LONGLEAZE LANE, MELKSHAM

Energy Statement Report

A report prepared for and on behalf of:

Aspire

HARNISS

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Energy Statement

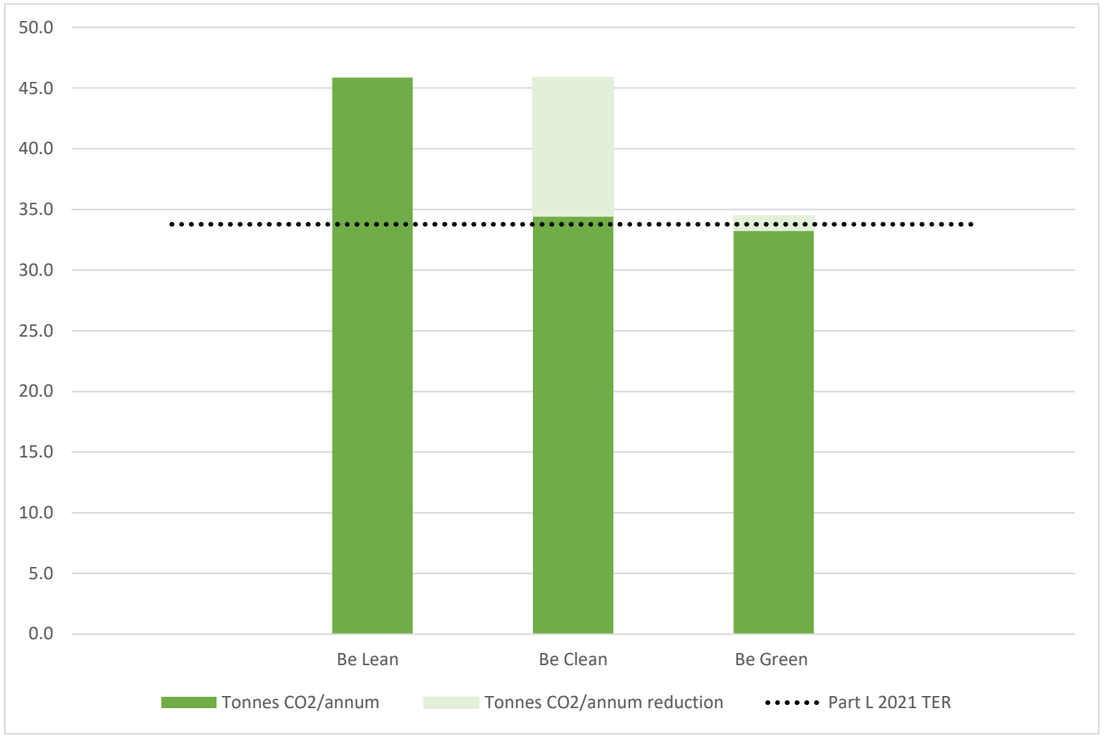
1.0 EXECUTIVE SUMMARY

1.1 This document details the intended energy and sustainability strategy for the proposed care home based on Longleaze Lane, Melksham. The development briefly comprises of the construction of a new 82 bed care home (Use Class C2) on the site and the associated works including car parking, access, landscaping, and associated engineering. This report has been prepared by Harniss Consulting on behalf of Aspire

1.2 The ethos for the design of the proposed development follows the recognised energy hierarchy to "Be Lean, Be Clean, Be Green", i.e. to minimise the building's energy usage before applying low carbon technologies/renewables to the design.

1.3 By following the energy hierarchy, the building wasn't found to be compliant with Building Regulations Approved Document Part L2:2021 without additional renewable or low carbon technology. However, with the inclusion of, a full air source heat pump solution, efficient mechanical ventilation systems and 50m² Photovoltaic array, the development is compliant against Part L2:2021

1.4 The scheme has a predicted carbon reduction of circa 1.49% beyond part L compliance (0.12kgCO2 /annum) based upon the included provision of ASHP technology and a 0.25kWp photovoltaic array (approx. 50m²).



Summary

The following summarises the key drivers of the energy strategy for the development:

- **Enhanced building fabric performance has been targeted through improved thermal performance and reduced air permeability.**
- **Energy efficient heating, domestic hot water, cooling, ventilation, and lighting systems throughout.**
- **Energy efficient controls for HVAC and lighting to minimise building in-use energy.**
- **An initial desk top study was undertaken to assess the most viable low zero caron technologies for proposed implementation to achieve compliance with the local planning policy.**
- **a full air source heat pump solution, efficient mechanical ventilation systems and 50m² Photovoltaic array, the development is compliant against Part L2:2021 was found to be the most feasible source of low carbon technology for the Care Home on this project based on the findings of Section 6, whole life cycle cost, spatial considerations, and impact to the local population / building aesthetics.**

The conclusion of the conceptual design stage energy strategy is to a full air source heat pump solution, efficient mechanical ventilation systems and 50m² Photovoltaic array to meet Part L2: 2021 regulations.

The Strategy outlined in this report would result in the same impact as the following (10 tonnes of CO2 saved over 20 years):



168 Trees

Grown for 10 years

17 Flights

From London to New York (per passenger)

918 Train journeys

From London to Paris (per passenger)

2.0 INTRODUCTION

2.1 The report has been prepared in accordance with Part L2:2021 of the building regulations with the assessment showing compliance with all applicable criteria.

2.2 The strategy for the development takes into account the recognised energy hierarchy to "Be Lean, Be Clean, Be Green", i.e. to minimise the energy usage within each building before applying renewable technologies to the design.

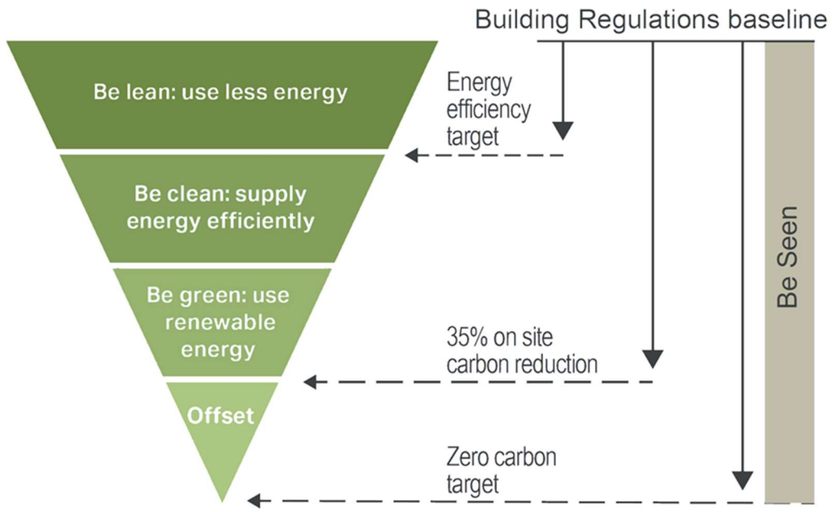


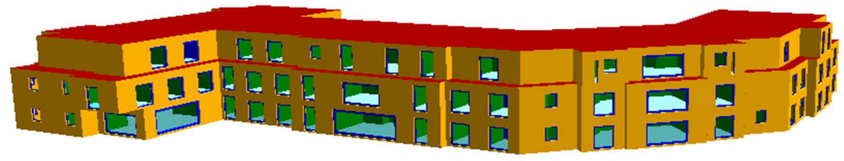
Figure 2 – GLA Energy Hierarchy

2.3 Further work will be required at later stages in the detailed design process to ensure that the requirement to comply with the above targets and that all statutory guidelines or local planning enforcement requirements are met.

2.4 Based on the construction values outlined by the architect and working to a high efficiency building services specification the baseline building achieved compliance with AD Part L2 2021 without renewable or LZC technology being applied.

3.0 THERMAL MODELLING

3.1 Analysis for the building has been undertaken utilising EDSL Tas software version 9.5.5. EDSL Tas is industry leading NCM accredited thermal modelling software which carries out dynamic hourly simulations of the anticipated energy usage and compares it against the notional benchmarks set under AD Part L2 of the building regulations. The software was initially used to determine a baseline carbon emission using fabric performance values as discussed with the development team (as detailed in the body of the report) without contribution from additional renewable technologies.



4.0 LOCAL PLANNING POLICIES

4.1 The development is within the Wiltshire Council and so falls under the Wiltshire Core Strategy – Core Policy 41 – Sustainable construction and low-carbon energy.

Core Policy 41 -Sustainable construction and low-carbon energy

Climate change adaptation

New development, building conversions, refurbishments and extensions will be encouraged to incorporate design measures to reduce energy demand. Development will be well insulated and designed to take advantage of natural light and heat from the sun and use natural air movement for ventilation, whilst maximising cooling in the summer.

Sustainable construction

New homes (excluding extensions and conversions) will be required to achieve at least Level 4 (in full) of the Code for Sustainable Homes. Conversions of property to residential use will not be permitted unless BREEAM's Homes "Very Good" standards are achieved.

All non-residential development will be required to achieve the relevant BREEAM "Very Good" standards, rising to the relevant BREEAM "Excellent" standards from 2019.

Existing buildings

Retrofitting measures to improve the energy performance of existing buildings will be encouraged in accordance with the following hierarchy:

i. Reduce energy consumption through energy efficiency measures

ii. Use renewable or low-carbon energy from a local/district source

iii. Use building-integrated renewable or low-carbon technologies.

Opportunities should be sought to facilitate carbon reduction through retrofitting at whole street or neighbourhood scales to reduce individual costs, improve viability and support coordinated programmes for improvement.

Renewable and low-carbon energy

All proposals for major development87 will be required to submit a Sustainable Energy Strategy alongside the planning application outlining the low-carbon strategy for the proposal.

In all cases, including those listed above, proposals relating to historic buildings, listed buildings and buildings within conservation areas and world heritage sites should ensure that appropriate sensitive approaches and materials are used.

Safeguarding of the significance of heritage assets should be in accordance with appropriate national policy and established best practice.

5.0 DESCRIPTION OF DEVELOPMENT

5.1 The proposed development consists of a new 82 bed care home (Use Class C2) located in Longleaze Lane, Melksham, briefly comprising of:

- 82 bed care home with dedicated ensuites
- Community spaces including
- Main reception area
- Kitchen and Restaurant Café
- Lounges
- Dining Rooms
- Activity Areas

5.2 Our assessment has been based on the following architectural AutoCAD drawings, produced by Aspire:

- ASP-CH-034-PL001A-LocationPlan
- ASP-CH-034-PL002C-SitePlan
- ASP-CH-034-PL003C-Elevations1
- ASP-CH-034-PL004C-Elevations2
- ASP-CH-034-PL007B-GroundFloor
- ASP-CH-034-PL008B-FirstFloor
- ASP-CH-034-PL009B-SecondFloor
- ASP-CH-034-PL010B-RoofPlan

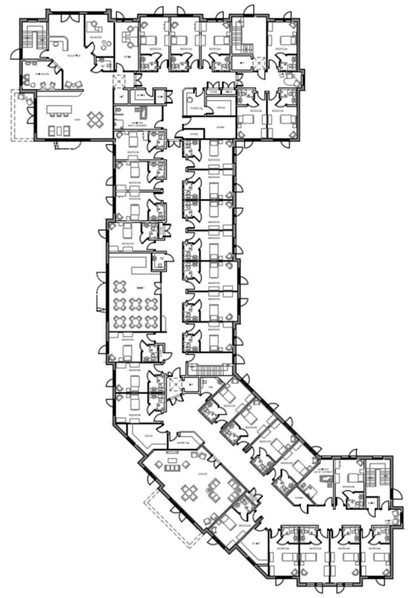


Figure 1: Aspire Floor Plan



Figure 2: Aspire Site Plan

6.0 USE LESS ENERGY (BE LEAN)

6.1 The proposed development and the energy strategy detailed herein has low-energy use at its core with significant passive and energy efficient measure having been specified, these include:

- A significant improvement over limiting U-valves within Building Regulations. The thermal performance of the building envelope has been maximised to its fullest within the constraints of a traditional-build with 100mm cavity.
- Air permeability improved over the limiting value. The target will be to improve yet further on the air permeability during the construction phase but given the relatively small percentage of total energy that the heating system contributes to, any further gain will result in minimal actual reduction against the Target Emission Rate calculated under Approved Document Part L.
- Improved SFP's for ventilation systems including high efficiency heat recovery and demand LED CO_2 speed controls.
- Improved efficacy lighting specified which reduces primary energy usage.
- Automatic lighting controls used throughout, where appropriate for care i.e. proximity infrared used throughout in ensuites, bathrooms, stores, etc. timeclocks utilised for corridor night-time setback.

6.2 To this end, the proposed design promotes reducing the CO_2 emissions from delivered energy consumption by minimising operational energy demand through passive and best-practice measures. With these measures incorporated, then the addition of low carbon technologies and renewable energy system will have a greater impact – renewable energy sources should not be used as an alternative to a well-designed building.

6.3 A preliminary thermal energy model has been constructed of the care home EDSL Tas software version 9.5.5. The software was used to determine a baseline performance utilising the employer's requirements including the project specifications, room data sheets and good industry custom and practice.

6.4 The model was produced using constructions advised by the project architect which were:

Building Fabric Parameter	Value
Air permeability (m3/(m2.h) @ 50Pa)	4.0
External Wall U-value (W/m2.K)	0.18
Roof U-value (W/m2.K)	0.13
Ground Floor U-value (W/m2.K)	0.15
Glazing U-value (W/m2.K)	1.4
Glazing G-value	0.4 (0.36 to Bi Fold)

Table 1: U-value Parameter

In line with the first stage of the recognised energy hierarchy of intervention to "Be Lean, Be Clean, Be Green", it is essential to ensure that an efficient building and building services systems have been designed and proposed, prior to the consideration of application of LZC technologies.

The first stage of Be Lean, indicates a 11% improvement over the baseline.

Target Emissions Rating (TER)	**8.03 kgCO_2/m^2.annum**
Building Emissions Rating (BER)	**10.9 kgCO_2/m^2.annum**
Target Primary Energy Rating (TPER)	**85.72 kWh/m^2.annum**
Building Primary Energy Rating (BPER)	**117.97 kWh/m^2.annum**

Energy Performance Certificate
Non-Domestic Building

HM Government

Longleaze Lane, Melksham

Certificate Reference Number:
9600-3282-2877-1211-6549

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

10 This is how energy efficient the building is.

Less energy efficient

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7.0 HEATING INFRASTRUCTURE (BE CLEAN)

7.1 The second stage of the recognised energy hierarchy of 'Be Lean, Be Clean, Be Green' is to exploit local energy resources such as secondary heat to reduce the developments carbon emissions. From reviewing online heat maps from the Department for Business, Energy, & Industrial Strategy (shown in figure 3) there are no available heat networks to readily connect to in the local vicinity of the proposed development. Due to there being no local heat network that can be capitalised upon there are no associated carbon emission savings at this stage. However, this does not preclude a future heat network connection, should one become operational locally.

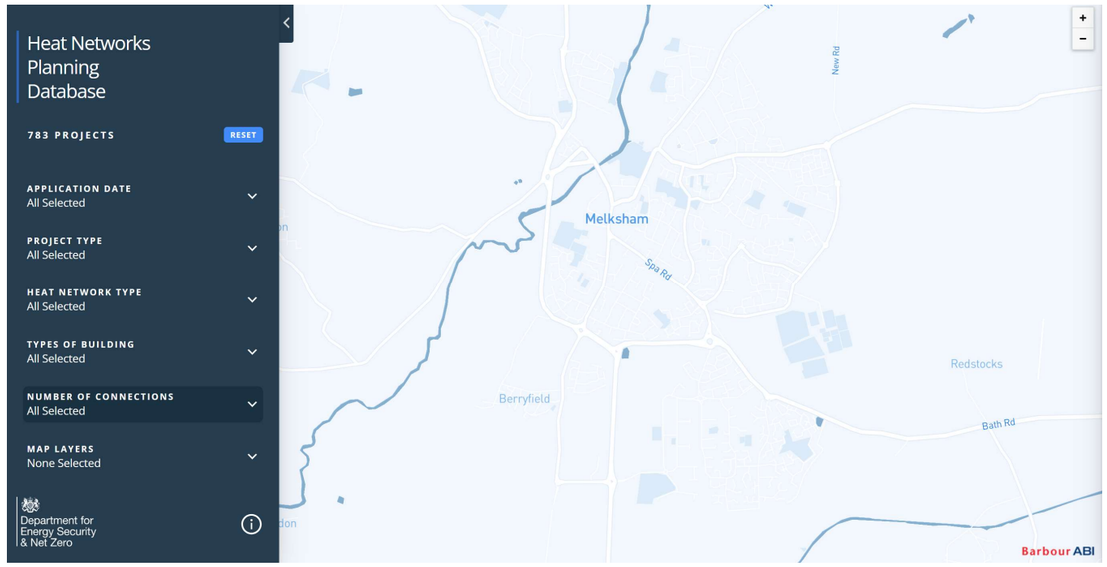


Figure 3: Heat Network Planning Database check

8.0 LOW CARBON AND RENEWABLE TECHNOLOGY

8.1 This section provides a brief overview of available renewable and low/zero carbon technologies (LZC). The technical feasibility of installing each LZC technology at the proposed care home has been assessed in order to discount any unsuitable options at an early stage. A summary of the feasibility process is presented in the following table discusses the advantages and disadvantages that are specific to the project:

Technology	Brief Description	Benefits	Issues/Limitations	Feasible for site
Solar Photovoltaic	Photovoltaic panels convert solar radiation into electrical energy	Low maintenance. No moving parts. Easily integrated into building design.	Any overshadowing affects panel performance. Large area required for installation. Panels ideally inclined and facing southerly direction.	Yes
Solar Thermal	Solar thermal energy can contribute towards space heating and hot water requirements.	Low maintenance.	Must be sized for the building base load hot water requirements. Panels ideally inclined at around 30 degrees and facing southerly direction	Yes
Wind Turbine	Wind generation equipment operates on the basis of wind turning a propeller, which is used to drive an alternator to generate electricity. Small scale (1kW – 15kW) wind turbines can be pole or roof mounted.	Low maintenance/ On-going cost. Excess electricity can be exported to the grid.	Planning issues. Aesthetic impact. Background noise Space limitations on site. Minimum wind speed requirements. Wind survey to be undertaken to verify 'local' viability.	No
Biomass	Modern wood-fuel boilers are highly efficient, clean and almost carbon	Stable long-term running costs. Potential good CO_2 saving.	Large area needed for fuel delivery and storage. Reliable fuel supply chain required. Regular maintenance required Significant plant space required. Air pollution / Clean Air Act limits use.	No
Ground Source Heat Pump (GSHP)	GSHP systems tap into the earth's considerable energy store to provide both heating and cooling to buildings.	Minimal maintenance. Unobtrusive technology. Flexible installation options to meet available site footprint.	Large area required for horizontal pipes Full ground survey required to determine geology. More beneficial to the development if cooling is required. Integration with piled foundations must be done at an early stage. The lack of space to locate the underground pipework loops and the associated plant around the site.	No
Air Source Heat Pump	Electric air source heat pumps extract thermal energy from the surrounding air and transfer it to the working fluid (air or water).	Efficient use of fuel. Relatively low capital costs.	Specialist maintenance. Some additional plant space required. External proximity to boundary and noise generation with units cycling. Impact of the required external plant and associated noise within the domestic setting can be a nuisance to residents.	Yes
Combined Heat and Power	A Combined Heat and Power (CHP) installation is effectively a mini on-site power plant providing both electrical power and thermal heat. CHP is strictly an energy efficiency measure rather than a renewable energy technology.	Potential high CO_2 saving available. Efficient use of fuel. Excess electricity can be exported to the grid	Maintenance intensive. Sufficient base thermal and electrical demand required. Additional plant space required. Noise and air quality constraints.	No
Earth Ducts	Passive pre-treatment of fresh air	Low cost Free energy	Requires significant air loads and riser space	No
Onsite Battery Storage	PV Battery Storage able to charge the battery during periods of low electrical load & discharging battery power at times of low/no solar radiation	Battery discharges power during periods of low solar radiation. Reduce electrical energy supply costs.	Specialist Maintenance Additional Plant space required Low Electrical Baseload, battery storage not economically viable	No

Table 2: Low/Zero Technologies

Table 3: Low/Zero Technologies

8.2 The energy strategy of this development has utilised a full air source heat pump solution, efficient mechanical ventilation systems and 50m² Photovoltaic array.

9.0 PHOTOVOLTAIC SYSTEM (PV)

9.1 A PV system uses layers of semi-conductor material to produce electricity generated directly from sunlight. Several types of PV are available with varying costs and performance.

9.2 The efficiency ranges around 20% for high performance panels, based on peak output under ideal conditions. For the panels to function effectively, they must be installed in an unshaded location, and correctly orientated based on the site latitude.

9.3 PV panels are mounted on a metal racking system which are typically angled at between 5 and 30 degrees to improve the energy capture, for maintenance the system requires access paths, provided with man safe system where required. Visual impact has to be taken in consideration, PV solar system installation will be prevented on a sloping roof and therefore will be visible. The intermittency and unpredictability of solar energy due to weather is an element which can dictate that the system is not used at full potential. A further consideration is the additional structural provisions to support the photovoltaic panels and metal racking system which for a system of this size is considerable.





Picture 1 & 2: Roof mounted PV panels and frame mounted PV on a flat roof.

10.0 LIFE CYCLE COSTING – PV SOLAR ARRAY

10.1 In order to establish the life cycle cost for the PV renewable systems the report will need to establish costing for Energy Consumption, Energy Generation, Maintenance and Estimated Fuel Tariffs.

10.2 For the basis of this study the following estimated fuel costs shall be used:

PAYBACK

Fuel	Cost (£/kWh)
Electricity	£0.450

Electricity Generator	Electrical Energy Required (kWh)	Fuel Cost (Electric) (£)
Grid	50,229	£22,603
PV	50,229	£0
	Cost Difference	£22,603

Cost of PV unit inc. Installation / Commissioning (£)	Total Annum Savings after Maintenance (£/annum)	Years to Payback
£28,800	£22,603	1.3

Cost of PV unit inc. Installation / Commissioning (£)	Total Annum Savings after Maintenance x 20 Years (£)	Total Savings over 20 Years (£)
£28,800	£452,064	£423,264

11.0 LIFE CYCLE COSTING - ASHP

11.1 In order to establish the life cycle cost for the renewable systems the report will need to establish costing for Energy Consumption, Energy Generation, Maintenance and Estimated Fuel Tariffs.

11.2 Below illustrates system costs for the low carbon technology.

PAYBACK

Fuel	Cost (£/kWh)
Electricity	£0.450
Gas	£0.120

Gas Fired Generator (Baseline)	Total Energy Consumed (kWh)	Fuel Cost (Gas) (£)
Boilers	165,908	£19,909
	Total Cost	£19,909

Electric Generator	Total Energy Consumed (kWh)	Fuel Cost (Electric) (£)
ASHP's	107,981	£48,591
	Total Cost	£48,591

Generator	Cost for Gas Consumption (£)	Cost for Electrical Consumption (£)	Total Fuel Cost (£)
Gas Fired	£19,909	£0	£19,909
ASHP	£0	£48,591	£48,591
		Cost Difference	-£28,682

Cost of ASHP unit inc. Installation / Commissioning (£)	Total Annum Savings after Maintenance (£/annum)	Year to Payback
£300,000	-£29,267	-10.3

Cost of ASHP unit inc. Installation / Commissioning (£)	Total Annum Savings after Maintenance x 20 Years (£)	Total Savings over 20 Years
£300,000	-£585,348	-£885,348

12.0 LIFE CYCLE COSTING - COMBINED

12.1 In order to establish the life cycle cost for the renewable systems the report will need to establish costing for Energy Consumption, Energy Generation, Maintenance and Estimated Fuel Tariffs.

12.2 Below illustrates both systems costs for the renewable and low carbon technology, this shows how when paired the systems can become more viable to include within the energy strategy.

COMBINED PAYBACK

Fuel	Cost (£/kWh)
Electricity	£0.450

Cost of Low Carbon/Renewable technology	
ASHP Heating and Hot water	£300,000
PV	£28,800
Total Cost	£328,800

Technology Savings Per Annum	
ASHP Heating and Hot water	-£29,267
PV	£22,603
Total Cost	-£6,664

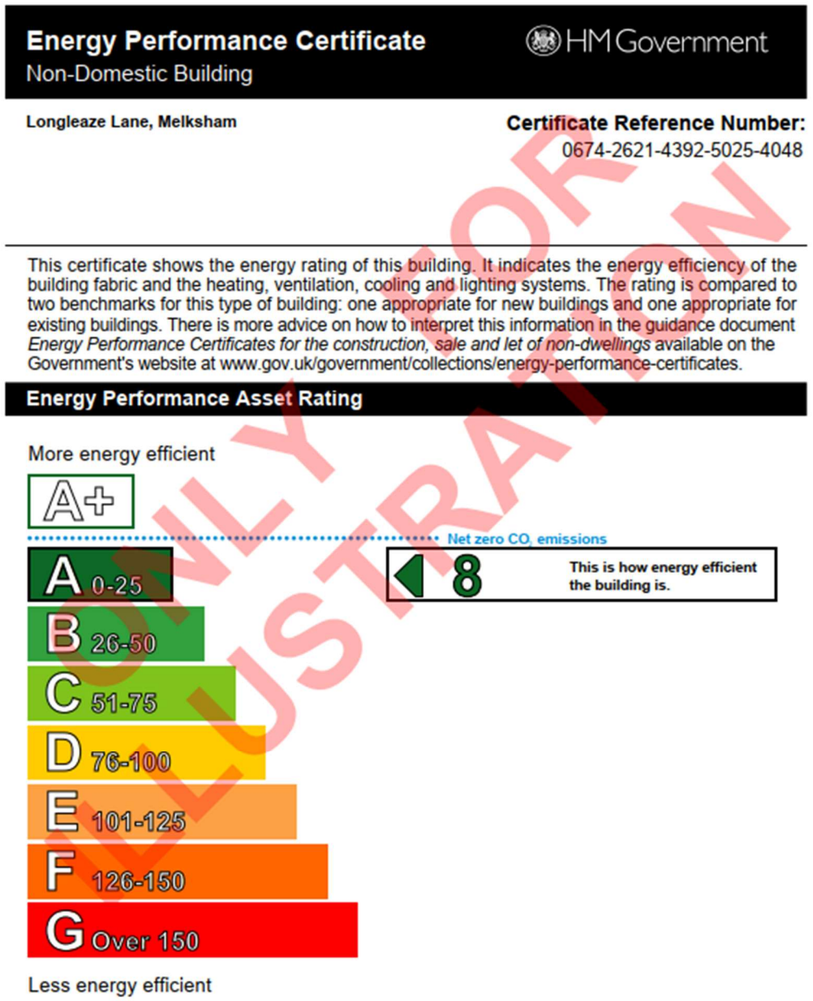
Cost of PV unit inc. Installation / Commissioning (£)	Total Annum Savings after Maintenance x 20 Years (£)	Total Savings over 20 Years (£)
£328,800	-£133,284	-£462,084

13.0 RESULTS WITH LOW CARBON TECHNOLOGY (BE GREEN)

13.1 With the inclusion of a full air source heat pump solution, additional BMS control measures, electrical power correction and 50m² Photovoltaic array the building was able to achieve a 15% reduction.

13.2 The scheme is compliant with the current 2021 Building regulations and the local planning requirements of Wiltshire Council, incorporating Low/Zero Carbon technology.

Target Emissions Rating (TER)	**8.03 kgCO_2/m².annum**
Building Emissions Rating (BER)	**7.91 kgCO_2/m².annum**
Target Primary Energy Rating (TPER)	**87.14 kWh/m².annum**
Building Primary Energy Rating (BPER)	**85.65 kWh/m².annum**



14.0 M+E SPECIFICATION:

14.1 Lighting Strategy:

This energy Demand will be limited by the application of LED lighting throughout. The following light design requirements are therefore stipulated,

Lighting Zone	Luminaire Circuit/Watt	LOR	Photocell Dimming	Occupancy Sensors
All Zones	110	1	No	No
Occasionally Occupied Areas	110	1	No	Yes (0.3w/m²)

14.2 Ventilation strategy:

The Ventilation Strategy will be designed to meet with occupant/ client requirements across the varied activity zones within the development, whilst maintaining the energy efficiency needed to lower carbon emissions.

The following Strategy is proposed:

Ventilation Zone	System	Specific Fan Power	Heat Recovery (eff)
Bedroom Ensuite	Trickle Vent to Windows Extract Fans in WC/Ensuite	0.23	No
Communal Areas	Trickle Vent to Windows Basic extract	1.1	No
Wc's	Individual Extract Fans	0.23	No
Stores	N/a	N/a	N/a
Kitchen	Mechanical Supply/Extract	0.8	No

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14.3 Space & Water Heating:

After reviewing available technologies and the general need to move away from conventional gas heating + hot water systems, it is the intention to install a full air source heat pump system (ASHP), mounted on the roof of the development.

Heat Pump Specification as follows;

- VRF Heating efficiency of COP 5.0 and Cooling efficiency SCOP 6.0
- General Heating & Hot water Efficiency at 3.6
- HVAC system controls installed will operate efficiently and to include automatic monitoring and targeting with alarms for out-of-range values as well as local time and temperature control.

14.4 PV Array:

The proposed PV will be mounted on the flat roof as previously illustrated in Figure 4.

The building design will provide service riser accommodation to allow the roof mounted inverter(s) to be wired back to a distribution board and GS9 intake meter arrangement. Included in the table below is a breakdown of a proposed PV array:

Served Area	PV Area	PV peak Power (kWp)	PV energy generation (kWh.yr)
Roof of Care home	50m²	13.28	13,275

This energy assessment has identified a roof Mounted PV array of 13.28 kWp will generate 13,275 kWh of renewable electricity per annum and will result in a reduction of 1,8061 kg CO2 per Annum (calculated using SAP 10 emission factors) This is assuming the use of 32No 425 Watts PV.

The combination of measures would ensure that the development meets with current part L 2021 Target emissions rates.

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

2315 - Longleaze Lane, Melksham

As designed

Date: Tue Jul 25 16:00:01 2023

Administrative information

Building Details

Address: Longleaze Lane, Melksham,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.5"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.5

BRUKL compliance module version: v6.1.e.0

Certifier details

Name:

Telephone number:

Address: , ,

Foundation area [m^2]: 1389.73

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	8.03	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	7.91	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	87.14	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	85.65	
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	0.19	0.19	External Wall
Floors	0.18	0.15	0.15	Ground Floor
Pitched roofs	0.16	0.11	0.11	Roof
Flat roofs	0.18	-	-	No flat roofs in project
Windows** and roof windows	1.6	1.45	1.45	ED.02 - 1.250X2.4
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	-	-	No personnel doors in project
Vehicle access & similar large doors	1.3	-	-	No vehicle access or similar large doors in project
High usage entrance doors	3	-	-	No high usage entrance doors in project

$U_{a\text{-}Limit}$ = Limiting area-weighted average U-values [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [$W/(m^2K)$]

* 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/m^2K

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	5

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- Rad Heat/Nat Vent

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	-	-	-	-
Standard value	2.5*	N/A	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.					

2- Rad Heat/ Extract (111 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	-	-	-	-
Standard value	2.5*	N/A	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.					

3- Rad Heat / Mech vent (25 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	-	-	1.1	0.8
Standard value	2.5*	N/A	N/A	1.5^	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. ^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

4- VRF / Mech Vent (7 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	5	6	-	1.1	0.8
Standard value	2.5*	3	N/A	1.5^	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. ^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

5- Drugs Store (5 Zones)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0	6	-	0.23	0.8
Standard value	N/A	3	N/A	1.5^	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
^ Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.					

6- Kitchen (02-Kitchen 1)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.6	-	-	-	-
Standard value	2.5*	N/A	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- ASHP HWS

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	3.6	0
Standard value	2*	N/A
* Standard shown is for all types except absorption and gas engine heat pumps.		

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
00-Hair salon 1	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Cafe 1	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Ensuite 1	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 1	0.2	-	-	-	-	-	-	-	-	-	N/A
00-W.C 1	0.2	-	-	-	-	-	-	-	-	-	N/A
01-W.C 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-W.C 1	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Sluice 1	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Sluice 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Sluice 1	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Hoist 1	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Hoist 1	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Dining 1	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Dining 1	-	-	-	1.1	-	-	-	-	-	-	N/A
02-Dining 1	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Lounge 1	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Lounge 1	-	-	-	1.1	-	-	-	-	-	-	N/A
02-Lounge 1	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Assisted Bath 1	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Assisted Bath 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Assisted Bath 1	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Private Dining 1	-	-	-	1.1	-	-	-	-	-	-	N/A
02-Kitchen 1	-	-	-	-	-	-	-	-	0.8	-	N/A
02-Staff Lounge 1	-	-	-	1.1	-	-	-	-	-	-	N/A
02-Female Change 1	0.2	-	-	-	-	-	-	-	-	-	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
02-Male Change 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-KItchen Change 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Drugs 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Staff Shower 1	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Laundry 1	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Ensuite 2	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 3	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 4	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 5	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 6	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 7	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 8	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 9	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 10	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 11	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 12	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 13	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 14	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 15	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 16	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 17	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 18	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 19	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 20	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 21	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 22	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 23	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 24	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 25	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 26	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 27	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 28	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 29	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Ensuite 30	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Hoist 2	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Sluice 2	0.2	-	-	-	-	-	-	-	-	-	N/A
00-W.C 2	0.2	-	-	-	-	-	-	-	-	-	N/A
00-W.C 3	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Assisted Bath 2	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Lounge 2	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Circulation 2	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Circulation 3	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Circulation 4	-	-	-	1.1	-	-	-	-	-	-	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
00-Circulation 5	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Circulation 6	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Circulation 7	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Dining 2	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Drugs Store 1	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Drugs Store 1	0.2	-	-	-	-	-	-	-	-	-	N/A
00-Reception 1	-	-	-	1.1	-	-	-	-	-	-	N/A
00-Drugs Store 2	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 2	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 3	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 4	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 5	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 6	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 7	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 8	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 9	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 10	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 11	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 12	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 13	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 14	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 15	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 16	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 17	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 18	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 19	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 20	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 21	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 22	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 23	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 24	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 25	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 26	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 27	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 28	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 29	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 30	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 31	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 32	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 33	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 34	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Ensuite 35	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Circulation 2	-	-	-	1.1	-	-	-	-	-	-	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
01-Circulation 3	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Circulation 4	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Circulation 5	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Circulation 6	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Circulation 7	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Circulation 8	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Dining 2	-	-	-	1.1	-	-	-	-	-	-	N/A
01-Sluice 2	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Hoist 2	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Assisted Bath 2	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Drugs Store 2	0.2	-	-	-	-	-	-	-	-	-	N/A
01-Lounge 2	-	-	-	1.1	-	-	-	-	-	-	N/A
01-W.C 2	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Circulation 2	-	-	-	1.1	-	-	-	-	-	-	N/A
02-Circulation 3	-	-	-	1.1	-	-	-	-	-	-	N/A
02-Circulation 4	-	-	-	1.1	-	-	-	-	-	-	N/A
02-W.C 2	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 2	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 3	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 4	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 5	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 6	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 7	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 8	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 9	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 10	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 11	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 12	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 13	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 14	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 15	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 16	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 17	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 18	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 19	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 20	0.2	-	-	-	-	-	-	-	-	-	N/A
02-Ensuite 21	0.2	-	-	-	-	-	-	-	-	-	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
01-Bedroom 1	110	-	-
02-Bedroom 1	110	-	-

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
00-Hair salon 1	110	-	-
00-Cafe 1	110	-	-
00-Ensuite 1	110	-	-
01-Ensuite 1	110	-	-
02-Ensuite 1	110	-	-
00-W.C 1	110	-	-
01-W.C 1	110	-	-
02-W.C 1	110	-	-
00-Sluice 1	110	-	-
01-Sluice 1	110	-	-
02-Sluice 1	110	-	-
00-Hoist 1	110	-	-
01-Hoist 1	110	-	-
00-Circulation 1	110	-	-
01-Circulation 1	110	-	-
02-Circulation 1	110	-	-
00-Stair 1	110	-	-
01-Stair 1	110	-	-
02-Stair 1	110	-	-
00-Store 1	110	-	-
01-Store 1	110	-	-
02-Store 1	110	-	-
00-Dining 1	110	-	-
01-Dining 1	110	-	-
02-Dining 1	110	-	-
00-Lounge 1	110	-	-
01-Lounge 1	110	-	-
02-Lounge 1	110	-	-
00-Nurse station 1	110	-	-
01-Nurse station 1	110	-	-
02-Nurse station 1	110	-	-
00-Assisted Bath 1	110	-	-
01-Assisted Bath 1	110	-	-
02-Assisted Bath 1	110	-	-
01-Private Dining 1	110	-	-
02-Kitchen 1	110	-	-
02-Staff Lounge 1	110	-	-
02-Female Change 1	110	-	-
02-Male Change 1	110	-	-
02-KItchen Change 1	110	-	-
02-Drugs 1	110	-	-
02-Staff Shower 1	110	-	-
02-Plant 1	110	-	-

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
02-Laundry 1	110	-	-
02-Linen Store 1	110	-	-
00-Bedroom 1	110	-	-
00-Bedroom 2	110	-	-
00-Bedroom 3	110	-	-
00-Bedroom 4	110	-	-
00-Bedroom 5	110	-	-
00-Bedroom 6	110	-	-
00-Bedroom 7	110	-	-
00-Bedroom 8	110	-	-
00-Bedroom 9	110	-	-
00-Bedroom 10	110	-	-
00-Bedroom 11	110	-	-
00-Bedroom 12	110	-	-
00-Bedroom 13	110	-	-
00-Bedroom 14	110	-	-
00-Bedroom 15	110	-	-
00-Bedroom 16	110	-	-
00-Bedroom 17	110	-	-
00-Bedroom 18	110	-	-
00-Bedroom 19	110	-	-
00-Bedroom 20	110	-	-
00-Bedroom 21	110	-	-
00-Bedroom 22	110	-	-
00-Bedroom 23	110	-	-
00-Bedroom 24	110	-	-
00-Bedroom 25	110	-	-
00-Bedroom 26	110	-	-
00-Bedroom 27	110	-	-
00-Bedroom 28	110	-	-
00-Bedroom 29	110	-	-
00-Bedroom 30	110	-	-
00-Ensuite 2	110	-	-
00-Ensuite 3	110	-	-
00-Ensuite 4	110	-	-
00-Ensuite 5	110	-	-
00-Ensuite 6	110	-	-
00-Ensuite 7	110	-	-
00-Ensuite 8	110	-	-
00-Ensuite 9	110	-	-
00-Ensuite 10	110	-	-
00-Ensuite 11	110	-	-
00-Ensuite 12	110	-	-

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
00-Ensuite 13	110	-	-
00-Ensuite 14	110	-	-
00-Ensuite 15	110	-	-
00-Ensuite 16	110	-	-
00-Ensuite 17	110	-	-
00-Ensuite 18	110	-	-
00-Ensuite 19	110	-	-
00-Ensuite 20	110	-	-
00-Ensuite 21	110	-	-
00-Ensuite 22	110	-	-
00-Ensuite 23	110	-	-
00-Ensuite 24	110	-	-
00-Ensuite 25	110	-	-
00-Ensuite 26	110	-	-
00-Ensuite 27	110	-	-
00-Ensuite 28	110	-	-
00-Ensuite 29	110	-	-
00-Ensuite 30	110	-	-
00-Hoist 2	110	-	-
00-Nurse station 2	110	-	-
00-Stair 2	110	-	-
00-Stair 3	110	-	-
00-Stair 4	110	-	-
00-Store 2	110	-	-
00-Store 3	110	-	-
00-Store 4	110	-	-
00-Store 5	110	-	-
00-Store 6	110	-	-
00-Store 7	110	-	-
00-Store 8	110	-	-
00-Sluice 2	110	-	-
00-W.C 2	110	-	-
00-W.C 3	110	-	-
00-Assisted Bath 2	110	-	-
00-Lounge 2	110	-	-
00-Circulation 2	110	-	-
00-Circulation 3	110	-	-
00-Circulation 4	110	-	-
00-Circulation 5	110	-	-
00-Circulation 6	110	-	-
00-Circulation 7	110	-	-
00-Dining 2	110	-	-
00-Admins Office 1	110	-	-

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
00-Managers Office 1	110	-	-
00-Drugs Store 1	110	-	-
01-Drugs Store 1	110	-	-
00-Reception 1	110	95	-
00-Drugs Store 2	110	-	-
01-Stair 2	110	-	-
01-Stair 3	110	-	-
01-Stair 4	110	-	-
01-Bedroom 2	110	-	-
01-Bedroom 3	110	-	-
01-Bedroom 4	110	-	-
01-Bedroom 5	110	-	-
01-Bedroom 6	110	-	-
01-Bedroom 7	110	-	-
01-Bedroom 8	110	-	-
01-Bedroom 9	110	-	-
01-Bedroom 10	110	-	-
01-Bedroom 11	110	-	-
01-Bedroom 12	110	-	-
01-Bedroom 13	110	-	-
01-Bedroom 14	110	-	-
01-Bedroom 15	110	-	-
01-Bedroom 16	110	-	-
01-Bedroom 17	110	-	-
01-Bedroom 18	110	-	-
01-Bedroom 19	110	-	-
01-Bedroom 20	110	-	-
01-Bedroom 21	110	-	-
01-Bedroom 22	110	-	-
01-Bedroom 23	110	-	-
01-Bedroom 24	110	-	-
01-Bedroom 25	110	-	-
01-Bedroom 26	110	-	-
01-Bedroom 27	110	-	-
01-Bedroom 28	110	-	-
01-Bedroom 29	110	-	-
01-Bedroom 30	110	-	-
01-Bedroom 31	110	-	-
01-Bedroom 32	110	-	-
01-Bedroom 33	110	-	-
01-Bedroom 34	110	-	-
01-Bedroom 35	110	-	-
01-Ensuite 2	110	-	-

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
01-Ensuite 3	110	-	-
01-Ensuite 4	110	-	-
01-Ensuite 5	110	-	-
01-Ensuite 6	110	-	-
01-Ensuite 7	110	-	-
01-Ensuite 8	110	-	-
01-Ensuite 9	110	-	-
01-Ensuite 10	110	-	-
01-Ensuite 11	110	-	-
01-Ensuite 12	110	-	-
01-Ensuite 13	110	-	-
01-Ensuite 14	110	-	-
01-Ensuite 15	110	-	-
01-Ensuite 16	110	-	-
01-Ensuite 17	110	-	-
01-Ensuite 18	110	-	-
01-Ensuite 19	110	-	-
01-Ensuite 20	110	-	-
01-Ensuite 21	110	-	-
01-Ensuite 22	110	-	-
01-Ensuite 23	110	-	-
01-Ensuite 24	110	-	-
01-Ensuite 25	110	-	-
01-Ensuite 26	110	-	-
01-Ensuite 27	110	-	-
01-Ensuite 28	110	-	-
01-Ensuite 29	110	-	-
01-Ensuite 30	110	-	-
01-Ensuite 31	110	-	-
01-Ensuite 32	110	-	-
01-Ensuite 33	110	-	-
01-Ensuite 34	110	-	-
01-Ensuite 35	110	-	-
01-Circulation 2	110	-	-
01-Circulation 3	110	-	-
01-Circulation 4	110	-	-
01-Circulation 5	110	-	-
01-Circulation 6	110	-	-
01-Circulation 7	110	-	-
01-Circulation 8	110	-	-
01-Dining 2	110	-	-
01-Sluice 2	110	-	-
01-Hoist 2	110	-	-

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
01-Store 2	110	-	-
01-Store 3	110	-	-
01-Store 4	110	-	-
01-Store 5	110	-	-
01-Store 6	110	-	-
01-Store 7	110	-	-
01-Store 8	110	-	-
01-Assisted Bath 2	110	-	-
01-Nurse station 2	110	-	-
01-Drugs Store 2	110	-	-
01-Lounge 2	110	-	-
01-W.C 2	110	-	-
02-Circulation 2	110	-	-
02-Circulation 3	110	-	-
02-Circulation 4	110	-	-
02-Store 2	110	-	-
02-Bedroom 2	110	-	-
02-Bedroom 3	110	-	-
02-Bedroom 4	110	-	-
02-Bedroom 5	110	-	-
02-Bedroom 6	110	-	-
02-Bedroom 7	110	-	-
02-Bedroom 8	110	-	-
02-Bedroom 9	110	-	-
02-Bedroom 10	110	-	-
02-Bedroom 11	110	-	-
02-Bedroom 12	110	-	-
02-Bedroom 13	110	-	-
02-Bedroom 14	110	-	-
02-Bedroom 15	110	-	-
02-Bedroom 16	110	-	-
02-Bedroom 17	110	-	-
02-Bedroom 18	110	-	-
02-Bedroom 19	110	-	-
02-Bedroom 20	110	-	-
02-Bedroom 21	110	-	-
02-W.C 2	110	-	-
02-Ensuite 2	110	-	-
02-Ensuite 3	110	-	-
02-Ensuite 4	110	-	-
02-Ensuite 5	110	-	-
02-Ensuite 6	110	-	-
02-Ensuite 7	110	-	-

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
02-Ensuite 8	110	-	-
02-Ensuite 9	110	-	-
02-Ensuite 10	110	-	-
02-Ensuite 11	110	-	-
02-Ensuite 12	110	-	-
02-Ensuite 13	110	-	-
02-Ensuite 14	110	-	-
02-Ensuite 15	110	-	-
02-Ensuite 16	110	-	-
02-Ensuite 17	110	-	-
02-Ensuite 18	110	-	-
02-Ensuite 19	110	-	-
02-Ensuite 20	110	-	-
02-Ensuite 21	110	-	-
02-Stair 2	110	-	-
02-Nurse station 2	110	-	-
02-Nurse station 3	110	-	-
02-Store 3	110	-	-
02-Store 4	110	-	-
02-Stair 3	110	-	-
02-Stair 4	110	-	-

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?
01-Bedroom 1	NO (-61%)	NO
02-Bedroom 1	NO (-44%)	NO
00-Hair salon 1	NO (-83%)	NO
00-Cafe 1	NO (-31%)	NO
00-Dining 1	NO (-52%)	NO
01-Dining 1	NO (-62%)	NO
02-Dining 1	NO (-56%)	NO
00-Lounge 1	YES (+41%)	NO
01-Lounge 1	NO (-41%)	NO
02-Lounge 1	NO (-54%)	NO
00-Nurse station 1	N/A	N/A
01-Nurse station 1	N/A	N/A
02-Nurse station 1	N/A	N/A
01-Private Dining 1	NO (-61%)	NO
02-Staff Lounge 1	NO (-75%)	NO
02-Drugs 1	N/A	N/A
00-Bedroom 1	NO (-58%)	NO
00-Bedroom 2	NO (-59%)	NO
00-Bedroom 3	NO (-52%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
00-Bedroom 4	NO (-79%)	NO
00-Bedroom 5	NO (-72%)	NO
00-Bedroom 6	NO (-45%)	NO
00-Bedroom 7	NO (-35%)	NO
00-Bedroom 8	NO (-31%)	NO
00-Bedroom 9	NO (-38%)	NO
00-Bedroom 10	NO (-38%)	NO
00-Bedroom 11	NO (-31%)	NO
00-Bedroom 12	NO (-48%)	NO
00-Bedroom 13	NO (-48%)	NO
00-Bedroom 14	NO (-48%)	NO
00-Bedroom 15	NO (-57%)	NO
00-Bedroom 16	NO (-57%)	NO
00-Bedroom 17	NO (-71%)	NO
00-Bedroom 18	NO (-37%)	NO
00-Bedroom 19	NO (-49%)	NO
00-Bedroom 20	NO (-49%)	NO
00-Bedroom 21	NO (-37%)	NO
00-Bedroom 22	NO (-39%)	NO
00-Bedroom 23	NO (-47%)	NO
00-Bedroom 24	NO (-33%)	NO
00-Bedroom 25	NO (-30%)	NO
00-Bedroom 26	NO (-53%)	NO
00-Bedroom 27	NO (-53%)	NO
00-Bedroom 28	NO (-29%)	NO
00-Bedroom 29	NO (-35%)	NO
00-Bedroom 30	NO (-20%)	NO
00-Nurse station 2	N/A	N/A
00-Lounge 2	NO (-39%)	NO
00-Dining 2	NO (-18%)	NO
00-Admins Office 1	NO (-51%)	NO
00-Managers Office 1	NO (-77%)	NO
00-Drugs Store 1	N/A	N/A
01-Drugs Store 1	NO (-71%)	NO
00-Reception 1	NO (-28%)	NO
00-Drugs Store 2	NO (-73%)	NO
01-Bedroom 2	NO (-61%)	NO
01-Bedroom 3	NO (-53%)	NO
01-Bedroom 4	NO (-58%)	NO
01-Bedroom 5	NO (-60%)	NO
01-Bedroom 6	NO (-51%)	NO
01-Bedroom 7	NO (-79%)	NO
01-Bedroom 8	NO (-72%)	NO
01-Bedroom 9	NO (-44%)	NO
01-Bedroom 10	NO (-35%)	NO
01-Bedroom 11	NO (-31%)	NO
01-Bedroom 12	NO (-39%)	NO
01-Bedroom 13	NO (-39%)	NO
01-Bedroom 14	NO (-31%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
01-Bedroom 15	NO (-48%)	NO
01-Bedroom 16	NO (-48%)	NO
01-Bedroom 17	NO (-47%)	NO
01-Bedroom 18	NO (-57%)	NO
01-Bedroom 19	NO (-57%)	NO
01-Bedroom 20	NO (-72%)	NO
01-Bedroom 21	NO (-37%)	NO
01-Bedroom 22	NO (-49%)	NO
01-Bedroom 23	NO (-50%)	NO
01-Bedroom 24	NO (-37%)	NO
01-Bedroom 25	NO (-40%)	NO
01-Bedroom 26	NO (-47%)	NO
01-Bedroom 27	NO (-34%)	NO
01-Bedroom 28	NO (-30%)	NO
01-Bedroom 29	NO (-53%)	NO
01-Bedroom 30	NO (-54%)	NO
01-Bedroom 31	NO (-29%)	NO
01-Bedroom 32	NO (-35%)	NO
01-Bedroom 33	NO (-18%)	NO
01-Bedroom 34	NO (-44%)	NO
01-Bedroom 35	NO (-42%)	NO
01-Dining 2	NO (-36%)	NO
01-Nurse station 2	N/A	N/A
01-Drugs Store 2	N/A	N/A
01-Lounge 2	NO (-39%)	NO
02-Bedroom 2	NO (-46%)	NO
02-Bedroom 3	NO (-36%)	NO
02-Bedroom 4	NO (-33%)	NO
02-Bedroom 5	NO (-80%)	NO
02-Bedroom 6	NO (-59%)	NO
02-Bedroom 7	NO (-36%)	NO
02-Bedroom 8	NO (-79%)	NO
02-Bedroom 9	NO (-44%)	NO
02-Bedroom 10	NO (-66%)	NO
02-Bedroom 11	NO (-66%)	NO
02-Bedroom 12	NO (-74%)	NO
02-Bedroom 13	NO (-58%)	NO
02-Bedroom 14	NO (-58%)	NO
02-Bedroom 15	NO (-57%)	NO
02-Bedroom 16	NO (-50%)	NO
02-Bedroom 17	NO (-49%)	NO
02-Bedroom 18	NO (-49%)	NO
02-Bedroom 19	NO (-37%)	NO
02-Bedroom 20	NO (-38%)	NO
02-Bedroom 21	NO (-37%)	NO
02-Nurse station 2	N/A	N/A
02-Nurse station 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]	4207	4207
External area [m^2]	5453	5453
Weather	SWI	SWI
Infiltration [m^3/hm^2@ 50Pa]	5	3
Average conductance [W/K]	1533	1701
Average U-value [W/m^2K]	0.28	0.31
Alpha value* [%]	30.34	15.34

* 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
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
100	**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	4.38	3.87
Cooling	0.88	1.92
Auxiliary	13.61	10.43
Lighting	13.39	10.9
Hot water	26.34	31.83
Equipment*	82.25	82.25
TOTAL**	**58.61**	**58.94**

* 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	2.22	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*2.22*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	73.04	70.67
Primary energy [kWh_{PE}/m^2]	85.65	87.14
Total emissions [kg/m^2]	7.91	8.03

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] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	76.2	0	6.2	0	3	3.42	0	3.6	0
	Notional	52.3	0	5.5	0	1.9	2.64	0	----	----
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	128.2	0	10.4	0	5.9	3.42	0	3.6	0
	Notional	98.3	0	10.3	0	5.7	2.64	0	----	----
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	3.7	0	0.3	0	19.1	3.42	0	3.6	0
	Notional	3.6	0	0.4	0	20.3	2.64	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	1	175.3	0.1	8.1	21.6	5	6	5	6
	Notional	0.5	323.4	0.1	20.4	13.4	2.64	4.4	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	0	271.4	0	12.6	1.3	0	6	0	6
	Notional	0	284.1	0	17.9	10	0	4.4	----	----
[ST] Central heating using water: radiators, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	0.7	0	0.1	0	267	3.42	0	3.6	0
	Notional	0.8	0	0.1	0	133.9	2.64	0	----	----

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