

NI2.MH

Mansion house • row 1

sustainability statement: post construction review

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NI2.MH mansion house • row 1

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author:

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approver:

darren jones

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01 introduction

01.01 about this document

The purpose of this document is to verify that energy performance targets set out during the design stages (RIBA plan of works 2020; stage 3 + 4) and issued to the local planning authority (LPA) have been implemented into the as-built mansion house scheme.

Energy performance targets were described in the document '*NI2.MH sustainability statement*' and submitted to the LPA in order to discharge condition 17a of the planning permission and notices of contents document associated with this planning applications.

Following the successful discharge of condition 17a on 13 January 2020, (see below excerpt for reference) this document is to compare said statement with the as-built scheme.

This document is to be submitted to the City Council, as Local Planning Authority in order to discharge condition 17b.

01.02 discharge statement 17a

The following information has been submitted in respect of this planning condition:

"Part L 1A compliance report, Environmental Product Declaration, Sustainability and Energy Statement by TACE and Sustainability Statement by shedkm are stamped as received by the City Council, as Local Planning Authority, on the 5 June 2019

The above information has been considered and is acceptable. In order to discharge this planning condition in full, a post construction review certificate/statement shall be submitted for approval, within a timescale that has been previously agreed in writing, to the City Council as Local Planning Authority."

02 energy usage

02.01 overview

The energy usage strategy and energy performance targets set by the design team were communicated to the contractor team from initial appointment and continued to be a point of reference throughout stage 5 detail design and during construction.

The main contractor and m+e sub-contractor both understood the importance of reaching the energy performance targets set during stage 4 and both have been keen to build upon these strategies to ensure that the completed building meets or exceeds expectations.

The main contractor along with associated specialist sub-contractors have taken their roles and responsibilities seriously and as such have developed stage 5 energy performance calculations (SAP calculations) in advance of final as-built SAP and EPC's. Stage 5 design SAP modelling was used in order to assist the team in making key decisions and enable the team to deviate where necessary from the stage 4 design requirements whilst still retaining the same overall building performance level.

Design energy performance calculations were used to provide a Predicted Energy Assessment (PEA) rating and confirmation that design changes made during construction either met or exceeded energy performance expectations. Stage 4 SAP calculations, Stage 5 SAP calculations and PEA ratings can be found in the appendices of this document.

To this end there are similarities and differences that can be seen between the stage 4 design and the final as-built scheme which are highlighted below.

02.02 building performance targets

The fundamentals of minimising energy usage through a 'fabric-first' approach remained of high importance through stage 5 and construction with the specification of the internal fabric of the building remaining an extremely high standard. Evidence of this can be seen within the final U-values and anticipated air tightness.

The enhanced U-values and air tightness targets set within the stage 4 part L report were significantly lower than minimum Part L standards. These overall targets have been realised with any underperformance of individual elements being offset by over performance elsewhere in the building. All U-values meet or exceed the minimum requirements set out in part L1A of the Building Regulations.

The overall services strategy remains consistent with the design stage strategy, i.e. all apartments are dual aspect for effective cross-ventilation via opening windows on opposite facades, supplemented by trickle vents and high efficiency extract only ventilation. Heating is low demand, thanks to good U-values and low air permeability, and is by electric panel heaters throughout.

Natural daylight has been maximised through the installation of large, carefully placed windows and high ceilings. Overheating through direct exposure to mid-day summer sun has been reduced through shading by way of over-sailing balconies located on the south facade. The completed building also benefits from large roof lights which bring natural daylight down the central cores of the building and deep into the centre of the plan. The design has successfully incorporated the use of natural day light and the effects of this can be seen to both enhance the enjoyment of the spaces whilst also minimising the use of artificial lighting.

A high performance building envelope and considered design is complimented by an enhanced building service system including LED lighting and heating systems with intelligent user controls. These technologies have been embraced by the project's m+e sub-contractor and are further improving internal comfort whilst minimising the buildings impact on the environment.

Further to this the suggested use of renewable energy technology has been implemented through the installation of photovoltaic arrays situated on the roof.

03 materials

The ambition to utilise cross laminated timber (CLT) for the superstructure of mansion house has been realised.

CLT has extremely low embodied energy and sequesters carbon throughout its growth. All CLT used is sourced from sustainably managed forests and can be traced through a socially responsible supply chain. All timber is FSC and PFEC certified and a comprehensive Environmental Product Declaration (EPD) certificate has previously been provided.

CLT structure has been successfully exposed forming a large percentage of the internal fabric of the building. This has been an extremely challenging task and has involved expertise across many disciplines, however the environmental benefit of this design decision and hard work is now being realised. The amount of exposed CLT equates to a large reduction in the m2 area of lining materials, finishing boards, paints and other decorative finishes harmful to the environment that would have otherwise been required. The material waste reduction as a consequence is also noteworthy.

Where linings have been used for enhanced performance or decoration, robust and low maintenance materials have been specified and installed. Some examples are the use of tiled floors and through-coloured MDF being installed throughout communal and residential high traffic areas, minimising the need for future maintenance, redecoration or replacement, with further benefits for whole lifecycle embodied carbon performance.

appendices

appendix a

stage 4 SAP calculations_____9

appendix b

stage 5 SAP calculations + PEA rating_____10

shedkm

appendix a

part L1A compliance report

(inc. stage 4 SAP calculations)

produced by TACE consulting services engineers
revision B - March 2018

Block Compliance WorkSheet: All plots

User Details

Assessor Name: Aymon Winter
Software Name: Stroma FSAP

Stroma Number: STRO014511
Software Version: Version: 1.0.4.2

Calculation Details

Dwelling	DER	TER	DFEE	TFEE	TFA
03-18-67968 Block 1 Flat 1 PL1	-46.09	32.66	60.5	69.3	68.84
03-18-67968 Block 1 Flat 2 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 1 Flat 3 PL1	31.77	29.38	47.3	58.5	68.84
03-18-67968 Block 1 Flat 4 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 1 Flat 5 PL1	31.77	29.38	47.3	58.5	68.84
03-18-67968 Block 1 Flat 6 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 1 Flat 7 PL1	31.77	29.38	47.3	58.5	68.84
03-18-67968 Block 1 Flat 8 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 1 Flat 9 PL1	40.08	39.09	65.3	90.6	68.84
03-18-67968 Block 1 Flat 10 PL1	36.59	34.86	56.5	76.5	68.84
03-18-67968 Block 2 Flat 11 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 2 Flat 12 PL1	34.88	29.29	51.7	57.8	68.84
03-18-67968 Block 2 Flat 13 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 2 Flat 14 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 2 Flat 15 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 2 Flat 16 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 2 Flat 17 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 2 Flat 18 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 2 Flat 19 PL1	35.07	33.62	53.6	72.5	68.84
03-18-67968 Block 2 Flat 20 PL1	36.59	34.86	56.5	76.5	68.84
03-18-67968 Block 3 Flat 21 PL1	34.88	29.29	51.7	57.8	68.84
03-18-67968 Block 3 Flat 22 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 3 Flat 23 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 3 Flat 24 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 3 Flat 25 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 3 Flat 26 PL1	27.03	25.36	36.4	44.9	68.84

Block Compliance WorkSheet: All plotsCont...

Dwelling	DER	TER	DFEE	TFEE	TFA
03-18-67968 Block 3 Flat 27 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 3 Flat 28 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 3 Flat 29 PL1	35.07	33.62	53.6	72.5	68.84
03-18-67968 Block 3 Flat 30 PL1	36.59	34.86	56.5	76.5	68.84
03-18-67968 Block 4 Flat 31 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 4 Flat 32 PL1	36.89	31.5	57.3	65.5	68.84
03-18-67968 Block 4 Flat 33 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 4 Flat 34 PL1	30.32	28.25	44.6	54.9	68.84
03-18-67968 Block 4 Flat 35 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 4 Flat 36 PL1	30.32	28.25	44.6	54.9	68.84
03-18-67968 Block 4 Flat 37 PL1	27.03	25.36	36.4	44.9	68.84
03-18-67968 Block 4 Flat 38 PL1	30.32	28.25	44.6	54.9	68.84
03-18-67968 Block 4 Flat 39 PL1	35.07	33.62	53.6	72.5	68.84
03-18-67968 Block 4 Flat 40 PL1	40.21	39.18	65.5	90.9	68.84

Calculation Summary

Total Floor Area	2753.60
Average TER	28.43
Average DER	28.42
Average DFEE	43.97
Average TFEE	55.17
Compliance	Pass
% Improvement DER TER	0.04
% Improvement DFEE TFEE	20.3

appendix b

design stage 5 projected SAP calculations

produced by Aberla m+e sub-contractors + stage 5 designers

a selection of 4 apartments across the 4 mansion house blocks have been presented however full EPC's are available on request

SAP Input

Property Details: apartment406

Address:	Masion House, New Islington, Manchester
Located in:	England
Region:	North West England
UPRN:	
Date of assessment:	20 February 2020
Date of certificate:	21 March 2020
Assessment type:	New dwelling design stage
Transaction type:	New dwelling
Tenure type:	Unknown
Related party disclosure:	No related party
Thermal Mass Parameter:	Calculated 82.67
Water use <= 125 litres/person/day:	True
PCDF Version:	456

Property description:

Dwelling type:	Flat	
Detachment:		
Year Completed:	2020	
Floor Location:	Floor area:	Storey height:
Floor 0	70 m ²	2.78 m
Living area:	36.1 m ² (fraction 0.516)	
Front of dwelling faces:	North West	

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:	
TYPE A	Manufacturer	Windows	triple-glazed	Yes		
TYPE B	Manufacturer	Windows	triple-glazed	Yes		
TYPE E	Manufacturer	Windows	triple-glazed	Yes		
TYPE F	Manufacturer	Windows	triple-glazed	Yes		
Name:	Gap:	Frame Factor:	g-value:	U-value:	Area:	No. of Openings:
TYPE A	12mm	0.81	0.63	1.1	3.2	1
TYPE B	12mm	0.78	0.63	1.1	2.3	1
TYPE E	12mm	0.913	0.63	1.1	4.8	1
TYPE F	12mm	0.78	0.63	1.1	2.3	1
Name:	Type-Name:	Location:	Orient:	Width:	Height:	
TYPE A		External Wall	North East	0	0	
TYPE B		External Wall	North East	0	0	
TYPE E		External Wall	South West	0	0	
TYPE F		External Wall	South West	0	0	

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
<u>External Elements</u>							
External Wall	36	12.6	23.4	0.14	0	False	14
stairwell wall	27.78	0	27.78	0.2	0.9	False	9
lift wall	9.954	0	9.95	0.2	0.9	False	9
Bay roof	0.9	0	0.9	0.15	0		9
bay floor	0.9			0.25			20
<u>Internal Elements</u>							
Partition walls	84.2						9

SAP Input

Party Elements

APT wall	42.7	20
party ceiling	69.1	20
part floor	70	30

Thermal bridges:

Thermal bridges:	User-defined (individual PSI-values) Y-Value = 0.0095			
	Length	Psi-value		
	4.9	0	E23	Balcony within or between dwellings, balcony support penetrates wall
[Approved]	1.4	0.06	E10	Eaves (insulation at ceiling level)
	1.4	0.08	E14	Flat roof
[Approved]	5.77	0.09	E16	Corner (normal)
	5.77	0	E17	Corner (inverted internal area greater than external area)
	1.4	0	P4	Roof (insulation at ceiling level)

Ventilation:

Pressure test:	Yes (As designed)
Ventilation:	Centralised whole house extract
	Number of wet rooms: Kitchen + 2
	Ductwork: , Rigid
	Approved Installation Scheme: True
Number of chimneys:	0
Number of open flues:	0
Number of fans:	0
Number of passive stacks:	0
Number of sides sheltered:	0
Pressure test:	3

Main heating system:

Main heating system:	Room heaters
	Electric (direct acting) room heaters
	Fuel: Electricity
	Info Source: Manufacturer Declaration
	Manufacturer's data
	Efficiency: 100.0%
	Panel, convector or radiant heaters

Main heating Control:

Main heating Control:	Programmer and room thermostats
	Control code: 2605

Secondary heating system:

Secondary heating system:	None
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Water heating:

Water heating:	Electric immersion (on-peak or off-peak)
	Water code: 903
	Fuel :Electricity
	Hot water cylinder
	Cylinder volume: 150 litres
	Cylinder insulation: Measured loss, 1.13kWh/day
	Primary pipework insulation: False
	Cylinderstat: True
	Cylinder in heated space: True
	Immersion: Dual
	Solar panel: False

Others:

Electricity tariff:	Standard Tariff
In Smoke Control Area:	Yes

SAP Input

Conservatory:	No conservatory
Low energy lights:	100%
Terrain type:	Low rise urban / suburban
EPC language:	English
Wind turbine:	No
Photovoltaics:	<u>Photovoltaic 1</u> Installed Peak power: 0.4 Tilt of collector: 30° Overshading: None or very little Collector Orientation: South
Assess Zero Carbon Home:	No

Block Compliance WorkSheet: block compliance

User Details

Assessor Name: Robert Clayton
Software Name: Stroma FSAP

Stroma Number: STRO033617
Software Version: Version: 1.0.4.25

Calculation Details

Dwelling	DER	TER	DFEE	TFEE	TFA
apartment101	33.27	33.01	50.9	71.5	70.4
apartment102	29.13	29.76	40.2	59.7	70
apartment 103	29.11	30.23	41	61.4	70.4
apartment 104	28.22	30.23	39.2	61.4	70.4
apartment105	31.35	29.77	44.7	59.8	70
apartment 106	29.13	29.76	40.2	59.7	70
apartment 107	29.13	29.76	40.2	59.7	70
apartment 108	32.13	31.81	48.8	67.6	70.4
apartment201	26.27	26.89	36.9	51.4	70.4
apartment202	22.94	23.19	27.8	38.1	70
apartment205	22.99	23.67	28.8	39.8	70.4
apartment206	23	23.67	28.9	39.8	70.4
apartment203	22.94	23.19	27.9	38.1	70
apartment204	23.12	23.34	28.2	38.6	70
apartment207	22.94	23.19	27.8	38.1	70
apartment208	24.99	25.7	34.5	47.5	70.4
apartment301	26.27	26.89	36.9	51.4	70.4
apartment302	22.94	23.19	27.8	38.1	70
apartment303	22.94	23.19	27.9	38.1	70
apartment304	22.94	23.19	27.8	38.1	70
apartment305	22.94	23.19	27.8	38.1	70
apartment306	22.94	23.19	27.8	38.1	70
apartment307	22.99	23.67	28.8	39.8	70.4
apartment308	25.05	25.7	34.7	47.5	70.4
apartment401	26.27	26.89	36.9	51.4	70.4
apartment402	22.94	23.19	27.8	38.1	70

Block Compliance WorkSheet: block complianceCont...

Dwelling	DER	TER	DFEE	TFEE	TFA
apartment403	22.94	23.19	27.9	38.1	70
apartment404	22.94	23.19	27.8	38.1	70
apartment405	22.94	23.19	27.8	38.1	70
apartment406	22.94	23.19	27.8	38.1	70
apartment407	22.94	23.19	27.9	38.1	70
apartment408	24.84	25.7	34.3	47.5	70.4
apartment501	35.33	36.09	34.3	47.5	70.4
apartment 502	33.55	32.18	50.6	68.6	70
apartment503	31.72	30.69	47.2	63.7	70
apartment504	33.81	32.33	51	69.1	70
apartment505	33.63	32.18	50.6	68.6	70
apartment506	33.55	32.18	50.6	68.6	70
apartment5.07	33.55	32.18	50.6	68.6	70
apartment508	35.49	36.21	57.3	82.2	70.4

Calculation Summary

Total Floor Area	2806.00
Average TER	27.13
Average DER	26.98
Average DFEE	36.40
Average TFEE	50.65
Compliance	Pass
% Improvement DER TER	0.55
% Improvement DFEE TFEE	28.13

Predicted Energy Assessment



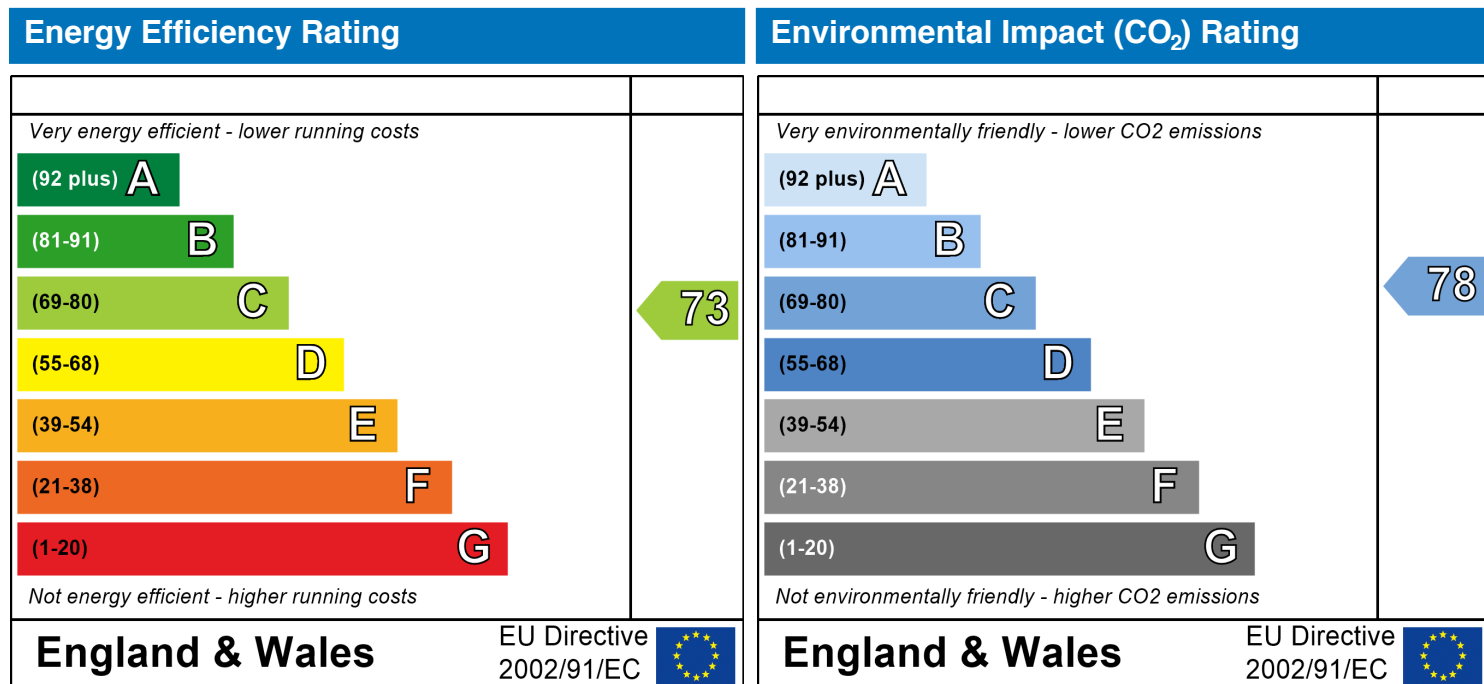
Masion House
New Islington
Manchester

Dwelling type:
Date of assessment:
Produced by:
Total floor area:

Mid floor Flat
20 February 2020
Robert Clayton
70 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

Predicted Energy Assessment



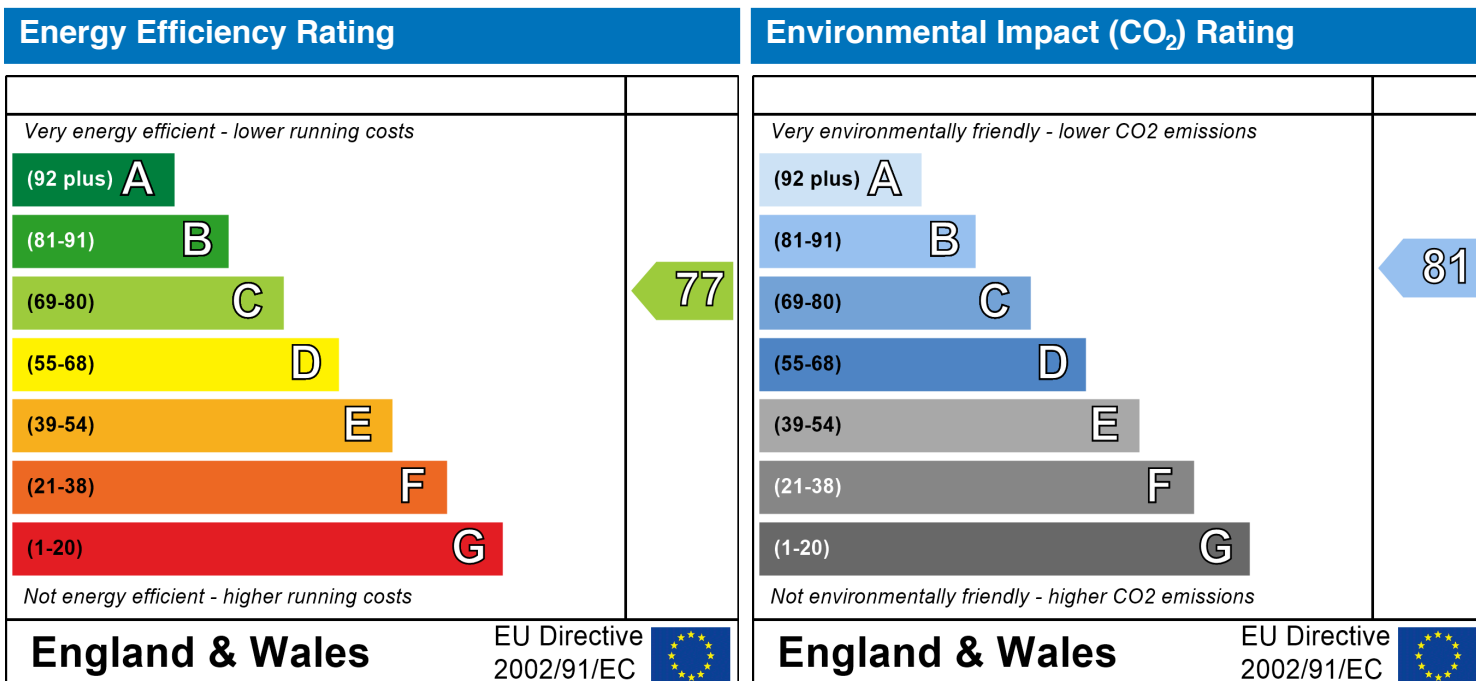
Masion House
New Islington
Manchester

Dwelling type:
Date of assessment:
Produced by:
Total floor area:

Mid floor Flat
20 February 2020
Robert Clayton
70.4 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

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Predicted Energy Assessment



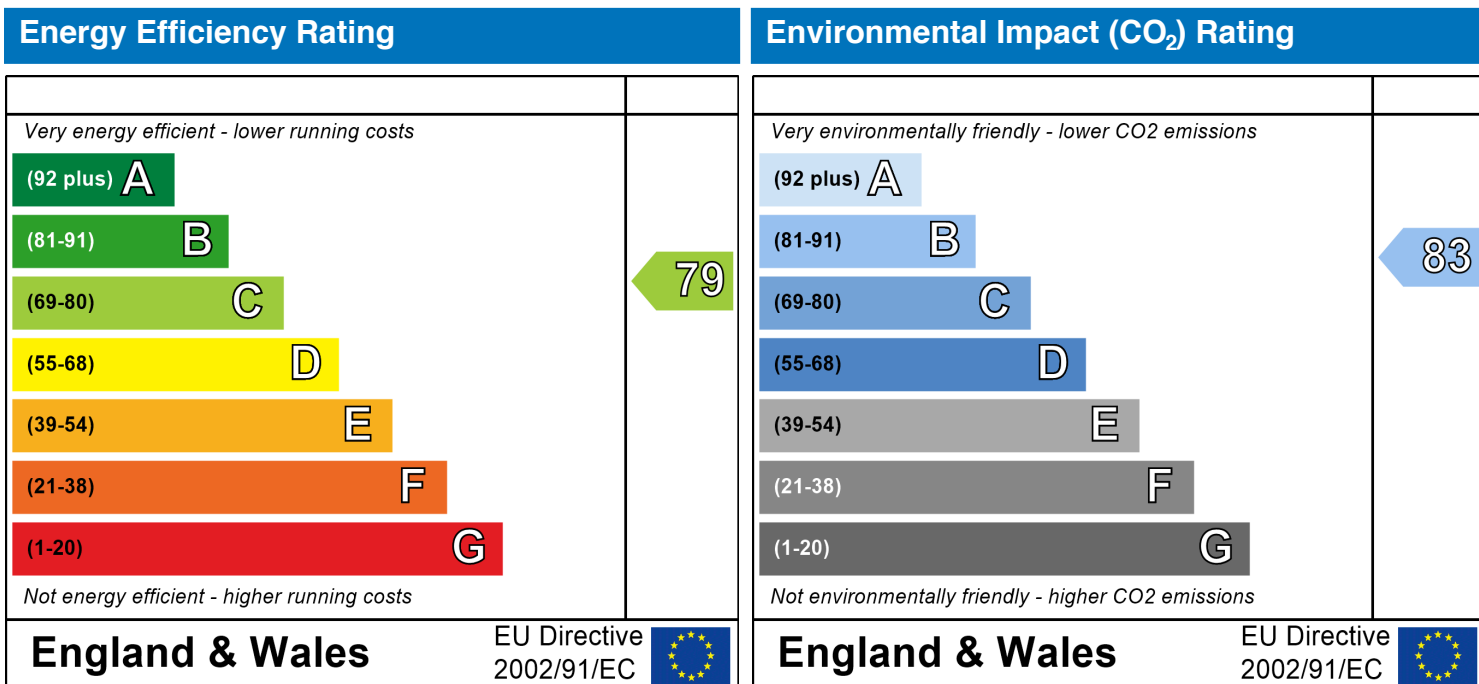
Masion House
New Islington
Manchester

Dwelling type:
Date of assessment:
Produced by:
Total floor area:

Mid floor Flat
20 February 2020
Robert Clayton
70.4 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

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Predicted Energy Assessment



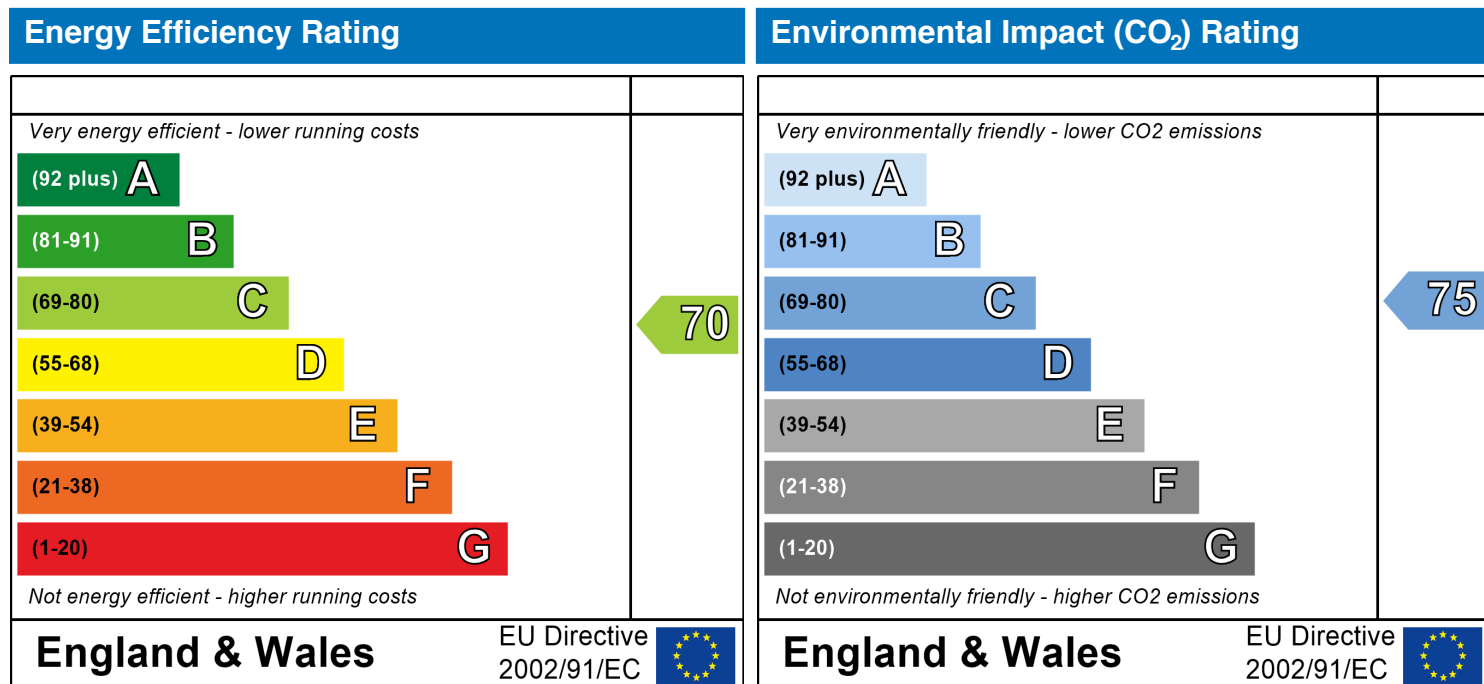
Masion House
New Islington
Manchester

Dwelling type:
Date of assessment:
Produced by:
Total floor area:

Top floor Flat
20 February 2020
Robert Clayton
70 m²

This is a Predicted Energy Assessment for a property which is not yet complete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, an Energy Performance Certificate is required providing information about the energy performance of the completed property.

Energy performance has been assessed using the SAP 2012 methodology and is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.



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