Jonathan Richard Associates
Building Services Consultants

SUSTAINABILITY REPORT

Conversion & Extension of Existing Block to Apartments, Ironmonger Row, Coventry

Client: EDG Property

Project Reference: 20042

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1.1 INTRODUCTION & OBJECTIVES

Jonathan Richard Associates have been commissioned to provide a Sustainable Energy Statement for the proposed conversion and extension of existing building on Ironmonger Row Coventry to residential apartments and associated common areas.

The development will aim to reduce carbon emissions in accordance with the following energy hierarchy:

1. Be lean: use less energy
2. Be clean: supply energy efficiently
3. Be green: use materials from renewable sources, and a 'super-insulated' fabric.

The incorporation of these sustainability measures detailed further in this report allow for the proposed development to be deemed sustainable whilst targeting compliance with local and national policy.

Extract from CCC policy as follows;

Coventry City Council published a Proposed Core Strategy Consultation document7 in September 2011. This proposes a hub and spokes approach to development, whereby development is focused on the city centre and certain key areas across the city……..

Key objectives for the plan are to:

- *Stop green belt land being used for housing estates*
- *Encourage regeneration*
- *Support sustainable development*
- *Bring brown field land back into use*
- *Support local shopping centres, health provision and other services*
- *Improve roads and public transport on key routes into the city*
- *Reduce the city's carbon footprint*
- *Use the land required for new homes efficiently*
- *Provide easy access to the jobs already available*
- *Focus on the city centre as a showcase for the whole city*
- *Improve the health and wellbeing of Coventry citizens.*

Solutions are implemented to meet these objectives.

This report focuses on the sustainability areas to reduce the existing building carbon footprint and creating new dwellings sustainably.

1.2 ENERGY STATEMENT AND 'FABRIC FIRST' APPROACH

1.2.1 Energy Statement Summary

Sustainability features will reduce the potential carbon emissions of the development significantly by the inclusion throughout the design of a range of measures to include;

- Fabric First approach, super-insulated new structure/fabric.

- Energy efficient lighting.
- Sub-metering of relevant areas.
- Upgrading of existing 'U' values to walls, roof, windows and doors.
- Occupancy sensing in relevant areas will switch off lights and other services when not occupied.

It is anticipated that further measures will be adopted as a means of reducing carbon emissions associated with the development such as using construction materials that will be responsibly and legally sourced, as well as having BRE Green Guide ratings. Any insulation materials specified will also have a high Green Guide rating and be responsibly and legally sourced.

Existing plots to achieve at least a D rating to improve on the minimum requirements (E rating minimum requirements).

New plots would generally be a mixture of B and C ratings.

1.2.2 Details of Energy Strategy

The integration of passive design strategies using 'fabric first' approach to energy efficiency has been applied and preliminary SAP models have been prepared in compliance with ADL to inform the process.

The following principles have been applied to the scheme to minimise energy usage;

- Heating/hot water systems are proposed to be simplistic all-electric systems having low maintenance costs with time and temperature controls and the best insulation factors applied.

- Apps (Alexa, Hive etc) are to be considered for remote energy controls along with Smart Meters allowing occupants to better manage Energy usage.

- The options for central plant are not viable hence the need to focus more on the thermal performance of the structure which will far outlive the services installations.

- Improving the fabric thermal performance well above standard ADL compliant U values will ensure that very little heating is required even during the winter season.

- By improving the fabric U values we also make better use of internal heat gains from appliances, LED lighting and solar transmittance.

- The glazing 'whole system U values' will also be enhanced at around 0.95 U and will be treated to help control excessive heat-gain.

- Thermal modelling will be carried out to ensure overheating is negated.

- The ventilation strategy proposed will be System 4 of ADF which provides filtered fresh air, external ambient noise control, ease of maintenance along with ultra-high efficiency (circa 92% efficient) heat exchangers. Heat Recovery Ventilation Systems run 24/7 with Extra Low Voltage fans using minimal power maintaining a fresh environment and also provide night-time cooling. The systems will incorporate heat recovery, summer bypass dampers, and automatically adjust ventilation rates to suit activities. The occupants will also be able to open windows in habitable rooms, suitably restricted safe opening.

- Use of low energy LED lighting is proposed to be 100% throughout the site with PIR control for internal common areas and photocell/timer for external areas generally.

Consideration has been given to renewable energy sources concluding that there are no meaningful/viable renewable energy technologies suitable for this site given the small footprint and multi-storey configuration with minimal external grounds. It is considered likely that in the medium-term fossil fuels will eventually be phased out and certainly used less across the UK in preference of electrically powered systems.

This relatively simplistic approach with super-insulated fabric and all-electric heating/HWS, with good time and temperature control to each room helps to minimise maintenance and life-cycle costs, and the associated environmental impact compared with high-component Biomas/Wind/ASHP/GSHP/CHP.

1.3 ENERGY EFFICIENCY BEFORE RENEWABLES

Before applying any renewable energy technologies to the development, it is important to consider reducing the total energy requirement for electricity, space heating and hot water. This will be achieved through the energy efficiency measures, passive solar and low energy design techniques outlined below.

To reduce energy consumption associated with heat losses and gains through the fabric and air permeability the following fabric u values and air tightness test performance values are proposed.

These exceed the minimum building regulation standards for the new build areas in the example below:

External Walls	0.18	W/m^2 K
Exposed Roof	0.11	W/m^2 K
Exposed Floor	0.25	W/m^2 K
Glazing	0.95	W/m^2 K
Air Permeability	3.5	$m^3/hr/m^2$ @50Pa

All light fittings will be of the high frequency energy efficient fluorescent type with automatic controls in staff areas to turn lights off when areas are not occupied.

Space heating in all areas will have central time optimum start / stop control and temperature control to reduce energy consumed by the heating plant. The system will be responsive to external weather conditions and occupancy periods with these controls.

Sufficient natural and where required mechanical ventilation shall be provided to help reduce heat gains and energy consumption associated with mechanical cooling during the summer months.

The existing converted areas of the site would be insulated to comply with ADL for Change of Use, external walls insulated and glazing replaced to suit noise and thermal requirements.

SAP input values may be adjusted slightly pending effective selection of materials and their individual performance throughout the design period.

1.4 RENEWABLE ENERGY OPTIONS

The following technologies are recognised:

- Solar Hot Water
- Biomass
- Ground Source Heat Pump
- Gas Fired Combined Heat and Power
- Photovoltaic's
- Wind Turbines
- Air Source Heat Pump

1.4.1 Solar Domestic Hot Water

Solar hot water can be applied cost effectively to buildings with a high domestic hot water demand. In this case we would not recommend this option as the building does not have a high enough water demand.

1.4.2 Biomass

As there is no suitable boiler house or suitable fuel storage with access for delivery Biomass will not be considered further.

1.4.3 Ground Source Heat Pumps

The site is landlocked, an existing building covering the entire grounds having no floor space for installation of ground loops or vertical GSHP.

Considering the costs associated with excavation for the ground loops both the initial capital outlay and payback period would be higher than in comparison to air source heat pumps.

For these reasons ground source heat pumps will not be considered further.

1.4.4 Gas fired Combined Heat & Power

Combined Heat & Power (CHP) is the simultaneous generation of power and useful heat in a single process. Electricity is generated using an engine or a turbine and heat is recovered from the exhaust gases and cooling systems. CHP is most appropriate for buildings or sites with round the clock and year-round demands for heat and constant electricity usage in common areas. Hospitals, hotels and leisure centres with heated swimming pools are the most suitable types.

The common area electrical services serve only small corridor areas which are mainly naturally illuminated requiring PIR operated support and a small inverter controlled water booster set. Common areas are unheated to save energy. As there is not sufficient year-round demand for heat CHP will not be considered further as significant quantities of heat would not be put to use.

1.4.5 Photovoltaics (PV)

Photovoltaic systems use solar cells to convert sunlight into DC electricity and can also be integrated into buildings. They are distinct from other renewable technologies as they have no moving parts to be maintained and are silent in operation.

PV is a well used solution for renewable energy targets as it is clean, low maintenance and provides electricity to the grid.

The building does not have a roof facing within 45° of south which will give good access to good levels of solar radiation. Shading is provided by the surrounding buildings and shopping centre.

This could be a viable technology, however, is not likely to provide sufficient paypack to offset the material costs/wastage and maintenance compared with the Fabric First approach.

Use of PV panels would provide only a very small token amount of energy given the small roof-floor area ratio.

1.4.6 Wind Turbines

Wind power can be used to generate electricity either in parallel with mains supplies or for stand alone applications with battery back up. In order to produce worthwhile quantities of electricity, average wind speeds of more than 5 m/s are required.

The wind speed database indicates 4.8 m/s at 10m above ground level for the buildings OS grid co ordinates. Due to the low wind speed wind turbines will not be considered further.

1.4.7 Air Source Heat Pumps (ASHP)

Air source heat pumps use refrigerant technology to provide hot water at very high efficiencies (typically 400%). The majority of heat pump systems now incorporate inverter variable speed drives.

Due to their high efficiencies and lower capital costs in comparison to other technologies they are an effective solution.

However for this site there is insufficient space for ASHP plant which require substantial air movement and noise control when in close proximity to plots.

1.5 TRANSPORT

A Travel Plan will be produced, addressing the proposed impact of the development on travel patterns to include commuting, visitor and commercial journeys. The plan will detail how the impact can be minimised using a variety of measures e.g. car-sharing, dedicated bus services and provisions for cyclists etc. The Travel Plan will be adopted and acted upon by the building occupier.

The development is in close proximity to significant public transport nodes with local buses adjacent to the site.

Pool Meadow Bus Station is within 5 minutes walking distance of the site. It is managed by Transport for West Midlands. Local bus and national coach services operated by various companies serve the bus station which has 19 departure stands. National Express West Midlands has its depot adjacent to the bus station.

A range of primary local amenities are available which include shops, cafes and restaurants.

These features allow for the reduction of car-based travel and transport related pollution.

Note that the new bus fleet have very low NOx and CO emissions, and much lower engine noise.

1.6 WATER USE

Building Regulations and Statutory Authority guidance require that action is taken to reduce water usage. By specifying low water use taps, showers, cisterns etc, the water consumption at will be reduced by approximately 40%.

Modern pulsed water meters will be used for remote monitoring. A leak detection system will also be installed which will alert the building managers to any water leaks around the common area plant.

Individual apartments shall have water shut-off valves in accessible locations, labelled accordingly.

Landscaping is not applicable to this site.

To reduce the energy demand of the development as well as to help conserve water resources within the local area, it is anticipated that the fit-out works will provide for sanitary fittings which will be water efficient through measures such as dual flush toilets and low flow taps.

1.7 MATERIALS

Wherever possible, materials have been specified that achieve high ratings in the BRE Green Guide, which evaluates the overall environmental impact of their production and installation.

Materials have also been selected that have accredited chain of custody documentation, i.e. responsibly sourced.

The design of the building uses suitably robust materials in appropriate vulnerable locations and provides protection where damage may occur from vehicles, thus preventing the need for replacement and maintaining the aesthetics of the building.

Maximum use will be made of modular or standard panel sizing to reduce off-site manufacturing waste. Recycled aggregates will be used wherever possible and appropriate throughout the construction.

1.8 WASTE

A Resource Management Plan will be developed with the objective of minimising waste production by measures such as;

- On-going design review with the objective of reducing potential waste.
- Careful control of materials estimation and ordering.
- Putting systems in place to monitor and control construction waste during the build.
- Appointing specialist contractors to recycle construction waste.
- Provision of separate storage provision for various waste materials to allow more efficient recycling.
- There is no excavation require for the works, therefore no cut-fill exercise required.

- In conjunction with the client, an area for operational waste recycling will be identified. There is space at the rear courtyard which forms part of the development shared external common areas.

1.9 HEALTH & WELLBEING

The project will incorporate the following additional measures with use of available technologies to improve living conditions along with control of Noise & Air pollution to the plots.

- Suitable control of Noise to meet WHO Guidance and NPPF/NPSE and local planning requirements.
- Fully ventilated apartments with enhanced filtration for fresh air into living and sleeping areas, to enable windows to be left closed. Pressure control regime to positive pressure sleeping areas to maintain a fresh environment and negate cooking/WC smells. Carbon filtered cooker hoods.
- Filtration to include Nox control.
- Enhanced LED natural effect lighting systems to deep plan rooms where natural daylight is limited. Automatic settings enable mimicking of natural light tones and brightness throughout the day, installed behind reveals as indirect lighting.
- Ventilation systems to limit thermal overheating as per TM59.
- Noise report has been prepared showing enhanced performance for glazing systems and use of MVHR to ventilate apartments whilst windows are closed

1.10 FLOOD RISK ASSESSMENT

Flood maps sourced from the Environment Agency highlight that the development is at low risk of flooding from fluvial sources.

It is anticipated a site-specific Flood Risk Assessment will be undertaken which further confirms that the site is not at risk from other forms of flooding including seas, groundwater, sewers and reservoirs.

1.11 NOISE POLLUTION

The project will incorporate noise control for the newly formed dwellings in accordance with NPPF/NPSE and local authority guidelines.

Please refer to JRA site specific environmental noise report which shows enhanced glazing and ventilation to enable windows to be left closed due to local traffic and pedestrian noise.

There are no external or central plant items proposed for the development.

New local fan units for enhanced MVHR will have suitable noise control to achieve NR25 in bedrooms and NR30 in living areas and located so as not to allow excessive breakout noise into adjacent plots.

Apartments will be constructed in accordance with ADE of The Building Regulations for noise separation between plots and common areas, and between living rooms and bedrooms accordingly.

Noise separation between residential and ground floor commercial/retail areas shall be enhanced if required, noting that existing separating floors are of heavy concrete construction which already provide substantial separation. A new floating floor will be installed above with void area as ceiling treatment below is impractical due to commercial areas being currently in use.

1.12 APARTMENT VENTILATION TERMINALS

Please see Architect's elevations which show locations of new apartment enhanced MVHR ventilation terminals, 2 No. per plot 100x200mm approx. sized inlet/outlet terminals, in dedicated louvred/slotted bands above windows.

1.13 AIR QUALITY

Air quality within the area has improved considerably over recent years due the changes in Nox emissions for diesel vehicles including the new fleet of Buses which are considerably less noisy and are low emission.

The project will however incorporate enhanced powered fresh air with Nox filtration to the apartment living and sleeping areas.

There are no current adjacent restaurant/commercial ventilation terminals within around 50m plus of the site, however new ventilation fresh intakes will be located away from the service yard area at rear of the site.

1.14 APPENDICIES

14.1 TYPICAL INDICATIVE SAP CALCULATIONS

Sample SAP calculations attached for new build and change of use plots with Predicted Energy Assessments.

PREDICTED ENERGY ASSESSMENT

Design SAP
elmhurst energy

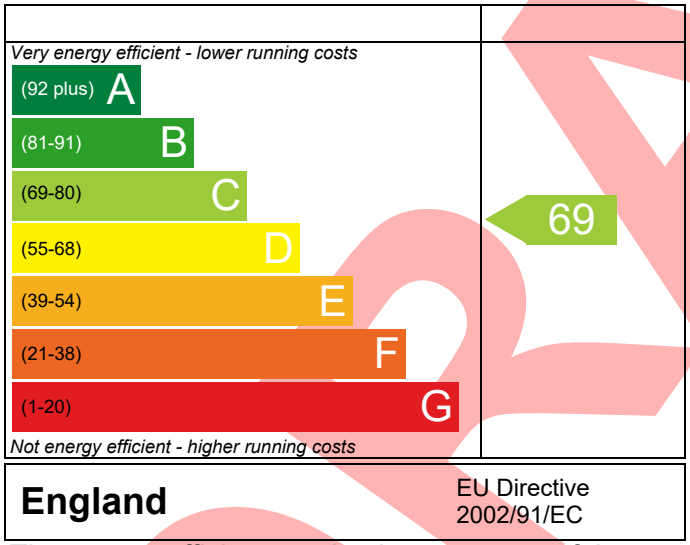
02, Ironmonger Row,
Coventry,
West Midlands

Dwelling type:	Flat, Mid-Terrace
Date of assessment:	20/07/2020
Produced by:	Andrew Twist
Total floor area:	33.16 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

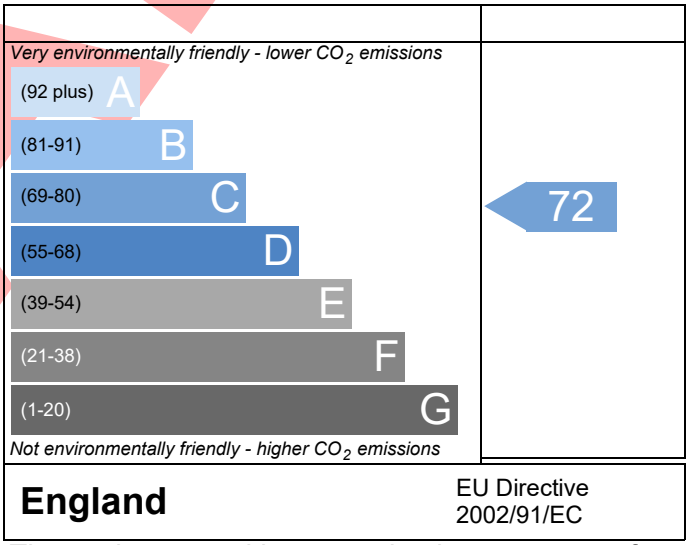
Energy Efficiency Rating



England EU Directive 2002/91/EC

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.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

PREDICTED ENERGY ASSESSMENT

Design SAP
elmhurst energy

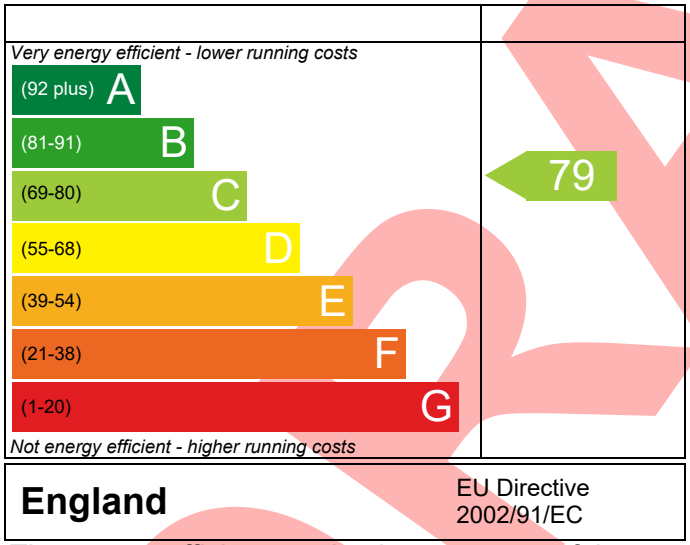
19, Ironmonger Row,
Coventry,
West Midlands

Dwelling type:	Flat, Mid-Terrace
Date of assessment:	20/07/2020
Produced by:	Andrew Twist
Total floor area:	33.49 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

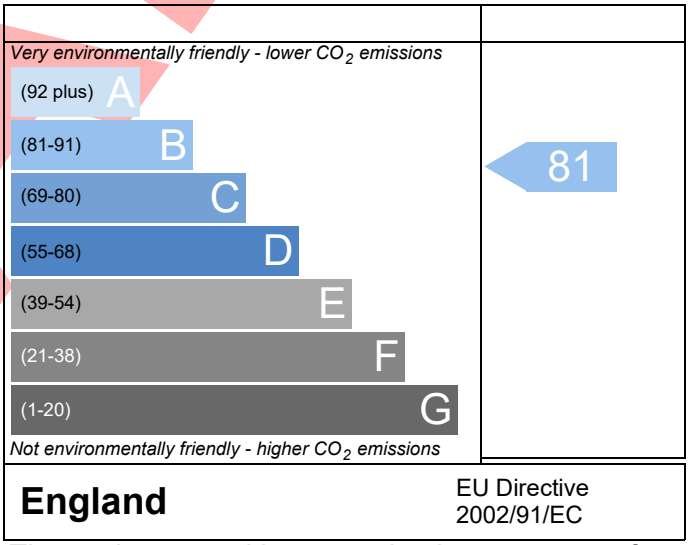
Energy Efficiency Rating



England EU Directive 2002/91/EC

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.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

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PREDICTED ENERGY ASSESSMENT

Design SAP
elmhurst energy

30, Ironmonger Row,
Coventry,
West Midlands

Dwelling type:	Flat, End-Terrace
Date of assessment:	22/07/2020
Produced by:	Andrew Twist
Total floor area:	80.77 m²

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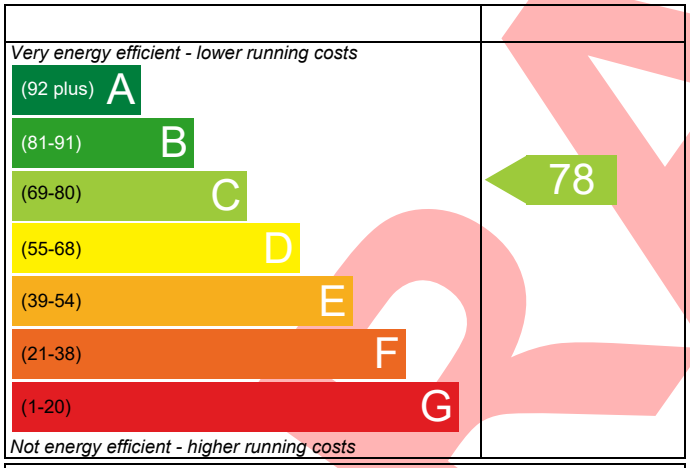
The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

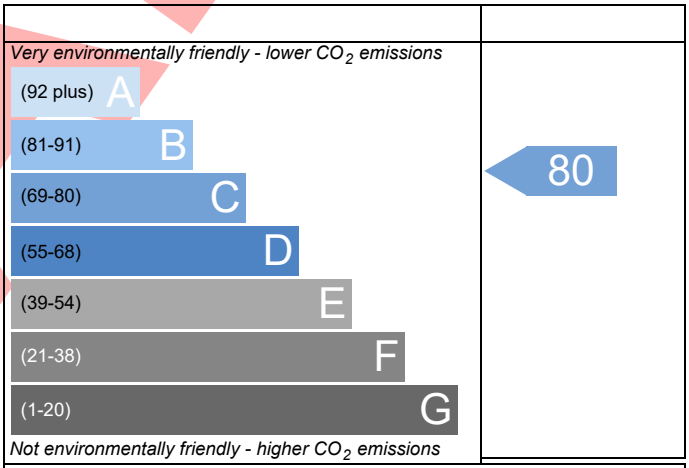
Energy Efficiency Rating



England EU Directive 2002/91/EC

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.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

PREDICTED ENERGY ASSESSMENT

Design SAP
elmhurst energy

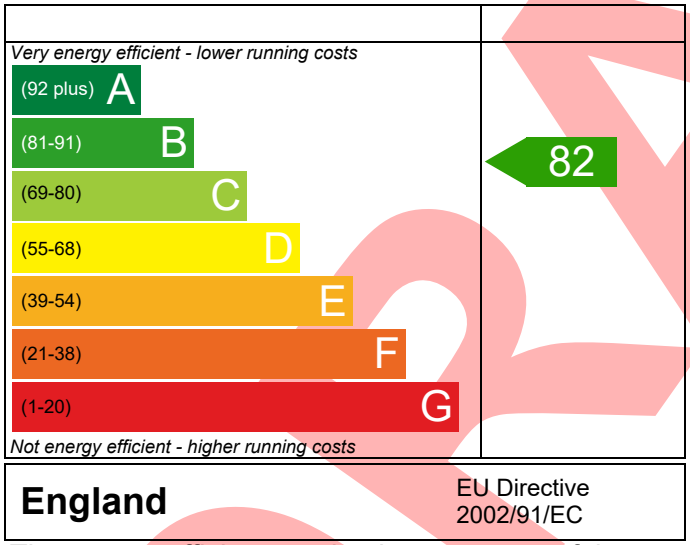
34, Ironmonger Row,
Coventry,
West Midlands

Dwelling type:	Flat, End-Terrace
Date of assessment:	22/07/2020
Produced by:	Andrew Twist
Total floor area:	66.98 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO_2) emissions.

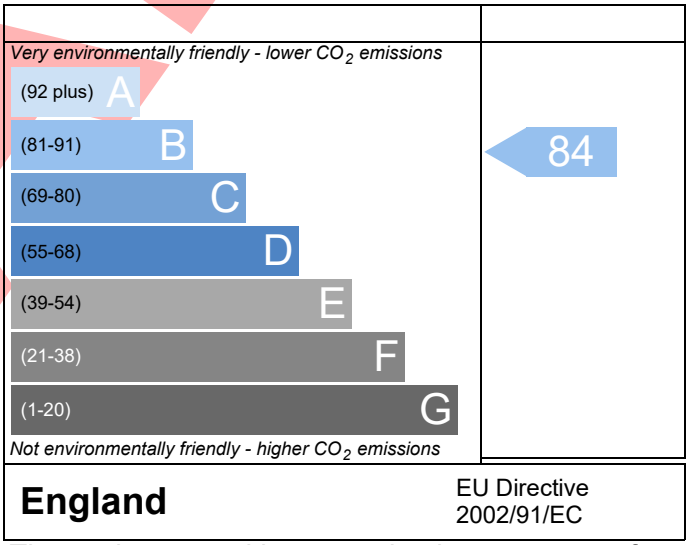
Energy Efficiency Rating



England EU Directive 2002/91/EC

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.

Environmental Impact (CO_2) Rating



England EU Directive 2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO_2) emissions. The higher the rating the less impact it has on the environment.

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SUMMARY FOR INPUT DATA
Calculation Type: Conversion (As Designed)

Design SAP
elmhurst energy

Property Reference	02 Ironmonger	**Issued on Date**	20/07/2020
Assessment Reference	02 Ironmonger	**Prop Type Ref**	
Property	02, Ironmonger Row, Coventry, West Midlands		

SAP Rating	69 C	**DER**	N/A	**TER**	N/A
Environmental	72 C	**% DER<TER**	N/A		
CO_2 Emissions (t/year)	1.57	**DFEE**	N/A	**TFEE**	N/A
General Requirements Compliance	N/A	**% DFEE<TFEE**	N/A		

Assessor Details	Mr. Andrew Twist, Andrew Twist, Tel: 0121 233 0474, andrew.twist@jraltd.co.uk	**Assessor ID**	V999-0001
Client	EDG Property, EDG Property		

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	East
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2020
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	14.01 m	33.16 m²	2.90 m

7.0 Living Area	15.92	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	137.6	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall 1	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.20	9.00	35.65	28.69
Corridor	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.20	60.00	4.98	2.88

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	29.92

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame	9.00	64.67

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Roof 1	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	33.16	33.16

SUMMARY FOR INPUT DATA
Calculation Type: Conversion (As Designed)

Design SAP
elmhurst energy

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	Concrete floor slab, carpeted	80.00	33.16

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Double glazed			0.76		0.70	1.30
Door	SAP table	Door to Corridor							1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Opening 1	Window	[1] External Wall 1	North	None	0.00					4.67	
Windoe	Window	[1] External Wall 1	West	None	0.00					2.29	
Door	Door to Corridor	[2] Corridor	East							2.10	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Default	
Y-value	0.150	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	15.00	m³/(h.m²) @ 50 Pa
Property Tested ?	No	
As Built AP_{50}	5.00	m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	No
Night Ventilation	No
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Data Sheet
Type	Mechanical extract ventilation - decentralised
Duct Type	Rigid
Brand, Model	TBC

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.50	In Room Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0

Number of passive vents	0	
Number of flueless gas fires	0	
21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	6	
Total number of L.E.L. fittings	4	
Percentage of L.E.L. fittings	66.67	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Description	Electric Panel	
Percentage of Heat	100	%
Main Heating	REA	
SAP Code	691	
Efficiency (SAP Table)	100.0	%
Controls	CRC Programmer and appliance thermostats	
Sap Code	2603	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HEI Immersion	
Water Heating	Independent	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	903	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.42	kWh/day

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

SUMMARY FOR INPUT DATA
Calculation Type: Conversion (As Designed)

Design SAP
elmhurst energy

None

SUMMARY FOR INPUT DATA
Calculation Type: Conversion (As Designed)

Design SAP
elmhurst energy

Property Reference	19 Ironmonger	**Issued on Date**	20/07/2020
Assessment Reference	19 Ironmonger	**Prop Type Ref**	
Property	19, Ironmonger Row, Coventry, West Midlands		

SAP Rating	79 C	**DER**	N/A	**TER**	N/A
Environmental	81 B	**% DER<TER**	N/A		
CO_2 Emissions (t/year)	1.08	**DFEE**	N/A	**TFEE**	N/A
General Requirements Compliance	N/A	**% DFEE<TFEE**	N/A		

Assessor Details	Mr. Andrew Twist, Andrew Twist, Tel: 0121 233 0474, andrew.twist@jraltd.co.uk	**Assessor ID**	V999-0001
Client	EDG Property, EDG Property		

SUMMARY FOR INPUT DATA FOR: Conversion (As Designed)

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, Mid-Terrace
2.0 Number of Storeys	1
3.0 Date Built	2020
4.0 Sheltered Sides	3
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	6.64 m	33.49 m²	2.90 m

7.0 Living Area	20.43	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	213.27	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall 1	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.20	9.00	9.64	5.69
Corridor	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.20	60.00	9.62	7.52

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	29.61

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame	9.00	76.61

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Ceilings 1	Concrete floor slab, carpeted	100.00	33.49

SUMMARY FOR INPUT DATA
Calculation Type: Conversion (As Designed)

Design SAP
elmhurst energy

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	Concrete floor slab, carpeted	80.00	33.49

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Double glazed			0.76		0.70	1.30
Door	SAP table	Door to Corridor							1.40

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Window	Window	[1] External Wall 1	East	None	0.00					3.95	
Door	Door to Corridor	[2] Corridor	West							2.10	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	No	
17.0 Thermal Bridging	Default	
Y-value	0.150	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	15.00	m³/(h.m²) @ 50 Pa
Property Tested ?	No	
As Built AP_{50}	5.00	m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	No
Night Ventilation	No
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Data Sheet
Type	Mechanical extract ventilation - decentralised
Duct Type	Rigid
Brand, Model	TBC

19.1 Mechanical extract ventilation - Decentralised

SFP	Fan/Room Type	Count
0.50	In Room Fan Other Wet Room	1

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0

SUMMARY FOR INPUT DATA
Calculation Type: Conversion (As Designed)

Design SAP
elmhurst energy

Number of flueless gas fires	0	
21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	6	
Total number of L.E.L. fittings	4	
Percentage of L.E.L. fittings	66.67	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Description	Electric Panel	
Percentage of Heat	100	%
Main Heating	REA	
SAP Code	691	
Efficiency (SAP Table)	100.0	%
Controls	CRC Programmer and appliance thermostats	
Sap Code	2603	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HEI Immersion	
Water Heating	Independent	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	903	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.42	kWh/day

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	30 Ironmonger	**Issued on Date**	22/07/2020
Assessment Reference	30 Ironmonger	**Prop Type Ref**	
Property	30, Ironmonger Row, Coventry, West Midlands		

SAP Rating	78 C	**DER**	24.75	**TER**	25.60
Environmental	80 C	**% DER<TER**	3.32		
CO_2 Emissions (t/year)	1.76	**DFEE**	49.79	**TFEE**	50.17
General Requirements Compliance	Pass	**% DFEE<TFEE**	0.77		

Assessor Details	Mr. Andrew Twist, Andrew Twist, Tel: 0121 233 0474, andrew.twist@jraltd.co.uk	**Assessor ID**	V999-0001
Client	EDG Property, EDG Property		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2020
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	17.11 m	36.35 m²	2.90 m
1st Storey:	20.72 m	44.42 m²	2.90 m

7.0 Living Area	28.45	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	84.81	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall 1	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.18	9.00	84.52	44.77
Corridor	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.20	60.00	8.49	6.39
Riser	Solid Wall	Other	0.20	0.00	16.70	16.70

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	56.28

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame	9.00	181.18

10.0 External Roofs

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Description	Type	Construction	U-Value (W/m^2K)	Kappa (kJ/m^2K)	Gross Area (m^2)	Nett Area (m^2)
External Roof 1	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	44.42	44.42

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m^2K)	Area (m^2)
Internal Ceiling 1	Other	0.00	44.42

11.1 Party Floors

Description	Construction	Kappa (kJ/m^2K)	Area (m^2)
Party Floor 1	Concrete floor slab, carpeted	80.00	36.35

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m^2K)
Windows	Manufacturer	Window	Double glazed			0.76		0.70	1.10
Door	Manufacturer	Door to Corridor							1.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m^2)	Curtain Closed
Window	Window	[1] External Wall 1	South	None	0.00					26.50	
Door	Door to Corridor	[2] Corridor	West							2.10	
Windows	Window	[1] External Wall 1	East	None	0.00					13.25	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	Yes	
17.0 Thermal Bridging	Default	
Y-value	0.150	W/m^2K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	$m^3/(h.m^2)$ @ 50 Pa
Property Tested ?		
As Built AP_{50}		$m^3/(h.m^2)$ @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	No
Night Ventilation	No
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500029
Configuration	2
MVHR Duct Insulated	Yes
Manufacturer SFP	1.13

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Duct Type	Rigid
MVHR Efficiency	89.00
Wet Rooms	2

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	12	
Total number of L.E.L. fittings	12	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Description	Electric Panel	
Percentage of Heat	100	%
Main Heating	REA	
SAP Code	691	
Efficiency (SAP Table)	100.0	%
Controls	CRC Programmer and appliance thermostats	
Sap Code	2603	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HEI Immersion	
Water Heating	Independent	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	903	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	

Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.42	kWh/day

32.0 Photovoltaic Unit One Dwelling

PV Cells kWp	Orientation	Elevation	Overshading	Connected to Dwelling
1.00	South	30°	None Or Little	Yes

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

Property Reference	34 Ironmonger	**Issued on Date**	22/07/2020
Assessment Reference	34 Ironmonger	**Prop Type Ref**	
Property	34, Ironmonger Row, Coventry, West Midlands		

SAP Rating	82 B	**DER**	22.47	**TER**	24.58
Environmental	84 B	**% DER<TER**	8.58		
CO_2 Emissions (t/year)	1.28	**DFEE**	38.83	**TFEE**	42.78
General Requirements Compliance	Pass	**% DFEE<TFEE**	9.24		

Assessor Details	Mr. Andrew Twist, Andrew Twist, Tel: 0121 233 0474, andrew.twist@jraltd.co.uk	**Assessor ID**	V999-0001
Client	EDG Property, EDG Property		

SUMMARY FOR INPUT DATA FOR: New Build (As Designed)

Orientation	West
Property Tenure	Unknown
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, End-Terrace
2.0 Number of Storeys	2
3.0 Date Built	2020
4.0 Sheltered Sides	2
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	6.64 m	33.49 m²	2.90 m
1st Storey:	6.64 m	33.49 m²	2.90 m

7.0 Living Area	20.43	m²
8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	122.09	kJ/m²K

9.0 External Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Wall 1	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.18	9.00	28.89	8.33
Corridor	Cavity Wall	Cavity wall : plasterboard on dabs, AAC block, filled cavity, any outside structure	0.20	60.00	9.62	7.52

9.1 Party Walls

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)
Party Wall 1	Filled Cavity with Edge Sealing	Steel frame	0.00	20.00	117.04

9.2 Internal Walls

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Wall 1	Plasterboard on timber frame	9.00	258.91

10.0 External Roofs

Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)
External Roof 1	External Flat Roof	Plasterboard, insulated flat roof	0.11	9.00	33.49	33.49

10.2 Internal Ceilings

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Internal Ceiling 1	Other	0.00	33.49

11.1 Party Floors

Description	Construction	Kappa (kJ/m²K)	Area (m²)
Party Floor 1	Concrete floor slab, carpeted	80.00	33.49

12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Windows	Manufacturer	Window	Double glazed			0.76		0.70	1.10
Door	Manufacturer	Door to Corridor							1.00

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Window	Window	[1] External Wall 1	East	None	0.00					13.25	
Door	Door to Corridor	[2] Corridor	West							2.10	
Windows	Window	[1] External Wall 1	West	None	0.00					7.31	

14.0 Conservatory	None	
15.0 Draught Proofing	100	%
16.0 Draught Lobby	Yes	
17.0 Thermal Bridging	Default	
Y-value	0.150	W/m²K
18.0 Pressure Testing	Yes	
Designed AP_{50}	3.00	m³/(h.m²) @ 50 Pa
Property Tested ?		
As Built AP_{50}		m³/(h.m²) @ 50 Pa

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather	Windows fully open
Cross ventilation possible	No
Night Ventilation	No
Air change rate	4.00

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	Yes
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500029
Configuration	2
MVHR Duct Insulated	Yes
Manufacturer SFP	1.13
Duct Type	Rigid
MVHR Efficiency	89.00
Wet Rooms	2

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
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20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				0
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System	No	
22.0 Lighting		
Internal		
Total number of light fittings	12	
Total number of L.E.L. fittings	12	
Percentage of L.E.L. fittings	100.00	%
External		
External lights fitted	No	
23.0 Electricity Tariff	Standard	
24.0 Main Heating 1	SAP table	
Description	Electric Panel	
Percentage of Heat	100	%
Main Heating	REA	
SAP Code	691	
Efficiency (SAP Table)	100.0	%
Controls	CRC Programmer and appliance thermostats	
Sap Code	2603	
25.0 Main Heating 2	None	
Community Heating	None	
28.0 Water Heating	HEI Immersion	
Water Heating	Independent	
Flue Gas Heat Recovery System	No	
Waste Water Heat Recovery Instantaneous System 1	No	
Waste Water Heat Recovery Instantaneous System 2	No	
Waste Water Heat Recovery Storage System	No	
Solar Panel	No	
Water use <= 125 litres/person/day	Yes	
SAP Code	903	
Immersion Heater	Dual	
29.0 Hot Water Cylinder	Hot Water Cylinder	
Cylinder In Heated Space	Yes	
Insulation Type	Measured Loss	
Cylinder Volume	150.00	L
Loss	1.42	kWh/day

SUMMARY FOR INPUT DATA
Calculation Type: New Build (As Designed)

Design SAP
elmhurst energy

32.0 Photovoltaic Unit One Dwelling

PV Cells kWp	Orientation	Elevation	Overshading	Connected to Dwelling
0.70	South	30°	None Or Little	Yes

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None