DohertyEnergy

ENERGY ASSESSMENT

Site
BROOK HOUSE,
54a COWLEY MILL ROAD, UXBRIDGE
UB8 2QE

Proposal
REDEVELOPMENT AND EXTENSION TO EXISTING OFFICE BUILDING

5th September 2025
Ref. E1530-ES-00

Contents

Executive Summary

The proposal is for the addition of two storeys (one on the same foot print as the existing first floor, one slightly reduced) at Brook House, 54a Cowley Mill Road, Uxbridge, UB8 2FX. The approximate total internal floor area of the extension is 1,634.69m^2, comprised mostly of office space with the remainder formed of circulation spaces and other amenities.

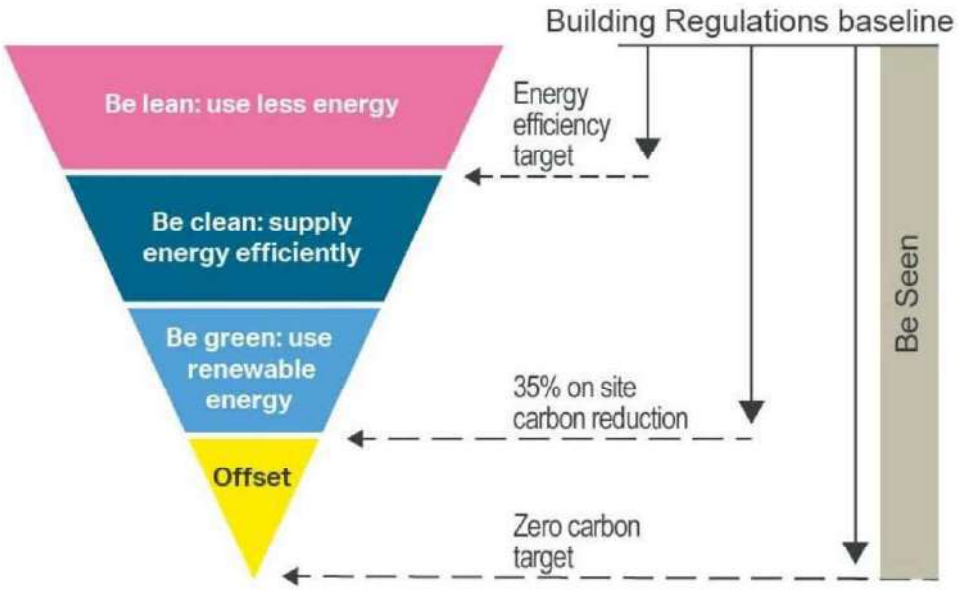
This Energy Assessment has been compiled to demonstrate that climate change mitigation measures comply with London Plan energy policies, including the energy hierarchy. It aims to ensure that energy remains an integral part of the development's design and evolution ["Energy Assessment Guidance – Greater London Authority guidance on preparing energy assessments as part of planning applications (June 2022)].

Under the energy policies of the London Plan, this development has been assessed against the criteria of achieving zero carbon – a 100% reduction in CO_2 emission beyond minimum compliance with Part L of the Building Regulations, with a 15% reduction resulting from the use of energy efficiency measures only. The relevant calculations have been carried out using the latest SAP 10.2 emissions factors. This assessment follows the energy hierarchy which is comprised of the following stages:

1. Be Lean – reducing energy demand through fabric improvements, energy efficiency measures and flexibility measures
2. Be Clean – utilising local energy sources such as waste heat and supplying clean energy efficiently by connecting to district heating networks
3. Be Green –producing, storing and using renewable energy on-site as far as is practical
4. Be Seen – monitoring, verifying and reporting on energy performance throughout the lifetime of the project

These stages can be summed up in the graphic below:

Figure 1 – The London Plan Energy Hierarchy



The measures used at each stage of the Energy Hierarchy, as well as the resulting decrease in carbon dioxide emissions, as well as the overall reduction in emissions, are summarised in the following sections.

Also addressed in this assessment are the following:

- How the site layout, building design and passive and active measures have been chosen to minimise the CO_2 emissions and address the risk of overheating
- The potential to connect to an existing or proposed district heating network
- The impact of the development on the air quality of the surrounding area
- Running costs, including fuel, installation and maintenance costs

Carbon Savings

Table 1 – Carbon Dioxide Emissions After Each Stage of the Energy Hierarchy for Non-Domestic Buildings

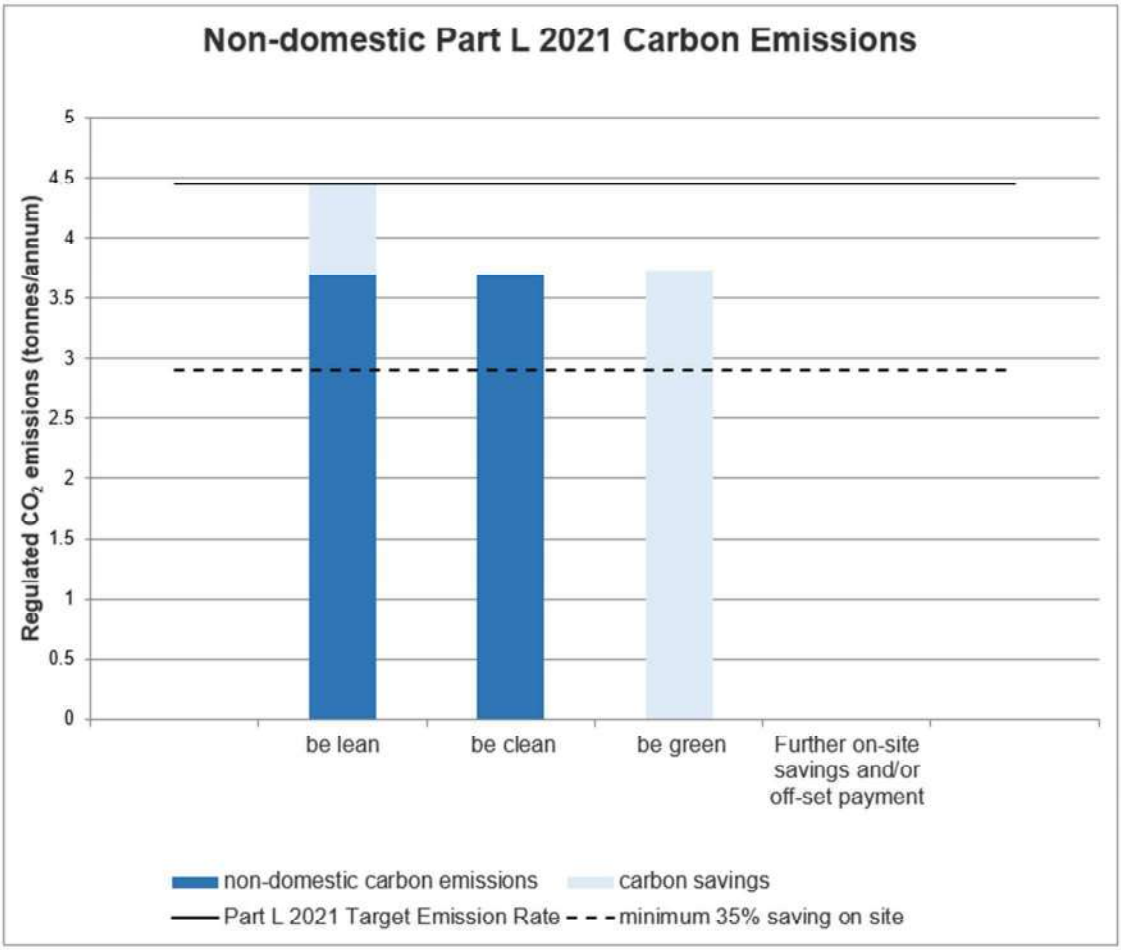
	Carbon dioxide emissions for non-domestic buildings (SBEM)	
	Regulated (Tonnes CO_2 per annum)	Unregulated (Tonnes CO_2 per annum)
Baseline: Part L 2021 of the Building Regulations Compliant Development	4.45	52.69
After energy demand reduction	3.69	52.69
After heat network/CHP	3.69	52.69
After renewable energy	-0.03	52.69

Table 2 – Regulated Carbon Dioxide Savings From Each Stage of the Energy Hierarchy for Non-Domestic Buildings

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)**
Be lean: Savings from energy demand reduction	0.75	**16.91**
Be clean: Savings from heat network/CHP	0.00	0.00
Be green: Savings from renewable energy	3.73	83.82
Cumulative on site savings	4.48	**100.74**
Carbon shortfall	-0.03	
	(Tonnes CO_2)	
Cumulative savings for offset payment	0.00	
Cash-in-lieu contribution	**£0.00***	

Please refer to the SAP and BRUKL reports and the following sections for more details.

Figure 2 – Non-Domestic SAP 10 Carbon Emissions



Demand Reduction (Be Lean)

As demonstrated in the following table, the proposed building specification has been used to exceed the minimum requirements of Part L of the Building Regulations.

Table 3 – Proposed Specification

Category	Item	Value/Details	Part L2 Notional Target
Building Fabric (W/m^2K)	Exposed Floor	0.13	0.18
	External Walls	0.15	0.26
	Flat Roof	0.10	0.18
Fenestration (W/m^2K)	Window	1.20 (g-value 0.30 with opaque white blinds blocking 25% of incoming light to all windows to combat overheating)	1.60
Thermal Bridging	Construction Details	Accredited and Enhanced Construction Details assumed in absence of actual build specification	-
Ventilation	Air Permeability (m^3/hm^2)	3.00	3.00
	Mechanical Ventilation	MVHR system (S.F.P. 0.9, heat recovery efficiency 0.76 with gas sensors linked to speed control) assumed to all zones except circulation spaces	Intermittent extract fans
Heating	Primary Heating System	Split System air conditioning system from air source heat pump, heating SCOP 4.20 and cooling SEER 7.01 assumed based on example Mitsubishi system	SCOP 2.50, SEER 5.00
	Controls	Local time and temperature controls	Local time and temperature controls
	Heat Distribution	Ceiling mounted cassette units	-
	Water Heating	Instantaneous electric hot water heaters	-
	Secondary Heating System	None	-
	Active Cooling	Split system as per heating system above	-
Additional Features	Low Energy Lighting	2W/m^2 power density assumed (85-329lm/W)	95lm/W
	Renewables	None	-

Note: the notional target values given above are taken from Approved Document L2.

Table 4 – EUI and Space Heating Demand

	Area weighted non-domestic cooling demand (MJ/m^2)	Total area weighted non-domestic cooling demand (MJ/year)
Actual	81.6	133,390.70
Notional	73.7	120,476.65

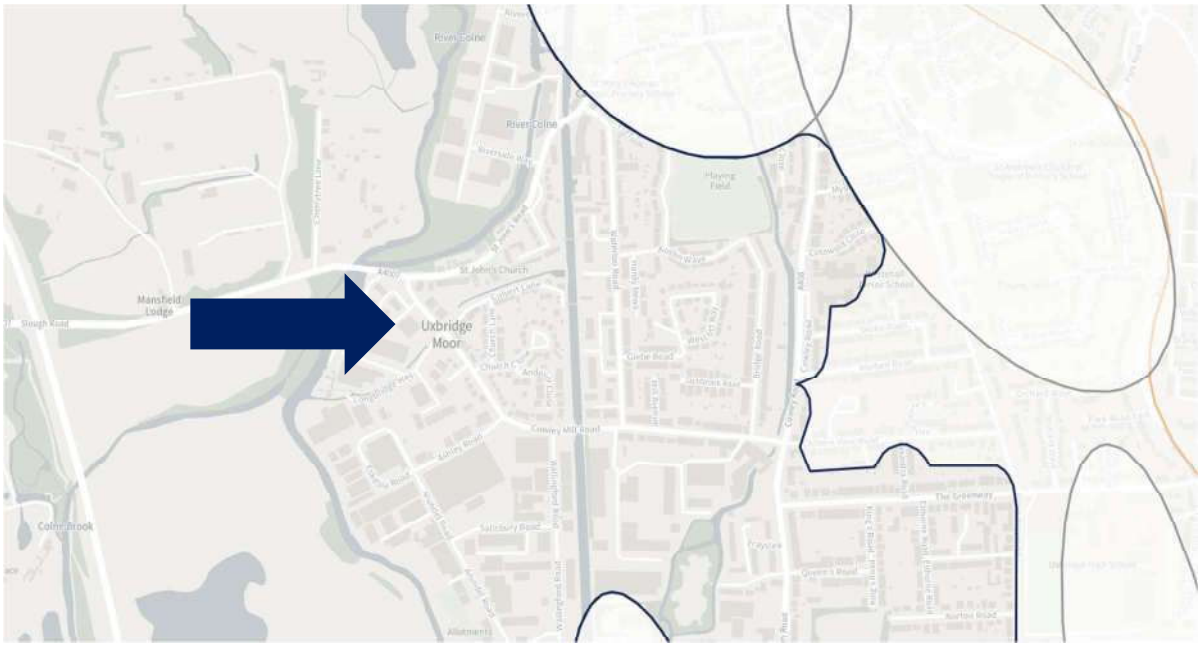
Table 5 – EUI and Space Heating Demand

Building type	EUI (kWh/m^2/year) (excluding renewable energy)	Space heating demand (kWh/m^2/year) (excluding renewable energy)	Methodology used	Explanatory notes (if expected performance differs from the Table 4 values in the guidance)
Office Extension	48.67	7.64	Part L2 - SBEM & none	N/A

Heating Infrastructure Including CHP (Be Clean)

As can be seen on excerpt from the London Heat Map below, there is no area heat network in operation or planned, although it is around 1200m from a proposed distribution line for a heat network (shown in orange). It is also in close proximity to both Heatmap Study Areas (the ellipses to the right of the excerpt) and a Heat Network Priority Area (the larger shaded area to the right of the excerpt)

Figure 3 – London Heat Map



The proposed heating and cooling strategy is a local split system, which, although efficient on a relatively small scale such as this, is not compatible with heat networks. Additionally, the losses associated with connecting to this single building some distance from the proposed heat distribution line may not make this feasible.

Furthermore, due to the relatively small size and low energy demand of this project, CHP or a dedicated heat network are considered inappropriate.

Therefore, as displayed on Tables 1-2 earlier in this document, there are no proposed energy and carbon savings that can be attributed to the connection to an area heating network or the use of a CHP system.

Renewable Energy (Be Green)

The following considerations have been made in selecting the preferred renewable energy option.

Table 6 – Feasibility Matrix of Appropriate Renewables

Technology	Requirements	Requirements Met?	Appropriate?
Photovoltaic panels	Roof facing east to west (through south)	Yes	Yes
	Little/no or modest overshading	Yes*	
	Flat roof or pitched roof not greater than 45°	Yes	
	Any size development	Yes	
Solar thermal	All requirements as for photovoltaic panels	Yes	No
	Hot water tank possible	No	
Air source heat pumps	Suitable external wall or roof	Yes	Yes
	Aesthetic considerations	Yes	
	Noise impact	Yes	
	Any size development	Yes	
Ground source heat pumps	External space for horizontal trench or vertical borehole	No	No
	Medium to large sized development	Yes	
	Archaeology	Unknown	
	Best suited to underfloor heating	Yes	
Biomass	Space needed for plant, fuel storage and deliveries	No	No
	Medium to large sized development	Yes	
	Minimal impact on residents (air quality, deliveries)	No	

**See the following aerial image demonstrating that the overshading risk is low for the likely location of any solar panels.*

Please refer to appendices A through G for more information about these technologies.

Figure 3 – Overshading Risk – Aerial Image of the Site

Note: the blue arrow shows the location of the existing building. As can be seen, there are no obstructions that are likely to create overshading to any potential solar panels.

Feasibility of Appropriate Renewables - Conclusion

Due to the size and location of this development, some renewable technologies are considered inappropriate for this site.

Solar thermal panels would not provide sufficient carbon reductions in order to achieve compliance and are not compatible with the assumed HVAC strategy.

Air source heat pumps are feasible for this development. The external units can be discretely sited on the new roof of the building where they will not affect access to or the aesthetics of the building but can easily be accessed for maintenance as well as allowing air to flow freely around the external units. The performance of this unit has been selected to be reflective of products available on the market, as an example of an available setup – other systems are available. The use of this system will allow heating and cooling to be provided to the building year-round, and provides a low-carbon emissions baseline. This does mean that, despite the low-carbon heating system, the heat pump cannot be used to demonstrate a carbon emissions reduction on-site.

However, there is scope for emissions reduction on-site relative to the low-carbon baseline. A photovoltaic panel array could be installed to the main roof with the array size scaled to make maximum use of the available roof space. This will need to be confirmed by a survey prior to installation. Additionally, it may be possible to tie in this proposed PV array to an energy storage system or electric vehicle (EV) charging point, although this would depend on these technologies being found suitable for this site. However, the benefits of using these technologies cannot currently be modelled within SBEM and so are not used as part of the approach to reduce carbon emissions associated with this development.

The use of the low-carbon heating system, in conjunction with a large PV array allows regulated carbon emissions to be reduced to zero for this site, as shown in Tables 1 and 2 above.

Appropriate Solution(s)

Photovoltaic Panels
ASHP

Table 7 – Proposed Renewables Specification

Total Array Size	Direct/Landlord's Supply	Orientation	Inclination	Overshading
36.40kWp	Direct Supply	South-West	15° (nominal)*	None or very little

*The SBEM calculation accepts 0°, 15°, 30°, 45°, 60° and 90°. The angle given is the nearest of these values to the true pitch of the PV.

With this configuration, the photovoltaic panels are estimated to generate 29,408.07kW/year. See the BRUKL reports for further details.

The size of array required can be achieved with 91 × 400-Watt panels or equivalent and take up an area of approximately 180-200m^2 of roof space.

The selected air source heat pump is assumed to have a SCOP of 4.20 and a SEER of 7.01 and is predicted to use 10,640.83kWh/year for both heating and cooling.

Post Construction Monitoring (Be Seen)

There is now a requirement that all major developments (10 or more dwellings, or more than 1,000m^2 of non-domestic floor space) monitor and report their energy performance post-construction to ensure that the actual energy usage and carbon emissions do not exceed the predicted values as well as ensuring that the development is in line with the overall net zero carbon target.

In order to comply with these requirements, the following reporting schedule should be followed, with the relevant data submitted by the appointed contractor to the 'Be Seen' portal:

1. Planning Stage
2. As-built (upon completion of the build)
3. In-use – data should be submitted annually for at least 5 years following completion

To help with these requirements, smart meters will be installed to allow overall electricity consumption to be monitored as well as being easily visible to the occupants, while the proposed heat pumps and photovoltaic panels will be monitored and kept well maintained to ensure effective and efficient operation after installation. Any problems identified will be rectified as soon as reasonably possible to ensure continuing energy efficiency throughout the lifetime of the building.

Monitoring the performance of the renewable technologies, as well as the energy efficiency measures incorporated into the design, will also help to keep running costs low for future occupants. The use of smart meters and clear billing, along with the use of available incentives such as the Clean Heat Grant as well as selling excess electricity generated by the PV arrays, will help to keep down costs as well as protecting the occupants against high energy prices.

Estimates of Associated Costs

Table 8 below gives an estimate as to the costs associated with the extension, breaking down the overall cost into various categories. This includes both initial installation costs (only those which differ between the two strategies) as well as the subsequent running costs.

Fuel costs are taken from SAP10.2 Table 12, with a grid electricity price of 16.49p/kWh. Standing charges for fuel prices (£72/year for grid electricity) are included within the overheads row. This also includes provision for other costs not covered elsewhere if applicable.

It is assumed that the plant will require replacement once each over the 30-year period, using the Boiler Upgrade Scheme, which began in April 2022, as indicative of any incentives which may be available. As this is a commercial scheme, no such incentives are available. The PV panels themselves are likely to last the full 30 years of the cost analysis (with most arrays only requiring replacement after a minimum of 25 years) and so the cost of replacing the panels (approximately £500 per panel) is not included. However, the inverters will need to be replaced once during this time span at a cost of around £800. Annual servicing for each PV array, including inspection and cleaning, is assumed to cost approximately £500. Annual servicing for a heat pump is estimated at £1000, given the size and complexity of the setup. Maintenance, installation and plant replacement costs are based on values from the Energy Saving Trust, scaled as appropriate for this site. The cost of plant is based on prices given in Mitsubishi's catalogue, taking into account the number of external and internal units likely required. This should be taken as indicative only as there may be some required equipment which have not been accounted for, such as pipework and ducting.

It is assumed that all electricity generated by the PV array will be used in the new offices, thus representing the savings associated with the use of locally generated electricity (with a cost factor of -16.49p/kWh) rather than payments made from selling electricity to the grid, which generally has a lower cost factor. As it is unlikely that all generated electricity will actually be used on site in practice, the savings from electricity sales are likely to be less.

The initial installation costs are assumed as the same for the plant replacement as an indicative value only, but also including an installation cost of £46,300 for the PV array. These values are reported in the installation costs section of each table below the running costs section to account for the fact that these higher costs only need to be paid once.

Table 8 – Running Costs Over 30 Years

Item	Cost Over 30 Years
Fuel Costs	£539,066.85
Incentives	£0.00
Electricity Sales	-£145,481.74
Plant Replacement	£115,599.00
Overheads	£2,430.00
Maintenance	£34,500.00
Total Running Costs	**£546,114.11**
Initial Installation Costs	£161,099.00
Total Cost	**£707,213.11**

Cooling and Overheating

The building has been designed to be airtight and with a high performing fabric. However, other features incorporated within the design of the building mitigate against the effects of overheating.

The water distribution system for the heating and air conditioning will be concentrated into risers to minimise heat gains, while low g-values and blinds to windows will help to reduce solar gains throughout the day, which will help prevent overheating. However, given the nature and proposed use for the building as well as the split-system nature of the HVAC, air conditioning will be available to maintain a suitable internal temperature if passive measures alone are insufficient. This will be used in conjunction with the proposed MVHR system incorporating a bypass for summer mode operation to help limit the waste heat produced by these systems.

Additional Considerations

To address air quality, no NOx or other particulate emitting appliances are proposed for this site.

Table 9 – Air Quality Impact

Energy Source	Total Fuel Consumption – Non-Residential (MWh/year)
Grid Electricity	50.15
Domestic/Communal Gas Boilers	0.00
Gas CHP	0.00
Connection to existing District Heating Network	0.00
Other Gas Use (e.g. Cookers)	0.00

Appendix A – Photovoltaic Panels

What are Photovoltaic Panels?

Photovoltaic Panels (PV) panels convert the energy in light received from the Sun into electricity. There are two types of system – grid connected systems are the most common and allow electricity to be drawn from the national grid during times when the panels are not generating enough electricity to provide all the power needs. This setup also allows any surplus electricity to be sold back to the grid. Conversely, standalone systems are not connected to the grid and so require supplementing with other power generating systems or batteries to ensure that the supply of electricity is not interrupted.

Space Requirements

PV Panels are composed of a series of small solar cells that are connected together. They come in a variety of shapes, sizes and outputs and ideally will be installed on an inclined south-facing roof to maximise the power generated. Larger arrays will result in more power being generated, up to the limits of available roof space. If space is limited, solar tiles can be installed as these can fit more capacity into the same area. However, these are more expensive than traditional panel installations.

Installation Costs, Funding, Maintenance and Payback

The average cost for a solar panel installation for a small-scale building is approximately £5,000-£9,000, although this is highly dependent on the size of array being installed. Planning permission is not usually required unless the panels are to be installed on a listed building or the property is situated in a conservation area.

The photovoltaic array can be expected to last for up to 25 years, depending on the manufacturer.

On January 1st 2020, a new government incentive scheme was introduced, known as the Smart Export Guarantee (SEG). For those installing small scale renewable technologies, with a maximum capacity of 5MW, the SEG will pay for each unit of electricity fed into the National Grid. It is anticipated that payback for a PV system could be achieved in approximately 12 years.

Advantages of Photovoltaic Panels

- Electricity bills reduced
- Source of renewable energy
- Reduced carbon footprint
- Low maintenance

Disadvantages of Photovoltaic Panels

- Relatively high upfront cost
- Energy generation varies with the average annual amount of radiation received
- Power output highly weather dependent
- No electricity produced at night
- Requires a lot of roof space for an effective array.

Appendix B – Solar Thermal Panels

What is Solar Thermal Energy?

A solar thermal system uses energy from the Sun to heat water which is then stored in a hot water cylinder.

Space Requirements

For a small scale solar thermal setup, it is suggested that approximately five square meters of south facing space will be required, to ensure that as much solar energy as possible can be collected. A sloping roof is not required as the panels can be fitted to a frame mounted on a flat roof or even hung from a wall.

Before installing a solar thermal system, it is important to check if your current setup is suitable – solar thermal systems require a hot water cylinder to store the heated water and are therefore not compatible with combination boilers or direct acting water heaters. If the cylinder present prior to the installation of the solar thermal system is not a solar cylinder, it will be necessary to either replace the cylinder with one which has a solar heating coil fitted or to add an extra cylinder with a solar coil to ensure that the system works correctly.

Installation Costs, Funding, Maintenance and Payback

The initial cost of installing a typical small scale solar thermal system is generally between £5,000 and £9,000. There are currently no financial schemes available for solar thermal panels.

Very little maintenance is usually required after the system is installed, although it is important to have the system inspected every three to seven years by a qualified solar panel expert.

The payback costs for solar panels depend greatly on the installation costs. For example, a system costing between £5,000 and £7,000 to install has a typical payback time between 13 and 17 years.

Planning Requirements

Planning permission is generally not required for the installation of a solar thermal system. However, restrictions may apply if the building is listed or sited within a conservation area – it is advisable to check with the local council prior to installation.

Advantages

- Clean and efficient water heating
- Easy to maintain
- Quiet
- Low carbon footprint

Disadvantages

- High initial cost
- Effectiveness depends on the number of hours of sunshine your area gets during the day
- The system is limited to only heating water – no electricity is produced
- Only useful if there is meaningful hot water demand

Appendix C – Air Source Heat Pumps

What are Air Source Heat Pumps?

Air source heat pumps (ASHPs) extract thermal energy from outside air (using the principles of vapour compression refrigeration), which can then be used to heat the building as well as to provide hot water. Heat pumps can also be run in reverse, cooling the building and transferring the excess heat to the outside.

There are two types of air source heat pump systems:

1. **Air to air** systems transfer the warmed air throughout the building using fans
2. **Air to water** systems transfer heat to water, which is then distributed via plumbing similar to that used in a conventional heating system with a boiler

Air source heat pumps operate at lower temperatures than traditional gas boilers. This means that these systems can be utilised more effectively with an underfloor heating setup compared to using radiators, as with underfloor heating the warmth is distributed more evenly and thus more efficiently. It is vital that the building fabric be well insulated if the benefits of an air source heat pump are to be fully utilised.

Space Requirements

An area on the exterior of the building, such as on a wall or roof, will be required for the external unit. This ideally should be in a warmer location which not only has enough space for the unit but is also clear of obstructions to allow air to flow freely.

Additionally, space will be required for the internal unit. Typically, these are no larger than a standard hot water cylinder or boiler unit, depending on the exact setup used. However, with many setups a separate hot water cylinder, along with the space for this, is also required.

Installation Costs, Funding, Maintenance and Payback

The cost of purchasing and installing an air source heat pump system is generally between £3,000 and £11,000, depending on the size and complexity of the setup. Additional costs may be incurred if your property is particularly large. However, it may be possible to obtain payments from the Government's Renewable Heat Incentive (RHI), which will offset some of the costs incurred with installing the heat pump.

Air source heat pumps can be expected to last for up to 20 years as long as they are inspected every three to five years by a qualified technician. A typical payback period for ASHPs is around 12 years, once RHI is taken into account.

Planning

It is advisable to consult your local planning authority prior to purchasing the heat pump to establish whether there are any restrictions as to the positioning of the external unit.

Advantages

- Lower fuel bills
- Can provide heating in winter and cooling in the summer as well as hot water year-round
- Low maintenance
- Low carbon footprint

Disadvantages

- Works more efficiently with underfloor heating, or larger radiators
- The outdoor unit produces noise so careful siting is required
- Less efficient in winter due to the need to extract heat from colder air, resulting in lower Coefficient of Performance (COP) values.

Air Source Heat Pump Example

Heating | Product Information

MITSUBISHI ELECTRIC

PUZ-WM85VAA(-BS)

Ecodan R32
Monobloc Air Source Heat Pump

R32

Key Features:	Key Benefits:
A+++ high efficiency system	Ultra low running cost
Ultra quiet noise levels	Flexible product placement
Maintains full heating capacity at low temperatures	Confident and quick product selection
Zero carbon solution	Help to tackle the climate crisis
MELCloud enabled	Remote control, monitoring, maintenance and technical support

MELCloud

ecodan
Renewable Heating Technology

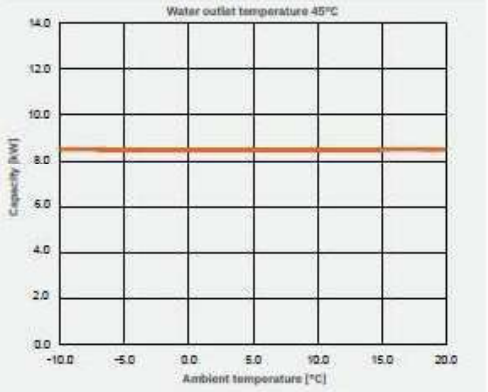
ecodan.co.uk

Heating | **Product Information**

PUZ-WM85VAA(-BS)
Ecodan R32
Monobloc Air Source Heat Pump

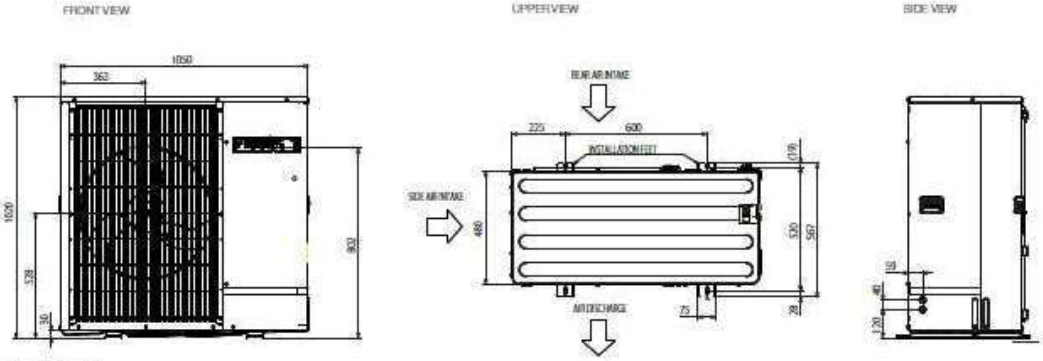
OUTDOOR UNIT		PUZ-WM85VAA(-BS)
HEAT PUMP SPACE HEATER - 55°C	ErP Rating	A+++
	η_s	139%
	SCOP (MCS)	3.48
HEAT PUMP SPACE HEATER - 35°C	ErP Rating	A+++
	η_s	192%
	SCOP (MCS)	4.84
HEAT PUMP COMBINATION HEATER - Large Profile*1	ErP Rating	A+
	η_{wh}	116%
HEATING*2 (A-7/W35)	Capacity (kW)	9.5
	Power Input (kW)	3.27
	COP	2.90
OPERATING AMBIENT TEMPERATURE (°C DB)		-20 ~ +35
SOUND DATA*3	Pressure Level at 1m (dBA)	45
	Power Level (dBA)*4	58
WATER DATA	Pipework Size (mm)	28
	Flow Rate (l/min)	24
	Water Pressure Drop (kPa)	15.0
DIMENSIONS (mm)	Width	1050
	Depth	400
	Height	1020
WEIGHT (kg)		98
ELECTRICAL DATA	Electrical Supply	220-240V, 50Hz
	Phase	Single
	Nominal Running Current (MAX) (A)*5	9.1 (22)
	Fuse Rating - MCB Sizes (A)*6	25
REFRIGERANT CHARGE (kg) / CO_2 EQUIVALENT (t)	R32 (GWP 675)	2.2/ 1.49

NOMINAL HEATING CAPACITY



Notes:
*1. Combination with 3 "PT23K Cylinder
*2. Under normal heating conditions as outdoor temp.: -7°CDB / -8°CWB, outlet water temp.35°C, inlet water temp.30°C
*3. Under normal heating conditions as outdoor temp.: 7°CDB / 6°CWB, outlet water temp.55°C, inlet water temp.47°C as tested to BS EN14511.
*4. Sound power level tested to BS EN12102.
*5. Under nominal heating conditions as outdoor temp. 7°C, outlet water temp. 35°C.
*6. MCB Sizes BS EN60898-2 & BS EN60947-2.
η_s is the seasonal space heating energy efficiency (SCOP/EF) η_{wh} is the water heating energy efficiency

PUZ-WM85VAA(-BS) DIMENSIONS



All dimensions (mm)

MITSUBISHI ELECTRIC
Changes for the Better
Telephone: 01707 282880
email: heating@meuk.mee.com
heating.mitsubishielectric.co.uk

Appendix D – Ground Source Heat Pumps

What are Ground Source Heat Pumps?

Ground source heat pumps (GSHPs) use pipes, buried in available land close to the building, to extract heat from the ground. Water and antifreeze are circulated around the pipes absorbing heat, which is the transferred through a heat exchanger in the heat pump into the building. From this point, the heat can be used to provide space or hot water heating, or the system can be run in reverse to provide cooling.

Ground source heat pumps operate at lower temperatures than traditional gas boilers. This means that these systems can be utilised more efficiently with an underfloor heating setup than with radiators. It is particularly vital that the building be well insulated to fully take advantage of the benefits of a ground source heat pump.

Space Requirements

There are two types of ground source heat pump systems:

1. **Horizontal** systems, which require an area of approximately 700m^2
2. **Vertical** systems, which have a borehole approximately a quarter of a metre across and up to 100m deep.

Larger sites will require either a larger area or more boreholes. Whichever system is chosen, suitable access must be available for the machinery required to install the pipework, especially in the case of the drill rig required for the vertical systems.

Space must also be available for the internal unit. These are typically larger than a standard gas boiler, approximately the size of a domestic hot water cylinder.

Installation Costs, Funding, Maintenance and Payback

Installing ground source heat pumps can cost between £10,000 and £18,000. The horizontal system is often cheaper as the expensive drill rig required to drill the borehole is unnecessary.

It may be possible to obtain payments from the Government's Renewable Heat Incentive (RHI), which will help to offset some of the costs involved with installing the heat pump. Additionally, the heat pump, if inspected regularly by a qualified servicer, can be expected to last for up to twenty years.

With low running costs and possible income from the RHI, the payback period can typically be between 8 and 12 years.

Planning Requirements

Ground source heat pumps are generally permitted, but some restrictions apply, such as with listed buildings. Consulting your local authority prior to installation is recommended.

Advantages

- Lower fuel bills, especially if used to replace direct electric heating
- Can provide both space and hot water heating
- Can provide heating in winter and cooling in summer as well as hot water year-round
- Lower carbon footprint
- Low maintenance
- More efficient in winter than air source heat pumps due to ground temperatures remaining more constant throughout the year

Disadvantages

- More expensive to install than air source heat pumps
- Suitable land must be available for the pipework or boreholes
- The building must be very well insulated
- Works most efficiently with underfloor heating or warm air distribution

Appendix E – Biomass

What is Biomass?

Biomass is any fuel obtained from natural or organic material, such as manure, forest debris or agricultural or horticultural waste. The most common biomass energy source is wood in the form of pellets, wood chips or logs. Biomass boilers can be used as a replacement for a fossil fuel-based heat source, and are best suited to medium to large scale sites.

Space Requirements

Typically, biomass boilers are contained in a single plant room serving the whole site. This room needs to be big enough for the boiler or boilers themselves, along with water tanks and space for fuel storage.

Installation Costs, Funding, Maintenance and Payback

The cost of a biomass boiler depends on a number of factors, including the type of boiler used, the fuel type and storage size. For example, the cost, including installation, of an automatically-fed pellet boiler can be as much as £20,000. It is important to note that biomass boilers are also eligible for the Government Renewable Heat Incentive (RHI) scheme, which provides payments to those using renewable heating systems. Therefore, despite the high initial cost, biomass boilers can have relatively short payback times of around 5-7 years.

Biomass boilers should be serviced every 12 months to ensure continued efficiency and to prevent any breakdowns.

Planning

There may be restrictions on the installation of biomass systems, due to concerns over local pollution and disruption to residents caused by deliveries.

Advantages

- Sustainable energy source
- Reduces dependence on fossil fuels
- Carbon-neutral – the carbon produced is absorbed by plants which can then be used as future biomass fuel
- Reduces waste sent to landfill
- Abundant availability of fuel

Disadvantages

- The burning of biomass fuels produces various gases that can contribute to local air pollution
- Space is required on-site for a plant room and fuel storage, as well as a designated fuel delivery area
- Constructing and operating biomass energy plants are often more expensive than more traditional power plants

Appendix F – Combined Heat and Power

What is Combined Heat and Power?

Combined Heat and Power (CHP), sometimes referred to as cogeneration, is a setup in which heat and power are generated simultaneously.

Energy which is lost at various steps in producing electricity in a conventional power plant can be captured and used to provide warmth. For example, water which has condensed from the steam used to turn the generating turbine is typically cooled in large cooling towers, with all the energy lost to the air. In a CHP plant, this 'waste' heat is instead used to produce hot water, hot air or steam, which can then be distributed to heat local buildings.

Space Requirements

Significant space is required for the power plant itself, as well as the additional space required for the recovery of the otherwise wasted heat. Additionally, to use this energy effectively, a large pipe network is needed to distribute the heat around the local area.

Installation Costs, Funding, Maintenance and Payback

The costs involved with setting up a CHP system, especially if the power plant is being constructed along with it rather than converted, are relatively high. As a result of this, these schemes tend to be large-scale long-term projects.

The network must be kept well maintained to avoid loss of service and to ensure continued operation. However, a large-scale network can heat a wide area more efficiently than with individual building heating systems, providing good long-term return on investments.

Advantages

- The CHP process can be applied to power plants that use either renewable or fossil fuels as well as those which use a combination of the two
- Emissions are generally lower than other electricity and heat producing systems
- A variety of energy consumers can benefit from the installation of a CHP plant, including hospitals, schools and industrial sites

Disadvantages

- CHP plants need to be local to their users to ensure as little energy is lost in the transmission as possible.
- The technology needed is expensive and more complex. Maintenance costs can also be greater
- Considerable amount of space is required for a full-size CHP setup, making it suitable only for larger sites

Appendix G – District Heating

What is District Heating?

Instead of relying on one boiler for each unit on site, district heating utilises hot water or steam from a single communal heat source and distributes that energy to a variety of consumers through a network of insulated pipes. This network can be as large as desired, allowing entire communities to benefit, as well as reducing the need for additional energy to be produced specifically for heating buildings in the local area.

In the individual property or building, a heat interface unit (HIU) gives the consumer control over the hot water they use in a similar manner to that provided by a traditional boiler.

Space Requirements

An energy centre or large plant room would be required for this type of system. Depending on the scale of the heat network, pipework may need to be laid underground to distribute the hot water across the site or to the local area.

Installation Costs, Funding, Maintenance and Payback

The initial cost of setting up district heating, including the plant and infrastructure needed to deliver the heat, is relatively high and so these large-scale schemes tend to be a long-term investment.

Regular maintenance is essential to ensure continued efficiency and to prevent any breakdowns.

Advantages

- More energy efficient as energy which is otherwise wasted can be used
- Lower carbon emissions
- Has the potential to reduce heating costs

Disadvantages

- If the main fuel source experiences problems, whole areas could potentially be without heating or hot water
- Can in some cases be more expensive than traditional heating
- A large network is required to gain full benefit – it is only suitable for use on very large sites or where there is a network already present

Appendix H – BRUKL Reports

The following pages contain the BRUKL Reports for the extension to Brook House, Uxbridge.

BRUKL Reports

- Brook House – Be Lean - BRUKL Report
- Brook House – Be Lean – Predicted EPC
- Brook House – Be Green - BRUKL Report
- Brook House – Be Green – Predicted EPC

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Brook House - Be Lean

As designed

Date: Thu Sep 04 14:07:05 2025

Administrative information

Building Details

Address: New Extension, Brook House, 54a Cowley Mill Road, Uxbridge, UB8 2FX

Certifier details

Name: Benjamin Leech

Telephone number: 01242 506150

Address: World of Smile Stadium Whaddon Road, Cheltenham, GL52 5NA

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.3.1

BRUKL compliance module version: v6.1.e.1

Foundation area [m²]: 408.68

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	2.72	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	2.26	
Target primary energy rate (TPER), kWh_{PE}/m^2.annum	29.56	
Building primary energy rate (BPER), kWh_{PE}/m^2.annum	24.8	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.15	0.15	Second Floor - 01. Office Suite S1_W_6
Floors	0.18	-	-	No heat loss floors
Pitched roofs	0.16	0.16	0.16	Second Floor - 14. Office Suite S14_R_6
Flat roofs	0.18	0.1	0.1	Second Floor - 01. Office Suite S1_R_3
Windows** and roof windows	1.6	1.2	1.2	Second Floor - 01. Office Suite S1_G_7
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	2.82	2.82	Second Floor - 33. Fire Escape_D_10
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

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

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Spit System Air Conditioning

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.2	7.01	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- Instant Electric Hot Water Heating

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Second Floor - 12. Office Suite S12	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 11. Office Suite S11	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 10. Office Suite S10	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 09. Office Suite S9	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 29. Office Suite S14	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 31. Board Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 30. Meeting Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 05. Office Suite S5	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 32. Informal Meeting Area	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 08. Office Suite S8	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 06. Office Suite S6	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 07. Office Suite S7	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 02. Office Suite S2	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 04. Office Suite S4	-	-	-	-	0.9	-	-	-	-	0.76	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Second Floor - 27. Store and Riser 3	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 21. Male W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 20. Male W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 03. Office Suite S3	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 24. Female W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 23. Female W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 02. Office Suite T2	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 09. Office Suite T9	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 08. Office Suite T8	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 07. Office Suite T7	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 06. Office Suite T6	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 32. Informal Meeting Area	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 10. Office Suite T10	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 30. Meeting Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 31. Board Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 05. Office Suite T5	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 29. Office Suite T14	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 04. Office Suite T4	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 11. Office Suite T11	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 21. Male W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 20. Male W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 23. Female W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 24. Female W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 03. Office Suite T3	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 12. Office Suite T12	-	-	-	-	0.9	-	-	-	-	0.76	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Second Floor - 01. Office Suite S1	256	-	-
Second Floor - 14. Office Suite S14	262	-	-
Second Floor - 13. Office Suite S13	257	-	-
Second Floor - 12. Office Suite S12	235	-	-
Second Floor - 11. Office Suite S11	262	-	-
Second Floor - 10. Office Suite S10	238	-	-
Second Floor - 09. Office Suite S9	241	-	-
Second Floor - 29. Office Suite S14	329	-	-
Second Floor - 31. Board Room	256	-	-
Second Floor - 30. Meeting Room	341	-	-
Second Floor - 05. Office Suite S5	260	-	-
Second Floor - 32. Informal Meeting Area	92	-	-
Second Floor - 08. Office Suite S8	268	-	-
Second Floor - 06. Office Suite S6	238	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Second Floor - 07. Office Suite S7	236	-	-
Second Floor - 33. Fire Escape	131	-	-
Second Floor - 26. Store and Riser 2	222	-	-
Second Floor - 25. Store and Riser 1	221	-	-
Second Floor - 18. Store By Lift	225	-	-
Second Floor - 16. Front Corridor Left	111	-	-
Second Floor - 02. Office Suite S2	244	-	-
Second Floor - 04. Office Suite S4	252	-	-
Second Floor - 28. Central Corridor	112	-	-
Second Floor - 27. Store and Riser 3	227	-	-
Second Floor - 19. Front Stairs	117	-	-
Second Floor - 21. Male W.C. Disabled	384	-	-
Second Floor - 15. Lift and Front Corridor	93	-	-
Second Floor - 22. Male W.C. Entrance Lobby	227	-	-
Second Floor - 20. Male W.C.	262	-	-
Second Floor - 03. Office Suite S3	262	-	-
Second Floor - 17. Front Corridor Right	95	-	-
Second Floor - 24. Female W.C. Disabled	453	-	-
Second Floor - 23. Female W.C.	211	-	-
Third Floor - 01. Office Suite T1	267	-	-
Third Floor - 02. Office Suite T2	257	-	-
Third Floor - 09. Office Suite T9	249	-	-
Third Floor - 08. Office Suite T8	267	-	-
Third Floor - 33. Fire Escape	118	-	-
Third Floor - 07. Office Suite T7	237	-	-
Third Floor - 06. Office Suite T6	244	-	-
Third Floor - 32. Informal Meeting Area	85	-	-
Third Floor - 10. Office Suite T10	238	-	-
Third Floor - 30. Meeting Room	299	-	-
Third Floor - 31. Board Room	243	-	-
Third Floor - 05. Office Suite T5	256	-	-
Third Floor - 28. Central Corridor	99	-	-
Third Floor - 29. Office Suite T14	292	-	-
Third Floor - 04. Office Suite T4	251	-	-
Third Floor - 11. Office Suite T11	257	-	-
Third Floor - 21. Male W.C. Disabled	307	-	-
Third Floor - 20. Male W.C.	223	-	-
Third Floor - 25. Store and Riser 1	170	-	-
Third Floor - 19. Front Stairs	102	-	-
Third Floor - 26. Store and Riser 2	170	-	-
Third Floor - 16. Front Corridor Left	98	-	-
Third Floor - 23. Female W.C.	189	-	-
Third Floor - 24. Female W.C. Disabled	356	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Third Floor - 17. Front Corridor Right	88	-	-
Third Floor - 03. Office Suite T3	264	-	-
Third Floor - 12. Office Suite T12	239	-	-
Third Floor - 22. Male W.C. Entrance Lobby	181	-	-
Third Floor - 15. Lift and Front Corridor 1	86	-	-
Third Floor - 13. Office Suite T13	268	-	-
Third Floor - 14. Office Suite T14	290	-	-
Third Floor - 18. Store By Lift	174	-	-
Third Floor - 27. Store and Riser 3	227	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Second Floor - 01. Office Suite S1	NO (-42.8%)	YES
Second Floor - 14. Office Suite S14	NO (-77.8%)	YES
Second Floor - 13. Office Suite S13	NO (-42.4%)	YES
Second Floor - 12. Office Suite S12	NO (-41.5%)	YES
Second Floor - 11. Office Suite S11	NO (-40.9%)	YES
Second Floor - 10. Office Suite S10	NO (-40%)	YES
Second Floor - 09. Office Suite S9	NO (-35.2%)	YES
Second Floor - 29. Office Suite S14	N/A	N/A
Second Floor - 31. Board Room	N/A	N/A
Second Floor - 30. Meeting Room	N/A	N/A
Second Floor - 05. Office Suite S5	NO (-30.1%)	YES
Second Floor - 32. Informal Meeting Area	N/A	N/A
Second Floor - 08. Office Suite S8	NO (-28.7%)	YES
Second Floor - 06. Office Suite S6	NO (-27.6%)	YES
Second Floor - 07. Office Suite S7	NO (-28.5%)	YES
Second Floor - 33. Fire Escape	NO (-64.5%)	YES
Second Floor - 26. Store and Riser 2	N/A	N/A
Second Floor - 25. Store and Riser 1	N/A	N/A
Second Floor - 18. Store By Lift	N/A	N/A
Second Floor - 16. Front Corridor Left	N/A	N/A
Second Floor - 02. Office Suite S2	NO (-34.8%)	YES
Second Floor - 04. Office Suite S4	NO (-22.2%)	YES
Second Floor - 28. Central Corridor	N/A	N/A
Second Floor - 27. Store and Riser 3	N/A	N/A
Second Floor - 19. Front Stairs	N/A	N/A
Second Floor - 21. Male W.C. Disabled	N/A	N/A
Second Floor - 15. Lift and Front Corridor	N/A	N/A
Second Floor - 22. Male W.C. Entrance Lobby	N/A	N/A
Second Floor - 20. Male W.C.	N/A	N/A
Second Floor - 03. Office Suite S3	NO (-28%)	YES
Second Floor - 17. Front Corridor Right	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Second Floor - 24. Female W.C. Disabled	N/A	N/A
Second Floor - 23. Female W.C.	N/A	N/A
Third Floor - 01. Office Suite T1	NO (-35.4%)	YES
Third Floor - 02. Office Suite T2	NO (-26%)	YES
Third Floor - 09. Office Suite T9	NO (-26.6%)	YES
Third Floor - 08. Office Suite T8	NO (-18.5%)	YES
Third Floor - 33. Fire Escape	NO (-70%)	YES
Third Floor - 07. Office Suite T7	NO (-18.3%)	YES
Third Floor - 06. Office Suite T6	NO (-18.7%)	YES
Third Floor - 32. Informal Meeting Area	N/A	N/A
Third Floor - 10. Office Suite T10	NO (-34.3%)	YES
Third Floor - 30. Meeting Room	N/A	N/A
Third Floor - 31. Board Room	N/A	N/A
Third Floor - 05. Office Suite T5	NO (-19%)	YES
Third Floor - 28. Central Corridor	N/A	N/A
Third Floor - 29. Office Suite T14	N/A	N/A
Third Floor - 04. Office Suite T4	NO (-19%)	YES
Third Floor - 11. Office Suite T11	NO (-34.1%)	YES
Third Floor - 21. Male W.C. Disabled	N/A	N/A
Third Floor - 20. Male W.C.	N/A	N/A
Third Floor - 25. Store and Riser 1	N/A	N/A
Third Floor - 19. Front Stairs	N/A	N/A
Third Floor - 26. Store and Riser 2	N/A	N/A
Third Floor - 16. Front Corridor Left	N/A	N/A
Third Floor - 23. Female W.C.	N/A	N/A
Third Floor - 24. Female W.C. Disabled	N/A	N/A
Third Floor - 17. Front Corridor Right	N/A	N/A
Third Floor - 03. Office Suite T3	NO (-18.5%)	YES
Third Floor - 12. Office Suite T12	NO (-34.6%)	YES
Third Floor - 22. Male W.C. Entrance Lobby	N/A	N/A
Third Floor - 15. Lift and Front Corridor 1	N/A	N/A
Third Floor - 13. Office Suite T13	NO (-35.1%)	YES
Third Floor - 14. Office Suite T14	N/A	N/A
Third Floor - 18. Store By Lift	N/A	N/A
Third Floor - 27. Store and Riser 3	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	1634.7	1634.7
External area [m^2]	1642.7	1642.7
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	3
Average conductance [W/K]	620.58	608.07
Average U-value [W/m^2K]	0.38	0.37
Alpha value* [%]	8.66	21.59

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
100	**Offices and Workshop Businesses**
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	1.95	3.35
Cooling	4.56	4.66
Auxiliary	1.56	1.56
Lighting	6.39	8.46
Hot water	1.97	1.97
Equipment*	31.23	31.23
TOTAL**	**16.44**	**19.99**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	109.19	105.54
Primary energy [kWh_{PE}/m^2]	24.8	29.56
Total emissions [kg/m^2]	2.26	2.72

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	27.5	81.6	2	4.6	1.6	3.91	4.98	4.2	7.01
	Notional	31.8	73.7	3.3	4.7	1.6	2.64	4.4	----	----

Key to terms

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Energy Performance Certificate

Non-Domestic Building

HM Government

New Extension
Brook House
54a Cowley Mill Road
Uxbridge
UB8 2FX

Certificate Reference Number:
5414-3302-7437-5463-6177

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO_2 emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

9 This is how energy efficient the building is.

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m^2):	1634.7
Building complexity:	Level 3
Building emission rate ($kgCO_2/m^2$ per year):	2.26
Primary energy use (kWh_{PE}/m^2 per year):	24.8

Benchmarks

Buildings similar to this one could have ratings as follows:

11 If newly built

44 If typical of the existing stock

Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	DesignBuilder SBEM v7.3.1 using calculation engine SBEM v6.1.e.2
Property Reference:	UPRN-000000000000
Assessor Name:	Benjamin Leech
Assessor Number:	ECMK304331
Accreditation Scheme:	ECMK Ltd
Assessor Qualifications:	NOS4
Employer/Trading Name:	Fenton Energy Ltd.
Employer/Trading Address:	
Issue Date:	04 Sep 2025
Valid Until:	03 Sep 2035 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 4589-3207-4813-3078-4772

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by ECMK Ltd. You can obtain contact details of the Accreditation Scheme at www.ecmk.co.uk.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Brook House - Be Green

As designed

Date: Thu Sep 04 14:13:00 2025

Administrative information

Building Details

Address: New Extension, Brook House, 54a Cowley Mill Road, Uxbridge, UB8 2FX

Certifier details

Name: Benjamin Leech

Telephone number: 01242 506150

Address: World of Smile Stadium Whaddon Road, Cheltenham, GL52 5NA

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.2

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.3.1

BRUKL compliance module version: v6.1.e.1

Foundation area [m²]: 408.68

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	2.72	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	-0.02	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	29.56	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	-1.55	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

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

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.15	0.15	Second Floor - 01. Office Suite S1_W_6
Floors	0.18	-	-	No heat loss floors
Pitched roofs	0.16	0.16	0.16	Second Floor - 14. Office Suite S14_R_6
Flat roofs	0.18	0.1	0.1	Second Floor - 01. Office Suite S1_R_3
Windows** and roof windows	1.6	1.2	1.2	Second Floor - 01. Office Suite S1_G_7
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	2.82	2.82	Second Floor - 33. Fire Escape_D_10
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

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

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- Spit System Air Conditioning

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.2	7.01	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- Instant Electric Hot Water Heating

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Second Floor - 12. Office Suite S12	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 11. Office Suite S11	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 10. Office Suite S10	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 09. Office Suite S9	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 29. Office Suite S14	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 31. Board Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 30. Meeting Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 05. Office Suite S5	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 32. Informal Meeting Area	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 08. Office Suite S8	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 06. Office Suite S6	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 07. Office Suite S7	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 02. Office Suite S2	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 04. Office Suite S4	-	-	-	-	0.9	-	-	-	-	0.76	N/A

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Second Floor - 27. Store and Riser 3	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 21. Male W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 20. Male W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 03. Office Suite S3	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 24. Female W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Second Floor - 23. Female W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 02. Office Suite T2	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 09. Office Suite T9	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 08. Office Suite T8	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 07. Office Suite T7	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 06. Office Suite T6	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 32. Informal Meeting Area	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 10. Office Suite T10	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 30. Meeting Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 31. Board Room	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 05. Office Suite T5	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 29. Office Suite T14	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 04. Office Suite T4	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 11. Office Suite T11	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 21. Male W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 20. Male W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 23. Female W.C.	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 24. Female W.C. Disabled	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 03. Office Suite T3	-	-	-	-	0.9	-	-	-	-	0.76	N/A
Third Floor - 12. Office Suite T12	-	-	-	-	0.9	-	-	-	-	0.76	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Second Floor - 01. Office Suite S1	256	-	-
Second Floor - 14. Office Suite S14	262	-	-
Second Floor - 13. Office Suite S13	257	-	-
Second Floor - 12. Office Suite S12	235	-	-
Second Floor - 11. Office Suite S11	262	-	-
Second Floor - 10. Office Suite S10	238	-	-
Second Floor - 09. Office Suite S9	241	-	-
Second Floor - 29. Office Suite S14	329	-	-
Second Floor - 31. Board Room	256	-	-
Second Floor - 30. Meeting Room	341	-	-
Second Floor - 05. Office Suite S5	260	-	-
Second Floor - 32. Informal Meeting Area	92	-	-
Second Floor - 08. Office Suite S8	268	-	-
Second Floor - 06. Office Suite S6	238	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Second Floor - 07. Office Suite S7	236	-	-
Second Floor - 33. Fire Escape	131	-	-
Second Floor - 26. Store and Riser 2	222	-	-
Second Floor - 25. Store and Riser 1	221	-	-
Second Floor - 18. Store By Lift	225	-	-
Second Floor - 16. Front Corridor Left	111	-	-
Second Floor - 02. Office Suite S2	244	-	-
Second Floor - 04. Office Suite S4	252	-	-
Second Floor - 28. Central Corridor	112	-	-
Second Floor - 27. Store and Riser 3	227	-	-
Second Floor - 19. Front Stairs	117	-	-
Second Floor - 21. Male W.C. Disabled	384	-	-
Second Floor - 15. Lift and Front Corridor	93	-	-
Second Floor - 22. Male W.C. Entrance Lobby	227	-	-
Second Floor - 20. Male W.C.	262	-	-
Second Floor - 03. Office Suite S3	262	-	-
Second Floor - 17. Front Corridor Right	95	-	-
Second Floor - 24. Female W.C. Disabled	453	-	-
Second Floor - 23. Female W.C.	211	-	-
Third Floor - 01. Office Suite T1	267	-	-
Third Floor - 02. Office Suite T2	257	-	-
Third Floor - 09. Office Suite T9	249	-	-
Third Floor - 08. Office Suite T8	267	-	-
Third Floor - 33. Fire Escape	118	-	-
Third Floor - 07. Office Suite T7	237	-	-
Third Floor - 06. Office Suite T6	244	-	-
Third Floor - 32. Informal Meeting Area	85	-	-
Third Floor - 10. Office Suite T10	238	-	-
Third Floor - 30. Meeting Room	299	-	-
Third Floor - 31. Board Room	243	-	-
Third Floor - 05. Office Suite T5	256	-	-
Third Floor - 28. Central Corridor	99	-	-
Third Floor - 29. Office Suite T14	292	-	-
Third Floor - 04. Office Suite T4	251	-	-
Third Floor - 11. Office Suite T11	257	-	-
Third Floor - 21. Male W.C. Disabled	307	-	-
Third Floor - 20. Male W.C.	223	-	-
Third Floor - 25. Store and Riser 1	170	-	-
Third Floor - 19. Front Stairs	102	-	-
Third Floor - 26. Store and Riser 2	170	-	-
Third Floor - 16. Front Corridor Left	98	-	-
Third Floor - 23. Female W.C.	189	-	-
Third Floor - 24. Female W.C. Disabled	356	-	-

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
Third Floor - 17. Front Corridor Right	88	-	-
Third Floor - 03. Office Suite T3	264	-	-
Third Floor - 12. Office Suite T12	239	-	-
Third Floor - 22. Male W.C. Entrance Lobby	181	-	-
Third Floor - 15. Lift and Front Corridor 1	86	-	-
Third Floor - 13. Office Suite T13	268	-	-
Third Floor - 14. Office Suite T14	290	-	-
Third Floor - 18. Store By Lift	174	-	-
Third Floor - 27. Store and Riser 3	227	-	-

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Second Floor - 01. Office Suite S1	NO (-42.8%)	YES
Second Floor - 14. Office Suite S14	NO (-77.8%)	YES
Second Floor - 13. Office Suite S13	NO (-42.4%)	YES
Second Floor - 12. Office Suite S12	NO (-41.5%)	YES
Second Floor - 11. Office Suite S11	NO (-40.9%)	YES
Second Floor - 10. Office Suite S10	NO (-40%)	YES
Second Floor - 09. Office Suite S9	NO (-35.2%)	YES
Second Floor - 29. Office Suite S14	N/A	N/A
Second Floor - 31. Board Room	N/A	N/A
Second Floor - 30. Meeting Room	N/A	N/A
Second Floor - 05. Office Suite S5	NO (-30.1%)	YES
Second Floor - 32. Informal Meeting Area	N/A	N/A
Second Floor - 08. Office Suite S8	NO (-28.7%)	YES
Second Floor - 06. Office Suite S6	NO (-27.6%)	YES
Second Floor - 07. Office Suite S7	NO (-28.5%)	YES
Second Floor - 33. Fire Escape	NO (-64.5%)	YES
Second Floor - 26. Store and Riser 2	N/A	N/A
Second Floor - 25. Store and Riser 1	N/A	N/A
Second Floor - 18. Store By Lift	N/A	N/A
Second Floor - 16. Front Corridor Left	N/A	N/A
Second Floor - 02. Office Suite S2	NO (-34.8%)	YES
Second Floor - 04. Office Suite S4	NO (-22.2%)	YES
Second Floor - 28. Central Corridor	N/A	N/A
Second Floor - 27. Store and Riser 3	N/A	N/A
Second Floor - 19. Front Stairs	N/A	N/A
Second Floor - 21. Male W.C. Disabled	N/A	N/A
Second Floor - 15. Lift and Front Corridor	N/A	N/A
Second Floor - 22. Male W.C. Entrance Lobby	N/A	N/A
Second Floor - 20. Male W.C.	N/A	N/A
Second Floor - 03. Office Suite S3	NO (-28%)	YES
Second Floor - 17. Front Corridor Right	N/A	N/A

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Second Floor - 24. Female W.C. Disabled	N/A	N/A
Second Floor - 23. Female W.C.	N/A	N/A
Third Floor - 01. Office Suite T1	NO (-35.4%)	YES
Third Floor - 02. Office Suite T2	NO (-26%)	YES
Third Floor - 09. Office Suite T9	NO (-26.6%)	YES
Third Floor - 08. Office Suite T8	NO (-18.5%)	YES
Third Floor - 33. Fire Escape	NO (-70%)	YES
Third Floor - 07. Office Suite T7	NO (-18.3%)	YES
Third Floor - 06. Office Suite T6	NO (-18.7%)	YES
Third Floor - 32. Informal Meeting Area	N/A	N/A
Third Floor - 10. Office Suite T10	NO (-34.3%)	YES
Third Floor - 30. Meeting Room	N/A	N/A
Third Floor - 31. Board Room	N/A	N/A
Third Floor - 05. Office Suite T5	NO (-19%)	YES
Third Floor - 28. Central Corridor	N/A	N/A
Third Floor - 29. Office Suite T14	N/A	N/A
Third Floor - 04. Office Suite T4	NO (-19%)	YES
Third Floor - 11. Office Suite T11	NO (-34.1%)	YES
Third Floor - 21. Male W.C. Disabled	N/A	N/A
Third Floor - 20. Male W.C.	N/A	N/A
Third Floor - 25. Store and Riser 1	N/A	N/A
Third Floor - 19. Front Stairs	N/A	N/A
Third Floor - 26. Store and Riser 2	N/A	N/A
Third Floor - 16. Front Corridor Left	N/A	N/A
Third Floor - 23. Female W.C.	N/A	N/A
Third Floor - 24. Female W.C. Disabled	N/A	N/A
Third Floor - 17. Front Corridor Right	N/A	N/A
Third Floor - 03. Office Suite T3	NO (-18.5%)	YES
Third Floor - 12. Office Suite T12	NO (-34.6%)	YES
Third Floor - 22. Male W.C. Entrance Lobby	N/A	N/A
Third Floor - 15. Lift and Front Corridor 1	N/A	N/A
Third Floor - 13. Office Suite T13	NO (-35.1%)	YES
Third Floor - 14. Office Suite T14	N/A	N/A
Third Floor - 18. Store By Lift	N/A	N/A
Third Floor - 27. Store and Riser 3	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	1634.7	1634.7
External area [m^2]	1642.7	1642.7
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	3
Average conductance [W/K]	620.58	608.07
Average U-value [W/m^2K]	0.38	0.37
Alpha value* [%]	8.66	21.59

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
	Retail/Financial and Professional Services
	Restaurants and Cafes/Drinking Establishments/Takeaways
100	**Offices and Workshop Businesses**
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	Residential Institutions: Hospitals and Care Homes
	Residential Institutions: Residential Schools
	Residential Institutions: Universities and Colleges
	Secure Residential Institutions
	Residential Spaces
	Non-residential Institutions: Community/Day Centre
	Non-residential Institutions: Libraries, Museums, and Galleries
	Non-residential Institutions: Education
	Non-residential Institutions: Primary Health Care Building
	Non-residential Institutions: Crown and County Courts
	General Assembly and Leisure, Night Clubs, and Theatres
	Others: Passenger Terminals
	Others: Emergency Services
	Others: Miscellaneous 24hr Activities
	Others: Car Parks 24 hrs
	Others: Stand Alone Utility Block

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	1.95	3.35
Cooling	4.56	4.66
Auxiliary	1.56	1.56
Lighting	6.39	8.46
Hot water	1.97	1.97
Equipment*	31.23	31.23
TOTAL**	**16.44**	**19.99**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	17.99	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*17.99*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	109.19	105.54
Primary energy [kWh_{PE}/m^2]	-1.55	29.56
Total emissions [kg/m^2]	-0.02	2.72

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	27.5	81.6	2	4.6	1.6	3.91	4.98	4.2	7.01
	Notional	31.8	73.7	3.3	4.7	1.6	2.64	4.4	----	----

Key to terms

Heat dem [MJ/m2] = Heating energy demand
Cool dem [MJ/m2] = Cooling energy demand
Heat con [kWh/m2] = Heating energy consumption
Cool con [kWh/m2] = Cooling energy consumption
Aux con [kWh/m2] = Auxiliary energy consumption
Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER = Cooling system seasonal energy efficiency ratio
Heat gen SSEFF = Heating generator seasonal efficiency
Cool gen SSEER = Cooling generator seasonal energy efficiency ratio
ST = System type
HS = Heat source
HFT = Heating fuel type
CFT = Cooling fuel type

Energy Performance Certificate

Non-Domestic Building

HM Government

New Extension
Brook House
54a Cowley Mill Road
Uxbridge
UB8 2FX

Certificate Reference Number:
1218-4720-8831-4786-6410

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO_2 emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

0 This is how energy efficient the building is.

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m^2):	1634.7
Building complexity:	Level 3
Building emission rate ($kgCO_2/m^2$ per year):	-0.02
Primary energy use (kWh_{PE}/m^2 per year):	-1.55

Benchmarks

Buildings similar to this one could have ratings as follows:

11 If newly built

44 If typical of the existing stock

Administrative information

This is an Energy Performance Certificate as defined in the Energy Performance of Buildings Regulations 2012 as amended.

Assessment Software:	DesignBuilder SBEM v7.3.1 using calculation engine SBEM v6.1.e.2
Property Reference:	UPRN-000000000000
Assessor Name:	Benjamin Leech
Assessor Number:	ECMK304331
Accreditation Scheme:	ECMK Ltd
Assessor Qualifications:	NOS4
Employer/Trading Name:	Fenton Energy Ltd.
Employer/Trading Address:	
Issue Date:	05 Sep 2025
Valid Until:	04 Sep 2035 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 9134-9222-0316-8843-4603

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by ECMK Ltd. You can obtain contact details of the Accreditation Scheme at www.ecmk.co.uk.

A copy of this certificate has been lodged on a national register as a requirement under the Energy Performance of Buildings Regulations 2012 as amended. It will be made available via the online search function at www.ndepcregister.com. The certificate (including the building address) and other data about the building collected during the energy assessment but not shown on the certificate, for instance heating system data, will be made publicly available at www.opendatacommunities.org.

This certificate and other data about the building may be shared with other bodies (including government departments and enforcement agencies) for research, statistical and enforcement purposes. For further information about how data about the property are used, please visit www.ndepcregister.com. To opt out of having information about your building made publicly available, please visit www.ndepcregister.com/optout.

There is more information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government website at: www.gov.uk/government/collections/energy-performance-certificates. It explains the content and use of this document and advises on how to identify the authenticity of a certificate and how to make a complaint.

Opportunity to benefit from a Green Deal on this property

The Green Deal can help you cut your energy bills by making energy efficiency improvements at no upfront costs. Use the Green Deal to find trusted advisors who will come to your property, recommend measures that are right for you and help you access a range of accredited installers. Responsibility for repayments stays with the property - whoever pays the energy bills benefits so they are responsible for the payments.

To find out how you could use Green Deal finance to improve your property please call 0300 123 1234.