specifications to reduce regulated energy use and CO_2 emissions. The performance standards outlined at design stage are as follows:

Table 1: Proposed Passive Design Measures

	Proposed Design
External Wall *U-Value Target*	0.20 W/m^2.K
External Window *U-Value Target*	1.40 W/m^2.K
Exposed Floor *U-Value Target*	0.10 W/m^2.K
Roof *U-Value Target*	0.12 W/m^2.K
Infiltration	3.00 m^3.h/m^2 @50Pa
Thermal Mass	Precide calculations
Thermal Bridging	Notional value used as baseline
DHW Heating Pipework	All primary pipework to be fully insulated. Insulated immersion cylinder (≤ 1.18 kWh/day standing losses)
Ventilation and Cooling	Balanced MVHR. MVHR with ~90% efficiency
Lighting	High efficiency LED lighting proposed for 100% of spaces.
Renewables (Part L and EN6)	0.2kWp/ apartment and 0.51 kWp/apartment

3.2. SAP emissions target

Energy demand and carbon emissions modelling was undertaken using approved SAP software in compliance with Part L1A 2013. Key average outputs from the SAP assessments at design stage included:

The proposed active design measures for the domestic section are displayed below in Table 4.

- **Dwelling Emissions Rate (DER)**: 22.02 kgCO_2/m²/year
- **Target Emissions Rate (TER)**: 24.26 kgCO_2/m²/year
- **Dwelling Fabric Energy Efficiency (DFEE)**: 38.69 kWh/m²
- **Target Fabric Energy Efficiency (TFEE)**: 39.57 kWh/m²

These values demonstrate that the development was designed to achieve approximately 9% improvement in carbon emissions compared to the TER defined under Part L 2013, and a 15% improvement over Part L 2010.

3.3. Sustainability Summary

The development was designed in alignment with key environmental and sustainability policies under the Manchester Core Strategy and national best practice. The following measures were incorporated at the design stage.

- **Water Management**: Drainage strategy included SUDS measures and provision for a green roof, alongside low-flow fittings targeting 125 l/p/d water use.
- **Waste Strategy**: Centralised refuse and recycling store with 4-stream segregation and no refuse chute to support recycling efforts.
- **Biodiversity**: Provisions for ecological enhancements and recommendations for bat surveys, informed by planning-stage ecology reports.
- **Construction Waste**: Design incorporated SWMP principles aiming for reduced waste generation, material reuse, and low-embodied carbon choices.
- **Climate Resilience**: Passive design to minimise overheating risks, with orientation, glazing, and thermal mass considered to reduce reliance on mechanical cooling.

4. Post Construction review

A review of the design versus as-built energy performance was conducted based on post-construction SAP calculations and available O&M data. This review captures key differences in fabric performance and MEP system implementation.

4.1. Fabric Performance Comparison

Table 2: Proposed fabric performance

Building fabric element	Minimum Part L1A U-Value (W/m²K)	Design Target U-Value (W/m²K)	As-Built U-Value (W/m²K)
External Wall	0.30	0.20	0.15
Floor	0.25	0.10	0.11
Roof	0.20	0.11	0.16
Windows	2.00	1.40	1.30
Doors	2.00	1.40	1.40

Air permeability tests conducted post-completion revealed values ranging from **2.72 to 7.32 m³/h·m² @ 50Pa** across the development.

MEP Systems

- **Heating**: Electric panel heaters with programmable room thermostats were installed, in line with design intent.
- **Ventilation**: MVHR systems were installed as specified; commissioning sheets were not available at review.
- **Lighting**: All lighting fixtures verified as low-energy LEDs.
- **Photovoltaics**: PV systems were installed and verified via layout drawings.

4.2. SAP Assessment results

Table 3: SAP results for proposed development

Room no	Type	SAP rating	DER	TER	DFEE	TFEE
G01	02-F	75C	26.51	28.43	51.75	58.42
G02	02-E	76C	26.04	28.65	51.66	58.75
101	02-A	82B	18.75	23.75	35.39	40.15
102	01-A	84B	19.85	26.95	33.64	41.34
103	02-B	77C	25.06	29.92	48.98	60.89
104	02-C	80C	21.87	25.02	40.37	45.48
105	01-B	84B	19.74	25.52	29.56	32.13
106	02-D	80C	21.53	24.78	38.13	43.48
201	02-A	82B	18.75	23.75	35.39	40.15
202	01-A	84B	19.85	26.95	33.64	41.34
203	02-B	84B	16.05	23	31.31	38.11
204	02-C	82B	18.99	24.19	36.65	42.74
205	01-B	84B	19.74	25.52	29.56	32.13
206	02-D	83B	16.94	22.34	31.12	35.36
301	02-A	82B	18.86	23.81	35.51	40.35
302	01-A	83B	21.26	26.95	34.49	41.34
303	02-B	83B	18.41	25.05	36.42	44.85
304	02-C	81B	20.07	24.19	37.27	42.74
305	01-B	83B	21.72	25.52	30.69	32.13
306	02-D	82B	18.51	21.83	31.33	33.65
401	02-A	81B	20.16	23.7	35.95	39.99
402	01-A	82B	23.23	29.13	39.54	48.51

403	02-B	82B	19.45	25.05	36.98	44.85
404	02-C	81B	20	23.98	36.86	42.06
405	01-B	84B	20.42	25.52	29.65	32.13
406	02-D	83B	17.23	22.34	31.27	35.36
501	02-A	80C	21.45	23.7	36.71	39.99
502	01-A	83B	21.68	26.95	34.76	41.34
503	02-B	82B	19.68	25.05	37.11	44.85
504	02-C	81B	20.55	24.22	37.6	42.8
505	01-B	83B	21.72	25.52	30.69	32.13
506	02-D	82B	18.51	21.83	31.33	33.65
601	02-A	81B	20.16	23.7	35.95	39.99
602	01-A	83B	21.26	26.95	34.49	41.34
603	02-B	75C	27.25	29.92	49.93	60.9
604	02-C	80C	20.83	24.22	37.79	42.8
605	01-B	83B	21.6	25.52	30.59	32.13
606	02-D	82B	19.37	22.34	32.51	35.36
701	02-G	73C	29.51	30.76	55.3	65.2
702	01-B	77C	31	31.18	49.52	51.28
703	02-H	73C	26.9	27.33	51.15	58.76

The post-construction SAP results give an average DER of 21.23 $kgCO_2/m^2$/year which is below the design-stage block compliance target of 22.02 $kgCO_2/m^2$/year. The post-construction block compliance DFEE is 37.89 kWh/m², again below the design stage prediction which was 38.69 kWh/m². These results reflect the improved specification of the as-built dwellings in key areas (windows and wall specification), and the generally positive air tightness achieved.

4.3. Sustainability summary

A review of the as-built development indicates that the majority of the sustainability measures proposed at design stage were successfully implemented.

Key sustainability themes and corresponding policy alignments are summarised below:

- **Policy EN4 (Low and Zero Carbon Development):** The energy hierarchy was implemented through passive design, efficient systems, and on-site PV generation.
- **Policy EN6 (CO_2 Emission Reductions):** SAP outcomes confirm that most dwellings met or came close to the targeted improvement over Part L 2013 baseline.
- **Policy EN8 (Climate Change Adaptation):** Passive measures and MVHR systems were incorporated as intended to mitigate overheating risk.
- **Policy EN14 (Flood Risk) and EN17 (Water Quality):** Drainage strategies including 13 m³ attenuation and a 5 l/s flow rate were delivered; a green roof was also confirmed.
- **Policy EN9 and EN15 (Biodiversity and Green Infrastructure):** Ecological enhancements were planned at design stage, though post-completion evidence of implementation is pending.
- **Policy EN16 (Air Quality):** The all-electric strategy and minimised air leakage rates contribute to reduced site-level emissions.
- **Policy EN19 (Waste Management):** A centralised refuse store with 4-stream segregation was installed; SWMP documentation was not available for review.
- **SPD 4.9 (Water Management):** Low-flow fixtures were specified to meet Part G targets (125 l/p/d); formal water calculations were not located.
- **SPD 4.10, 4.13 & 4.14 (Waste and Construction Management):** Design intent aligned with policy through early SWMP consideration and sustainable product specifications.

The as-built scheme reflects strong adherence to the sustainability principles and policies outlined at design stage and the implementation of fabric, systems, and infrastructure demonstrates a comprehensive approach to environmental performance and policy alignment.

5. Conclusion

The Ducie Street development demonstrates a clear commitment to energy efficiency and sustainability through its fabric-first approach, integration of low-carbon systems, and thoughtful design measures guided by local and national policy frameworks.

Design-stage ambitions were exceeded at post-construction, with confirmed delivery of key features such as low U-value fabric, MVHR ventilation, electric heating, LED lighting, and photovoltaic systems. SAP outputs confirm that the average performance achieved has exceeded the original carbon and energy targets.

Sustainability principles embedded in the Manchester Core Strategy and the SPD were actively considered throughout the design process and were, for the most part, implemented successfully in the final construction.