

Environmental Standards Statement

Beyer Close, Manchester



INCREASING LAND VALUE

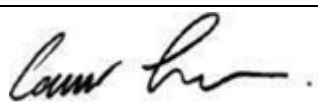
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Document Verification

This Environmental Standards Statement with Part L SAP assessments is in support of the Planning Application for the Proposed Development at Beyer Close, Manchester.

Site Address	Bayer Close, Manchester M18 8AR		
Job Number	LKM 21 1011		
Report Title	Environmental Standards Statement with SAP Assessments		
Date Issued	15 th April 2021	Document Ref.	
Prepared By	Brendon Berry Energy and Sustainability Surveyor	Signature	
Checked By	Conor Leyden Director	Signature	

This report has been prepared by LK Management Ltd using all reasonable skill, care and diligence on behalf of the consultant using evidence supplied by the design team.

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All information within this document has been assumed correct at the time of issue.

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1.0 Executive Summary

A Planning Application has been submitted to construct 4 no. three storey town houses with associated carparking, boundary treatments and landscaping at Beyer Close, Gorton, Manchester

Within Manchester City Council, Manchester Core Strategy 2012 to 2027 Policy EN4 and EN 6 Delivering Manchester's Local Development Framework, reference is made to 'Domestic CO₂ emissions reduction targets' and sustainable construction techniques and sets out guidance on targets for these energy reductions and targets for levels of Code for Sustainable Homes for new developments.

Policy EN 6 states that developments under 10 or more residential units should be '*expected to meet the minimum target, where viable*'

Due to the fact that the current application is for 4 dwellings and the building is the basement of an existing multi story historic building it is not possible to achieve exceedance on building regulations relating to CO₂ emissions.

The following report will show where improvements can be made and the intentions of the developer to design energy efficiency measures into the development.

2.0 Introduction

This Sustainability Report has been prepared by LK Management Limited, appointed by Iconic BNB Limited. The report and its associated Appendices describe the sustainable design and construction measures included in the proposals for the development of the site.

The Application Site proposal is for a high quality residential development of 4No. 3 bedroom dwellings for private sale which will help meet a well-established and accepted need for high quality versatile accommodation in the area of both size and bed spaces.

Our report is based upon a comprehensive review of the design proposals that have been prepared by Jonathan Blackstone and the clients Design Team and sets out how the development will meet the requirements of Manchester Core Strategy 2012 to 2027 Policy EN 6 showing where the policies, where possible will be met to reduce energy consumption through a 'fabric first' approach and how the sustainability criteria will be achieved.

In Manchester's Local Development Framework Core Strategy Development Plan Document, it states in Policy EN4 that 'Wherever possible new development and retrofit projects, including energy generation plant, must be located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.

This introduction outlines the development proposals and our methodology for assessing the opportunities guiding sustainability issues within the scheme.

Outlined below are the key sustainability achievements of this development:

- A residential development of 4No. 3 bedroom high quality residential dwellings for private sale, which will meet a well-established and accepted need for housing in the area.
- Following a Fabric First Approach to reduce energy demand from exceptional building materials specification and to remove the need to use unsustainable non-renewable sources whilst still maintaining the requisite energy reduction targets.
- High levels of insulation, efficient heating systems, exceptionally low levels of air permeability.
- 100% energy efficient lights throughout the development.
- Internal water use within all dwellings to be reduced to a targeted 90 litres per person per day through the provision of water efficient fittings, thus preserving water supplies.
- The use of materials with low embodied energy which are locally sourced where available.
- Reducing the site impact using considerate construction techniques and utilising local labour where applicable.
- Sustainable transport promoted with all dwellings within close proximity of a bus stop and providing all new residents with comprehensive information on the public transport provision.

- Waste minimisation principles adopted both during construction and in the lifespan of the development through promotion of recycling/composting measures.
- Initiatives developed to ensure a high quality place to live, including measures to minimise crime, improve security, provide outside spaces and achieve acceptable noise levels.
- Recycling provision within the units and site wide implementation of services via L.A. Collection Schemes.

Initial example energy calculations (SAP) have been completed on Elmhurst approved software by a licensed energy assessor however these will need to be further developed as the building is existing opposed to new build.

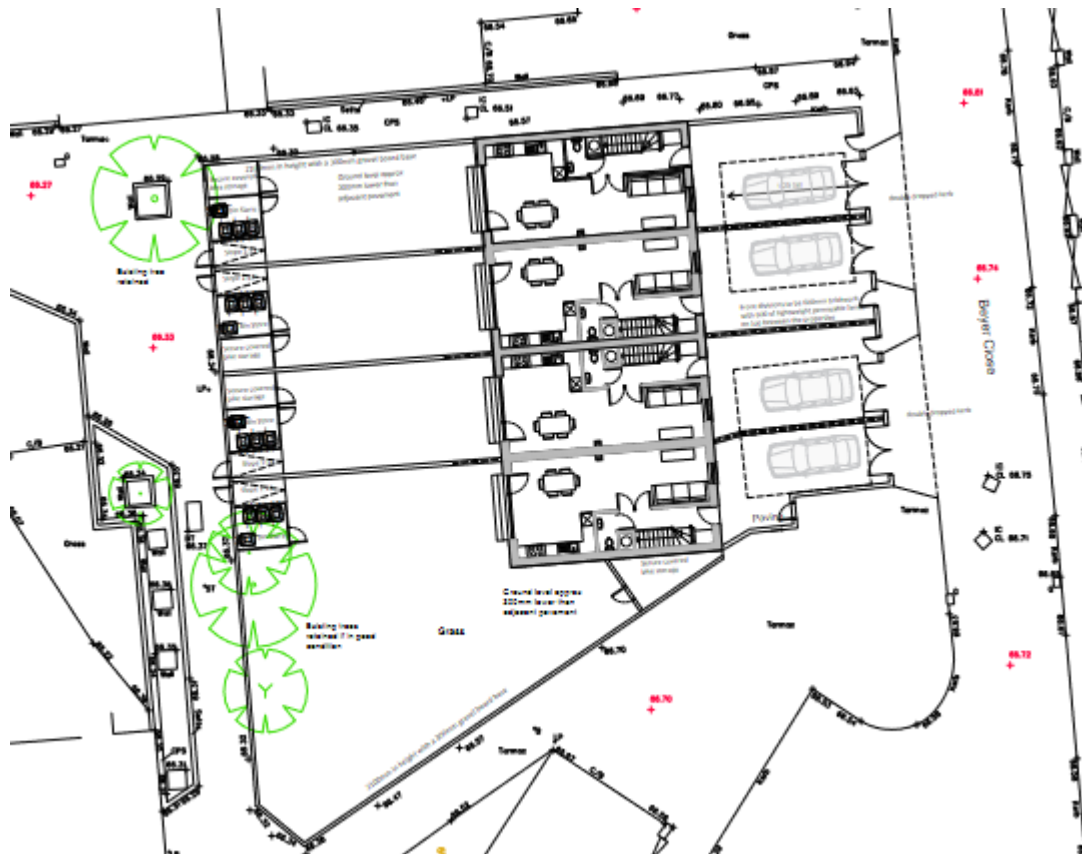
A thorough assessment of the sustainability-related planning policies for the Application site has been carried out, to ensure that the development is actively responding to them.

Following these assessments it is our view that a sustainable development will be created and delivered, with very good build and sustainability standards being developed despite the fact the development comprises the conversion of a basement in an existing historic building.

3.0 Scheme Description – The Application Site

The proposed site is in the outskirts of Manchester centre in Gorton, with a wide range of local amenities all within walking distance and good connections via rail, bus, tram and other modes of transport.

The planned development area is in a residential and contains 4 No. dwellings, redeveloping an area of waste ground at the end of Beyer Close which will meet a well-established and accepted need for housing space within the area.



4.0 Methodology and Structure

The policies and methodologies analysed have been at local, regional and national levels, all of which are pertinent to this scheme.

The Local and National Policies relating to sustainability of this scheme are:

- Manchester City Council Adopted Core [2012, Manchester City Council]
- National Planning Policy Framework (NPPF) [March 2010, HM Government]
- Approved Document L1A: Conservation of fuel and power (New Dwellings), [March 2010, HM Government]
- Definition of Zero Carbon Homes [December 2008, HM Government]
- Water Efficiency Calculator for New Dwellings [September 2009, HM Government]

It is important to note the significant importance of the Manchester City Council Core Strategy. This document is a key document in the Local Development Framework as it sets out the overall vision and strategy for place making and will provide the context for all subsequent Local Development Documents and their proposals. It is based on guidance set out in the National Planning Policy Framework.

We have included an example SAP assessment within this study. SAP is the Governments Standard Assessment Procedure which is the methodology for measuring CO₂ and Energy Efficiency within habitable buildings. Example SAP calculations are located in Appendix 1.

5.0 Relevant Policy - National

The Government published the National Planning Policy Framework (NPPF) and related documents on the 27th March 2012. The NPPF states that “The purpose of the planning system is to contribute to the achievement of sustainable development”, and that “to achieve sustainable development, economic, social and environmental gains should be sought jointly and simultaneously”.

6.0 Relevant Policy - Local

At local level the most important document, as previously mentioned, is the Manchester Core Strategy 2012 to 2027, particularly Policy EN 6. Elements within the strategy with specific themes relevant to this development include improvements over and above Building Regulations.

The example SAP calculations within appendix 1 show these improvements and indicate how the development complies with the requirements of the Core Strategy.

Furthermore there are a number of improvements that are available within this development that will achieve significant energy savings and these are summarised in the next section.

7.0 Development Specific Fabric First Approach to Reducing Energy Demand- The Results

This section will attempt to explain the projected energy usage for the development compared to that set by Building Regulation standards where Dwelling's Emission's Rates are compared to the Target Emission's Rate (TER) as set by Building Regulations.

The way, in which regulations work, incorporating renewables is likely to increase final energy demands from other sources with the onus of passing Building Regulation standards being met by the renewable technology and thus by sacrificing improvements in the fabric. Installing certain renewables at build stage in lieu of increased fabric efficiency also means that there is less opportunity for potential improvement later in the building life and the properties are actually less energy efficient with energy wasted to a greater extent, the shortfall in the percentage reductions only being 'made up' with a renewable allocation.

Indeed in the winter months with solar technology (thermal and PV), when the sun's not at its strongest and energy demand is at its highest the greater benefit here, in terms of energy saved, is via improved fabric insulation values and not through the use of renewable technology.

The design criteria will improve the domestic CO₂ emissions reduction targets to 40% increase on Part L 2006 (15% over Part L 2010 & 2013) for the residential dwellings which in excess of Manchester Core Strategy 2012 to 2027.

Metrics and Method

It is not possible to accurately calculate "energy consumption of the total development" as there is no agreeable metrics to do this, as upon site completion individual users will impart their own preferences on heating and lighting use. The only way to do this to any reasonable accuracy is to estimate the finished development usage using the SAP software, based on a set of modelled unit types applicable to the site and for the results to be apportioned across the whole development to achieve an estimated average total usage.

Regulations for the conservation of fuel and power measure homes on the amount of calculated CO₂ emitted from them. This also, only measures Primary (or Regulated) Energy Demand, this incorporates;

- Space Heating
- Water Heating
- Energy for Pumps and Fans for heating and ventilation
- Energy for Lighting

There is no agreed metrics for "Secondary Energy Demand", which could be interpreted to be required within any calculation for "energy consumption of the total site". Secondary Energy Demand includes; external lighting, extra plugged in side lighting, TVs, computers, white goods and other consumer electronics. The original Zero Carbon Definition of 2008 did include Secondary Energy Demand, but no metrics was ever agreed in order to calculate final energy demand. Secondary energy demand has since been dropped from the proposed definition, due to no agreed metrics and significant behavioural impacts making any calculations largely inaccurate.

For the purpose of this report we will only take Primary Energy Demand into account, for which the SAP calculations within Appendix 1.

Reducing Energy Demand – Fabric First Approach

Part L requires that all dwellings are calculated to produce less CO₂ than a theoretical target. This Target Emission Rate (TER) is often known as the *notional building*. The calculated Dwelling Emission Rate (DER or BER) must be a percentage improvement over the TER.

In order to calculate the TER and DER/BER the following elements are taken into consideration within the SAP calculation;

Long Term Elements;

- Floor space, Orientation, Exposure and Location in the UK, number and size of openings for doors and windows.
- U Values (heat loss) of Walls, Floors, Roofs, Windows and Doors.
- Details of junctions between elements and thermal breaks.
- Air Permeability of the building (a home can be well insulated, but if there are gaps in the construction; warmed air will escape)

Shorter Term Elements;

- Space Heating System
- Hot Water Heating System
- Control of Heating System
- Ventilation
- Lighting
- Renewable Energy Technologies.

All the elements play a role in the calculated DER/BER and the regulations allow the developer to choose which elements they wish to focus on in order to be the most cost effective way to achieve the required CO₂ target.

Part L does have limiting backstops for the Longer Term Elements (the Fabric of the building), but otherwise they are tradable. Specifying renewable energy technologies means that to achieve the DER/TER, the fabric can be worse than without and a Building Regulation pass still achieved with renewable technology offsetting fabric improvements. Equally because the regulations are based upon Carbon, not Energy demand this means the actual energy demand for the design dwellings with renewables is likely to be significantly higher.

Fabric First Approach; Local and National Policy

This Fabric First Approach is set out in a number of relevant policies. Initially in the 2008 Zero Carbon Definition the “Energy Hierarchy” was initially created with the emphasis put on Energy Efficiency before Carbon Compliance. Literally Energy Efficiency is the fabric of the building, while Carbon Compliance is renewable technologies.

This same principle is followed within Manchester’s 2012-2027 Core Strategy “Under Policy EN4 developers will initially be expected to secure high levels of energy efficiency and low energy demand.”

Fabric First Approach Proposals

It is proposed that the dwellings are built to Fabric First standards because this will reduce the energy demand from non-renewable sources the most. This in turn will save a greater amount of CO₂ and keep residents bills to a minimum.

Renewable Technologies Feasibility

As part of Manchester Core Strategy 2012 to 2027 there is a requirement to consider the technical feasibility and financial viability of LZC technologies which will be considered within this section.

There are a number of different renewable technologies which could be used to reduce CO₂ emissions across the development site and in turn reduce the overall energy consumption of the total site. However, most are not suitable or feasible for the site in question. The Table 4 below details the feasibility of potential renewable technologies

Table 4: Feasibility of Renewable Technologies

Technology	Feasibility*			Comments
	H	M	L	
Ground Source and Air Source Heat Pumps			✓	Air source heat pumps would be suitable for the new build and refurbished dwellings as they deliver low-carbon heat. Typically, for each 1kw of electricity used, 3kw of heat are delivered offering real carbon savings. However, Air Source Heat Pumps to work efficiently, require very high levels of insulation and air tightness and as such the efficiencies would be low when connected to a traditional wet system. Currently, the way the regulations work, to achieve the same Building Regulations standards means that to be cost effective the insulation and air tightness are likely to be not as high as efficient gas boilers. Because ASHPs use mains electricity the NOx emissions associated from their use (based upon grid electricity) is significantly higher than condensing gas boilers. Alternatively Ground Source Heat Pumps could be considered, however this would require considerable capital investment and complete redesign of the residential units to provide a wet system of underfloor heating; whereas this can be seen as a good form of background heat the efficiencies are not good when linked to a wet system with customers of traditional housing unaccustomed to this form of heating and standard of living.

				Typically GSHP can deliver hot water to the properties via an array of pipework either horizontally or vertically. It is deemed that a horizontal array in the instance would not be extensive enough to provide the heat required to serve the individual dwellings because of the restricted sizes. Potentially the arrays could be located vertically within bore holes but again due to the constraints of the site being in central Manchester with no external area to the building, this would not be feasible. There would also be a concern for both air source and ground source heat pumps that the area of land required is not available to achieve this.
Wind Power			✓	Wind power can provide significant amount of power at relatively low cost. However, this site is within an urban environment with average wind speeds at 4.4 metres per second. The Department for Energy and Climate Change suggest that wind speeds must be at least 5 m/s for Wind Power to be effective. Also due to the location of the site, there would be no place to install the required equipment. This technology is therefore deemed not feasible.
Photovoltaics	✓			Photovoltaic cells and tiles can be installed on southeast through southwest facing roofs. It is important that PV arrays are not over-shadowed during the day as this has a significant effect on the output. Photovoltaics (PV) have little or no maintenance and are easy to install both as part of the build sequence or retrospectively and any excess power can also be exported to the grid. Because PV is easy to install it does not necessarily have to be installed when the house is built, therefore it makes it an ideal technology for retrofit opportunities. Financially the cost is not excessively an overburden to contribute, with a fabric first approach, to meet the LPAs requirements for CO₂ reductions. Depending on the results of the more detailed design stage SAP, the fabric first approach may provide sufficient improvements on the building regulations to negate the need for this installation. If the fabric first approach does not achieve the

				required improvements then this method may need to be considered.
Solar Hot Water Systems			✓	Suitable for houses. Delivers good calculated carbon and fuel cost savings; however larger properties are less viable due to the size of water tanks required and the infrastructure and legal complexities for private units makes this technology unfeasible. Solar hot water relies upon thermal heat, rather than light (unlike solar PV) therefore it is most effective on hotter days. These are the days when the requirement for heating and hot water is at its lowest. Because there is a limit to useful heat from the Solar hot water, and there is no (or proposed) heat network in the area any excess heat is wasted. Therefore, as the size of the PV system is only restricted by the roof size (rather than usefulness) PV can better utilise more of the roof. As the most efficient way to heat these properties is with gas condensing combi boilers and the space allocations needed for large hot water storage cylinders then it is deemed that that solar water is not as feasible as solar PV.

Recommendation for Renewables

The feasibility of the different renewable technologies has been reviewed and their appropriateness for this housing development explored. At this stage it is recommended that within the detailed design stage to focus on a Fabric First approach, in an attempt to achieve the same energy benefits and required CO₂ reductions using this approach. If this is not feasible to achieve, then the use of PV's or other renewable technology will be considered.

8.0 Conclusion

This Sustainability Report sets out the approach to the creation of a sustainable development at Beyer Close, Manchester by complying with Manchester Core Strategy with particular reference to Policy EN 6.

The report is based upon a review of the proposals and a thorough analysis of relevant national, regional and local planning policy requirements.

The development on Beyer Close, Manchester sets out to satisfy all key planning policy requirements, and in some cases exceeds them.

As a result we consider that the design is a sustainable development, which sensitively addresses the Application Site's constraints and optimises its opportunities at the same time as meeting a known housing need.

This sustainable development has been created through the implementation of many measures, including the following key points:

- A residential development of a brownfield site which will meet a well-established and accepted need for housing in the area.
- Improving energy demand and lower overall consumption through the use modern construction techniques to achieve industry excellent standards for fabric heat loss figures (U values) for all elements of the external construction, along with very air tight units.
- Meeting and exceeding Approved Document part L1A (2015) of the Building Regulations by a minimum of 15% as per point 9.81 of Core Policies in Wigan Local Plan
- Peripheral areas of highly landscaped buffers providing ecological interest as well as increase impermeable surfaces and will help to reduce the developments carbon footprint.
- 100% energy efficient lights throughout the development.
- Internal water use within all dwellings to be reduced to a targeted figure of less than 120 litres per person per day through the provision of water efficient fittings, thus preserving water supplies.
- The use of materials with low embodied energy which are locally sourced where available.
- Reducing the site impact using considerate construction techniques and utilising local labour where applicable.
- A surface water design that avoids, reduces and delays the discharge of rainfall run-off to watercourses and public sewers using infiltration and attenuation techniques where applicable and viable.

- Ecology of the Application Site will be examined by a qualified Ecologist and any key ecological recommendations are expected to be adopted and key features protected during the development aimed at enhancing the existing ecology in the area.
- Sustainable transport promoted with all dwellings within close proximity of a bus stop and providing all new residents with comprehensive information on the public transport provision.
- Waste minimisation principles adopted both during construction and in the lifespan of the development through promotion of recycling/composting measures.
- Initiatives developed to ensure a high quality place to live, including measures to minimise crime, improve security, provide outside spaces and achieve acceptable noise levels.
- Recycling provision within the units and site wide implementation of services via Local Authority collection schemes.

Based on the inclusion of the above matters we believe that we have demonstrated the maximum amount of improvement against building regulations possible for this scheme.

Further improvements may be possible when detail design is underway and further details are available.

Appendix 1 – Example Sample Design Stage SAP

This design submission has been carried out using Approved SAP software. It has been prepared from plans and specifications and may not reflect the property as constructed.

Assessor name	Mr Laurie Wills	Assessor number	3906
Client		Last modified	01/06/2017
Address	1 Foxtail semi detached , Manchester , M1		

Dwelling

Development:	N/A	House type:	
Property type:	House		
Built form:	Semi-detached	Year built:	2016
Tariff:	Standard	Assess summer overheating:	Yes
Thermal mass:	Medium	Thermal mass parameter:	250.00
Separated heated conservatory:	No	Degree day region:	W Pennines (Eng)
Sheltered sides:	2	Terrain:	Low Rise U/S

Storeys:

Name	Area (m ²)	Height (m)
Lowest occupied	39.10	2.40
+1	36.70	2.70

Floors

Ref - Name	Type	Construction	Storey Location	Living Area (m ²)	Area (m ²)	U-value (W/m ² K)
Floor 1 - Floor 1	Ground	Suspended not timber	Lowest occupied	14.70	39.10	0.15
Living area that has no heat loss:	0.00					

Walls

Ref - Name	Type	Construction	Gross Area (m ²)	U-value (W/m ² K)
Wall 2 - party	Party	Fully filled cavity with sealed edges	39.20	0.00
Wall 1 - Wall 1	External	Cavity	92.20	0.24

Roofs

Ref - Name	Construction	Gross Area (m ²)	U-value (W/m ² K)
Roof 1 - Roof 1	Pitched (joists)	39.10	0.10

Openings

Opening Ref: 1 Window, Double glazed (low-E), 'win', master: Yes, linked to: 0

Location:	Wall 1	Source:	From Manufacturer	Orientation:	North West
Overshading:	None / Very little	Width (m):	0.70	Height (m):	1.00
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m ² K):	1.20

Opening Ref: 2 Window, Double glazed (low-E), 'win', master: No, linked to: 1

Location:	Wall 1	Source:	From Manufacturer	Orientation:	North West
Overshading:	None / Very little	Width (m):	1.80	Height (m):	1.20
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m ² K):	1.20

Opening Ref: 3 Window, Double glazed (low-E), 'win', master: No, linked to: 1

Location:	Wall 1	Source:	From Manufacturer	Orientation:	North West
Overshading:	None / Very little	Width (m):	0.70	Height (m):	1.20
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m ² K):	1.20

Opening Ref: 4 Window, Double glazed (low-E), 'win', master: No, linked to: 1

Location:	Wall 1	Source:	From Manufacturer	Orientation:	North West
Overshading:	None / Very little	Width (m):	1.30	Height (m):	1.20
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m²K):	1.20

Opening Ref: 5 Solid door, N/A, ' front door ', master: Yes, linked to: 0

Location:	Wall 1	Source:	From Manufacturer	Orientation:	N/A
Overshading:	N/A	Width (m):	0.90	Height (m):	2.10
Frame:	u-PVC	Transmittance factor:	N/A	U-value (W/m²K):	1.00

Opening Ref: 6 Window, Double glazed (low-E), ' rear win ', master: No, linked to: 1

Location:	Wall 1	Source:	From Manufacturer	Orientation:	South East
Overshading:	None / Very little	Width (m):	1.30	Height (m):	1.20
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m²K):	1.20

Opening Ref: 7 Window, Double glazed (low-E), ' rear win', master: No, linked to: 1

Location:	Wall 1	Source:	From Manufacturer	Orientation:	South East
Overshading:	None / Very little	Width (m):	0.70	Height (m):	1.20
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m²K):	1.20

Opening Ref: 8 Window, Double glazed (low-E), ' rear win', master: No, linked to: 1

Location:	Wall 1	Source:	From Manufacturer	Orientation:	South East
Overshading:	None / Very little	Width (m):	1.30	Height (m):	1.10
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m²K):	1.20

Opening Ref: 9 Window, Double glazed (low-E), ' rear win', master: No, linked to: 1

Location:	Wall 1	Source:	From Manufacturer	Orientation:	South East
Overshading:	None / Very little	Width (m):	1.60	Height (m):	2.10
Frame:	u-PVC	Transmittance factor:	0.72	U-value (W/m²K):	1.20

Thermal Bridging					
Ref	Description	Length (m)	Source	ψ (W/m·K)	Result
E1	Steel lintel with perforated steel	0	Default Value	N/A	0
E2	Other lintels (including other steel)	10.3	Approved	0.3	3.09
E3	Sill	9.4	Approved	0.04	0.376
E4	Jamb	24.6	Approved	0.05	1.23
E5	Ground floor (normal)	19.1	Approved	0.16	3.056
E19	Ground floor (inverted)	N/A	Default Value	N/A	0
E20	Exposed floor (normal)	N/A	Default Value	N/A	0
E21	Exposed floor (inverted)	N/A	Default Value	N/A	0
E22	Basement floor	N/A	Default Value	N/A	0
E6	Intermediate floor within a dwelling	17.2	Approved	0.07	1.204
E7	Party floor between dwellings (in building)	N/A	Default Value	N/A	0
E8	Balcony within a dwelling, wall insulation	N/A	Default Value	N/A	0
E9	Balcony between dwellings, wall insulation	N/A	Default Value	N/A	0
E23	Balcony within or between dwellings	N/A	Default Value	N/A	0
E10	Eaves (insulation at ceiling level)	11.4	Approved	0.06	0.684
E24	Eaves (insulation at ceiling level)	N/A	Default Value	N/A	0
E11	Eaves (insulation at rafter level)	N/A	Default Value	N/A	0
E12	Gable (insulation at ceiling level)	7.7	Approved	0.24	1.848
E13	Gable (insulation at rafter level)	N/A	Default Value	N/A	0
E14	Flat roof	N/A	Default Value	N/A	0
E15	Flat roof with parapet	N/A	Default Value	N/A	0
E16	Corner (normal)	12.6	Approved	0.09	1.134
E17	Corner (inverted - internal area ground)	2.4	Approved	-0.09	-0.216
E18	Party wall between dwellings	10.2	Approved	0.06	0.612

E25 Staggered party wall between dwelli	N/A	Default Value	N/A	0
P1 Ground floor	7.7	Default Value	0.16	1.232
P6 Ground floor (inverted)	N/A	Default Value	N/A	0
P2 Intermediate floor within a dwellin	7.7	Default Value	0	0
P3 Intermediate floor between dwelling	N/A	Default Value	N/A	0
P7 Exposed floor (normal)	N/A	Default Value	N/A	0
P8 Exposed floor (inverted)	N/A	Default Value	N/A	0
P4 Roof (insulation at ceiling level)	7.7	Default Value	0.24	1.848
P5 Roof (insulation at rafter level)	N/A	Default Value	N/A	0
R1 Head	0	Default Value	N/A	0
R2 Sill	0	Default Value	N/A	0
R3 Jamb	0	Default Value	N/A	0
R4 Ridge (vaulted ceiling)	N/A	Default Value	N/A	0
R5 Ridge (inverted)	N/A	Default Value	N/A	0
R6 Flat ceiling	N/A	Default Value	N/A	0
R7 Flat ceiling (inverted)	N/A	Default Value	N/A	0
R8 Roof wall (rafter)	N/A	Default Value	N/A	0
R9 Roof wall (flat ceiling)	N/A	Default Value	N/A	0

Equivalent γ value: 0.094

Ventilation

Air permeability entered:	Yes	Seek exemption (<3 dwellings):			No
Design air permeability rate:	5.00				
Number of...	Open fireplaces	Open flues	Flueless gas fires	Extract fans	Passive vents
	0	0	0	3	0
Mechanical ventilation:	Not present (natural)				

Space heating

Main heating category:	Individual system/s	Number of systems:	1
Secondary heating:	No	Open flue or chimney:	No
Unconnected gas point:	N/A	Smoke control area:	No
Type:	Boiler	Efficiency source:	Product database
Product index:	016980		
Product details:	Johnson & Starley QuanTec HR28C		
Boiler type:	N/A	Fuel:	Mains gas
Condensing:	Yes	Flue type:	Balanced
Fan assisted flue:	Yes		
Combi type:	Instantaneous	Uses electricity:	N/A
Keep hot power rating:	N/A		
System:	Condensing combi with automatic ignition (1998 or later)		
Controls:	Time and temperature zone control - plumbing circuit		
Interlock:	Yes	Delayed start thermostat:	No
Compensation:	None	Burner control:	Modulating
Emitter:	Radiators	Pump in heated space:	No
Flow Temp:	> 45°C		
Installed 2013 or later:	Yes		
FGHRS:	N/A, N/A, N/A		
FGHRS index:	N/A		
FGHRS PV (kWp):	None		

Water heating

Type:	From main	Fuel:	Mains gas
Water separately timed:	N/A	Water use ≤ 125 litres/person/day:	Yes
Heat pump uses immersion:	N/A	Summer immersion:	N/A

Thermal store type: N/A

Store details:

Cylinder volume (litres): N/A

Thermostat: N/A

In heated space: N/A

Primary pipework insulated: N/A

WWHRS:

WWHRS: N/A

Renewables

No renewables present

Other

Internal lighting

Standard fittings: 0 Low energy fittings: 8 Total fittings: 8

Summer overheating

Thermal mass parameter (TMP): 250.00

User defined air change rate: No

Air change rate (ach): N/A

Cross ventilation on most floors: Yes

Window ventilation: Fully open half the time

Source of user defined values: N/A

Curtains closed in daylight hours: No

Fraction curtains closed: N/A

Blind/curtain type: N/A

Special features (Appendix Q)

No Appendix Q special features present

Cooling details

No space cooling present

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