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**Hanslink Ltd.
Library Parade
Woodley
Reading, RG5 3LX**



Energy Statement

JDP Head Office: Davidson House, Forbury Square, Reading RG1 3EU



email@jdp-ltd.co.uk



www.jdp-ltd.co.uk



0118 972 2911

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REPORT AMENDMENTS

PARAGRAPH	AMENDMENT
ISSUE 01	
	Issue 01 issued as J1273-ENERGYREP
ISSUE 02	
General	Formatting updated.
Executive Summary	Updated to incorporate Planning Condition 10 and EV charging.
1.0	Updated to incorporate Planning Condition 10 and EV charging.
4.0	Updated for clarity.
10.0	Section added.
11.0	Section added.
12.0	Equivalent kWh usage added.

EXECUTIVE SUMMARY

This energy statement has been prepared on behalf of Hanslink Ltd, the Applicant, in support of a planning application for the proposed development at Library Parade, Crockhamwell Road, Woodley, Reading, Berkshire, RG5 3LX.

Wokingham Borough Council's strategic policy for minimising carbon emissions in accordance with the Local Plan, sets out their intention to implement national policy and ensure net-zero carbon emissions are achieved by no later than 2050.

The Development will adopt a 'fabric first' approach to reducing the anticipated energy demand and CO₂ emissions. Passive measures will achieve a significant site-wide reduction in regulated CO₂ emissions beyond the Building Regulations Part L (2021) requirements.

The site is not located within an 'Opportunity Area' for the implementation of a heat network and there are no existing heat networks nearby, however, the Development will seek to further reduce the CO₂ emissions by implementing renewable and low carbon technologies. These include incorporating air-source heat pumps as the primary heat source for hot water production.

The Energy Strategy requires are further confirmed in the Planning Condition No. 10 which also sets out a requirement to confirm the viability of electric vehicle charging.

10. Energy Statement – Prior to the commencement of development, an Energy Statement indicating that an absolute minimum of the 10% of the predicted energy requirement of the development will be obtained from decentralised renewable and/or low carbon sources (as defined in the glossary of Planning Policy Statement: Planning and Climate Change(December 2007) or any subsequent version) shall be submitted to and approved in writing by the local planning authority. The Statement shall also investigate the viability of providing electric vehicle charging points at construction. The approved scheme shall be implemented before the flats are first occupied and shall remain operational for the lifetime of the development.

Reason: To ensure developments contribute to sustainable development. Relevant policy: NPPF Section 14, Core Strategy policy CP1, Managing Development Delivery Local Plan policy CC05 & the Sustainable Design and Construction Supplementary Planning Document.

The Energy Statement sets out a solution with 40% of the energy used by the proposed development (fixed building services) will be from heat pump systems which exceeds the 10% requirement within Planning Condition No. 10.

The development includes EV charging in line with Approved Document S: Infrastructure for charging electric vehicles and in line with requirements for Planning Condition No. 10.

1.0 INTRODUCTION

- 1.1 JDP has been instructed by Hanslink Ltd. hereafter referred to as the Applicant, to prepare an energy strategy planning statement in support of a planning application for the proposed redevelopment of an existing site known as 'Library Parade,' hereafter referred to as the Development.
- 1.2 The site for development is located within Woodley Town Centre Shopping Precinct and comprises an existing two-storey building accommodating seven commercial units with private (off-road) car park comprising approximately 15 (unmarked) bays. The site is located within a pedestrianised zone and accessed via Crockhamwell Road. See location map in Figure 1 (below).
- 1.3 It is proposed to demolish the existing building and construct a new part 3-storey, part 4-storey building accommodating five commercial units at ground level and sixteen apartments on upper floors including one duplex apartment over two floors. The proposed dwelling types include eleven 1-Bed and five 2-Bed apartments. A private car park at ground floor level provides 12 new car parking spaces, each with EV charge points and external refuse and cycle store.

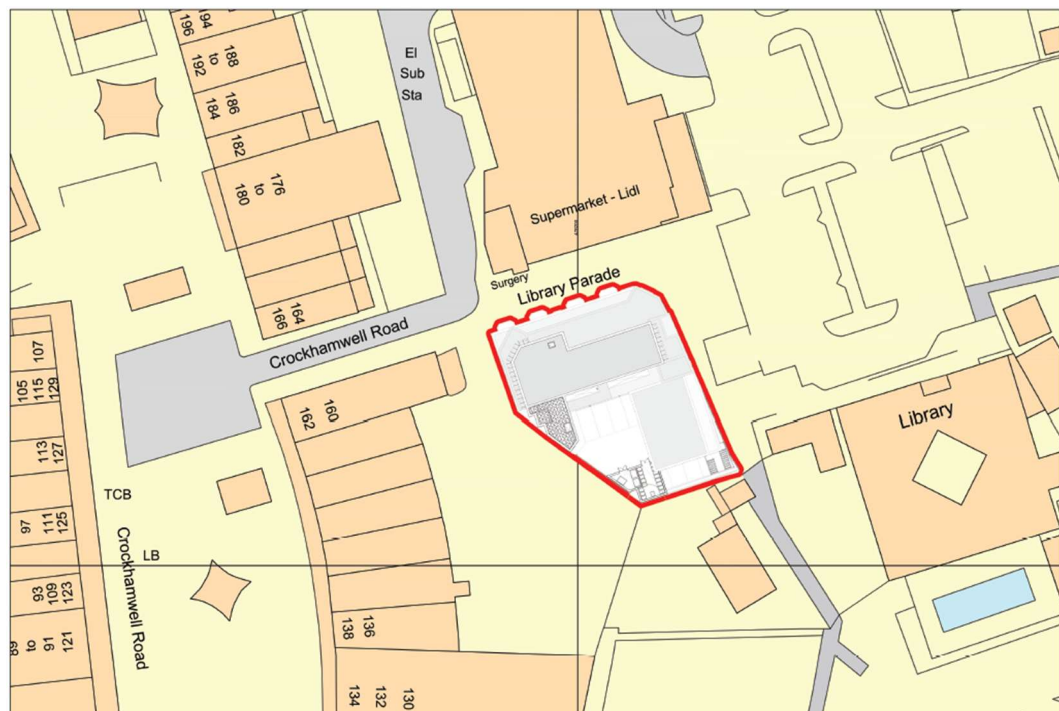


Figure 1, Site Location Map

- 1.4 Wokingham Borough Council's Local Plan sets out the Council's intention to implement national policy and ensure net-zero carbon emissions are achieved by no later than 2050. In addition to the Local Plan this Energy Strategy responds to the Planning Conditions associated with this proposed development, specifically Planning Condition No. 10.
- 1.5 The approach is to demonstrate the project can achieve a minimum 10% carbon emission reduction over that of the Part L (2021) Building Regulations through the use of renewable technologies alone required by The Local Plan. The provision of EV charging is also detailed in the report.

- 1.6 This Energy Strategy follows the energy hierarchy and the fundamental approach adopted is as follows:
- a) Minimising carbon dioxide emissions in accordance with the following energy hierarchy:
 - Be lean - use less energy
 - Be clean - supply energy efficiently
 - Be green - use renewable energy
 - b) Assess feasibility of connecting to existing heat network, if not feasible investigate the practicality of including a CHP¹ and a DHN². The feasibility of connecting to an existing heat network will be assessed and an outline given of potential CHP and related DHN network at the site. The feasibility of including on-site renewables should be carried out.
 - c) Achieve a minimum 10% reduction in emissions through the use of renewable technologies against Part L of Building Regulations 2021.
- 1.7 A Water Efficiency assessment will also be required using the methodology set out in Approved Document G (2015 with 2016 amendments).
- 1.8 EV charging proposals are included inline with Approved Document S: Infrastructure for charging electric vehicles.

2.0 POLICY CONTEXT

2.1 Planning Policy

Planning documents referenced for this report are as follows:

- a) National Planning Policy Framework (NPPF) July 2021
- b) Wokingham Local Plan Core Strategy 2010
- c) Energy and Sustainability Statement SPD 2020
- d) South East Plan (NRM11) 2010

- 2.2 The council's planning policy is set out in the Local Plan, adopted in 2019, and supplementary planning guidance in response to the climate emergency. Key policies relating to energy consumption and CO2 emissions (NRM11) include the following.

Policy CP1 – Sustainable Development

- 2.3 Contribute towards the goal of reaching zero-carbon developments by including appropriate on-site renewable energy features and minimising energy consumptions by measures of appropriate layout and orientation, building form, design and construction, and design to take account of microclimate to minimise CO2 emissions through careful consideration to how all aspects of development form.

Policy CC04 – Sustainable Design and Construction

- 2.4 Planning permission will only be granted for proposals that seek to deliver high quality sustainably designed and constructed developments.

¹ Combined Heat and Power

² District Heat Network

Policy CC05 – Renewable Energy and Decentralised Energy Networks

- 2.5 Local opportunities to contribute towards decentralised energy supply from renewable and low-carbon technologies will be encouraged. **Planning permission will only be granted for proposals that deliver a minimum 10% reduction in carbon emissions through renewable energy or low carbon technology and promoting renewable energy and decentralised energy works in line with LA's criteria.**
- 2.6 The additional commentary in the Wokingham Borough Council Climate Change Interim Policy Position Statement, December 2022, are noted.
- 2.7 The development will be required to comply with Building Regulations Part L (2021) requirements.

3.0 BUILDING REGULATIONS, PART L (CONSERVATION OF FUEL AND POWER)

Building Regulations, Part L (2021)

- 3.1 The Government has legislated to achieve net zero carbon by 2050 at the latest and this will have considerable impact on how new homes are constructed and heated. In January 2021 the Government published its response to the Future Homes Standard (FHS) consultation. In the response document the Government confirmed it would proceed with the Standard in 2025, subject to a public consultation on the full technical specification. The Standard is expected to deliver a 75% reduction in CO2 emissions and require new homes to be heated from a low carbon heat source such that homes will be “zero carbon ready”. It is expected that the Standard will represent the final step for the house building industry and further decarbonisation will be delivered because of the decarbonisation of the National Grid network.
- 3.2 Building Regulations were revised in 2021, increasing the reduction of CO2 emissions required. New homes will be expected to reduce emissions by demanding increase in fabric standard (thermal insulation and glazing) and the use of onsite renewable and low carbon energy technology. In anticipation of the 2025 Standard the Government has published Part L 2021, which came into effect in June 2022, to deliver a saving of 31% in CO2 emissions from domestic buildings and 27% from non-domestic buildings.
- 3.3 The revisions are expected to provide the industry and supply chains with the incentive, skills and time to prepare for the FHS in 2025. In accordance with best practice of sustainable design for new homes, in this document it is recommended that thermally insulated fabric, improved glazing, Air Source Heat Pumps (ASHP) and on site solar PV electrical generation, is incorporated to achieve a significant reduction of emissions below the Target Emissions Rate (TER).
- 3.4 Compliance with Part L (2021) benchmarks is achieved by demonstrating compliance with the following criteria:
 - a) Criterion One - requires that, as designed, the anticipated CO2 emissions do not exceed the calculated notional building Target Emission Rate (TER). Additionally, the building fabric energy efficiency for domestic buildings must be no worse than the Target Fabric Energy Efficiency (TFEE).
 - b) Criterion Two places upper limits on the efficiency of controlled fittings and services.
 - c) Criterion Three requires that spaces are not subject to excessive solar gains causing rooms to overheat.

- d) Criterion Four requires that the 'As-built' performance of the building should be consistent with the DER. This includes air-permeability testing and appropriate commissioning of building services systems.
- e) Criterion Five requires that provision should be made for energy-efficient operation by providing the building owner with information enabling them to operate the building in a way that uses no more fuel and power than is reasonable. This can be achieved by preparing operating and maintenance manuals (O&Ms) and producing a building logbook.

4.0 METHODOLOGY

- 4.1 This statement outlines how the Development will have a reduced impact on climate change by reducing CO₂ emissions associated with the energy use of the Development.
- 4.2 Each step of the energy consumption and CO₂ emissions reduction are assessed against a Building Regulations, Part L (2021) carbon emissions compliant baseline figure. Dwellings have been assessed using the Standard Assessment Procedure (SAP) using Elmhurst Energy Systems SAP2012 Calculator (Design System) version 4.14r19.
- 4.3 A representative sample of apartments have been selected to establish the estimated energy performance for the building. A combined average of the estimated annual carbon emissions data has been applied across all the residential areas to estimate the total residential energy performance.
- 4.4 Whilst the appraisals within this statement are based on the SAP calculation methodology it should not be understood to be predictive assessment of likely future energy requirements or otherwise. SAP includes fixed building services only, and energy bills will likely be higher as these will include small power energy consumption, such as TV's, computers, hair dryers, lamps etc. The heating energy demand is based on a standardised model. Occupant behaviour and weather conditions will affect actual energy consumption.

5.0 BASELINE (TER)

- 5.1 The SAP results (see Appendices) baseline regulated carbon emissions for a Building Regulations compliant development is given by the calculating Target Emission Rate (TER) values for the representative sample of apartments.

DESCRIPTION	ANNUAL CO ₂ EMISSIONS (Tonnes CO ₂)
Unit 1 – End-terrace, first floor, 2-bed maisonette	15.19
Unit 4 – End-terrace, first floor, 1-bed apartment	14.30
Unit 5 – Semi-detached, first floor, 1-bed apartment	11.08
Unit 9 – End-terrace, second floor, 2-bed apartment	10.93
Unit 11 - Semi-detached, second floor, 1-bed apartment	10.74
Unit 13 - End-terrace, third floor, 2-bed apartment	12.50
Unit 15 - Semi-detached, third floor, 1-bed apartment	12.47

Table 1, Calculated TER Values

- 5.2 A combined average of the estimated annual carbon emissions data has been applied to estimate the total building energy performance and the total (site-wide) TER equates to 183 Tonnes CO₂ per year.

6.0 DEMAND REDUCTION (BE LEAN)

Passive Design Measures

- 6.1 Developments must meet the requirements of Building Regulations, Part L (2021) Requirements through demand reduction measures. These measures include passive design measures (i.e., architectural and building fabric) and active design measures (energy efficient services). This section outlines the proposals for specifying building fabric and services beyond the requirements of Building Regulations.
- 6.2 Passive design measures are the most effective and robust measures for reducing CO2 emissions as the performance of the solutions (e.g. wall insulation), is unlikely to deteriorate significantly with time or be subject to change by future property owners and therefore it is likely that the benefits of these measures will continue at a similar level for the duration of their installation.
- 6.3 The Development will adopt a 'fabric first' approach to reducing the anticipated energy demand and CO2 emissions.

Glazing

- 6.4 Glazing ratio will be optimised to achieve a balance between providing natural daylighting to reduce the use of artificial lighting, the provision of passive solar heating to limit the need for space heating in winter and limiting summertime solar gains to reduce space cooling demands and limit the likelihood of high internal temperatures. Glazing on the south, east and west facing facades can lead to beneficial solar gains in winter months, whilst glazing on northerly orientations will typically lose heat. It should be noted that the glazing has a large impact on compliance with Building Regulations Approved Document Part O.
- 6.5 Solar gains can be beneficial in winter months as a means of avoiding the need for active heating to maintain comfortable internal temperatures. However, in summer months excessive solar gains can lead to the potential for high internal temperatures. The solar energy transmittance (g-value) of the glass will be targeted to allow solar gains in winter but control solar gains in summer. A value of no more than 70% is targeted, maximising the amount of natural daylight available in each internal space and reducing the need for artificial light sources.

Thermal Insulation

- 6.6 Demand for space heating can be significant but will be reduced through the provision of an efficient thermal envelope, by reducing the thermal transmittance of the building envelope where appropriate and reducing heating and cooling requirements. The building fabric will consist of high-performing materials using accredited construction details to reduce heat lost through thermal bridging.
- 6.7 The passive energy design principles adopted in the proposed design include good thermal performance of the building's construction components. The thermal performance of the proposed fabric constructions is summarised in Table 2 (overleaf). The Part L limiting factors have been included for reference.

BUILDING ELEMENT	ELEMENT SPECIFICATION (W/m ² ·K)	PART L LIMITING FACTOR (W/m ² ·K)
Roof	0.13	0.16
External Walls	0.18	0.26
Ground Floor	0.11	0.18
Windows and Rooflights	1.20	1.60

Table 2, Building Envelope Details

Airtightness

- 6.8 A significant proportion of heat loss from buildings in winter is through air leakage. Building Regulations Part L (2021) set a minimum standard for air permeability at 8 m³ of air per hour per square meter of envelope area, as measured at 50 Pa. It is proposed that the building shall be designed to achieve an air permeability of no more than 3 m³/hr/m² @ 50 Pa. To achieve this construction details are required with enhanced protection against thermal bridging and ventilation air paths, this includes, but not limited to window jambs, door jambs and the junction between the floor and the wall.

Thermal Bridging

- 6.9 Accredited Construction Details (ACD's) will be developed to provide the performance standards required to achieve the higher energy efficiency requirements of the Building Regulations. Based on the ACD's, the thermal bridging is assumed with a maximum Y-value of 0.08 W/m²·K.

- 6.10 SAP Results (Be Lean)

The building fabric energy efficiency must be no worse than the Target Fabric Energy Efficiency (TFEE) in accordance with Building Regulations.

DESCRIPTION	ENERGY EFFICIENCY (kWh/(m ² ·year))	
	TFEE	DFEE
Unit 1 – End-terrace, first floor, 2-bed maisonette	48.83	46.80
Unit 4 – End-terrace, first floor, 1-bed apartment	32.24	31.73
Unit 5 – Semi-detached, first floor, 1-bed apartment	19.88	19.35
Unit 9 – End-terrace, second floor, 2-bed apartment	27.12	26.87
Unit 11 - Semi-detached, second floor, 1-bed apartment	17.77	17.75
Unit 13 - End-terrace, third floor, 2-bed apartment	34.60	34.38
Unit 15 - Semi-detached, third floor, 1-bed apartment	26.19	25.50

Table 3 – Calculated Fabric Efficiencies

- 6.11 The estimated annual carbon emissions data has been applied to estimate the total building (fabric) energy performance. The total (site-wide) savings for the 'Be Lean' stage equate to 10.29 kWh/m² per year which represents an 2.3% improvement on the baseline TFEE Building Regulations, Part L (2021).

Water efficiency

The requirement G2 and Regulation 36 of AD Part G 2015 (with 2016 amendments) of the current Building Regulations requires reasonable provision to be made by installing fittings and fixed appliances that use water efficiently to prevent excessive water consumption. Therefore, careful selection of appliances, sanitary ware and fittings will

be undertaken to reduce water consumption to better the requirement of Part G to not exceed 110 litres per person per day. These measures will include:

- a) Low volume dual flush WCs
- b) Low flow taps/mixers (for basins and baths)
- c) Low flow shower mixers and heads
- d) Fill limitation on baths
- e) Low water consumption Washing machines
- f) Low water consumption Dishwashers (where fitted).

Appliance Efficiency

- 6.12 Where provided, white goods will be selected with an EU Energy Efficiency Rating equal to (or better than) the following:

APPLIANCE	EFFICIENCY RATING
Fridges and fridge freezers	Rating of A +
Washing machines	Rating of A + +
Dishwashers	Rating of A +
Washer-dryers	Rating of A
Tumble-dryers	Rating of A

Table 4 – Summary of Proposed Appliance Efficiency

7.0 HEATING INFRASTRUCTURE (BE CLEAN)

Infrastructure

- 7.1 The following section discusses the infrastructure and clean energy supply measures to be considered for the Development in order to further reduce regulated CO₂ emissions and outline the technologies that may be financially viable and suitable for implementation.

Decentralised Energy Networks

- 7.2 The Development is not within an 'Opportunity Area' for the implementation of a heat network and there are no existing heat networks nearby.

On-site Technologies

- 7.3 This section considers the relative merits of providing a stand-alone on-site heat network served by a dedicated energy centre through a dedicated Combined Heat and Power (CHP) system. For efficient operation, a CHP engine requires a high base heating load. A CHP engine does not operate in the same manner as a traditional gas boiler and is not well suited to highly variable loads. Where thermal demand is adequate, CHP can achieve reductions in primary energy demand relative to traditional sources. The benefit of a CHP engine is based on the heat carbon factor, which is derived from CHP efficiency, gas carbon factor and electricity carbon factor of the national grid.

A CHP would not suit this project due to the lack of a substantial baseload and the proposed development's likely viable energy use pattern. In addition, CHP engines typically operate on natural gas and can significantly affect the local air quality. Furthermore, in line with the wider UK Government strategy to reduce our impact on the environment by steadily moving away from fuel combustion to produce energy, it is

not proposed for this Development to be connected to the local gas distribution network. For these reasons, a CHP local heat network will not be considered further.

- 7.4 Consequently, the use of heat sources for new developments offers no carbon saving measures to be implemented at the 'Be Clean' stage.

8.0 RENEWABLE ENERGY (BE GREEN)

- 8.1 Once energy demand has been reduced during the "Be Lean" stage and consideration has been made to supply energy efficiently and connect to a DHN³, the final step of the energy hierarchy is to incorporate renewable energy to further reduce emissions. Renewable technologies harness energy from natural and renewable resources such as sunlight, wind, tides and geothermal heat that is naturally replenished, to supply renewable energy or supplement grid-supplied electricity or energy from fossil fuels in buildings.

- 8.2 There are many renewable technologies available. However, not all of these are commercially viable or suitable for urban/city-centre locations or appropriate for this Development in particular. The following technologies have been considered as part of this assessment:

- a) Ground Source Heat Pumps
- b) Air Source Heat Pumps
- c) Photovoltaics
- d) Wind turbines
- e) Solar Thermal Water Heating
- f) Biomass

Ground Source Heat Pumps

- 8.3 GSHPs have three common varieties:

- a) Horizontal, closed-loop
- b) Vertical, closed-loop
- c) Vertical, open-loop

- 8.4 The performance characteristics and technical requirements of each vary. Typically, vertical open-loop GSHP systems operate at the highest efficiencies and can produce the highest thermal output. Open-loop boreholes would require suitable local geology and aquifers and would require an abstraction license from the Environment Agency who would consider the impact on local water supplies and water courses. Closed loop GSHP systems are typically required to operate in balance, such that over the year, the amount of heat extracted from the ground is equivalent to the amount of heat rejected to and/or absorbed by the ground.

- 8.5 Since the Development, will have a year round demand for heating and hot water, there would be a large imbalance between the amount of heat extracted and heat rejected to the ground over a yearly cycle, which could lead to permafrost issues. That will render the system unusable and potentially damage nearby structures and ecology.

³ District Heat Network

- 8.6 Impacts on ground conditions are also valid considerations for all GSHP technologies. A horizontal loop option would require a significant amount of excavation and require a large installation area. Similarly, a vertical loop will require significant ground investigations and there must be no obstructions in the ground such as buried services or underground structures.
- 8.7 The high capital cost and the complexities of installing a GSHP will not be a practical or economically viable solution for this Development.

Air Source Heat Pumps

- 8.8 ASHPs have two common varieties:
- a) Air to Water (used for heating, hot water and cooling systems)
 - b) Air to Air (limited to space conditioning only)
- 8.9 ASHPs have a slightly lower seasonal efficiency than GSHP. However, the seasonal efficiency of ASHP is still typically greater than that of gas-fired boilers. It can still offer significant CO₂ savings, even using the SAP 2012 carbon factors, which are generally considered outdated and are due to be updated and implemented for the new SAP10 procedure. Furthermore, ASHP requires significantly less space than GSHPs. Given the advantages of air-source heat pumps, they will be included in the proposed Development for domestic hot water heating as an enhanced building service in the 'Be Green' scenario.

Photovoltaics

- 8.10 Photovoltaic panels (PV) convert solar radiation (sunlight) into electricity. The cells do not need direct sunlight to work and can still generate some electricity on a cloudy day. Because the output of PV panels depends on many uncontrollable variables, the annual generation is estimated using calculations based on test data for the panels and standardised local weather data which represent a typical year's conditions.
- 8.11 The electricity generated could offset the grid-supplied energy used for the building and ensure the net-zero target is attainable by 2050.

Wind Turbines

- 8.12 Wind turbines harness the power of the wind and use it to generate electricity. About 40% of all wind energy in Europe blows over the UK, making it an ideal country for domestic turbines (known as micro-wind or small-wind turbines). There are two types of domestic-sized wind turbine: Pole mounted and building mounted. Pole mounted turbines are free standing and are erected in a suitably exposed position and are often about 5 kW to 6 kW in size. Building mounted turbines are smaller and can be installed on the roof of a home where there is a suitable wind resource. Often these are around 1 kW to 2 kW in size. Large scale turbines in exposed locations offer one of the best financial returns of all renewable energy systems as the system's payback increases dramatically with the size of the turbine. However, small-scale systems offer much lower levels of performance and recent studies have questioned the viability and output from such systems, particularly in urban environments.
- 8.13 For efficient operation and to yield high energy output, wind turbines require a smooth laminar flow of air. The Development is located within an urban environment and therefore, the wind flow profile is likely to be erratic and, consequently, not conducive

to high annual yields. Moreover, mounting wind turbines on the roofs of the Development could result in unacceptable vibration and resonance being felt within dwellings. The turbines are also likely to generate noise which may be a nuisance to neighbouring properties. This scenario is likely to result in the turbines being switched off. Given the above, micro wind turbines will not be considered for implementation for this Development.

Solar Thermal

- 8.14 Solar thermal panels operate by capturing solar energy and transferring this via glycol to a thermal store to generate hot water. These systems can operate at efficiencies up to 75%; thus, a high energy yield can be derived from small collector areas. Solar Thermal systems can be challenging to design and install and require significant maintenance to keep the system functioning as designed. Solar thermal systems are most appropriate for buildings with high year-round domestic hot water demand. Although a typical solar thermal system will offset some of the annual hot water demand for a building, the heat network is proposed to use electricity to the AHSP's and circulation pumps within the system. This means the resultant CO₂ and cost savings will be relatively low. Furthermore, due to the complex nature of a solar thermal system, the high maintenance requirement and associated access requirements, this system will not be selected for implementation.

Biomass

- 8.15 Biomass boilers burn wood fuel or other renewable/sustainable bio-fuel sources to generate heat instead of grid-supplied natural gas, a finite resource. Biomass boilers can operate at high efficiencies, comparable to commercial condensing gas boilers. However, they require a large fuel store to maintain continuous operation during the winter months. Because of this, Biomass Boilers require substantial amounts of plant space. Furthermore, fuel deliveries in urban and suburban locations increase the required vehicle movements and increase greenhouse gas emissions.
- 8.16 Furthermore, Biomass boilers also result in higher emissions levels of Nitrous Oxide (NO_x) compared to gas boilers. This can negatively impact the local air quality. It is likely that the use of a biomass boiler could yield significant regulated CO₂ emissions savings. However, this would also likely result in an increase of NO_x emissions from the Development, require significant space for fuel storage and add the complication of regular fuel deliveries. Therefore, biomass boilers will not be considered further.

Proposals

- 8.17 Generally, in residential buildings, space heating is the primary source of carbon dioxide emissions, and hot water is the second. Due to the high demand of the heating and hot water, the most efficient energy strategy would be to reduce the carbon emissions by specifying a higher efficiency system such as an Air Source Heat Pump (ASHP) as the primary heat source for hot water would offer a high percentage CO₂ reduction.
- 8.18 The total site-wide DER utilising ASHP technology for hot water equates to 73 Tonnes CO₂ per year which represents a 60% improvement on the baseline TER (183 Tonnes) Building Regulations, Part L (2021).

SAP Results (Be Green)

DESCRIPTION	ANNUAL CO ₂ EMISSIONS (Tonnes CO ₂)
Unit 1 – End-terrace, first floor, 2-bed maisonette	6.99
Unit 4 – End-terrace, first floor, 1-bed apartment	6.28
Unit 5 – Semi-detached, first floor, 1-bed apartment	3.66
Unit 9 – End-terrace, second floor, 2-bed apartment	4.39
Unit 11 - Semi-detached, second floor, 1-bed apartment	3.22
Unit 13 - End-terrace, third floor, 2-bed apartment	5.52
Unit 15 - Semi-detached, third floor, 1-bed apartment	4.54

Table 5, Calculated DER Values

9.0 WATER EFFICIENCY

- 9.1 More than 20% of the UK's water is used domestically, with over 50% of this used for flushing WCs and washing (source: Environment Agency). The majority of this comes from drinking quality standard or potable water.
- 9.2 The water efficiency measures included will ensure that the water use target of 110litres per person per day is achieved. Water efficient devices will be fully evaluated and installed wherever possible. The specification of such devices will be considered during Stage 3 and 4 of the design. Each will be subject to an evaluation based on technical performance, cost and market appeal and compliance with the water use regulations. The following devices will be incorporated within the dwellings to achieve the water efficiency requirements.
- a) water efficient taps
 - b) water efficient toilets
 - c) low output showers
 - d) flow restrictors to manage water pressures to achieve optimum levels
 - e) water meters
- 9.3 Building Regulations Approved Document Part G – G2 and Appendix B set out the methodology for assessing water efficiency in buildings. Below is a typical specification, which would achieve the 110 Litres per person per year target (including 5 litres for external use).

APPLIANCE	FLOW RATE / CAPACITY
WC	5/3 L (dual Flush)
Basin Taps / Basins	4 L/min
Bath	180 L
Shower (Without plug)	8 L/min
Kitchen Taps / Sink	6 L
Washing Machine	8.17 L/kg
Dishwasher	1.25 L/place setting
Water use	103.3 L/person/day

Table 6, Appliances Consumption Data

- 9.4 In addition to the above, sanitary fittings and appliances will all comply with the maximum consumption of fittings as set out in Building Regulations Approved Document G.

- 9.5 No greywater or rainwater systems are proposed. Therefore, calculated wholesome water consumption per person per day is 103.3 litres which is less than the maximum permitted 105 litres for internal use in accordance with the Planning policy.

10.0 ELECTRICAL LOAD ASSESSMENT

- 10.1 To assess the residential electrical load the following assumptions/approximations have been made:
- a) Electric heat pumps are to be used for hot water and heating to all dwellings, suitably sized for the estimated heating load requirements.
 - b) Lighting will be LED throughout.
 - c) General small power at typical rates for dwellings per type.
 - d) Electric ovens and hobs are to be used with maximum loads of 4.0 kW and 7.5 kW respectively.
 - e) Street lighting based on LED lighting.
 - f) Allowance for landlords services and any centralised mechanical equipment within blocks of flats
- 10.2 Suitable individual diversification factors have been allowed as per industry guidance, specifically IET BS 7671:2018 On-Site Guide and BSRIA BG 9 2011.
- 10.3 A site wide diversification has been applied based on SSEN calculations and the number of properties being fed by a single supply.
- 10.4 The diversified electrical loads are as follows:

LOAD SCHEDULE					
Dwelling Type	Diversified Load Per Property	Total Number	Site Load with Individual Diversity (kW)	SSEN Diversity	Site Load With All Diversity (kW)
1-Bed Flat	14.92	11	150	0.60	90.0
2-Bed Flat	15.37	5	100	0.60	60.0
Landlord's Services					5.0
Total		16	250		155

Table 7, Load Assessment

11.0 ELECTRIC VEHICLE CHARGING

- 11.1 Approved Document S: Infrastructure for charging electric vehicles took effect on 15th June 2022. The document covers the requirements of electric vehicle (EV) charging points for both residential and non-residential premises.
- 11.2 Part S1 of the building regulations states that new residential developments with associated parking spaces shall have 1 EV charger per parking space, although there are limitations of the requirement.
- 11.3 Part S4 states that new non-residential buildings with more than 10 allocated parking spaces must have a minimum of 1 parking space with EV charging. Cable routes must then be provided to 1 fifth of the remaining spaces.
- 11.4 Mixed-use developments must adhere to both above regulations.

- 11.5 EV charge points are required to be capable of delivering a minimum of 7 kW and be designed in accordance with BS EN 6185 in order to comply with building regulations.
- 11.6 12 No. parking spaces are proposed, each with access to the EV charging post. A dual service post is proposed.



Figure 5, Dual EV Charger

- 11.7 A full site load assessment should be undertaken to ensure capacity when specifying EV chargers. Where the EV charging load is greater than the available load, a load management system can be implemented to allow for the use of a greater number of EV chargers than would normally be possible. This can be done by either setting a limit on the electrical load the chargers can take which is then equally distributed between them or by actively monitoring the total building load and adjusting EV charging capacity based on this information.
- 11.8 Power requirements for 12 No. EV chargers is around 88 kW. Adding this to the load assessment above gives a total of 243 kW.

12.0 CONCLUSION

- 12.1 When reviewing the energy strategy for this development, careful consideration has been given to the context of the site, local planning policy and Building Regulations. The approach taken for the proposed energy strategy for the development has followed the policies contained within the Wokingham Borough Local Plan and SPD's. A sequential approach will be adopted in line with the Energy Hierarchy, assessing in turn, the feasibility of reducing the energy demand of the building, using energy more cleanly and finally applying renewable technologies.

12.2 This can be achieved by adopting an efficient building envelope solution together with efficient mechanical and electrical plant and equipment throughout the building, including the following energy reduction measures to be considered within the design:

- a) High thermal performance of construction elements, including glazing.
- b) Low building air leakage rate ($3\text{m}^3/\text{hr}/\text{m}^2$ at 50 Pa)
- c) Natural Ventilation and daylighting
- d) Variable speed fans and pumps
- e) Low energy lighting including automatic occupancy controls.
- f) ASHP renewable technology

12.3 The Development is anticipated to achieve CO₂ emissions below the Building Regulations, Part L (2021) baseline through passive design measures and using air-source heat pumps as the primary heat source.

12.4 ASHP Scheme Summary Tables:

	REGULATED ANNUAL CO₂ EMISSIONS (Tonnes CO ₂ /yr)
Baseline	183
Be Lean, Be Clean, Be Green	73
	REGULATED ANNUAL ENERGY USAGE (kWh/yr)
Individual (gas-fired) heating and hot water	66,631
Electric heating and ASHP hot water	27,461

Table 8, Site Wide – (Top) Regulated Carbon Emissions and (Bottom) equivalent kWh Usage

	ANNUAL CO₂ EMISSION SAVING (Tonnes CO ₂ /yr)	PERCENTAGE SAVINGS (%)
Baseline	0	0
Be Lean, Be Clean, Be Green	110	60

Table 9, Site Wide – Carbon Emissions Savings

	ANNUAL ENERGY (kWh)	CONTRIBUTION (%)
Electric Heating	11,926	43%
Heat Pump Hot Water	11,113	40%
Pumps, fans, electric	1,935	7%
Lighting	2,487	9%

Table 1 - Energy Breakdown - Example Dwelling Unit

12.5 Incorporating electric heating and an ASHP for hot water, the development can be expected to achieve CO₂ savings of approx. 60% over Building Regulations, Part L (2021) baseline which exceeds policy compliance with LPA requirements.

12.6 The ASHP (hot water) accounts for 40% of the energy used which exceeds the 10% minimum in the Planning Condition (Condition 10).

13.0 APPENDICES

APPENDIX A – AS DESIGNED SAP CALCULATIONS

Summary for Input Data



Property Reference	Unit One		Issued on Date	07/11/2024	
Assessment Reference	00001_U Value & Opening		Prop Type Ref		
Property	Unit One, RGS 3LX				
SAP Rating	72 C	DER	6.99	TER	15.19
Environmental	94 A	% DER < TER			53.98
CO ₂ Emissions (t/year)	0.49	DFEE	46.80	TFEE	48.83
Compliance Check	See BREL	% DFEE < TFEE			4.17
% DPER < TPER	10.15	DPER	72.36	TPER	80.53
Assessor Details	Mrs. Neha Tandon			Assessor ID	Q054-0001
Client					

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

Orientation	West				
Property Tenure	ND				
Transaction Type	6				
Terrain Type	Urban				
1.0 Property Type	Flat, End-Terrace				
Position of Flat	Mid-floor flat				
Which Floor	1				
2.0 Number of Storeys	2				
3.0 Date Built	2025				
4.0 Sheltered Sides	1				
5.0 Sunlight/Shade	Average or unknown				
6.0 Thermal Mass Parameter	Enter TMP value				
Thermal Mass	100.00	kJ/m ² K			
7.0 Electricity Tariff	Standard				
Smart electricity meter fitted	No				
Smart gas meter fitted	No				
7.0 Measurements					
	Ground floor:	Heat Loss Perimeter	Internal Floor Area	Average Storey Height	
	1st Storey:	18.20 m	41.00 m ²	2.50 m	
		18.20 m	41.00 m ²	2.50 m	
8.0 Living Area	16.40 m ²				
9.0 External Walls					
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)
Lower External Wall	Cavity Wall	Other	0.18		45.50
FF External Wall	Cavity Wall	Other	0.18		45.25
9.1 Party Walls					
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Party Wall 1	Filled Cavity with Edge Sealing	Other	0.00		20.75
Party Wall 2	Filled Cavity with Edge Sealing	Other	0.00		20.75
10.0 External Roofs					
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)
External Roof 1	External Flat Roof	Other	0.13	0.00	41.00
11.0 Heat Loss Floors					
Description	Type	Storey Index	Construction	U-Value (W/m ² K)	Shelter Code
Exposed Floor	Exposed Floor - Solid	Lowest occupied	Other	0.11	None
12.0 Opening Types					

Summary for Input Data



Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Door	Manufacturer	Solid Door				0.00			1.00
Window	Manufacturer	Window	Double glazed			0.50		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Window	Window	Lower External Wall	West	2.00	
Window	Window	FF External Wall	West	2.00	
Window	Window	FF External Wall	West	2.00	
Window	Window	Lower External Wall	West	0.90	
Door	Door	Lower External Wall	West	2.40	
Window	Window	Lower External Wall	South	0.80	
Window	Window	Lower External Wall	South	0.80	
Window	Window	FF External Wall	South	0.80	
Window	Window	FF External Wall	East	0.80	
Window	Window	Lower External Wall	East	6.70	
Window	Window	FF External Wall	East	2.70	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Psi	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	11.90	0.20	0.20	No
E3 Sill	Independently assessed	11.90	0.04	0.04	No
E4 Jamb	Independently assessed	30.20	0.04	0.04	No
E6 Intermediate floor within a dwelling	Independently assessed	18.20	0.07	0.07	No
E16 Corner (normal)	Independently assessed	10.00	0.09	0.09	No
E18 Party wall between dwellings	Independently assessed	10.00	0.06	0.06	No
E9 Balcony between dwellings, wall insulation continuous	Table K1 - Default	5.00	0.15	0.15	No
E15 Flat roof with parapet	Table K1 - Default	26.40	0.30	0.30	No
E20 Exposed floor (normal)	Table K1 - Default	26.40	0.32	0.32	No
P4 Party wall - Roof (insulation at ceiling level)	Independently assessed	10.00	0.24	0.24	No
P7 Party Wall - Exposed floor (normal)	Independently assessed	10.00	0.00	0.00	No

Y-value

 W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500502
Configuration	3
Manufacturer SFP	0.66
Duct Type	Rigid
MVHR Efficiency	93.00
Wet Rooms	3
SFP from Installer Commissioning Certificate	No
MVHR System Location	Inside heated envelope (Installed exclusively)
Duct Installation Specification	Level 2

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0

Summary for Input Data



Number of fuelless gas fires	0									
21.0 Fixed Cooling System	No									
22.0 Pressure Testing	Yes									
Designed AP ₅₀	3.00								m ³ /(h.m ²) @ 50 Pa	
Test Method	Blower Door									
22.0 Lighting	No									
No Fixed Lighting	No									
	Name Lighting 1	Efficacy 90.00	Power 9.00	Capacity 810.00	Count 20					
24.0 Main Heating 1	SAP table									
Description	Electric Radiators									
Percentage of Heat	100.00								%	
Fuel Type	Electricity									
SAP Code	691									
In Winter	100.00									
In Summer	302.95									
Controls SAP Code	2603									
25.0 Main Heating 2	Database									
Percentage of Heat	0.00								%	
Database Ref. No.	105752									
Fuel Type	Electricity									
In Winter	0.00									
In Summer	302.95									
Model Name	EDL170-S20RF									
Manufacturer	Auer									
Controls	2100									
26.0 Heat Networks	None									
Space Community Heating	None									
Water Community Heating	None									
Existing Space	No									
	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	None									
Heat source 2	None									
Heat source 3	None									
Heat source 4	None									
Heat source 5	None									
27.0 Secondary Heating	None									
28.0 Water Heating	Main Heating 2									
Water Heating	Main Heating 2									
SAP Code	914									
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									
Cold Water Source	From mains									
Bath Count	1									
Immersion Only Heating Hot Water	No									

Summary for Input Data



28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
shower	Combi boiler or unvented hot water system	8.00		No	
shower 1	Combi boiler or unvented hot water system	8.00		No	

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder	Internal Store
Insulation Type	Measured Loss
Cylinder Volume	173.00 L
Loss	1.92 kWh/day
In Airing Cupboard	No

34.0 Small-scale Hydro

None											
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost	Typical savings per year	Ratings after Improvement	
		SAP rating	Environmental Impact
		0	0
		0	0
		0	0

Summary for Input Data



Property Reference	Unit 4		Issued on Date	07/11/2024	
Assessment Reference	00001	Prop Type Ref			
Property					

SAP Rating	79 C	DER	6.28	TER	14.30
Environmental	96 A	% DER < TER	56.08		
CO ₂ Emissions (t/year)	0.29	DFEE	31.73	TFEE	32.24
Compliance Check	See BREL	% DFEE < TFEE	1.61		
% DPER < TPER	14.34	DPER	65.27	TPER	76.20

Assessor Details	Mrs. Neha Tandon	Assessor ID	Q054-0001
Client			

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

Orientation	North									
Property Tenure	1									
Transaction Type	6									
Terrain Type	Urban									
1.0 Property Type	Flat, End-Terrace									
Position of Flat	Mid-floor flat									
Which Floor	1									
2.0 Number of Storeys	1									
3.0 Date Built	2025									
4.0 Sheltered Sides	0									
5.0 Sunlight/Shade	Average or unknown									
6.0 Thermal Mass Parameter	Enter TMP value									
Thermal Mass	100.00									kJ/m ² K

7.0 Electricity Tariff	Standard									
Smart electricity meter fitted	No									
Smart gas meter fitted	No									

7.0 Measurements	Ground floor:		Heat Loss Perimeter	Internal Floor Area	Average Storey Height
			23.70 m	53.00 m ²	2.50 m

8.0 Living Area	21.20					m ²
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9.0 External Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)	Shelter Rec	Shelter	Openings	Area Calculation Type
	External Wall 1	Cavity Wall	Other	0.18	48.25	11.00	38.21	0.00	None	10.04	Enter Gross Area
	Wall to Stairs	Cavity Wall	Other	0.18	11.00	11.00	0.00	None	None	0.00	Enter Gross Area

9.1 Party Walls	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Rec	Shelter
	Party Wall 1	Filled Cavity with Edge Sealing	Other	0.00	30.00	30.00	None	None

10.0 External Roofs	Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	External Roof 1	External Plane Roof	Other	0.11	0.00	1.70	1.70	None	0.00	Enter Gross Area	0.00

10.1 Party Ceilings	Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
	Party Ceiling 1	Other	0.00	53.00

11.1 Party Floors	Description	Storey Index	Construction	Kappa (kJ/m ² K)	Area (m ²)
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Summary for Input Data



Party Floor 1	Lowest occupied	Other	0.00	53.00
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12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Door	Manufacturer	Solid Door				0.00			
Window	Manufacturer	Window	Double glazed			0.50		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
Window	Window	External Wall 1	North East	2.72	
Window	Window	External Wall 1	North	2.08	
Window	Window	External Wall 1	East	0.30	
Window	Window	External Wall 1	East	0.30	
Window	Window	External Wall 1	East	2.24	
Door	Door	External Wall 1	South	2.40	

14.0 Conservatory

None

15.0 Draught Proofing

100 %

16.0 Draught Lobby

No

17.0 Thermal Bridging

Calculate Bridges

17.1 List of Bridges

Bridge Type	Source Type	Length	PaI	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	5.00	0.30	0.30	No
E3 Sill	Independently assessed	5.00	0.04	0.04	No
E4 Jamb	Independently assessed	13.60	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	41.40	0.07	0.07	No
E14 Flat roof	Independently assessed	6.00	0.08	0.08	No
E16 Corner (normal)	Independently assessed	12.50	0.09	0.09	No

Y-value 0.11 W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation System Present No

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of fuelless gas fires	0

21.0 Fixed Cooling System

No

22.0 Pressure Testing

Yes

Designed AP₅₀ 3.00 m³/(h.m²) @ 50 Pa

Test Method Blower Door

22.0 Lighting

No Fixed Lighting No

Name	Efficacy	Power	Capacity	Count
Lighting 1	90.00	9.00	810.00	20

24.0 Main Heating 1

SAP table

Description Electric Radiators

Percentage of Heat 100.00 %

Fuel Type Electricity

SAP Code 691

In Winter 100.00

Summary for Input Data



In Summer	302.95									
Controls SAP Code	2603									

25.0 Main Heating 2	Database									
Percentage of Heat	0.00									%
Database Ref. No.	105752									
Fuel Type	Electricity									
In Winter	0.00									
In Summer	302.95									
Model Name	EDL170-520RF									
Manufacturer	Auer									
Controls	2100									

26.0 Heat Networks	None									
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Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	None								
Heat source 2	None								
Heat source 3	None								
Heat source 4	None								
Heat source 5	None								

27.0 Secondary Heating	None									
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28.0 Water Heating	Main Heating 2									
SAP Code	914									
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									
Cold Water Source	From mains									
Bath Count	1									
Immersion Only Heating Hot Water	No									

28.1 Showers										
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To					
shower	Combi boiler or unvented hot water system	11.00		No						

28.3 Waste Water Heat Recovery System										
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29.0 Hot Water Cylinder	Internal Store									
Insulation Type	Measured Loss									
Cylinder Volume	173.00									L
Loss	1.92									kWh/day
In Airing Cupboard	No									

Recommendations										
Lower cost measures	None									
Further measures to achieve even higher standards										
Typical Cost	Typical savings per year	SAP rating	Ratings after Improvement	Environmental Impact						
		0		0						
		0		0						
		0		0						

Summary for Input Data



Property Reference	Unit 5	Issued on Date	07/11/2024
Assessment Reference	00001	Prop Type Ref	
Property			
SAP Rating	87 B	DER	3.65
Environmental	97 A	TER	11.08
CO ₂ Emissions (t/year)	0.18	% DER < TER	66.97
Compliance Check	See BREL	DFEE	19.35
% DPER < TPER	33.62	TFEE	19.88
		% DFEE < TFEE	2.66
		DPER	38.77
		TPER	58.41
Assessor Details	Mrs. Neha Tandon	Assessor ID	Q054-0001
Client			

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

Orientation	North									
Property Tenure	1									
Transaction Type	6									
Terrain Type	Urban									
1.0 Property Type	Flat, Mid-Terrace									
Position of Flat	Mid-floor flat									
Which Floor	1									
2.0 Number of Storeys	1									
3.0 Date Built	2025									
4.0 Sheltered Sides	0									
5.0 Sunlight/Shade	Average or unknown									
6.0 Thermal Mass Parameter	Enter TMP value									
Thermal Mass	100.00									KJ/m ² K
7.0 Electricity Tariff	Standard									
Smart electricity meter fitted	No									
Smart gas meter fitted	No									
7.0 Measurements	Ground floor: Heat Loss Perimeter 8.80 m Internal Floor Area 55.00 m² Average Storey Height 2.50 m									
8.0 Living Area	25.10									m ²
9.0 External Walls										
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Other	0.18		22.00	15.12	0.00	None	6.88	Enter Gross Area
9.1 Party Walls										
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter			
Party Wall 1	Filled Cavity with Edge Sealing	Other	0.00		60.00		None			
10.0 External Roofs										
Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area(m ²)	Nett Area (m ²)	Shelter Code	Shelter Factor	Calculation Type	Openings
External Roof 1	External Plane Roof	Other	0.13	0.00	8.00	8.00	None	0.00	Enter Gross Area	0.00
10.1 Party Ceilings										
Description	Construction					Kappa (kJ/m ² K)	Area (m ²)			
Party Ceiling 1	Other					0.00	55.00			
11.1 Party Floors										
Description	Storey Index	Construction				Kappa (kJ/m ² K)	Area (m ²)			
Party Floor 1	Lowest occupied	Other				0.00	55.00			

Summary for Input Data



12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Door	Manufacturer	Solid Door				0.00			1.00
Window	Manufacturer	Window	Double glazed			0.50		0.70	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m²)	Pitch
window	Window	External Wall 1	South	2.72	
window	Window	External Wall 1	North	2.08	
window	Window	External Wall 1	North	2.08	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Pa	Adjusted Reference:	Imported
E2 Other lintels (Including other steel lintels)	Independently assessed	4.30	0.30	0.30	No
E3 Sill	Independently assessed	4.30	0.04	0.04	No
E4 Jamb	Independently assessed	9.60	0.04	0.04	No
E7 Party floor between dwellings (In blocks of flats)	Independently assessed	5.10	0.07	0.07	No
E14 Flat roof	Independently assessed	12.50	0.08	0.08	No
E18 Party wall between dwellings	Independently assessed	10.00	0.06	0.06	No
E17 Corner (Inverted – Internal area greater than external area)	Independently assessed	5.00	-0.09	-0.09	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500794
Configuration	1
Manufacturer SFP	0.54
Duct Type	Rigid
MVHR Efficiency	90.00
Wet Rooms	1
SFP from Installer Commissioning Certificate	No
MVHR System Location	Inside heated envelope (Installed exclusively)
Duct Installation Specification	Level 2

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of fuelless gas fires	0

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP ₅₀	3.00 m³/(h.m²) @ 50 Pa
Test Method	Blower Door

Summary for Input Data



22.0 Lighting

No Fixed Lighting

No				
Name	Efficacy	Power	Capacity	Count
Lighting 1	90.00	9.00	810.00	20

24.0 Main Heating 1

Percentage of Heat

SAP table

100.00 %

Fuel Type

Electricity

SAP Code

691

In Winter

100.00

In Summer

302.95

Controls SAP Code

2603

25.0 Main Heating 2

Percentage of Heat

Database

0.00 %

Database Ref. No.

105752

Fuel Type

Electricity

In Winter

0.00

In Summer

302.95

Model Name

EDL170-S20RF

Manufacturer

Auer

Controls

2100

26.0 Heat Networks

None

	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	None									
Heat source 2	None									
Heat source 3	None									
Heat source 4	None									
Heat source 5	None									

27.0 Secondary Heating

None

28.0 Water Heating

Water Heating

Main Heating 2

SAP Code

914

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

Cold Water Source

From mains

Bath Count

1

Immersion Only Heating Hot Water

No

28.1 Showers

Description

Shower Type

Flow Rate

Rated Power

Connected

Connected To

Shower

Combi boiler or unvented hot water system

11.00

[kW]

No

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Insulation Type

Internal Store

Measured Loss

Cylinder Volume

173.00

L

Loss

1.92

kWh/day

In Airing Cupboard

No

Summary for Input Data



34.0 Small-scale Hydro

None

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost

Typical savings per year

Ratings after Improvement
SAP rating Environmental impact

0	0
0	0
0	0

Summary for Input Data



Property Reference	Unit 9	Issued on Date	07/11/2024
Assessment Reference	00001	Prop Type Ref	
Property			

SAP Rating	83 B	DER	4.39	TER	10.93
Environmental	96 A	% DER < TER	59.84		
CO ₂ Emissions (t/year)	0.28	DFEE	26.87	TFEE	27.12
Compliance Check	See BREL	% DFEE < TFEE	0.94		
% DPER < TPER	19.91	DPER	46.04	TPER	57.48

Assessor Details	Mrs. Neha Tandon	Assessor ID	Q054-0001
Client			

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

Orientation	North	
Property Tenure	1	
Transaction Type	6	
Terrain Type	Urban	
1.0 Property Type	Flat, End-Terrace	
Position of Flat	Mid-floor flat	
Which Floor	1	
2.0 Number of Storeys	1	
3.0 Date Built	2025	
4.0 Sheltered Sides	0	
5.0 Sunlight/Shade	Average or unknown	
6.0 Thermal Mass Parameter	Enter TMP value	
Thermal Mass	100.00	kJ/m²K

7.0 Electricity Tariff	Standard
Smart electricity meter fitted	No
Smart gas meter fitted	No

7.0 Measurements	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
	Ground floor: 26.80 m	75.00 m ²	2.50 m

8.0 Living Area	22.20	m ²
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Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Other	0.18		56.00	45.64	0.00	None	10.36	Enter Gross Area
Wall to Stairs	Cavity Wall	Other	0.18		11.00	11.00	0.00	None	0.00	Enter Gross Area

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)	Shelter Res	Shelter
Party Wall 1	Filled Cavity with Edge Sealing	Other	0.00		38.25		None

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceiling 1	Other	0.00	75.00

Description	Storey Index	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Floor 1	Lowest occupied	Other	0.00	75.00

Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m ² K)
Door	Manufacturer	Solid Door				0.00			1.00
Window	Manufacturer	Window	Double glazed			0.50		0.70	1.20

Summary for Input Data



13.0 Openings

Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
Window	Window	External Wall 1	North East	2.72	
Window	Window	External Wall 1	East	0.30	
Window	Window	External Wall 1	East	0.30	
Window	Window	External Wall 1	East	2.24	
Door	Door	External Wall 1	South	2.40	
Window	Window	External Wall 1	South	2.40	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	Pa	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	5.00	0.30	0.30	No
E3 Sill	Independently assessed	5.00	0.04	0.04	No
E4 Jamb	Independently assessed	13.40	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	53.60	0.07	0.07	No
E16 Corner (normal)	Independently assessed	12.50	0.09	0.09	No
E18 Party wall between dwellings	Independently assessed	15.00	0.06	0.06	No
E9 Balcony between dwellings, wall insulation continuous	Table K1 - Default	5.90	0.15	0.15	No
E17 Corner (Inverted - Internal area greater than external area)	Independently assessed	5.00	-0.09	-0.09	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
Manufacturer SFP	0.60
Duct Type	Rigid
MVHR Efficiency	90.00
Wet Rooms	2
Brand, Model	tbc
SFP from Installer Commissioning Certificate	No
MVHR System Location	Inside heated envelope (installed exclusively)
Duct Installation Specification	Level 2

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of fuelless gas fires	0

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP ₅₀	3.00 m ³ /(h.m ²) @ 50 Pa
Test Method	Blower Door

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting 1	90.00	9.00	810.00	20

Summary for Input Data



24.0 Main Heating 1

SAP table	
Percentage of Heat	100.00 %
Fuel Type	Electricity
SAP Code	691
In Winter	100.00
In Summer	302.95
Controls SAP Code	2603

25.0 Main Heating 2

Database	
Percentage of Heat	0.00 %
Database Ref. No.	105752
Fuel Type	Electricity
In Winter	0.00
In Summer	302.95
Model Name	EDL170-520RF
Manufacturer	Auer
Controls	2100

26.0 Heat Networks

1.0 Heat Networks		None								
	Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	None									
Heat source 2	None									
Heat source 3	None									
Heat source 4	None									
Heat source 5	None									

27.0 Secondary Heating

None	
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28.0 Water Heating

Water Heating	Main Heating 2
SAP Code	914
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
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower	Combi boiler or unvented hot water system	11.00		No	

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Internal Store	
Insulation Type	Measured Loss
Cylinder Volume	173.00 L
Loss	1.92 kWh/day
In Airing Cupboard	No

Recommendations

Lower cost measures	None
Further measures to achieve even higher standards	

Summary for Input Data



Typical Cost

Typical savings per year

Ratings after Improvement
SAP rating Environmental Impact
0 0
0 0
0 0

Summary for Input Data



Property Reference	Unit 11	Issued on Date	07/11/2024
Assessment Reference	00001	Prop Type Ref	
Property			
SAP Rating	89 B	DER	3.22
Environmental	98 A	TER	10.74
CO ₂ Emissions (t/year)	0.15	% DER < TER	70.02
Compliance Check	See BREL	DFEE	17.75
% DPER < TPER	39.63	TTEE	17.77
		% DFEE < TTEE	0.12
		DPER	34.17
		TPER	56.61
Assessor Details	Mrs. Neha Tandon	Assessor ID	Q054-0001
Client			

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

Orientation	North										
Property Tenture	1										
Transaction Type	6										
Terrain Type	Urban										
1.0 Property Type	Flat, Mid-Terrace										
Position of Flat	Mid-floor flat										
Which Floor	1										
2.0 Number of Storeys	1										
3.0 Date Built	2025										
4.0 Sheltered Sides	2										
5.0 Sunlight/Shade	Average or unknown										
6.0 Thermal Mass Parameter	Enter TMP value										
Thermal Mass	100.00									kJ/m²K	
7.0 Electricity Tariff	Standard										
Smart electricity meter fitted	No										
Smart gas meter fitted	No										
7.0 Measurements											
				Heat Loss Perimeter		Internal Floor Area		Average Storey Height			
Ground floor:				9.00 m		54.00 m²		2.50 m			
8.0 Living Area	20.00									m²	
9.0 External Walls											
Description	Type	Construction		U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Res	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Other		0.18		20.25	13.25	0.00	None	7.00	Enter Gross Area
9.1 Party Walls											
Description	Type	Construction		U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter			
Party Wall 1	Filled Cavity with Edge Sealing	Other		0.00		51.50		None			
10.1 Party Ceilings											
Description			Construction				Kappa (kJ/m²K)	Area (m²)			
Party Ceiling 1			Other				0.00	54.00			
11.1 Party Floors											
Description			Storey Index	Construction				Kappa (kJ/m²K)	Area (m²)		
Party Floor 1			Lowest occupied	Other				0.00	54.00		
12.0 Opening Types											
Description	Data Source	Type	Glazing		Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)	
Door	Manufacturer	Solid Door					0.00			1.00	
Window	Manufacturer	Window	Double glazed				0.50		0.70	1.20	

Summary for Input Data



13.0 Openings

Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
Window	Window	External Wall 1	South	2.40	
Window	Window	External Wall 1	North	4.60	

14.0 Conservatory

15.0 Draught Proofing

 %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	PaI	Adjusted Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	3.60	0.20	0.20	No
E3 Sill	Independently assessed	3.60	0.04	0.04	No
E4 Jamb	Independently assessed	7.60	0.04	0.04	No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	18.00	0.07	0.07	No
E18 Party wall between dwellings	Independently assessed	10.00	0.06	0.06	No
E17 Corner (Inverted – Internal area greater than external area)	Independently assessed	5.00	-0.09	-0.09	No
E9 Balcony between dwellings, wall insulation continuous	Table K1 - Default	5.30	0.15	0.15	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present	Yes
Approved Installation	No
Mechanical Ventilation data Type	Database
Type	Balanced mechanical ventilation with heat recovery
MV Reference Number	500794
Configuration	1
Manufacturer SFP	0.54
Duct Type	Rigid
MVHR Efficiency	90.00
Wet Rooms	1
SFP from Installer Commissioning Certificate	No
MVHR System Location	Inside heated envelope (installed exclusively)
Duct Installation Specification	Level 2

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of flueless gas fires	0

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Test Method

22.0 Lighting

No Fixed Lighting

Name	Efficacy	Power	Capacity	Count
Lighting 1	90.00	9.00	810.00	20

Summary for Input Data



24.0 Main Heating 1

SAP table	
Description	Electric Radiators
Percentage of Heat	100.00 %
Fuel Type	Electricity
SAP Code	691
In Winter	100.00
In Summer	302.95
Controls SAP Code	2603

25.0 Main Heating 2

Database	
Percentage of Heat	0.00 %
Database Ref. No.	105752
Fuel Type	Electricity
In Winter	0.00
In Summer	302.95
Model Name	EDL170-S20RF
Manufacturer	Auer
Controls	2100

26.0 Heat Networks

None

Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	None								
Heat source 2	None								
Heat source 3	None								
Heat source 4	None								
Heat source 5	None								

27.0 Secondary Heating

None

28.0 Water Heating

Water Heating	Main Heating 2
SAP Code	914
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
Cold Water Source	From mains
Bath Count	1
Immersion Only Heating Hot Water	No

28.1 Showers

Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower	Combi boiler or unvented hot water system	8.00		No	

28.3 Waste Water Heat Recovery System

29.0 Hot Water Cylinder

Internal Store	
Insulation Type	Measured Loss
Cylinder Volume	173.00 L
Loss	1.92 kWh/day
In Airing Cupboard	No

34.0 Small-scale Hydro

None

Summary for Input Data



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Recommendations												
Lower cost measures												
None												
Further measures to achieve even higher standards												
					Typical Cost		Typical savings per year					
										Ratings after Improvement		
										SAP rating	Environmental Impact	
										0	0	
										0	0	
										0	0	

Summary for Input Data



Property Reference	Unit 13	Issued on Date	07/11/2024
Assessment Reference	00001	Prop Type Ref	
Property			
SAP Rating	78 C	DER	5.52
Environmental	96 A	TER	12.50
CO ₂ Emissions (t/year)	0.36	% DER < TER	55.84
Compliance Check	See BREL	DFEE	34.38
% DPER < TPER	12.73	TFEE	34.60
		% DFEE < TFEE	0.66
		DPER	57.54
		TPER	65.93
Assessor Details	Mrs. Neha Tandon	Assessor ID	Q054-0001
Client			

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

Orientation	West										
Property Tenure	1										
Transaction Type	6										
Terrain Type	Urban										
1.0 Property Type	Flat, End-Terrace										
Position of Flat	Mid-floor flat										
Which Floor	1										
2.0 Number of Storeys	1										
3.0 Date Built	2025										
4.0 Sheltered Sides	0										
5.0 Sunlight/Shade	Average or unknown										
6.0 Thermal Mass Parameter	Enter TMP value										
Thermal Mass	100.00									kJ/m²K	
7.0 Electricity Tariff	Standard										
Smart electricity meter fitted	No										
Smart gas meter fitted	No										
7.0 Measurements	Ground floor: 26.80 m Heat Loss Perimeter 26.80 m Internal Floor Area 75.00 m² Average Storey Height 2.50 m										
8.0 Living Area	22.20									m²	
9.0 External Walls	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Rec	Shelter	Openings	Area Calculation Type
	External Wall 1	Cavity Wall	Other	0.18	0.18	56.00	45.54	0.00	None	10.36	Enter Gross Area
	Wall to Stairs	Cavity Wall	Other	0.18	0.18	11.00	11.00	0.00	None	0.00	Enter Gross Area
9.1 Party Walls	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Res	Shelter			
	Party Wall 1	Filled Cavity with Edge Sealing	Other	0.00	0.00	38.25		None			
10.0 External Roofs	Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area(m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
	External Roof 1	External Plane Roof	Other	0.11	0.00	75.00	75.00	None	0.00	Enter Gross Area	0.00
11.1 Party Floors	Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)						
	Party Floor 1	Lowest occupied	Other	0.00	75.00						
12.0 Opening Types	Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)	

Summary for Input Data



Door	Manufacturer	Solid Door	Double glazed	0.00	1.00
Window	Manufacturer	Window		0.50	1.20

13.0 Openings

Name	Opening Type	Location	Orientation	Area (m ²)	Pitch
Window	Window	External Wall 1	North East	2.72	
Window	Window	External Wall 1	East	0.30	
Window	Window	External Wall 1	East	0.30	
Window	Window	External Wall 1	East	2.24	
Window	Window	External Wall 1	South	2.40	
Door	Door	External Wall 1	South	2.40	

14.0 Conservatory

15.0 Draught Proofing %

16.0 Draught Lobby

17.0 Thermal Bridging

17.1 List of Bridges

Bridge Type	Source Type	Length	PaI	Adjusted Reference:	Imported
E2 Other lintels (Including other steel lintels)	Independently assessed	5.00	0.30	0.30	No
E3 Sill	Independently assessed	5.00	0.04	0.04	No
E4 Jamb	Independently assessed	13.40	0.04	0.04	No
E7 Party floor between dwellings (In blocks of flats)	Independently assessed	53.60	0.07	0.07	No
E9 Balcony between dwellings, wall insulation continuous	Table K1 - Default	5.90	0.15	0.15	No
E16 Corner (normal)	Independently assessed	12.50	0.09	0.09	No
E17 Corner (Inverted – Internal area greater than external area)	Independently assessed	5.00	-0.09	-0.09	No
E14 Flat roof	Independently assessed	42.10	0.08	0.08	No
E18 Party wall between dwellings	Independently assessed	15.00	0.05	0.05	No

Y-value W/m²K

19.0 Mechanical Ventilation

Mechanical Ventilation

Mechanical Ventilation System Present

Mechanical Ventilation data Type

Type

Manufacturer SFP

Duct Type

MVHR Efficiency

Wet Rooms

Brand, Model

SFP from Installer Commissioning Certificate

MVHR System Location

Duct Installation Specification

20.0 Fans, Open Fireplaces, Flues

Number of open chimneys

Number of open flues

Number of chimneys/flues attached to closed fire

Number of flues attached to solid fuel boiler

Number of flues attached to other heater

Number of blocked chimneys

Number of intermittent extract fans

Number of passive vents

Number of flueless gas fires

21.0 Fixed Cooling System

22.0 Pressure Testing

Designed AP₅₀ m³/(h.m²) @ 50 Pa

Test Method

22.0 Lighting

Summary for Input Data



No Fixed Lighting	No				
	Name Lighting 1	Efficacy 90.00	Power 9.00	Capacity 810.00	Count 20

24.0 Main Heating 1	SAP table				
Percentage of Heat	100.00 %				
Fuel Type	Electricity				
SAP Code	691				
In Winter	100.00				
In Summer	302.95				
Controls SAP Code	2603				

25.0 Main Heating 2	Database				
Percentage of Heat	0.00 %				
Database Ref. No.	105752				
Fuel Type	Electricity				
In Winter	0.00				
In Summer	302.95				
Model Name	EDL170-S20RF				
Manufacturer	Auer				
Controls	2100				

26.0 Heat Networks	None				
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Heat Source	Fuel Type	Heating Use	Efficiency	Percentage Of Heat	Heat	Heat Power Ratio	Electrical	Fuel Factor	Efficiency type
Heat source 1	None								
Heat source 2	None								
Heat source 3	None								
Heat source 4	None								
Heat source 5	None								

27.0 Secondary Heating	None				
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28.0 Water Heating	Main Heating 2				
SAP Code	914				
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				
Cold Water Source	From mains				
Bath Count	1				
Immersion Only Heating Hot Water	No				

28.1 Showers					
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
Shower	Combi boiler or unvented hot water system	11.00		No	

28.3 Waste Water Heat Recovery System					
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29.0 Hot Water Cylinder	Internal Store				
Insulation Type	Measured Loss				
Cylinder Volume	173.00 L				
Loss	1.92 kWh/day				
In Airing Cupboard	No				

Summary for Input Data



Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

Typical Cost

Typical savings per year

Ratings after Improvement	
SAP rating	Environmental Impact
0	0
0	0
0	0

Summary for Input Data



Property Reference	Unit 15	Issued on Date	07/11/2024
Assessment Reference	00001	Prop Type Ref	
Property			
SAP Rating	84 B	DER	4.54
Environmental	97 A	TER	12.47
CO ₂ Emissions (t/year)	0.21	% DER < TER	63.59
Compliance Check	See BREL	DFEE	25.50
% DPER < TPER	27.44	TFEE	26.19
		% DFEE < TFEE	2.64
		DPER	47.81
		TPER	65.89
Assessor Details	Mrs. Neha Tandon	Assessor ID	Q054-0001
Client			

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

Orientation	North									
Property Tenure	1									
Transaction Type	6									
Terrain Type	Urban									
1.0 Property Type	Flat, Mid-Terrace									
Position of Flat	Mid-floor flat									
Which Floor	1									
2.0 Number of Storeys	1									
3.0 Date Built	2025									
4.0 Sheltered Sides	0									
5.0 Sunlight/Shade	Average or unknown									
6.0 Thermal Mass Parameter	Enter TMP value									
Thermal Mass	100.00									kJ/m²K
7.0 Electricity Tariff	Standard									
Smart electricity meter fitted	No									
Smart gas meter fitted	No									
7.0 Measurements										
	Ground floor:		Heat Loss Perimeter		Internal Floor Area		Average Storey Height			
			9.00 m		54.00 m²		2.50 m			
8.0 Living Area	20.00									m²
9.0 External Walls										
Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)	Shelter Rec	Shelter	Openings	Area Calculation Type
External Wall 1	Cavity Wall	Other	0.18		20.25	13.25	0.00	None	7.00	Enter Gross Area
9.1 Party Walls										
Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Area (m²)	Shelter Rec	Shelter			
Party Wall 1	Filled Cavity with Edge Sealing	Other	0.00		51.50		None			
10.0 External Roofs										
Description	Type	Construction	U-Value (W/m²K)	Kappa (kJ/m²K)	Gross Area (m²)	Nett Area (m²)	Shelter Code	Shelter Factor	Calculation Type	Openings
External Roof 1	External Flat Roof	Other	0.11	0.00	54.00	54.00	None	0.00	Enter Gross Area	0.00
11.1 Party Floors										
Description	Storey Index	Construction	Kappa (kJ/m²K)	Area (m²)						
Party Floor 1	Lowest occupied	Other	0.00	54.00						
12.0 Opening Types										
Description	Data Source	Type	Glazing	Glazing Gap	Filling Type	G-value	Frame Type	Frame Factor	U Value (W/m²K)	
Door	Manufacturer	Solid Door				0.00			1.00	

Summary for Input Data



Window	Manufacturer	Window	Double glazed	0.50	0.70	1.20
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13.0 Openings						
Name	Opening Type	Location	Orientation	Area (m ²)	Pitch	
Window	Window	External Wall 1	South	2.40		
Window	Window	External Wall 1	North	4.60		

14.0 Conservatory	None
15.0 Draught Proofing	100 %
16.0 Draught Lobby	No

17.0 Thermal Bridging	Calculate Bridges
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17.1 List of Bridges						
Bridge Type	Source Type	Length	Psi	Adjusted	Reference:	Imported
E2 Other lintels (including other steel lintels)	Independently assessed	3.60	0.30	0.30		No
E3 Sill	Independently assessed	3.60	0.04	0.04		No
E4 Jamb	Independently assessed	7.60	0.04	0.04		No
E7 Party floor between dwellings (in blocks of flats)	Independently assessed	18.00	0.07	0.07		No
E18 Party wall between dwellings	Independently assessed	10.00	0.06	0.06		No
E17 Corner (Inverted – Internal area greater than external area)	Independently assessed	7.00	-0.09	-0.09		No
E14 Flat roof	Independently assessed	29.60	0.08	0.08		No

Y-value	0.07	W/m ² K
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19.0 Mechanical Ventilation	
Mechanical Ventilation	
Mechanical Ventilation System Present	Yes
Mechanical Ventilation data Type	Data Sheet
Type	Balanced mechanical ventilation with heat recovery
Manufacturer SFP	0.60
Duct Type	Rigid
MVHR Efficiency	90.00
Wet Rooms	2
Brand, Model	tbc
SFP from Installer Commissioning Certificate	No
MVHR System Location	Inside heated envelope (Installed exclusively)
Duct Installation Specification	Level 2

20.0 Fans, Open Fireplaces, Flues	
Number of open chimneys	0
Number of open flues	0
Number of chimneys/flues attached to closed fire	0
Number of flues attached to solid fuel boiler	0
Number of flues attached to other heater	0
Number of blocked chimneys	0
Number of intermittent extract fans	0
Number of passive vents	0
Number of flueless gas fires	0

21.0 Fixed Cooling System	No
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22.0 Pressure Testing	Yes
Designed AP ₅₀	3.00 m ³ /(h.m ²) @ 50 Pa
Test Method	Blower Door

22.0 Lighting					
No Fixed Lighting	No				
	Name	Efficacy	Power	Capacity	Count
	Lighting 1	90.00	9.00	810.00	20

24.0 Main Heating 1	SAP table
Percentage of Heat	100.00 %

Summary for Input Data



Fuel Type	Electricity				
SAP Code	691				
In Winter	100.00				
In Summer	302.95				
Controls SAP Code	2603				

25.0 Main Heating 2	Database				
Percentage of Heat	0.00	%			
Database Ref. No.	105752				
Fuel Type	Electricity				
In Winter	0.00				
In Summer	302.95				
Model Name	EDL170-S20RF				
Manufacturer	Auer				
Controls	2100				

26.0 Heat Networks	None				
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27.0 Secondary Heating	None				
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28.0 Water Heating	Main Heating 2				
Water Heating	Main Heating 2				
SAP Code	914				
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				
Cold Water Source	From mains				
Bath Count	1				
Immersion Only Heating Hot Water	No				

28.1 Showers					
Description	Shower Type	Flow Rate [l/min]	Rated Power [kW]	Connected	Connected To
shower	Combi boiler or unvented hot water system	11.00		No	

28.3 Waste Water Heat Recovery System					
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29.0 Hot Water Cylinder	Internal Store				
Insulation Type	Measured Loss				
Cylinder Volume	173.00	L			
Loss	1.92	kWh/day			
In Airing Cupboard	No				

Recommendations					
Lower cost measures	None				
Further measures to achieve even higher standards					
Typical Cost	Typical savings per year	Ratings after Improvement			
		SAP rating	Environmental Impact		
		0	0		
		0	0		
		0	0		