

Land at Meadow Road Reading

Energy Statement

Issue 3 – Planning

17th July 2025



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REVISIONS

Issue	Description	Date
1	Draft Issue	10/06/25
2	Planning Issue	08/07/25
3	Planning Issue – incorporating design team comments.	17/07/25

Latest amendments highlighted **red** in document.

EXECUTIVE SUMMARY

This Energy Statement has been prepared to support the planning application in connection with the proposed development of 11no. new business units at the Land at Meadow Road, Reading.

The statement seeks to demonstrate how compliance with the following can be achieved:

- Building Regulations Part L2A 2021
- Reading Local Plan (2019)

The statement also advises on the following:

- BREEAM
- Draft EPC ratings

All calculations undertaken within the statement are based on the developer's specification for the shell buildings with future fitout allowances for the warehouse and office undercrofts.

Building Regulations Part L2A 2021

The calculated **TER/BER** is as follows:

Unit	TER (kgCO ₂ /m ² /yr)	BER (kgCO ₂ /m ² /yr)	Part L2 Compliance
1	2.28	-0.26	PASS
2	2.28	-0.42	PASS
3	2.00	-0.39	PASS
4	2.29	-0.30	PASS
5	2.20	-0.42	PASS
6	2.17	-0.26	PASS
7	2.24	-0.29	PASS
8	3.56	-0.47	PASS
9	3.19	-0.39	PASS
10	2.80	-0.36	PASS
11	2.74	-0.49	PASS

Reading Local Plan – CC2

To comply with the local plan policy CC2: Sustainable Design and Construction all non-residential development is expected to achieve a BREEAM 'Excellent' emissions rating.

The minimum standards for BREEAM 'Excellent' under Ene01 reduction of energy use and carbon emissions is 4no. credits. Units 8–11 exceed the minimum compliance requirements. In contrast, due to the nature of an industrial development and limited scope of the proposed shell buildings, Units 1–7 are projected to achieve a BREEAM rating of 'Very Good'.

The minimum standards for BREEAM 'Excellent' under Ene02 energy monitoring is 1no. credit. The buildings proposed meet the minimum standards.

Reading Local Plan – CC3

To comply with the local plan policy CC3: Adaption to Climate Change all non-residential development is expected wherever possible to be orientated to maximise opportunities for both natural heating and ventilation and reducing exposure to wind and other elements.

Proposals involving both new and existing buildings shall demonstrate how they have been designed to maximise resistance and resilience to climate change for example by including measures such as solar shading, thermal mass, heating and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, green walls, etc;

Passive and active design measures are considered and implemented, and energy and carbon emission reductions are presented in **Section 4 Energy Efficiency, Decentralised Energy Networks and Renewable Energy** in line with policy CC3. The green buildings proposed will also utilise air source heat pumps and PV arrays to achieve net zero carbon status in line with planning policy CC3: Adaption to Climate Change.

Reading Local Plan – CC4

To comply with the local plan policy CC4: Decentralised Energy all non-residential development shall consider the inclusion of decentralised energy provision, within the site, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision. The development is also expected to link into existing decentralised energy networks or demonstrate why this is not feasible.

Through a detailed feasibility study, it can be demonstrated that the development is not suitable for the inclusion of decentralised energy provision and is not situated near any existing decentralised energy networks. See **Section 4 Energy Efficiency, Decentralised Energy Networks and Renewable Energy** for further details.

EPC

The Green buildings modelled within this statement achieve an **EPC A+**.

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1.0 INTRODUCTION

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The statement seeks to demonstrate how compliance with the following can be achieved:

- Building Regulations Part L2A 2021
- Reading Local Plan (2019)

The statement also advises on the following:

- BREEAM
- Draft EPC ratings

All calculations undertaken within the statement are based on the developer's specification for the shell building with future fitout allowances for the warehouse and undercroft.

1.1 Building Regulations Part L2A 2021

1.1.1 Energy Performance

All new buildings must be built to a minimum standard of total energy performance. This is evaluated by comparing calculations of the performance of the 'actual building' against calculations of the performance of a theoretical building, called the 'notional building'. This must be carried out both at the design stage and when work is complete.

1.1.2 Limiting Standards

The performance of the building fabric and building services systems must also be no worse than the limiting standards set out in the Approved Document.

1.2 Reading Local Plan (2019)

1.2.1 Reading Local Plan Policy – CC2

To comply with the local plan policy CC2: Sustainable Design and Construction all non-residential development is expected to achieve a BREEAM 'Excellent' emissions rating.

For a number of uses, including offices, the requirement to achieve 'Excellent' ratings is unlikely to significantly affect viability. However, some types of development, such as industrial uses, warehouses and schools might find it more difficult to meet these standards. In these cases, developments must demonstrate

that the standard to be achieved is the highest possible for the development, and at a minimum meets the BREEAM 'Very Good' standard.

1.2.2 Reading Local Plan Policy – CC3

To comply with the local plan policy CC3: Adaption to Climate Change all non-residential development is expected wherever possible to be orientated to maximise opportunities for both natural heating and ventilation and reducing exposure to wind and other elements.

Proposals involving both new and existing buildings shall demonstrate how they have been designed to maximise resistance and resilience to climate change for example by including measures such as solar shading, thermal mass, heating and ventilation of the building and appropriately coloured materials in areas exposed to direct sunlight, green and brown roofs, green walls, etc;

1.2.3 Reading Local Plan Policy – CC4

To comply with the local plan policy CC4: Decentralised Energy all non-residential development shall consider the inclusion of decentralised energy provision, within the site, unless it can be demonstrated that the scheme is not suitable, feasible or viable for this form of energy provision. The development is also expected to link into existing decentralised energy networks or demonstrate why this is not feasible.

1.3 BREEAM

It is a requirement of the Reading Local Plan that a BREEAM 'Excellent' rating is achieved.

BREEAM is a world-leading environmental assessment tool, that measures the sustainability of new and refurbished buildings. Under BREEAM, developments are assessed against nine categories covering the following:

- Management
- Health and Wellbeing
- Energy
- Transport
- Water
- Materials
- Waste
- Land Use and Ecology
- Pollution

This statement advises the number of credits that would be achieved under BREEAM Energy Ene01 based on the calculated Building Regulations Part L2A 2021 **TER** and **BER** figures. Credits are achieved through Ene01 Reduction of energy use and carbon emissions by:

- Encouraging the design of energy efficient buildings with energy performance above national building regulations.
- Encouraging the accurate modelling of operational energy consumption.

BREEAM Energy credit Ene02 Energy Monitoring encourages the installation of energy sub-metering to facilitate the monitoring of operational energy consumption.

The statement advises the level of energy metering proposed to comply with the requirements of BREEAM Ene02.

1.4 Draft Energy Performance Certificate (EPC) Ratings

EPC 'A+' ratings are being targeted as a minimum requirement. This statement advises the draft EPC ratings based on the **TER** and **BER** figures derived from the Building Regulations Part L Volume 2 (2021 Edition) energy performance calculations.

2.0 BRIEF SCOPE OF DEVELOPMENT PROPOSALS

The proposed development comprises of 11no. new business units for flexible warehouse/industrial use with first floor office mezzanines and associated service yard and car parking areas.



Proposed Site Plan

The proposed building form and orientation are as detailed on PRC architects plan and elevation drawings accompanying the planning submission.

Refer to Appendix 1 for full details of all building and services design data.

3.0 APPROACH & METHODOLOGY

3.1 Energy Calculations

All energy calculations undertaken as part of this statement have been carried out using the SBEM calculation methodology, in accordance with the requirements of Building Regulations Part L Volume 2 (2021), using IES Apache software as the interface tool.

3.2 Future Fit-Out Allowances (*Building Regulations Guidance*)

Where services are not being installed as part of the developers works allowances have been made in the calculations for future fitting out in accordance with the requirements of Building Regulations Part L Volume 2 (2021 Edition).

Full details of these allowances are defined in Appendix 1.

3.3 Calculation Clarifications

3.3.1 Regulated & Un-regulated Energy Uses

Regulated energy uses are those in connection with space heating/cooling, hot water heating, lighting and ventilation.

Un-regulated energy uses are those in connection with the building user process/equipment small power loads.

The calculations within this statement are based on regulated energy uses only.

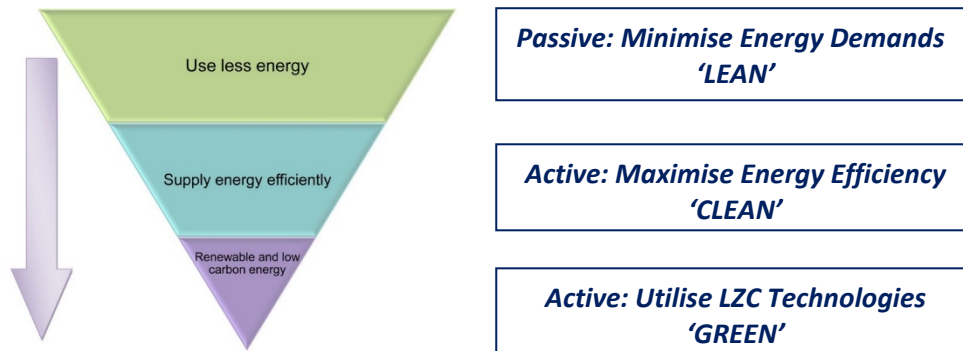
3.3.2 Carbon Reduction from Air Source Heat Pumps

In the case of the air source heat pump heating/cooling systems serving the office area heating, the renewable energy contribution has been taken for the heating component only. The Carbon savings have been calculated based on a comparison of the Carbon emissions against a notional gas fired heating system, with a COP figure of 0.91.

4.0 ENERGY EFFICIENCY, DECENTRALISED ENERGY NETWORKS AND RENEWABLE ENERGY

4.1 Reducing Energy Consumption & Carbon Emissions

To comply with the Reading Local Plan (2019) the proposed development will seek to minimise energy consumption and carbon emissions by applying the following energy hierarchy of passive and active measures.



4.1.1 Use Less Energy (LEAN)

Passive Enhancements

The following '**Passive**' energy enhancement measures will be incorporated into the development proposals in order to reduce energy demands:

Passive Design Measures	
Roof U-value	The U-value of the Roof has been improved from the minimum requirements of Part L2 2021 of 0.18W/m2K to 0.16W/m2K to reduce the energy demands for heating.
Roof-light U Value	The U-value of the Roof-lights has been improved from the minimum requirements of Part L2 2021 of 2.20W/m2K to 1.30W/m2K to reduce the energy demands for heating.
Roof-Light Areas	Roof-Light Areas are based on the optimum area for energy efficiency when balancing energy saving through the use of daylight lighting controls against the increase energy demands for heating and the requirements to limit solar overheating.
Air Permeability	Air Permeability has been improved from the minimum requirements of Part L2 2021 of 8m3/hr/m2 to 3.0m3/hr/m2 to reduce the energy demands for heating.

Passive Design Measures	
Solar Heat Gain Control	Solar Heat Gain Control is achieved through the use of solar control glazing to reduce the need and/or the energy demands for artificial cooling.
Daylight efficiency	Daylight efficiency has been achieved by ensuring a balance has been met between solar energy and useful daylight.
Building Layout	The Building Layout has been designed to maximise the use of office space where active energy enhancement measures can be utilised.
Thermal mass	Thermal mass within the building is achieved through the use of a dense concrete slab between floors.
Ventilation	Heat Recovery Ventilation Units are provided for fresh air supply/extract to the office areas (when natural ventilation is not appropriate) to reduce energy used for heating/cooling.
Adaption to climate change	Adaption to climate change has been addressed through the space provision for future capacity increase in the buildings heating/cooling systems.

Active Enhancements

The following '**Active**' energy enhancement measures will be incorporated into the development proposals in order to reduce energy usage:

Active Design Measures	
High Efficiency LED Lighting	High Efficiency LED Lighting has been specified to reduce lighting energy use.
Warehouse Lighting	Warehouse Lighting has been specified with automatic PIR occupancy sensing and daylight dimming controls to reduce lighting energy use.
Office Lighting	Office Lighting has been specified with automatic PIR occupancy sensing and daylight dimming controls to reduce lighting energy use.
WC Lighting	WC Lighting has been specified with automatic PIR occupancy sensing controls to reduce lighting energy use.
Power Factor Correction	Power Factor Correction has been specified to improve electrical efficiencies by ensuring a power factor no worse than 0.95.
Air Source Heat Pump Heating	Air source heat pump heating has been specified within the office area to reduce electricity demand

4.1.2 Supply Energy Efficiently (CLEAN)

District Heating & Cooling

The Sustainable Design and Construction Supplementary Planning Document (Adopted 2019) identifies 'clusters' potentially suitable for heat network schemes across the region, as seen in the below extract. According to the study the Meadow Road site is not considered within a 'cluster'.



Meadow Road site

Providing a new communal heating/cooling system to serve the proposed development is not considered feasible in this instance given the speculative nature of the buildings and the uncertainty of future heating and cooling demands. The infrastructure costs and the ongoing management, service and maintenance obligations to the Landlord are also considered prohibitive on development of this scale.

Communal CHP (Combined Heat & Power) (CLEAN)

Combined Heat and Power (CHP) refers to the local simultaneous generation of electricity and heat. Electricity is generated by an on-site electrical generator, commonly fuelled by gas, liquid fuel or biomass, and heat is recovered from the exhaust gases and cooling systems which is used to provide hot water.

CHP systems are most appropriate and economically viable where there is high heat demands for a large proportion of the day throughout the year i.e. hospitals, hotels, leisure centres or larger mixed used developments. In the case of the proposed development the base heating demand is minimal, comprising hot water for hand washing only, and the demand for space heating will be seasonal.

Due to absence of a substantial and constant heating demand the use of a CHP system is not considered viable in this instance.

4.1.3 Renewable & Low Carbon Energy (GREEN)

The table below identifies which renewable energy technologies are considered feasible for this development.

Technology	Feasible	Reason
Transpired Solar Collectors	No	Due to the speculative nature of the development and the orientation of suitable façades, transpired solar collectors incorporated into the building cladding system (as Solarwall or similar) are not considered feasible in this instance.
Photovoltaic Panels (PV)	Yes	The buildings have large relatively flat roof areas which would be suitable for PV installations.
Air Source Heating	Yes	Air Source Heating is considered a feasible solution for the office areas. There are no conflicts with site land use and noise criteria.
Ground Source Heating	No	- Detailed ground investigations would be required to determine the suitability and size of a ground source heating solution in this location. - The cost of a closed loop or open loop borehole system are considered prohibitive for this development. - There is likely insufficient area on-site for a horizontal 'slinky' type solution.
Solar Water Heating	No	This is considered a feasible technology however the demand for hot water is a very small proportion of the building's total energy demands and therefore the benefits are extremely limited.
Biomass Heating	No	- Not considered suitable for use in connection with the proposed heating systems in the office and warehouse area. - Air quality & pollution issues associated with the use of biomass. - Fuel storage & re-filling requirements are considered difficult to accommodate on site.

Technology	Feasible	Reason
Wind Turbines	No	- Local wind speeds are below those generally recommended for wind turbines to be a viable renewable solution. - Given the location of the site the visual and noise impacts from the wind turbines on neighbouring sites are considered prohibitive.

4.2 Low & Zero Carbon Technologies

Following the above feasibility assessment, roof mounted **Photovoltaic Arrays** on all units and **ASHP's** to provide heating/cooling to the office areas within units 8 & 9 and units 10 & 11 will be incorporated into the development proposals.

4.2.1 Photovoltaic Panels (PV)

Photovoltaic systems convert energy from the sun into electricity through semi-conductor cells. Systems consist of semi-conductor cells connected together and mounted into modules. Modules are connected to an inverter to turn their direct current (DC) output into alternating current (AC) electricity for use in buildings.

Photovoltaics supply electricity to the building they are attached to or to any other load connected to the electricity grid. Excess electricity can be exported back to the Grid when the generated power exceeds the local need.

PV systems require only daylight, not sunlight to generate electricity (although more electricity is produced with more sunlight), so energy can still be produced in overcast or cloudy conditions.

Photovoltaic cells typically come in modular panels which can be floor or roof mounted. Ideally the panels should face between south-east and south-west, at an elevation of about 30-40°. However, in the UK even flat roofs receive 90% of the energy of an optimum system.



Typical Roof Mounted PV Array

4.2.2 Estimated Carbon/Energy Savings & Payback Periods

For PV systems payback is achieved through (1) Reduced grid electrical energy consumption, (2) smart export payments.

The table below illustrates the estimated carbon & energy savings and payback periods for the PV systems proposed to achieve net zero carbon status:

Estimated PV Carbon & Energy Savings & Simple Payback Periods							
Unit	PV Area	Annual Carbon Savings	Annual Energy Savings	Capital Cost	Annual Energy Cost Savings	Smart Export Payments	Simple Payback Period
	(m2)	(kg.CO2)	(kWh)	(£)	(£)	(£)	(years)
1	32.3	751	5,898	5,653	884.72	147.45	5.48
2	35.7	820	6,454	6,248	968.06	161.34	5.53
3	44.2	1,021	8,023	7,735	1,203.50	200.58	5.51
4	35.7	842	6,594	6,248	989.15	164.86	5.41
5	32.3	777	6,064	5,653	909.56	151.59	5.33
6	32.3	777	6,064	5,653	909.56	151.59	5.33
7	35.7	842	6,595	6,248	989.18	164.86	5.41
8	161.5	3,687	29,035	28,263	4,355.18	725.86	5.56
9	158.1	3,651	28,696	27,668	4,304.43	717.41	5.51
10	200.6	4,632	36,404	35,105	5,460.60	910.10	5.51
11	212.5	4,883	38,413	37,188	5,762.00	960.33	5.53

Notes:

1. Annual carbon & energy savings taken from BRUKL output documents in Appendix 3.
2. Capital cost based on £175/m² of PV.
3. Annual energy cost savings based on electricity charged at a rate of 30p/kWh and assumes that 50% of the energy generated will be used and 50% will be exported back into the grid at a Smart Export payment rate of 5.00p/kWh

4.2.3 Battery Storage

It would be possible for the proposed PV systems to be integrated with a battery storage system to store and utilise any surplus energy generated by the PV system for use at another time i.e. during non-daylight hours.

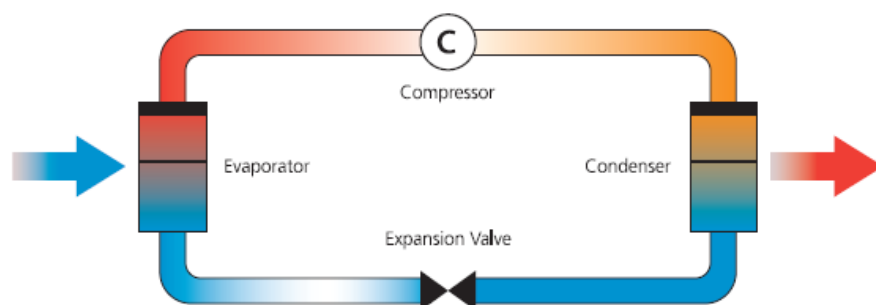
Battery units can also be installed as a stand-alone product, independent of a renewable energy source and used to store cheaper energy from the grid during lower cost periods and discharge during peak times to avoid demand charges and peak-time energy costs.

The suitability of a battery storage system should be assessed on a case-by-case basis and should be designed to suit known load profiles to capitalise on the potential benefits of installing such a system.

Given the speculative nature of the proposed development, where the building energy load profiles are unknown, installing a battery storage system is not considered appropriate as part of the Developer's works, however the PV systems shall be 'battery ready' to facilitate future installation by the building occupiers.

4.2.4 Air Source Heat Pumps (ASHPs)

Split or Multi Split type air conditioning systems are one-to-one systems consisting of one evaporator (fan coil) unit connected to an external condensing unit. Both the indoor and outdoor units are connected through copper tubing and electrical cabling. The indoor part (evaporator) pulls heat out from the surrounding air while the outdoor condensing unit transfers the heat into the environment, this cycle can be reversed to deliver heat to the space. Refrigerant in the heat exchanger absorbs heat from the outside air and evaporates. Vapour is compressed, thereby increasing pressure and vapour temperature. Hot vapour is condensed in the 2nd heat exchanger where heat is rejected. The liquid refrigerant passes back through an expansion valve, to start the cycle again.



ASHP Refrigeration Cycle

Variable refrigerant flow (VRF) is an air-conditioning system configuration where there is one outdoor condensing unit and multiple indoor units. The term variable refrigerant flow refers to the ability of the system to control the amount of refrigerant flowing to the multiple evaporators (indoor units), enabling the use of many evaporators of differing capacities and configurations connected to a single condensing unit. The arrangement provides an individualized comfort control, and simultaneous heating and cooling in different zones.

Air source heat pumps can only be considered as a renewable technology when used in heating mode. Refer to Annex VI of Directive 2009/28/EC for more detail on accounting for energy from heat pumps.



Typical ASHP Outdoor Units

4.2.5 Estimated Carbon & Energy Savings & Payback Periods

The tables below illustrate the estimated carbon & energy savings and simple payback periods for the ASHP systems proposed for the office areas.

For ASHP systems simple payback is determined by calculating the energy costs for heating compared to the energy costs if the same amount of heating were to be provided by a notional gas boiler.

Estimated Carbon Savings				
	Unit 8	Unit 9	Unit 10	Unit 11
System	Gas Boiler			
Efficiency	91%	91%	91%	91%
Heating Carbon Emissions (kgCO ₂ /yr)	2,344	2,254	2,912	3,073
System	Air Source Heat Pump			
Efficiency	430%	430%	430%	430%
Heating Carbon Emissions (kgCO ₂ /yr)	328	316	408	430
Carbon Savings (kgCO ₂ /yr)	2016	1938	2504	2643
Percentage Savings (%)	86%	86%	86%	86%

Estimated Energy Savings & Simple Payback Periods				
	Unit 8	Unit 9	Unit 10	Unit 11
System	Gas Boiler			
Efficiency	91%	91%	91%	91%
Heating Energy Consumption (kWh/yr)	11,162	10,734	13,867	14,634
Capital Cost (£)	2,983	3,482	6,136	7,065
Energy Cost (£/yr)	1,674.30	1,610.04	2,080.02	2,195.09
System	Air Source Heat Pump			
Efficiency	430%	430%	430%	430%
Heating Energy Consumption (kWh/yr)	2,362	2,271.70	2,934.80	3,097.10
Capital Cost (£)	6,280	7,331	12,918	14,874
Energy Cost (£/yr)	708.69	681.51	880.44	929.13
Energy Savings (£/yr)	965.61	928.53	1,199.58	1,265.96
Incentive Payments (£/yr)	n/a	n/a	n/a	n/a
Simple Payback Period (years)	3	4	6	6

Notes:

- Costs based on gas charged at a rate of 15p/kWh and electricity at a rate of 30p/kWh*

5.0 RESULTS SUMMARY

5.1 Base & Lean Building Results

5.1.1 Building CO2 Emissions

The calculated **BER** for the **Base & Lean building**, excluding PV & ASHP's, is as follows:

Unit	Base Emissions (*Standard Building) (kgCO ₂ /m ² /yr)	Lean BER (kgCO ₂ /m ² /yr)	Passive Design Reduction (kgCO ₂ /m ² /yr)
1	9	4.20	4.80
2	9	4.11	4.89
3	9	3.37	5.63
4	9	4.11	4.89
5	9	3.85	5.15
6	9	3.77	5.23
7	9	3.79	5.21
8	11	10.47	0.53
9	11	9.52	1.48
10	11	7.98	3.02
11	11	7.13	3.87

Refer to BRUKL output documents in Appendix 2.

*Standard Building emissions based on Building Regulations minimum standard attributes.

5.1.2 Building Primary Energy

The calculated **BPER** for the **Base building & Lean building**, excluding PV & ASHP's, is as follows:

Unit	Base Energy (*Standard Building) (kWh/m ² /yr)	Lean BPER (kWh/m ² /yr)	Passive Design Reduction (kWh/m ² /yr)
1	80	44.13	35.87
2	80	43.18	36.82
3	80	35.49	44.51
4	80	43.32	36.68
5	80	40.45	39.55
6	80	39.64	40.36
7	80	39.82	40.18
8	90	89.50	0.50
9	90	81.00	9.00
10	90	67.91	22.09
11	90	60.76	29.24

Refer to BRUKL output documents in Appendix 2.

*Standard Building emissions based on Building Regulations minimum standard attributes.

5.2 Green Building Results

5.2.1 Building Regulations Part L2A 2021 CO2 Emissions

The calculated **TER/BER** for the **Green building**, including PV & ASHP's, is as follows:

Unit	TER (kgCO ₂ /m ² /yr)	BER (kgCO ₂ /m ² /yr)	Renewable Design Reduction (kgCO ₂ /m ² /yr)	Part L2 Compliance
1	2.28	-0.26	2.54	PASS
2	2.28	-0.42	2.70	PASS
3	2.00	-0.39	2.39	PASS
4	2.29	-0.30	2.59	PASS
5	2.20	-0.42	2.62	PASS
6	2.17	-0.26	2.43	PASS
7	2.24	-0.29	2.53	PASS
8	3.56	-0.47	4.03	PASS
9	3.19	-0.39	3.58	PASS
10	2.80	-0.36	3.16	PASS
11	2.74	-0.49	3.23	PASS

Refer to BRUKL output documents in Appendix 3.

5.2.2 Building Regulations Part L2A 2021 Primary Energy

The calculated **TPER/BPER** for the **Green building**, including PV & ASHP's, is as follows:

Unit	TPER (kWh/m ² /yr)	BPER (kWh/m ² /yr)	Renewable Design Reduction (kWh/m ² /yr)	Part L2 Compliance
1	23.79	-7.23	31.02	PASS
2	23.75	-9.05	32.80	PASS
3	20.89	-7.82	28.71	PASS
4	23.91	-7.48	31.39	PASS
5	23.16	-8.52	31.68	PASS
6	22.70	-6.53	29.23	PASS
7	23.43	-7.05	30.48	PASS
8	36.74	-13.47	50.21	PASS
9	32.95	-11.74	44.69	PASS
10	29.14	-9.92	39.06	PASS
11	28.55	-10.79	39.34	PASS

Refer to BRUKL output documents in Appendix 3.

5.2.3 Building Regulations Part L2A 2021 – Minimum Standards

The performance of the building fabric and building services proposals are no worse than the design limits set out in the Approved Document. *Refer to Appendix 3.*

5.2.4 Building Regulations Part L2A 2021 – Overheating Analysis

The performance of the building against the solar overheating check show that the design is in compliance with the Approved Document. *Refer to Appendix 3.*

5.3 BREEAM

5.3.1 BREEAM Ene01

The table below shows the calculated credits achieved under BREEAM Ene01:

Unit	BREEAM Ene01 Credits
1	- (limited to 'very good')
2	- (limited to 'very good')
3	- (limited to 'very good')
4	- (limited to 'very good')
5	- (limited to 'very good')
6	- (limited to 'very good')
7	- (limited to 'very good')
8	4 min. – 'Excellent'
9	4 min. – 'Excellent'
10	4 min. – 'Excellent'
11	4 min. – 'Excellent'

5.3.2 BREEAM Ene02

Sub-metering shall be supplied and installed in accordance with the requirements of Building Regulations Part L as described in CIBSE TM39.

A data logger system shall be provided to collate data from the various energy meters.

For Further Information on BREEAM compliance please see BREEAM assessors' pre-assessment document.

5.4 Reading Local Plan (2019)

5.4.1 Policy CC2: Sustainable Design and Construction

The development is expected to achieve a BREEAM 'Excellent' emissions rating for units 8 – 11 in line with planning policy CC2: Sustainable Design and Construction.

Units 1 – 7 shall demonstrate a BREEAM 'Very Good' score.

5.4.2 Policy CC3: Adaption to Climate Change

The green buildings proposed have considered and implemented passive and active energy and carbon reduction measures and will utilise air source heat pumps and PV arrays to achieve net zero carbon status in line with planning policy CC3: Adaption to Climate Change.

5.4.3 Policy CC4: Decentralised Energy

Local plan policy CC4: Decentralised Energy requirements have been assessed and due to the absence of a substantial and constant heating demand or proximity to an existing network, the use of a CHP system is not considered viable in this instance.

5.5 Draft Energy Performance Certificate (EPC) Rating

The predicted Energy Performance Certificate (EPC) Rating for the building is as follows:

Unit	EPC Rating
1	A+ (-2)
2	A+ (-3)
3	A+ (-3)
4	A+ (-2)
5	A+ (-3)
6	A+ (-2)
7	A+ (-2)
8	A+ (-2)
9	A+ (-2)
10	A+ (-2)
11	A+ (-2)

Refer to Appendix 4 for a copy of the draft EPC certificate.

APPENDIX 1 – Building & M&E Design Data

BUILDING DATA

Building Address - Units 1-11 Meadow Road, Reading

SBEM Weather File - Swindon

Building Form & Orientation - As PRC Planning Issue drawings

SBEM Building Type - B2-B7 General Industrial

SBEM Room Types

Warehouse Area - Speculative Industrial

Office Undercroft - Open Plan Office

U-Values

External Walls - 0.26 W/m²K

Roof - 0.16 W/m²K

Exposed Floor - 0.18 W/m²K

Windows/Curtain Walling - 1.60 W/m²K (average inc. frame)

Spandrel Panels - 1.60 W/m²K (average inc. frame)

Roof-lights - 1.30 W/m²K

Personnel Doors - 1.60 W/m²K (average inc. frame)

Loading Bay Doors - 1.30 W/m²K (average inc. frame)

Glazing Data

Type - Pilkington Suncool 30/17

g-Value - 18%

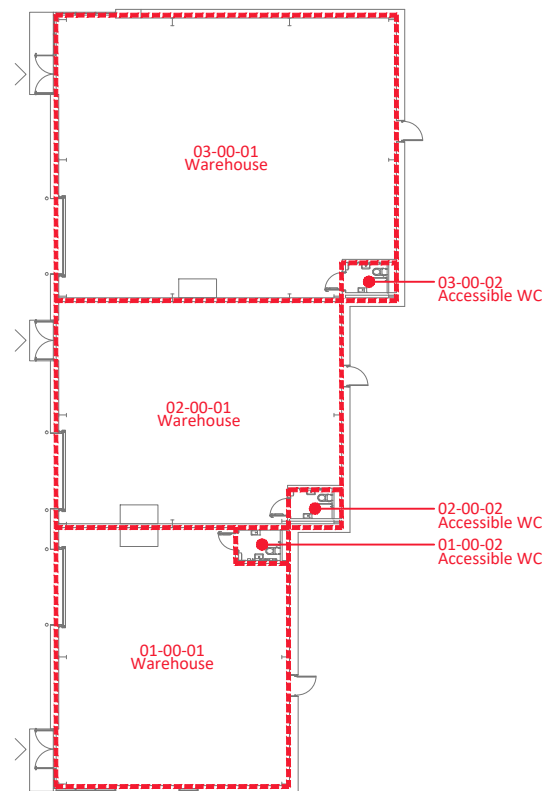
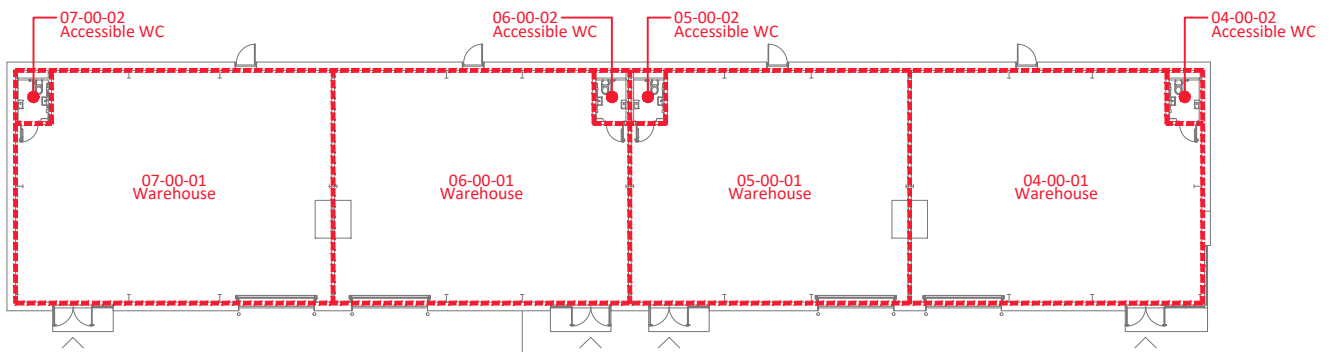
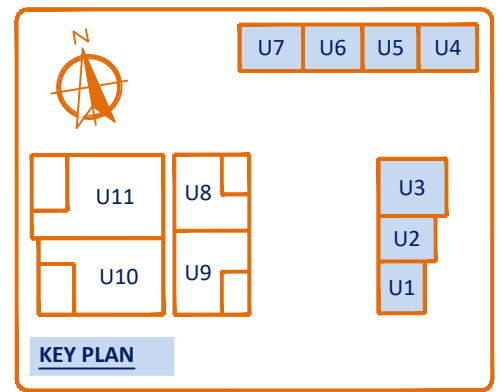
Light Transmission Value - 30%

Rooflight Data

g-value - 45%

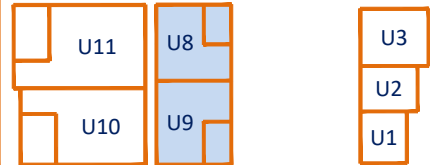
Light Transmittance - 43%

Air Permeability - 3.0m³/hr/m²

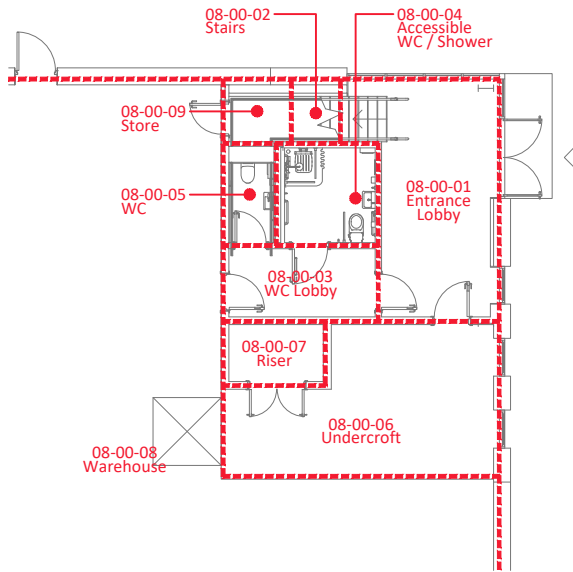




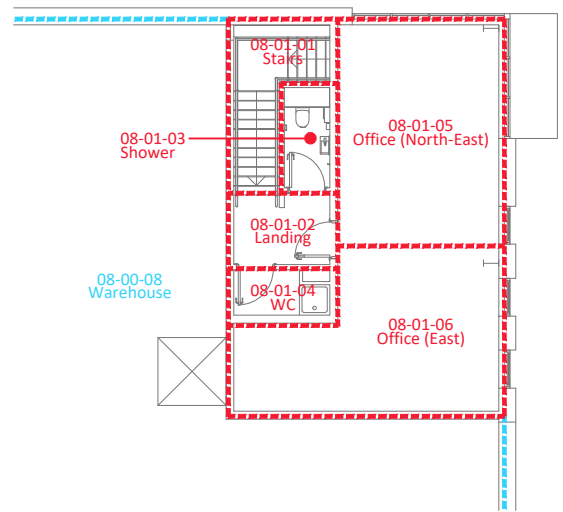
U7 U6 U5 U4



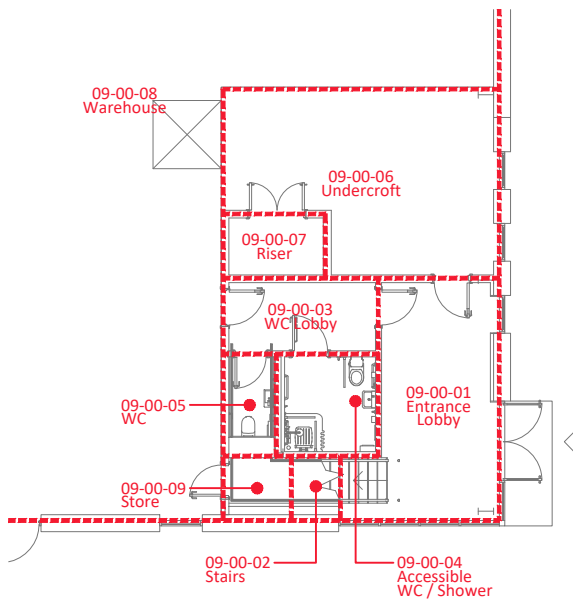
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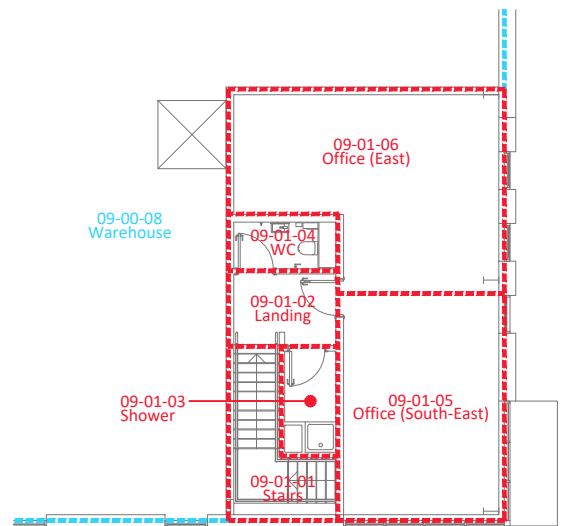
UNIT 8
Ground Floor



UNIT 8
First Floor



UNIT 9
Ground Floor



UNIT 9
First Floor



Shepherd Brombley Partnership
Unit 28 Basepoint Business Centre
1 Winnall Valley Road
Winchester
Hampshire
SO23 0LD
Tel: 01962 832656
Web: www.shepherdbrombley.co.uk

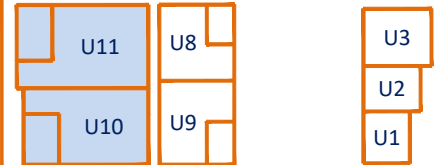
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Unit 8 + 9**
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**Appendix 1
IES Model Zone Names**

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Checked By: **AB**
Drawing Number:
0306 / Energy Statement
Drawing Status:
Planning

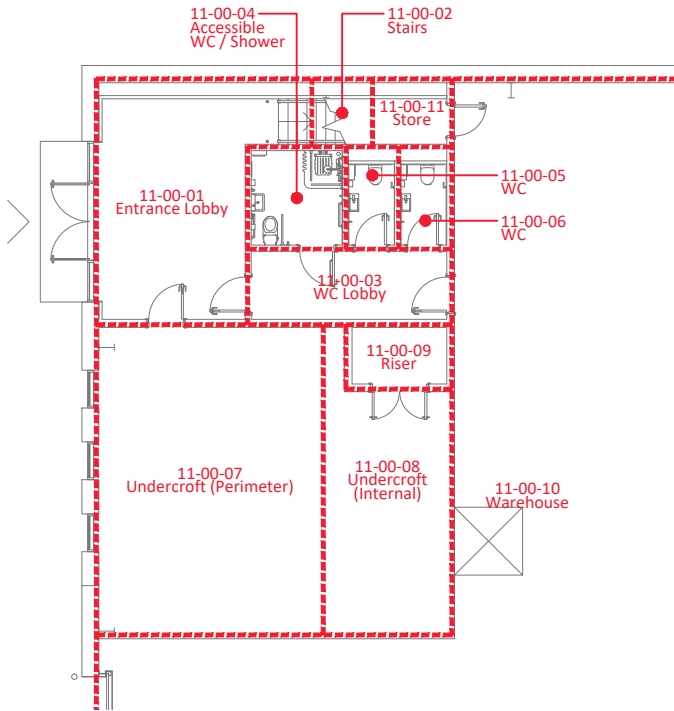
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Rev	Date	Description	Initials
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2	17-07-25	Planning	LKB/AB



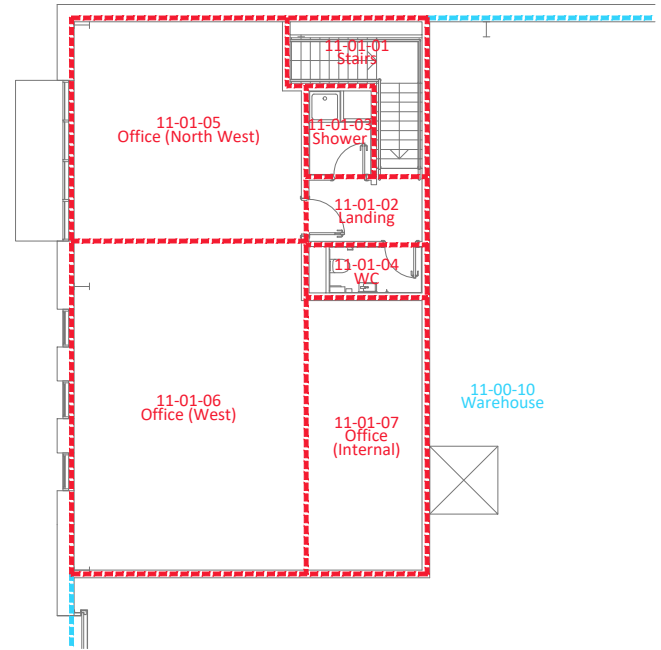
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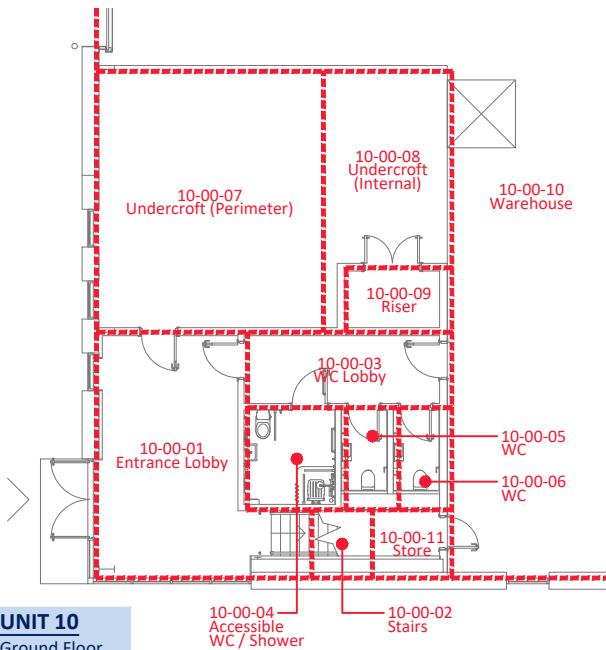
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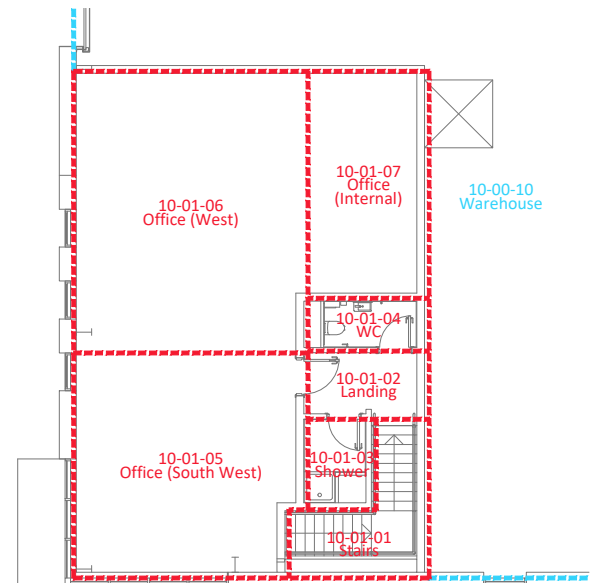
UNIT 11
Ground Floor



UNIT 11
First Floor



UNIT 10
Ground Floor



UNIT 10
First Floor



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Protect Title:
**Meadow Road, Reading
Unit 10 + 11**
Drawing Title:
**Appendix 1
IES Model Zone Names**

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LKB

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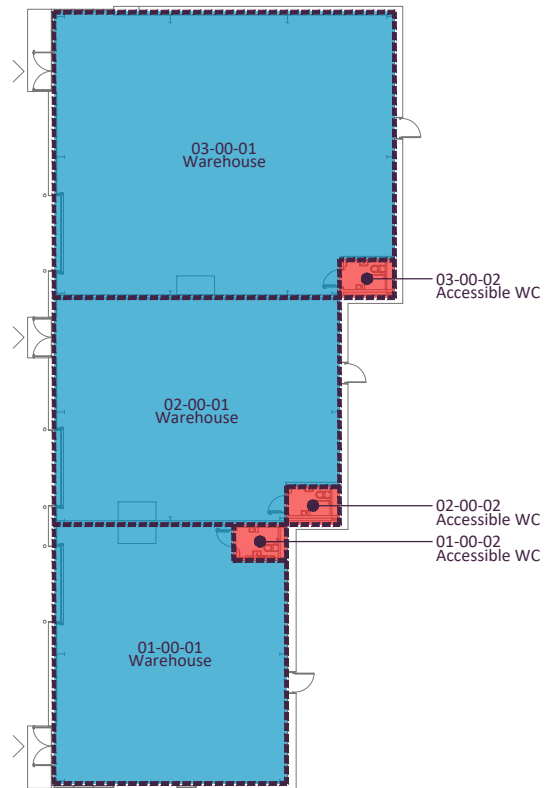
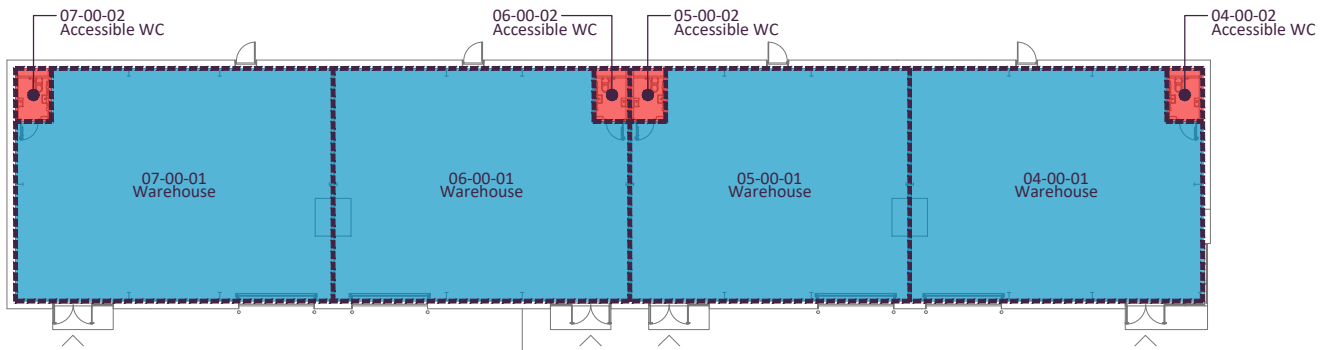
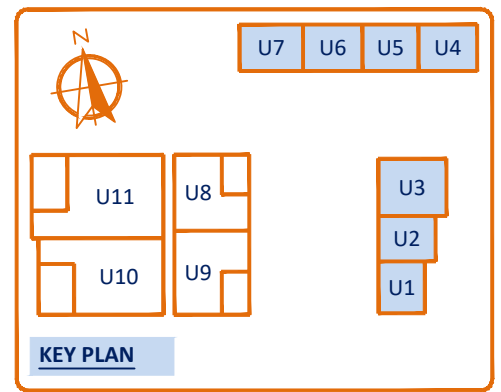
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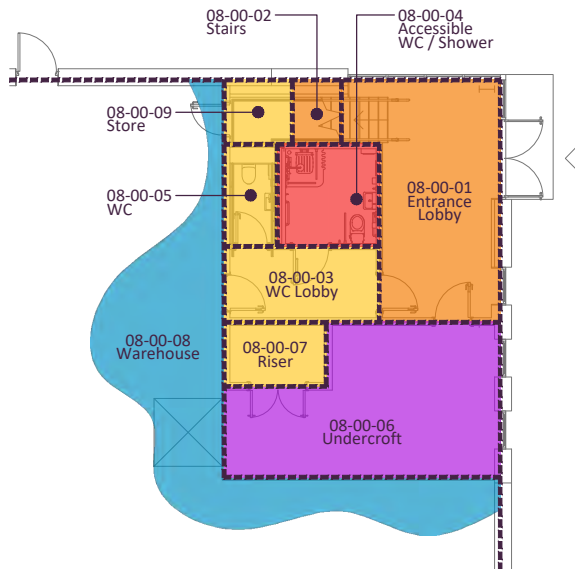
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Rev:
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Drawing Status:
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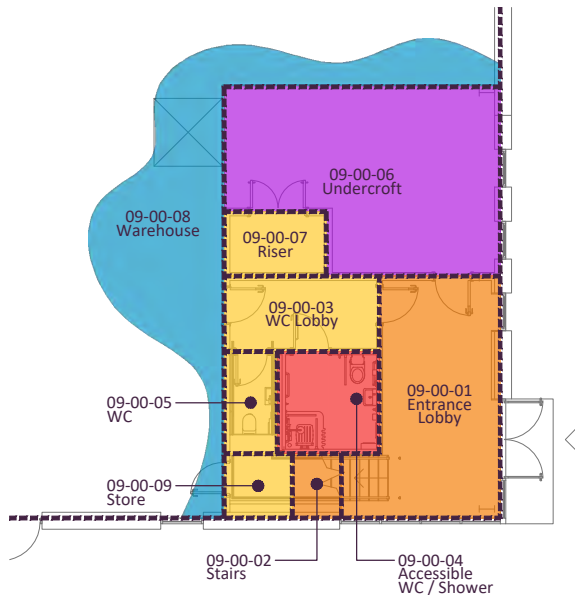
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PLANT		
SYSTEM TYPE	HO HEATING / COOLING	ELECTRIC TOWEL RAIL
EFFICIENCY	N/A	COP = 1.00



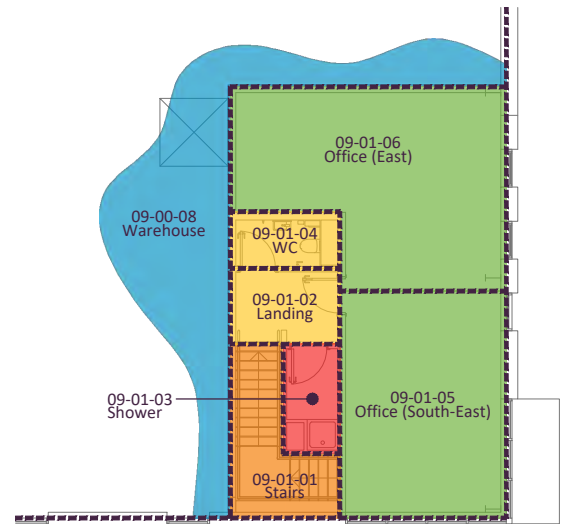
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Ground Floor



UNIT 8
First Floor

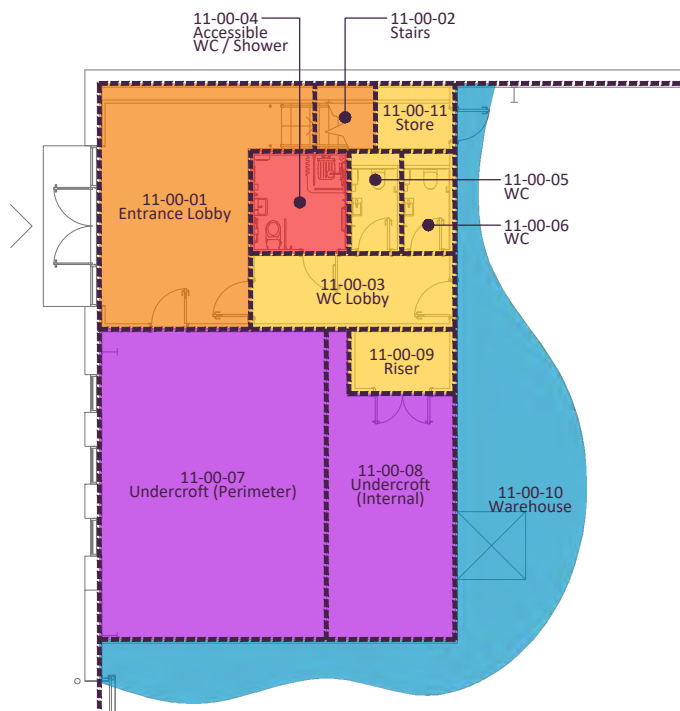


UNIT 9
Ground Floor

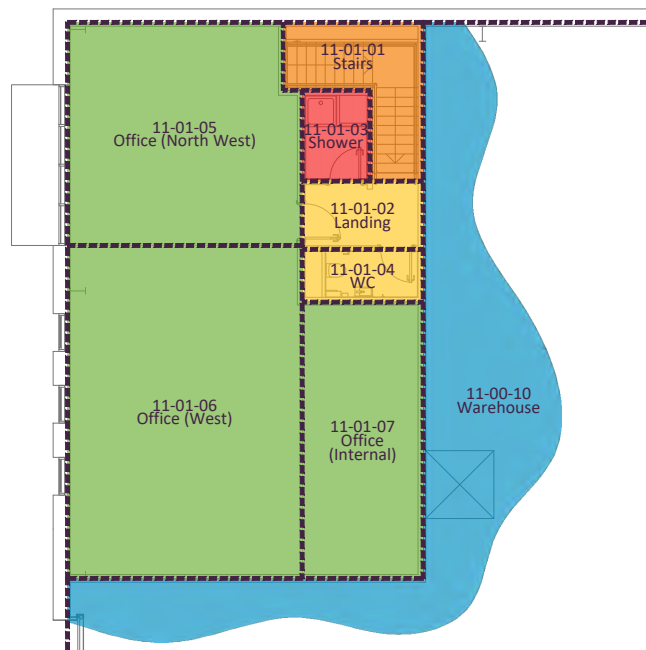


UNIT 9
First Floor

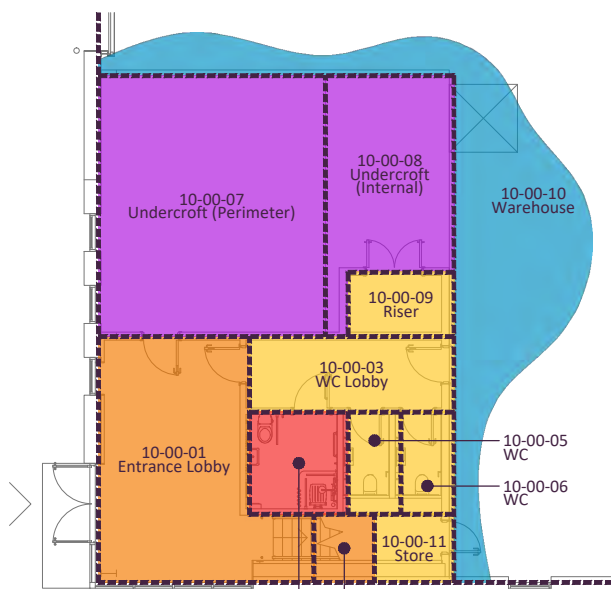
HATCH COLOUR						
PLANT						
SYSTEM TYPE	HO HEATING / COOLING	ELECTRIC TOWEL RAIL	ELECTRIC RADIATOR	ELECTRIC PANEL HEATER	VRF/MULTI-SPLIT AIR CONDITIONING UNIT	VRF/MULTI-SPLIT AIR CONDITIONING UNIT
EFFICIENCY	N/A	COP = 1.00	COP = 1.00	COP = 1.00	SEER = 7.00 COP = 4.30	SEER = 5.00 COP = 2.50 (B.REGS MIN STANDARD)



UNIT 11
Ground Floor



UNIT 11
First Floor

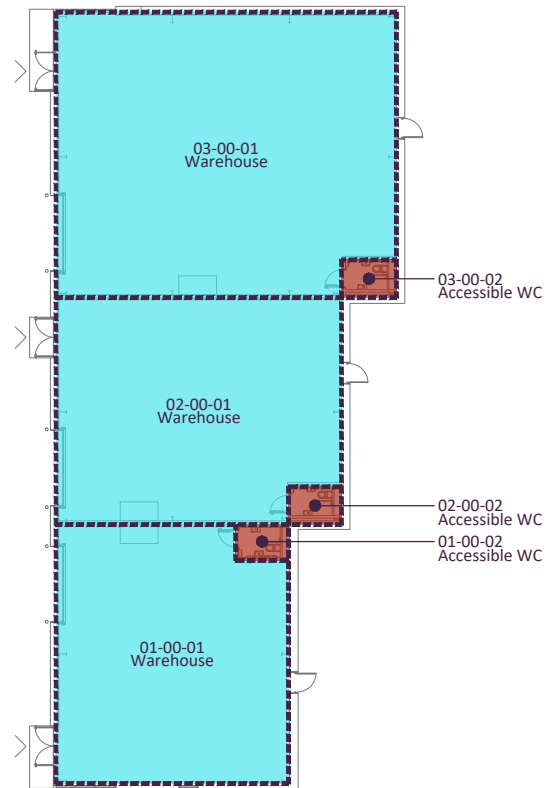
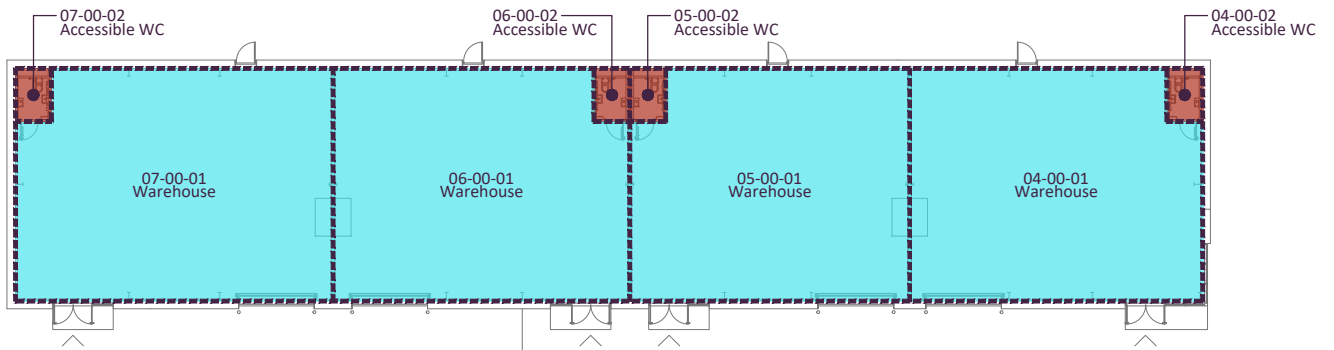
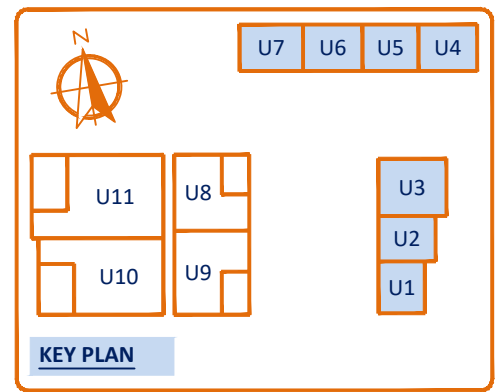


UNIT 10
Ground Floor

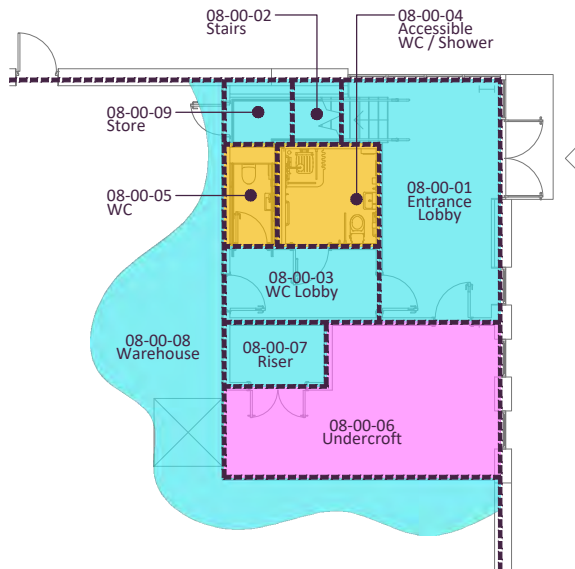


UNIT 10
First Floor

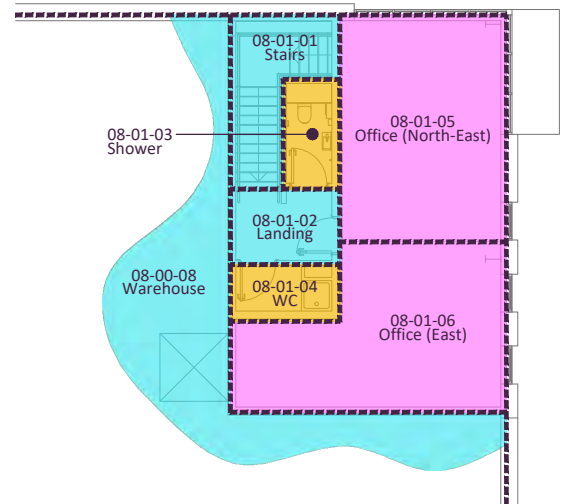
HATCH COLOUR						
PLANT						
SYSTEM TYPE	HO HEATING / COOLING	ELECTRIC TOWEL RAIL	ELECTRIC RADIATOR	ELECTRIC PANEL HEATER	VRF/MULTI-SPLIT AIR CONDITIONING UNIT	VRF/MULTI-SPLIT AIR CONDITIONING UNIT
EFFICIENCY	N/A	COP = 1.00	COP = 1.00	COP = 1.00	SEER = 7.00 COP = 4.30	SEER = 5.00 COP = 2.50 (B.REGS MIN STANDARD)



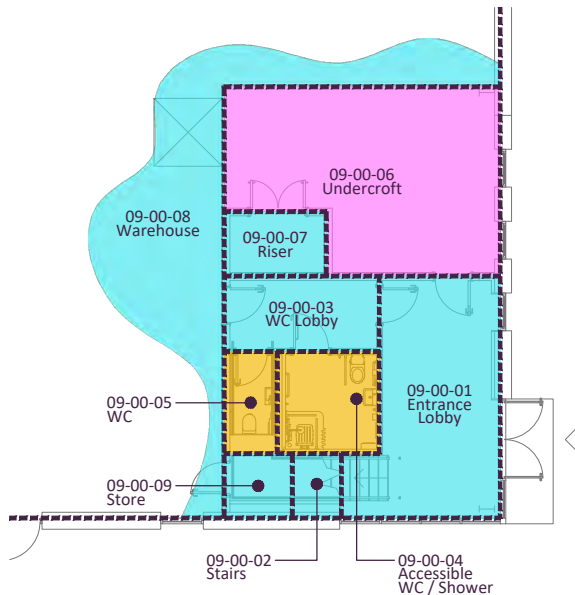
HATCH COLOUR		
PLANT		
SYSTEM TYPE	LOCAL EXTRACT FAN	NATURAL VENTILATION / INFILTRATION
SFP	0.3 W/l/s	N/A



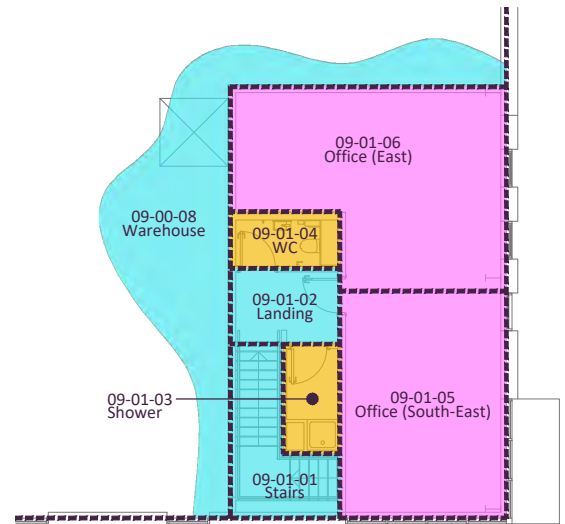
UNIT 8
Ground Floor



UNIT 8
First Floor

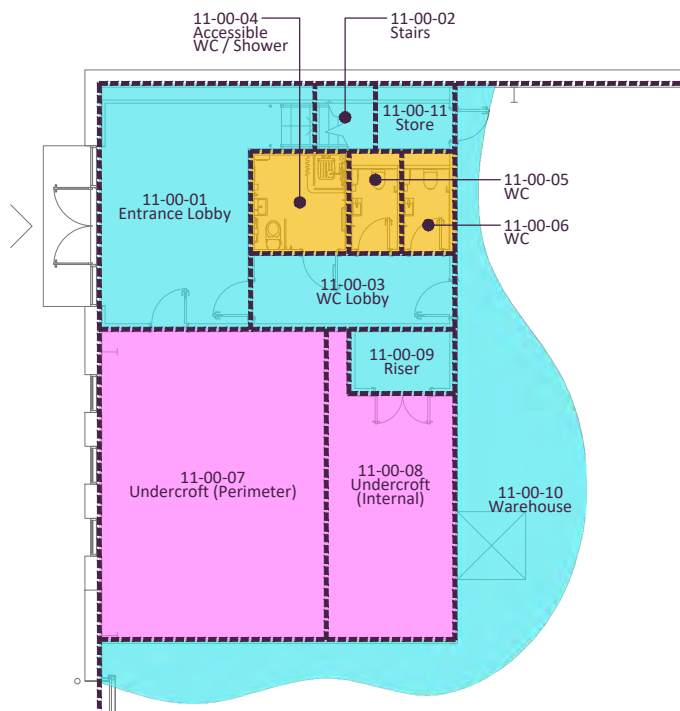


UNIT 9
Ground Floor



UNIT 9
First Floor

HATCH COLOUR			
PLANT			
SYSTEM TYPE	ZONAL EXTRACT FAN	NATURAL VENTILATION / INFILTRATION	HEAT RECOVERY UNIT
SFP	0.5 W/l/s	N/A	1.1 W/l/s



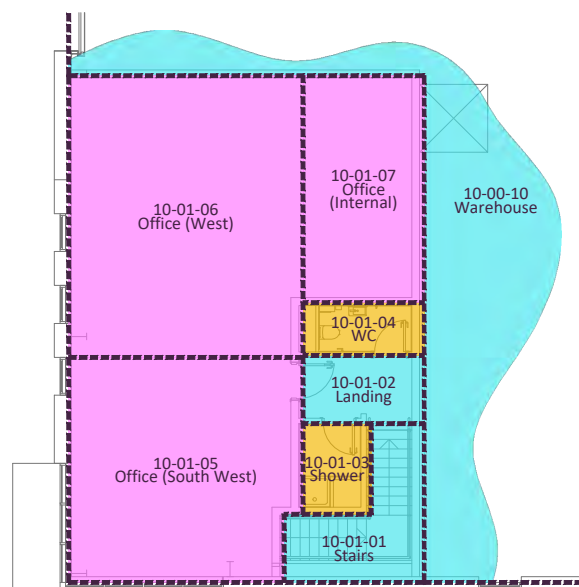
UNIT 11
Ground Floor



UNIT 11
First Floor

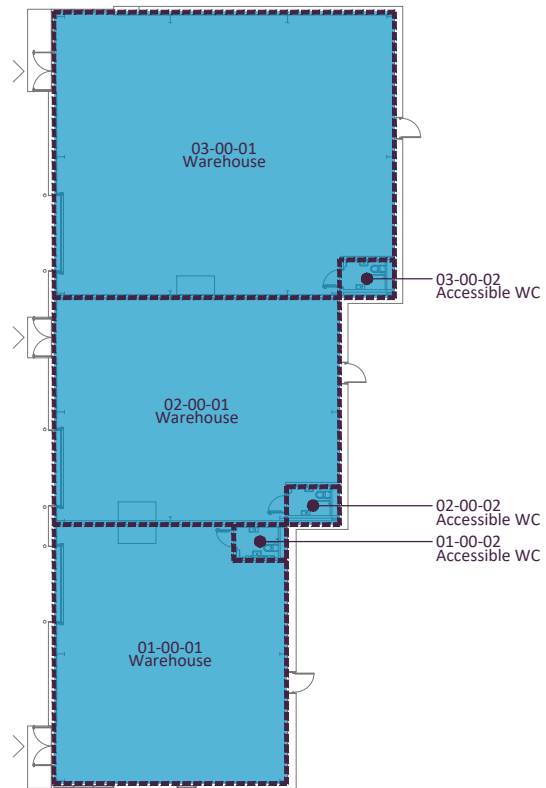
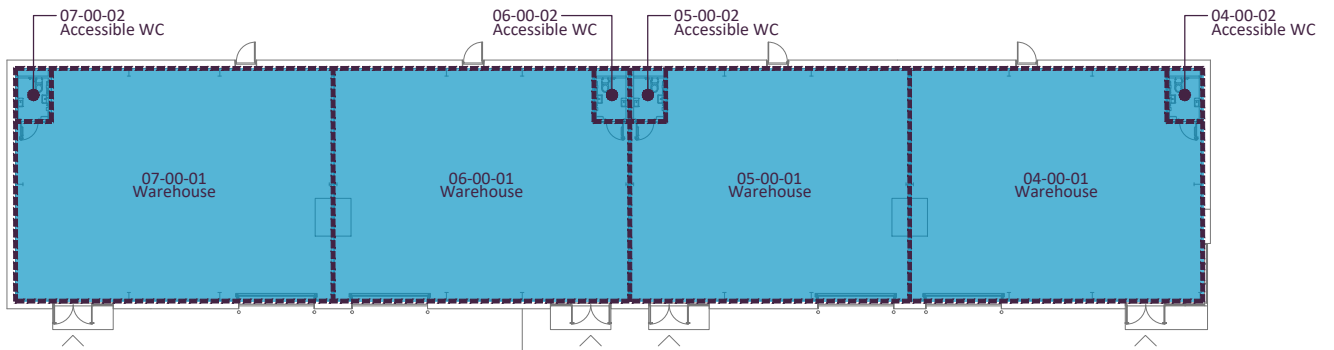
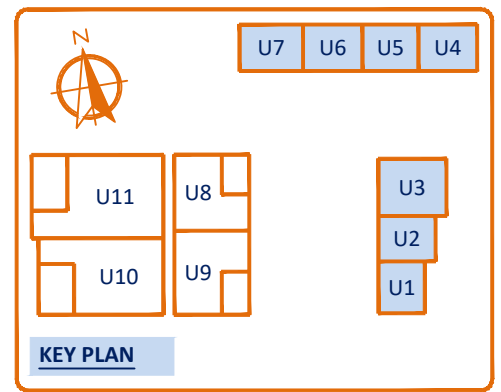


UNIT 10
Ground Floor

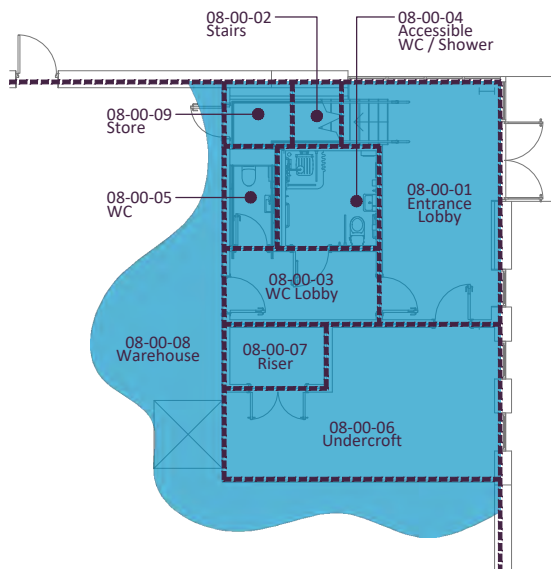


UNIT 10
First Floor

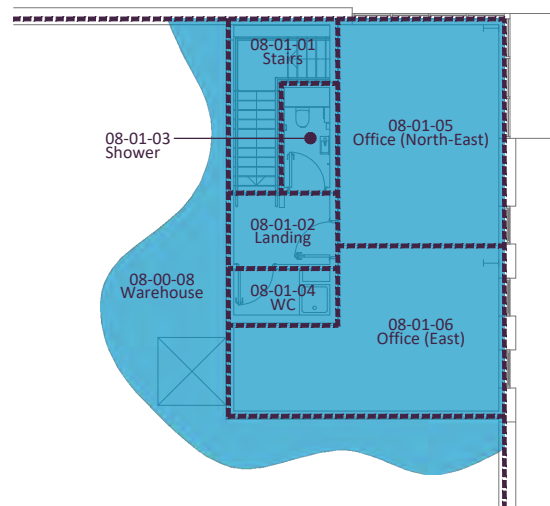
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PLANT			
SYSTEM TYPE	ZONAL EXTRACT FAN	NATURAL VENTILATION / INFILTRATION	HEAT RECOVERY UNIT
SFP	0.5 W/l/s	N/A	1.1 W/l/s



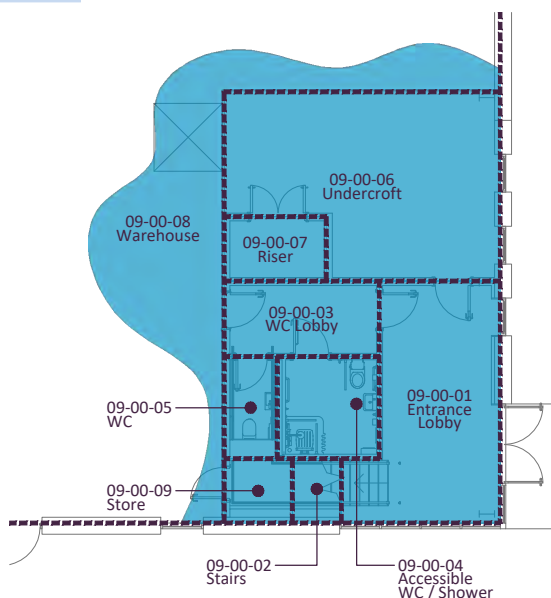
HATCH COLOUR	
PLANT	
SYSTEM TYPE	ELECTRIC HOT WATER STORAGE HEATER
RETURN LOOP	N/A



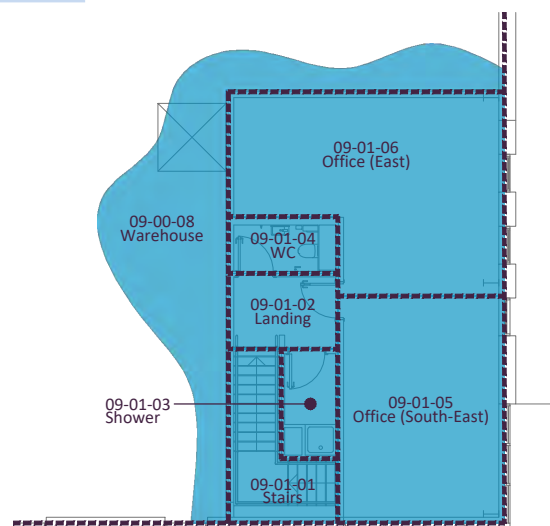
UNIT 8
Ground Floor



UNIT 8
First Floor

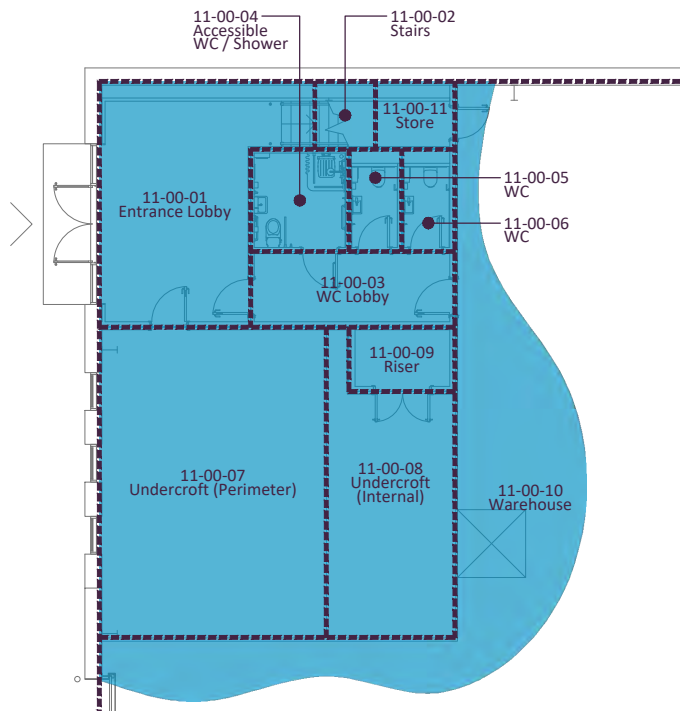


UNIT 9
Ground Floor

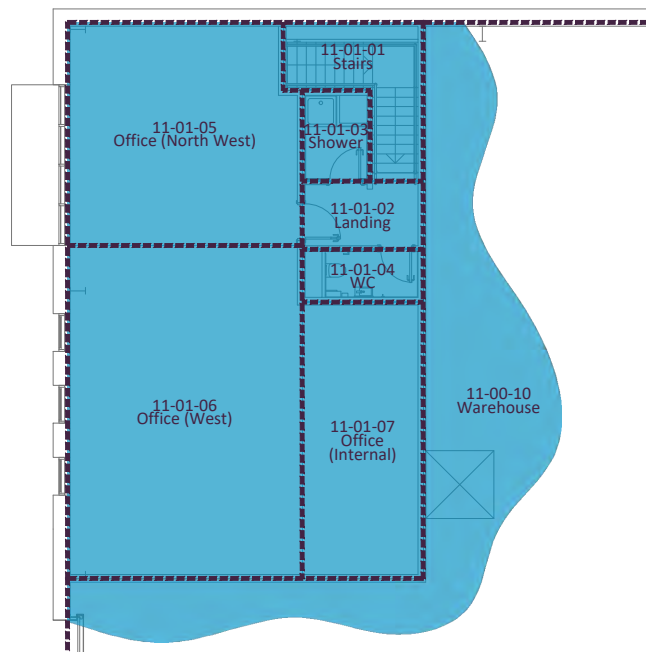


UNIT 9
First Floor

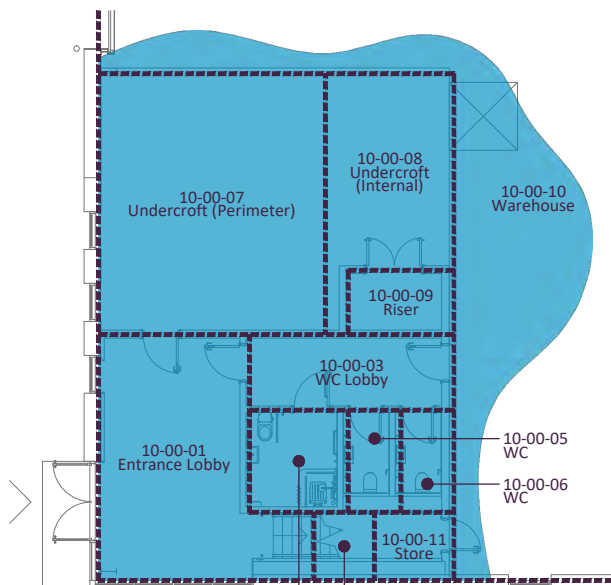
HATCH COLOUR	
PLANT	
SYSTEM TYPE	ELECTRIC HOT WATER STORAGE HEATER
RETURN LOOP	N/A



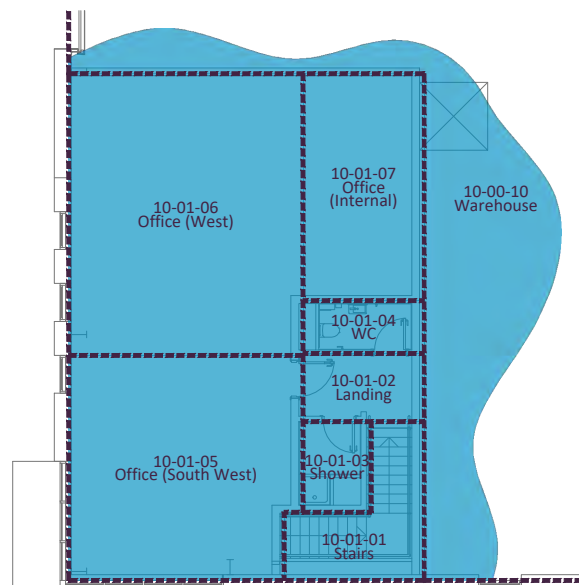
UNIT 11
Ground Floor



UNIT 11
First Floor

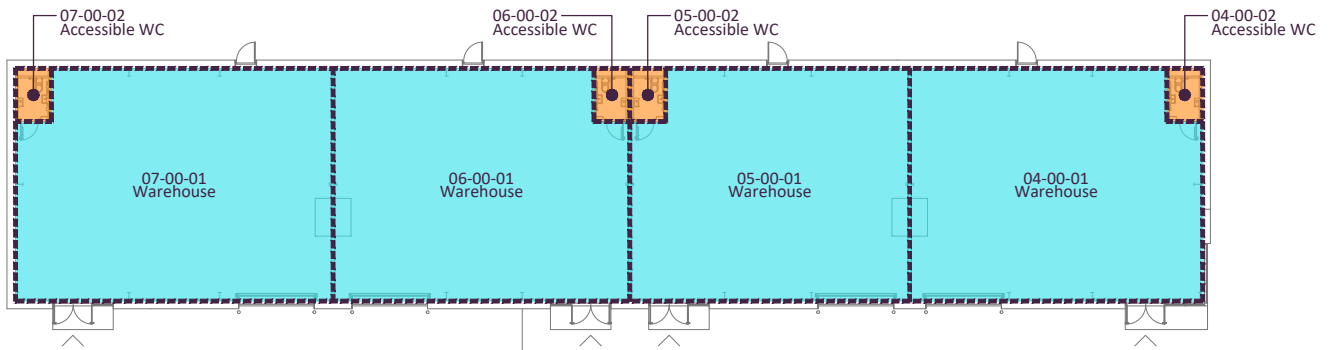
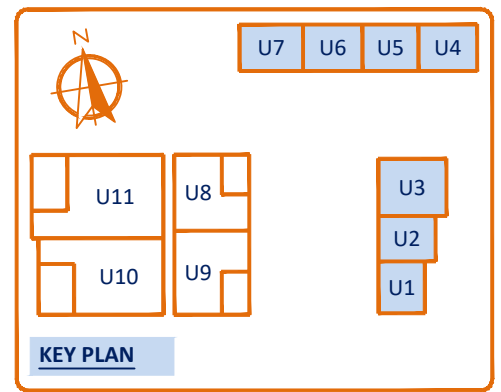


UNIT 10
Ground Floor



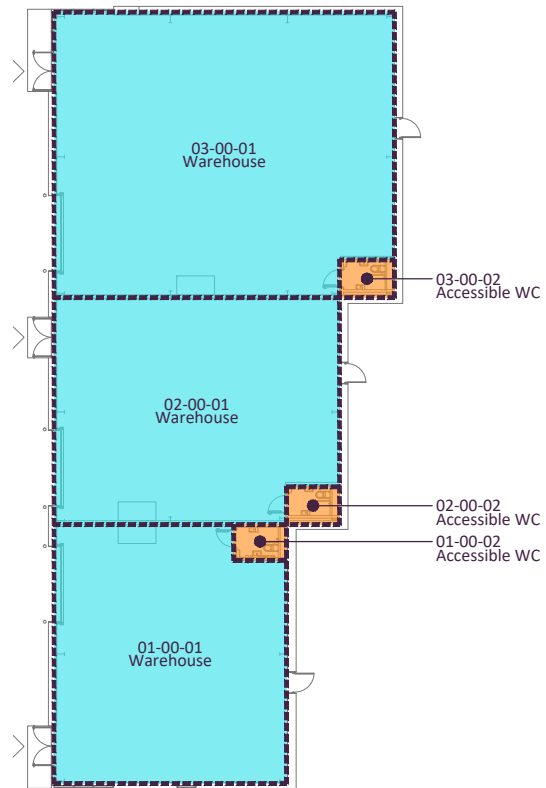
UNIT 10
First Floor

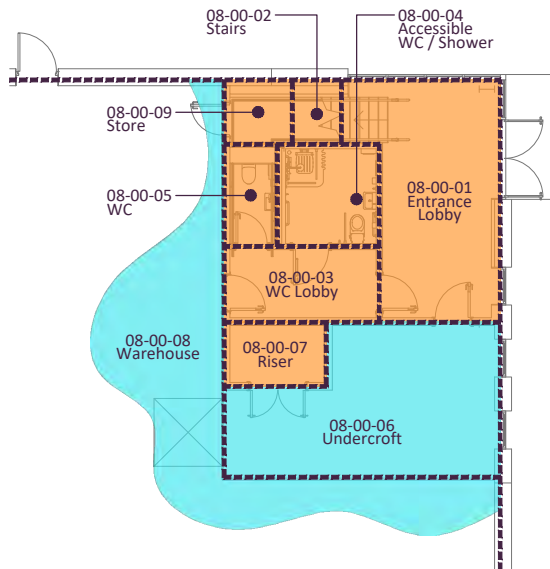
HATCH COLOUR	
PLANT	
SYSTEM TYPE	ELECTRIC HOT WATER STORAGE HEATER
RETURN LOOP	N/A



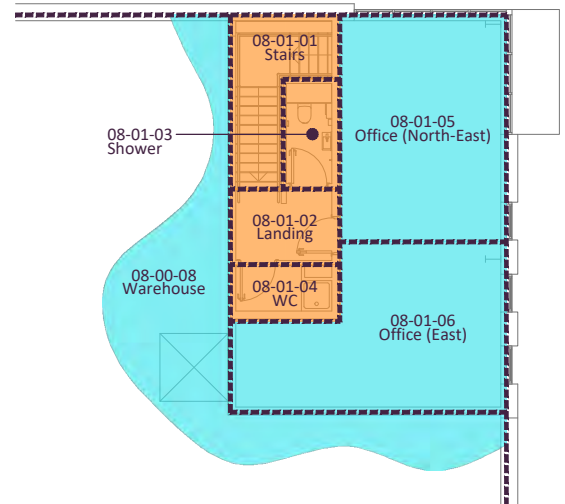
ZONE NAME	POWER CONSUMPTION
Warehouse	95 lm/W
Accessible WC	95 lm/W

HATCH COLOUR	CONTROL ZONE
	AUTO ON/OFF via PIR
	AUTO ON/OFF via PIR with DAYLIGHTING

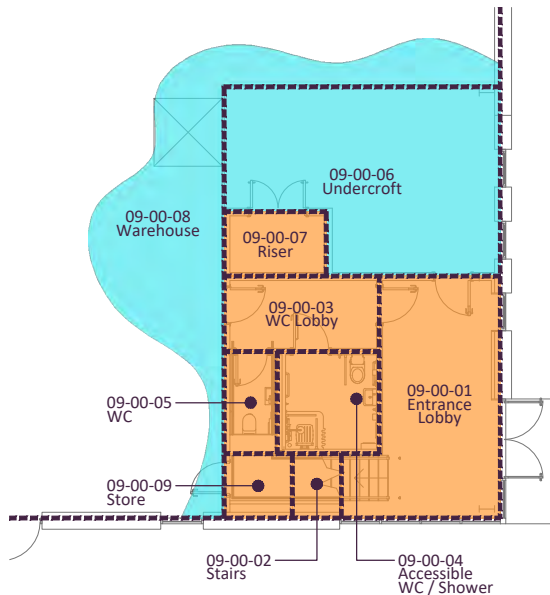




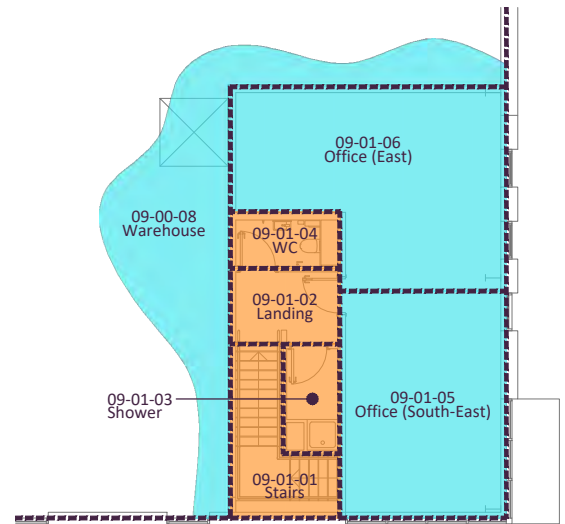
UNIT 8
Ground Floor



UNIT 8
First Floor



UNIT 9
Ground Floor

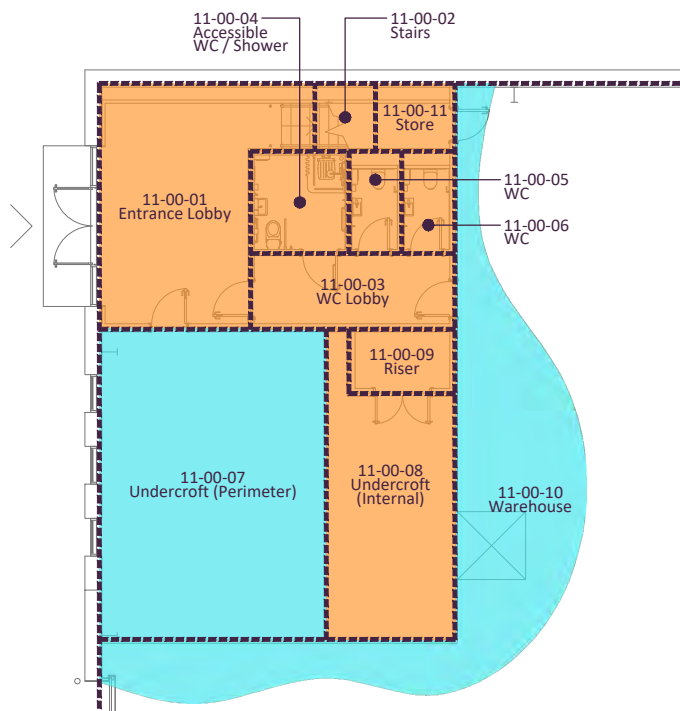


UNIT 9
First Floor

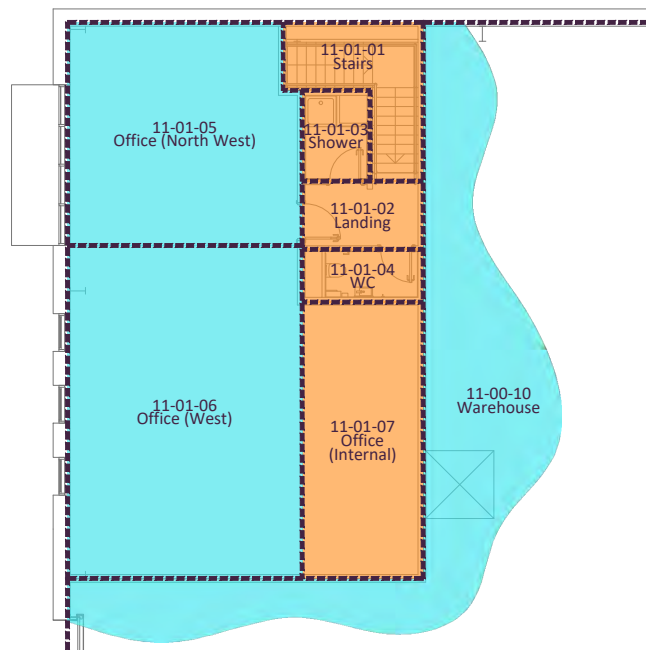
HATCH COLOUR	CONTROL ZONE
	AUTO ON/OFF via PIR
	AUTO ON/OFF via PIR with DAYLIGHTING

ZONE NAME	POWER CONSUMPTION
Entrance Foyer	95 lm/W
Stairs	95 lm/W
Riser / Store	95 lm/W
Accessible WC	95 lm/W
Office	95 lm/W

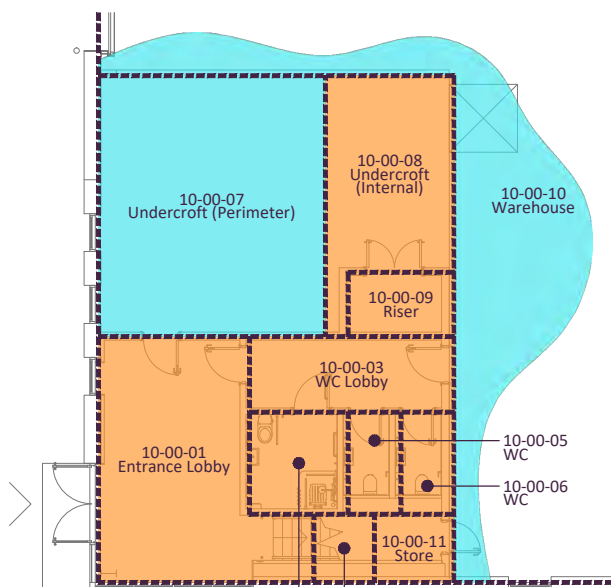
ZONE NAME	POWER CONSUMPTION
Landing	95 lm/W
Single WC	95 lm/W
WC Lobby	95 lm/W
Warehouse	95 lm/W
Undercroft	95 lm/W



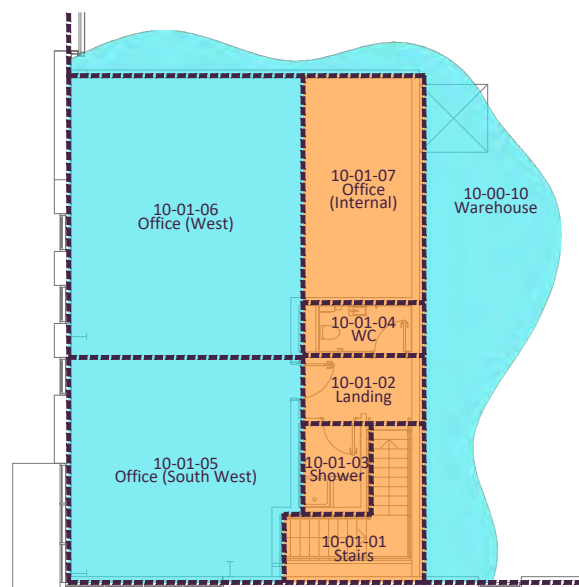
UNIT 11
Ground Floor



UNIT 11
First Floor



UNIT 10
Ground Floor

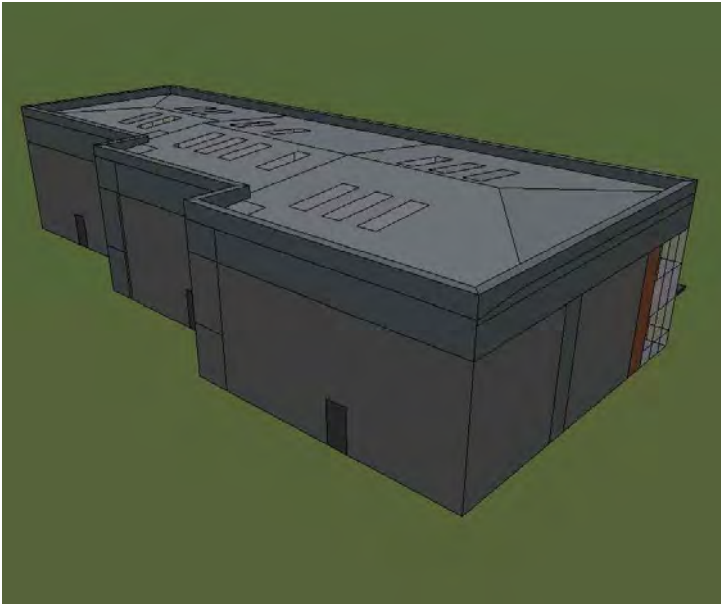
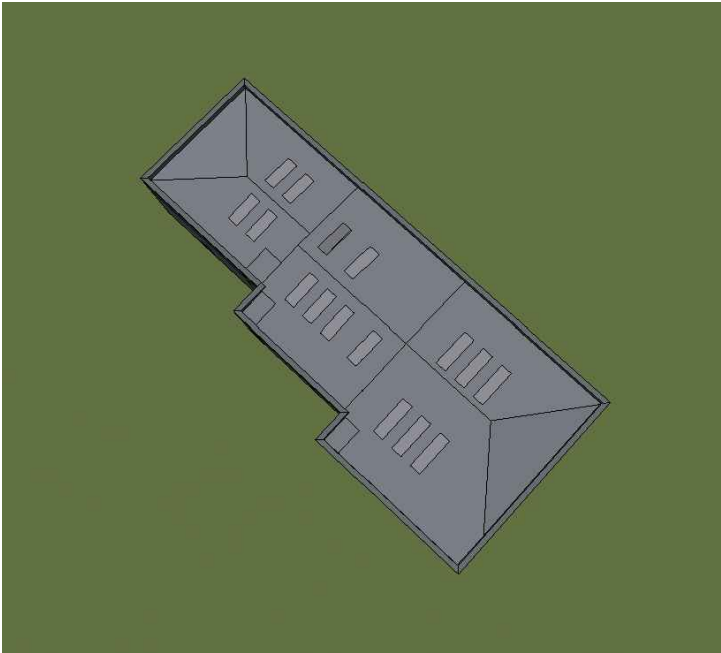


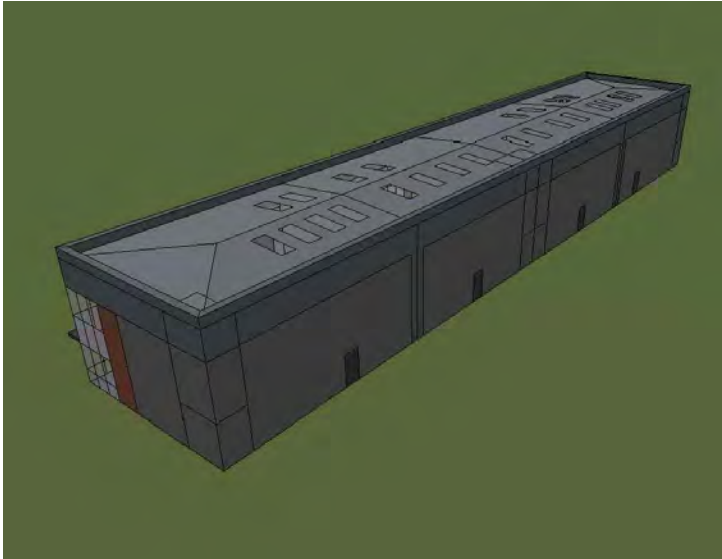
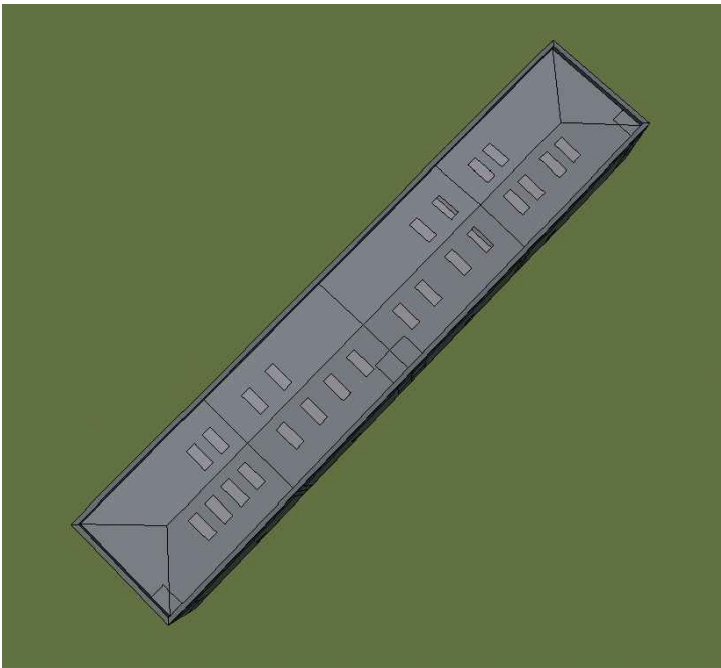
UNIT 10
First Floor

HATCH COLOUR	CONTROL ZONE
	AUTO ON/OFF via PIR
	AUTO ON/OFF via PIR with DAYLIGHTING

ZONE NAME	POWER CONSUMPTION
Entrance Foyer	95 lm/W
Stairs	95 lm/W
Riser / Store	95 lm/W
Accessible WC	95 lm/W
Office	95 lm/W

ZONE NAME	POWER CONSUMPTION
Landing	95 lm/W
Single WC	95 lm/W
WC Lobby	95 lm/W
Warehouse	95 lm/W
Undercroft	95 lm/W





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Protect Title:
Meadow Road, Reading
Unit 4 + 5 + 6 + 7
Drawing Title:
Appendix 1
IES VE Model Images

Scale:
nts

Paper Size:
A4

Drawn By:
LKB

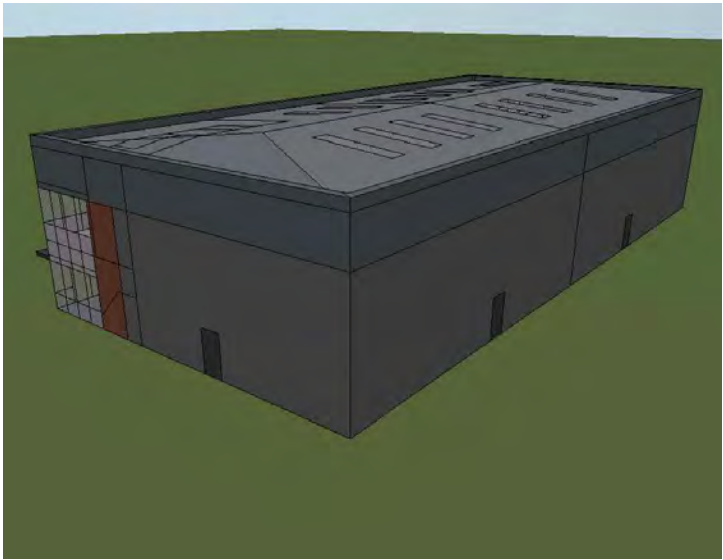
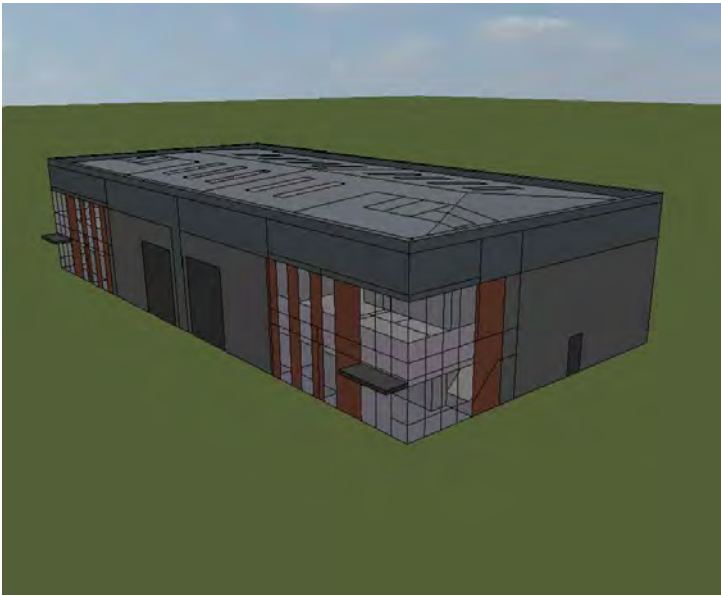
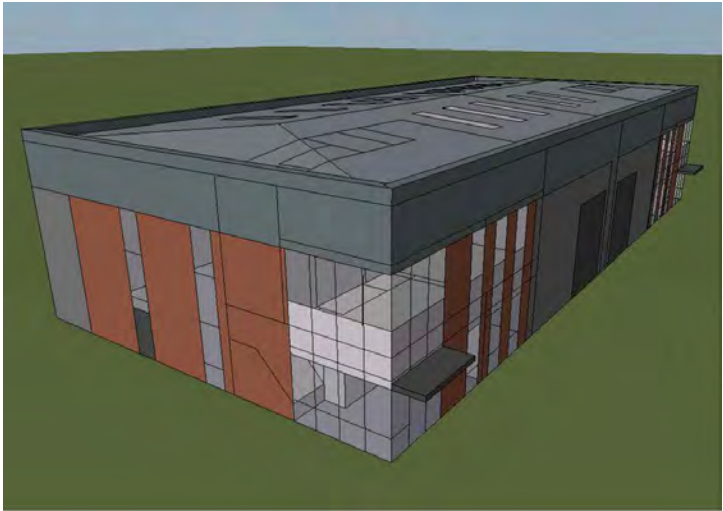
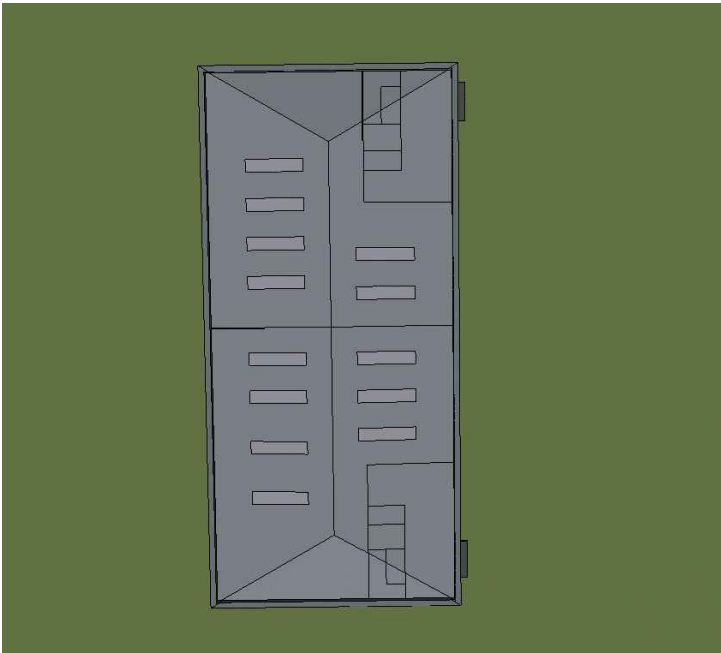
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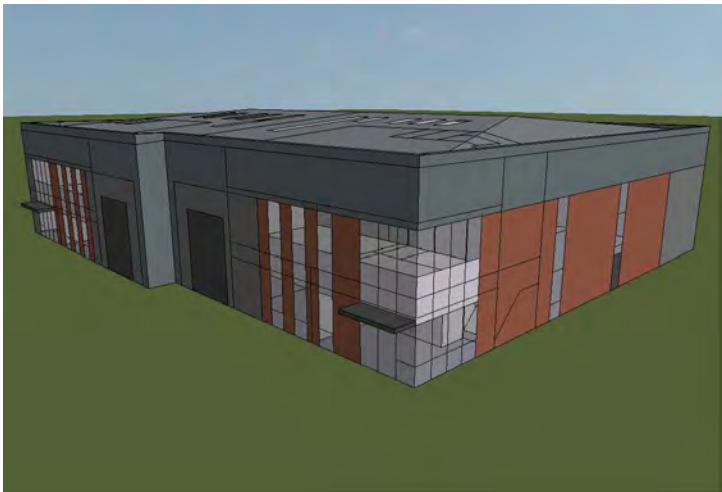
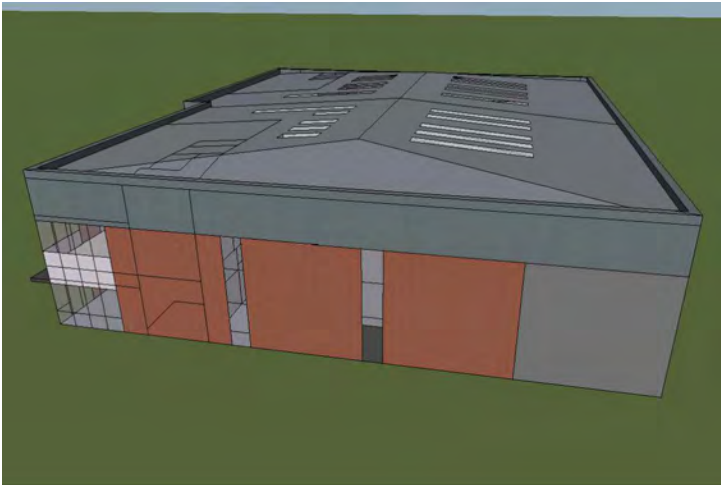
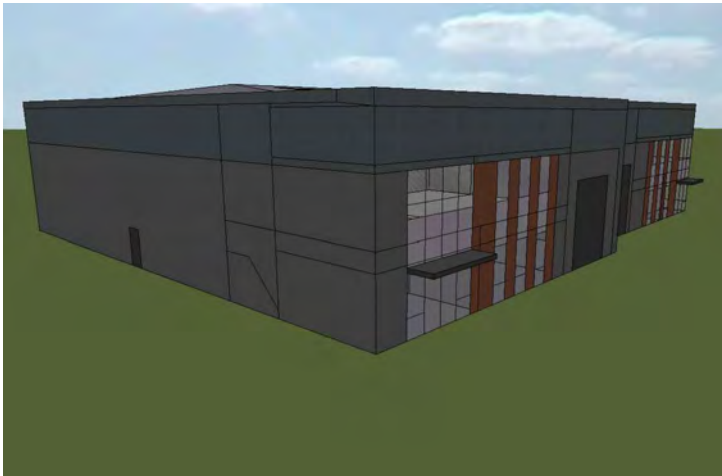
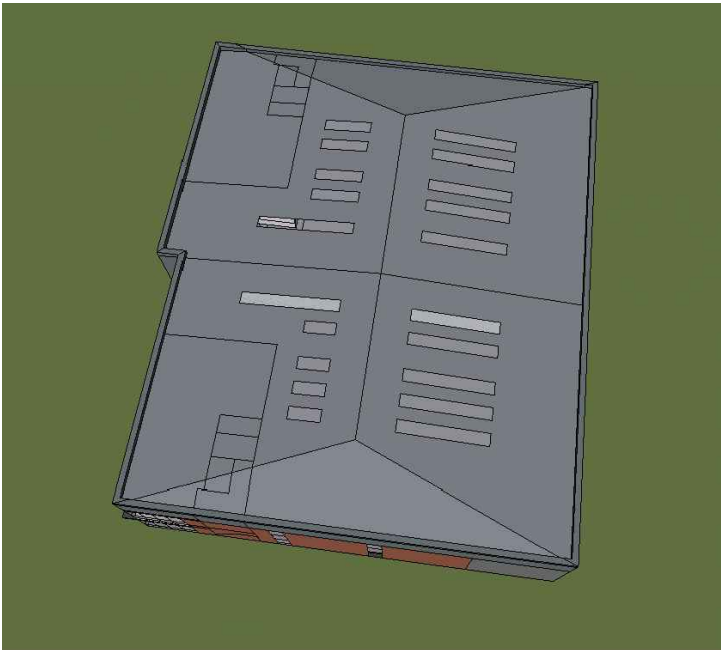
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0306 / Energy Statement

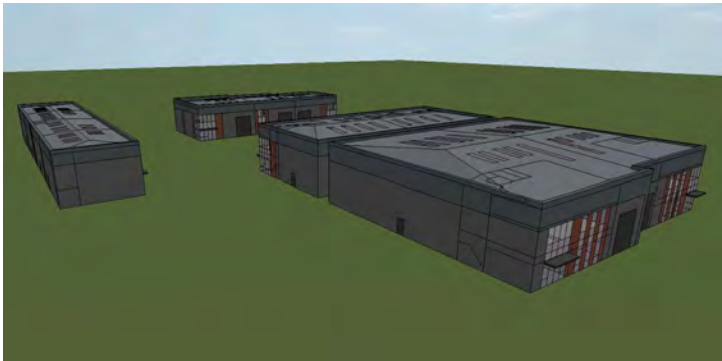
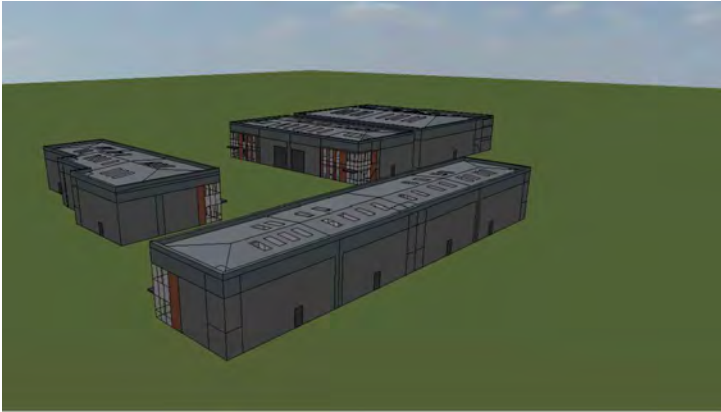
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Amendments:			
Rev	Date	Description	Initials
1	10-06-25	Draft	LKB/AB
2	17-07-25	Planning	LKB/AB







Shepherd Brombley Partnership
 Unit 28 Basepoint Business Centre
 1 Winnall Valley Road
 Winchester
 Hampshire
 SO23 0LD
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 Web: www.shepherdbrombley.co.uk

Protect Title:
Meadow Road, Reading

Drawing Title:
Appendix 1
IES VE Model Images

Scale:
nts

Paper Size:
A4

Drawn By:
LKB

Checked By:
AB

Drawing Number:
0306 / Energy Statement

Drawing Status:
Planning

Rev:
2

Amendments:			
Rev	Date	Description	Initials
1	10-06-25	Draft	LKB/AB
2	17-07-25	Planning	LKB/AB

APPENDIX 2 – BRUKL Output Documents (Lean Building)

Project name

Unit 1 - Lean

As designed

Date: Thu Jun 05 16:28:14 2025

Administrative information**Building Details**

Address: Unit 1, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.28
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	4.2
Target primary energy rate (TPER), kWh _{ep} /m ² annum	23.79
Building primary energy rate (BPER), kWh _{ep} /m ² annum	44.13
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	01000000:Surf[2]
Floors	0.18	0.18	0.18	01000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	01000000:Surf[38]
Windows** and roof windows	1.6	1.6	1.6	01000000:Surf[4]
Rooflights***	2.2	1.3	1.3	01000000:Surf[40]
Personnel doors [^]	1.6	1.6	1.6	01000000:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	01000000:Surf[24]
High usage entrance doors	3	1.6	1.6	01000000:Surf[25]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
01-00-02 - Accessible WC		0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
01-00-01 - Warehouse		95	-	-
01-00-02 - Accessible WC		95	-	-

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?
01-00-01 - Warehouse	NO (-9.1%)	NO

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]	168.5	168.5
External area [m ²]	657.3	657.3
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	233.92	223.57
Average U-value [W/m ² K]	0.36	0.34
Alpha value* [%]	25.23	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	11.54	5.22
Cooling	0	0
Auxiliary	0.49	0.62
Lighting	11.49	8.08
Hot water	5.82	3.9
Equipment*	29.98	29.98
TOTAL**	29.34	17.82

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	2.04
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	2.04

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	33.23	26.49
Primary energy [kWh _{PE} /m ²]	44.13	23.79
Total emissions [kg/m ²]	4.2	2.28

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1052.5	0	365.5	0	15.6	0.8	0	1	0
Notional	839.2	0	165.3	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 2 - Lean

As designed

Date: Thu Jun 05 16:31:41 2025

Administrative information**Building Details**

Address: Unit 2, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.6**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.28
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	4.11
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.75
Building primary energy rate (BPER), kWh _{eq} /m ² annum	43.18
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	02000003:Surf[8]
Floors	0.18	0.18	0.18	02000003:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	02000003:Surf[2]
Windows** and roof windows	1.6	1.6	1.6	02000003:Surf[13]
Rooflights***	2.2	1.3	1.3	02000003:Surf[1]
Personnel doors [^]	1.6	1.6	1.6	02000003:Surf[7]
Vehicle access & similar large doors	1.3	1.3	1.3	02000003:Surf[10]
High usage entrance doors	3	1.6	1.6	02000003:Surf[12]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
02-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	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
02-00-01 - Warehouse		95	-	-
02-00-02 - Accessible WC		95	-	-

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?
02-00-01 - Warehouse	NO (-17%)	NO

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]	181.2	181.2
External area [m ²]	580.6	580.6
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	173.72	207
Average U-value [W/m ² K]	0.3	0.36
Alpha value* [%]	25.27	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	10.95	5.27
Cooling	0	0
Auxiliary	0.48	0.61
Lighting	11.53	7.97
Hot water	5.73	3.9
Equipment*	29.98	29.98
TOTAL**	28.7	17.75

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	2
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	2

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	31.54	26.75
Primary energy [kWh _{PE} /m ²]	43.18	23.75
Total emissions [kg/m ²]	4.11	2.28

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1020.5	0	354.4	0	15.6	0.8	0	1	0
Notional	865.4	0	170.4	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 3 - Lean**As designed**

Date: Thu Jun 05 16:34:04 2025

Administrative information**Building Details**

Address: Unit 3, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.8**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3.37
Target primary energy rate (TPER), kWh _{eq} /m ² annum	20.89
Building primary energy rate (BPER), kWh _{eq} /m ² annum	35.49
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	03000001:Surf[13]
Floors	0.18	0.18	0.18	03000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	03000001:Surf[17]
Windows** and roof windows	1.6	1.6	1.6	03000001:Surf[1]
Rooflights***	2.2	1.3	1.3	03000001:Surf[18]
Personnel doors [^]	1.6	1.6	1.6	03000001:Surf[25]
Vehicle access & similar large doors	1.3	1.3	1.3	03000001:Surf[28]
High usage entrance doors	3	1.6	1.6	03000001:Surf[29]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
03-00-02 - Accessible WC		0.3	-	-	-	-	-	-	-	-	-	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
03-00-01 - Warehouse		95	-	-
03-00-02 - Accessible WC		95	-	-

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?
03-00-01 - Warehouse	NO (-7.5%)	NO

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]	271.8	271.8
External area [m ²]	951.7	951.7
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	300.47	313.77
Average U-value [W/m ² K]	0.32	0.33
Alpha value* [%]	25.2	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	8.11	3.7
Cooling	0	0
Auxiliary	0.33	0.42
Lighting	9.78	7.2
Hot water	5.39	3.94
Equipment*	29.94	29.94
TOTAL**	23.61	15.27

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	1.39
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	1.39

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	23.35	18.8
Primary energy [kWh _{PE} /m ²]	35.49	20.89
Total emissions [kg/m ²]	3.37	2

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1094.1	0	379.9	0	15.6	0.8	0	1	0
Notional	880.9	0	173.5	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 4 - Lean

As designed

Date: Thu Jun 05 16:38:14 2025

Administrative information**Building Details**

Address: Unit 4, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.29
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	4.11
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.91
Building primary energy rate (BPER), kWh _{eq} /m ² annum	43.32
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	04000009:Surf[2]
Floors	0.18	0.18	0.18	04000009:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	04000009:Surf[39]
Windows** and roof windows	1.6	1.6	1.6	04000009:Surf[5]
Rooflights***	2.2	1.3	1.3	04000009:Surf[37]
Personnel doors [^]	1.6	1.6	1.6	04000009:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	04000009:Surf[19]
High usage entrance doors	3	1.6	1.6	04000009:Surf[20]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
04-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	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
04-00-01 - Warehouse		95	-	-
04-00-02 - Accessible WC		95	-	-

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?
04-00-01 - Warehouse	NO (-19.3%)	NO

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]	190.7	190.7
External area [m ²]	730.5	730.5
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	250.21	247.16
Average U-value [W/m ² K]	0.34	0.34
Alpha value* [%]	25.31	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	11.16	5.39
Cooling	0	0
Auxiliary	0.44	0.55
Lighting	11.53	7.81
Hot water	5.69	3.92
Equipment*	29.97	29.97
TOTAL**	28.82	17.66

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	1.81
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	1.81

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	32.14	27.35
Primary energy [kWh _{PE} /m ²]	43.32	23.91
Total emissions [kg/m ²]	4.11	2.29

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1151.9	0	400	0	15.6	0.8	0	1	0
Notional	980	0	193	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 5 - Lean

As designed

Date: Thu Jun 05 16:40:00 2025

Administrative information**Building Details**

Address: Unit 5, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets**

The building does not comply with England Building Regulations Part L 2021

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.22
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3.85
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.16
Building primary energy rate (BPER), kWh _{eq} /m ² annum	40.45
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	05000001:Surf[2]
Floors	0.18	0.18	0.18	05000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	05000001:Surf[23]
Windows** and roof windows	1.6	1.6	1.6	05000001:Surf[5]
Rooflights***	2.2	1.3	1.3	05000001:Surf[19]
Personnel doors [^]	1.6	1.6	1.6	05000001:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	05000001:Surf[11]
High usage entrance doors	3	1.6	1.6	05000001:Surf[4]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
05-00-02 - Accessible WC	0.3	-	-	-	-	-	-	-	-	-	-	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
05-00-01 - Warehouse	95	-	-
05-00-02 - Accessible WC	95	-	-

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?
05-00-01 - Warehouse	NO (-13.9%)	NO

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]	182	182
External area [m ²]	603	603
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	188.84	210.88
Average U-value [W/m ² K]	0.31	0.35
Alpha value* [%]	25.18	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	9.64	4.83
Cooling	0	0
Auxiliary	0.46	0.58
Lighting	11.06	7.94
Hot water	5.74	3.91
Equipment*	29.97	29.97
TOTAL**	26.89	17.26

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	1.89
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	1.89

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	27.76	24.54
Primary energy [kWh _{PE} /m ²]	40.45	23.16
Total emissions [kg/m ²]	3.85	2.22

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	949.9	0	329.8	0	15.6	0.8	0	1	0
Notional	839.6	0	165.3	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 6 - Lean**As designed**

Date: Thu Jun 05 16:41:39 2025

Administrative information**Building Details**

Address: Unit 6, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.17
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3.77
Target primary energy rate (TPER), kWh _e /m ² annum	22.7
Building primary energy rate (BPER), kWh _e /m ² annum	39.64
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	06000001:Surf[2]
Floors	0.18	0.18	0.18	06000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	06000001:Surf[23]
Windows** and roof windows	1.6	1.6	1.6	06000001:Surf[6]
Rooflights***	2.2	1.3	1.3	06000001:Surf[19]
Personnel doors [^]	1.6	1.6	1.6	06000001:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	06000001:Surf[4]
High usage entrance doors	3	1.6	1.6	06000001:Surf[5]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
06-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
06-00-01 - Warehouse		95	-	-
06-00-02 - Accessible WC		95	-	-

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?
06-00-01 - Warehouse	NO (-18.7%)	NO

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]	193.1	193.1
External area [m ²]	639.6	639.6
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	196.38	221.64
Average U-value [W/m ² K]	0.31	0.35
Alpha value* [%]	25.16	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	9.13	4.56
Cooling	0	0
Auxiliary	0.43	0.54
Lighting	11.13	7.83
Hot water	5.68	3.92
Equipment*	29.96	29.96
TOTAL**	26.36	16.86

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	1.78
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	1.78

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	26.28	23.17
Primary energy [kWh _{PE} /m ²]	39.64	22.7
Total emissions [kg/m ²]	3.77	2.17

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	954	0	331.3	0	15.6	0.8	0	1	0
Notional	840.9	0	165.6	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 7 - Lean

As designed

Date: Thu Jun 05 16:49:13 2025

Administrative information**Building Details**

Address: Unit 7, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.24
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	3.79
Target primary energy rate (TPER), kWh _{ep} /m ² annum	23.43
Building primary energy rate (BPER), kWh _{ep} /m ² annum	39.82
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	07000001:Surf[1]
Floors	0.18	0.18	0.18	07000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	07000001:Surf[24]
Windows** and roof windows	1.6	1.6	1.6	07000001:Surf[8]
Rooflights***	2.2	1.3	1.3	07000001:Surf[20]
Personnel doors [^]	1.6	1.6	1.6	07000001:Surf[3]
Vehicle access & similar large doors	1.3	1.3	1.3	07000001:Surf[6]
High usage entrance doors	3	1.6	1.6	07000001:Surf[7]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value		0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1		
07-00-02 - Accessible WC		0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
Standard value		95	80	0.3
07-00-01 - Warehouse		95	-	-
07-00-02 - Accessible WC		95	-	-

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?
07-00-01 - Warehouse	NO (-9.9%)	NO

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]	206.6	206.6
External area [m ²]	783.5	783.5
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	234.19	262.71
Average U-value [W/m ² K]	0.3	0.34
Alpha value* [%]	25.19	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	9.83	5.11
Cooling	0	0
Auxiliary	0.4	0.51
Lighting	10.63	7.67
Hot water	5.62	3.93
Equipment*	29.96	29.96
TOTAL**	26.48	17.22

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	1.67
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	1.67

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	28.31	25.96
Primary energy [kWh _{PE} /m ²]	39.82	23.43
Total emissions [kg/m ²]	3.79	2.24

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1099.6	0	381.8	0	15.6	0.8	0	1	0
Notional	1008.4	0	198.6	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 8 - Lean

As designed

Date: Fri Jun 06 13:30:12 2025

Administrative information**Building Details**

Address: Unit 8, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 79.88**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	4.75
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	10.47
Target primary energy rate (TPER), kWh _{eq} /m ² annum	37.43
Building primary energy rate (BPER), kWh _{eq} /m ² annum	89.5
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	09000034:Surf[20]
Floors	0.18	0.18	0.18	09000034:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	0900001A:Surf[11]
Windows** and roof windows	1.6	1.6	1.6	09000034:Surf[1]
Rooflights***	2.2	1.3	1.3	0900001A:Surf[12]
Personnel doors [^]	1.6	1.6	1.6	0900001A:Surf[5]
Vehicle access & similar large doors	1.3	1.3	1.3	0900001A:Surf[1]
High usage entrance doors	3	1.6	1.6	09000034:Surf[18]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	5	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	7	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
08-00-04 - Accessible WC / Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-00-05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-00-06 - Undercroft	-	-	-	1.1	-	-	-	-	-	-	N/A	
08-01-03 - Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-01-04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-01-05 - Office (North-East)	-	-	-	1.1	-	-	-	-	-	-	N/A	
08-01-06 - Office (East)	-	-	-	1.1	-	-	-	-	-	-	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
08-00-01 - Entrance Lobby		95	-	-
08-00-02 - Stairs		95	-	-
08-00-03 - WC Lobby		95	-	-
08-00-04 - Accessible WC / Shower		95	-	-
08-00-05 - WC		95	-	-
08-00-06 - Undercroft		95	-	-
08-00-07 - Riser		95	-	-
08-00-08 - Warehouse		95	-	-
08-00-09 - Store		95	-	-
08-01-01 - Stairs		95	-	-
08-01-02 - Landing		95	-	-
08-01-03 - Shower		95	-	-
08-01-04 - WC		95	-	-
08-01-05 - Office (North-East)		95	-	-
08-01-06 - Office (East)		95	-	-

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?
08-00-06 - Undercroft	NO (-54.8%)	NO
08-00-08 - Warehouse	NO (-39.2%)	NO
08-01-05 - Office (North-East)	NO (-64.8%)	NO
08-01-06 - Office (East)	NO (-64.1%)	NO

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]	476.2	476.2
External area [m ²]	1310.8	1310.8
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	406.16	429.39
Average U-value [W/m ² K]	0.31	0.33
Alpha value* [%]	25.18	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	43.67	22.08
Cooling	0.35	0.31
Auxiliary	1.91	1.33
Lighting	13.18	9.47
Hot water	4.92	3.45
Equipment*	31.76	31.76
TOTAL**	64.03	36.65

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	9.22
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	9.22

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	134.62	97.86
Primary energy [kWh _{PE} /m ²]	89.5	37.43
Total emissions [kg/m ²]	10.47	4.75

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	504.8	0	175.3	0	0	0.8	0	1	0
Notional	389.8	0	76.8	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	291.6	0	101.2	0	21.9	0.8	0	1	0
Notional	276.6	0	54.5	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	346.2	36.3	113.4	2	6.1	0.85	4.97	0.91	7
Notional	203.7	35.5	62.5	2.1	1.8	0.91	4.63	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	343.2	29.7	112.4	2.3	6.1	0.85	3.55	0.91	5
Notional	227.6	23.6	69.8	1.4	1.8	0.91	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 9 - Lean

As designed

Date: Fri Jun 06 14:10:56 2025

Administrative information**Building Details**

Address: Unit 9, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 86.45**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.97
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	9.52
Target primary energy rate (TPER), kWh _{ep} /m ² annum	31.99
Building primary energy rate (BPER), kWh _{ep} /m ² annum	81
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	09000000:Surf[20]
Floors	0.18	0.18	0.18	09000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	09000019:Surf[20]
Windows** and roof windows	1.6	1.6	1.6	09000000:Surf[1]
Rooflights***	2.2	1.3	1.3	09000019:Surf[21]
Personnel doors [^]	1.6	1.6	1.6	09000019:Surf[4]
Vehicle access & similar large doors	1.3	1.3	1.3	09000019:Surf[1]
High usage entrance doors	3	1.6	1.6	09000000:Surf[18]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	5	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	7	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
09-00-04 - Accessible WC / Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-00-05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-00-06 - Undercroft	-	-	-	1.1	-	-	-	-	-	-	N/A	
09-01-03 - Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-01-04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-01-05 - Office (South-East)	-	-	-	1.1	-	-	-	-	-	-	N/A	
09-01-06 - Office (East)	-	-	-	1.1	-	-	-	-	-	-	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
09-00-01 - Entrance Lobby		95	-	-
09-00-02 - Stairs		95	-	-
09-00-03 - WC Lobby		95	-	-
09-00-04 - Accessible WC / Shower		95	-	-
09-00-05 - WC		95	-	-
09-00-06 - Undercroft		95	-	-
09-00-07 - Riser		95	-	-
09-00-08 - Warehouse		95	-	-
09-00-09 - Store		95	-	-
09-01-01 - Stairs		95	-	-
09-01-02 - Landing		95	-	-
09-01-03 - Shower		95	-	-
09-01-04 - WC		95	-	-
09-01-05 - Office (South-East)		95	-	-
09-01-06 - Office (East)		95	-	-

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?
09-00-06 - Undercroft	NO (-56.4%)	NO
09-00-08 - Warehouse	NO (-12.4%)	NO
09-01-05 - Office (South-East)	NO (-59%)	NO
09-01-06 - Office (East)	NO (-69.4%)	NO

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]	524.3	524.3
External area [m ²]	1430	1430
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	452.93	464.86
Average U-value [W/m ² K]	0.32	0.33
Alpha value* [%]	25.24	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	39.09	17.64
Cooling	0.44	0.79
Auxiliary	1.89	1.25
Lighting	11.75	9.15
Hot water	4.89	3.52
Equipment*	32.19	32.19
TOTAL**	58.06	32.35

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	9.09
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	9.09

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	122.67	87.67
Primary energy [kWh _{PE} /m ²]	81	31.99
Total emissions [kg/m ²]	9.52	3.97

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	483.2	0	167.8	0	0	0.8	0	1	0
Notional	352.2	0	69.4	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	283.2	0	98.3	0	21.9	0.8	0	1	0
Notional	248.7	0	49	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	299.3	44.4	98.1	2.5	6.1	0.85	4.97	0.91	7
Notional	154.2	85.7	47.3	5.1	1.8	0.91	4.63	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	306.4	33.7	100.4	2.6	6.1	0.85	3.55	0.91	5
Notional	156.3	56.6	48	3.4	1.8	0.91	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 10 - Lean**As designed**

Date: Fri Jun 06 13:56:56 2025

Administrative information**Building Details**

Address: Unit 10, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 130.04**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.38
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	7.98
Target primary energy rate (TPER), kWh _{eq} /m ² annum	27.01
Building primary energy rate (BPER), kWh _{eq} /m ² annum	67.91
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	11000020:Surf[5]
Floors	0.18	0.18	0.18	11000020:Surf[0]
Pitched roofs	0.16	0.16	0.16	10000006:Surf[20]
Flat roofs	0.18	0.16	0.16	10000006:Surf[24]
Windows** and roof windows	1.6	1.6	1.6	11000020:Surf[1]
Rooflights***	2.2	1.3	1.3	10000006:Surf[21]
Personnel doors [^]	1.6	1.6	1.6	10000006:Surf[4]
Vehicle access & similar large doors	1.3	1.3	1.3	10000006:Surf[1]
High usage entrance doors	3	1.6	1.6	11000020:Surf[3]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	5	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	7	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I		
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
10-00-04 - Accessible WC / Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
10-00-05 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
10-00-06 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
10-00-07 - Undercroft (Perimeter)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-00-08 - Undercroft (Internal)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-01-03 - Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
10-01-04 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
10-01-05 - Office (South West)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-01-06 - Office (West)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-01-07 - Office (Internal)		-	-	-	1.1	-	-	-	-	-	-	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
10-00-01 - Entrance Lobby		95	-	-
10-00-02 - Stairs		95	-	-
10-00-03 - WC Lobby		95	-	-
10-00-04 - Accessible WC / Shower		95	-	-
10-00-05 - WC		95	-	-
10-00-06 - WC		95	-	-
10-00-07 - Undercroft (Perimeter)		95	-	-
10-00-08 - Undercroft (Internal)		95	-	-
10-00-09 - Riser		95	-	-
10-00-10 - Warehouse		95	-	-
10-00-11 - Store		95	-	-
10-01-01 - Stairs		95	-	-
10-01-02 - Landing		95	-	-
10-01-03 - Shower		95	-	-
10-01-04 - WC		95	-	-
10-01-05 - Office (South West)		95	-	-
10-01-06 - Office (West)		95	-	-
10-01-07 - Office (Internal)		95	-	-

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?
10-00-07 - Undercroft (Perimeter)	NO (-68.4%)	NO
10-00-08 - Undercroft (Internal)	NO (-64.5%)	NO
10-00-10 - Warehouse	NO (-3.6%)	NO
10-01-05 - Office (South West)	NO (-65%)	NO
10-01-06 - Office (West)	NO (-77.8%)	NO
10-01-07 - Office (Internal)	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]	794.1	794.1
External area [m ²]	1990.7	1990.7
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	588.06	630.16
Average U-value [W/m ² K]	0.3	0.32
Alpha value* [%]	25.17	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	30.27	14.1
Cooling	0.56	0.93
Auxiliary	1.88	1.1
Lighting	11.43	9.03
Hot water	4.7	3.65
Equipment*	33.27	33.27
TOTAL**	48.83	28.8

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	9.03
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	9.03

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	98.59	73.7
Primary energy [kWh _{PE} /m ²]	67.91	27.01
Total emissions [kg/m ²]	7.98	3.38

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	433.8	0	150.6	0	0	0.8	0	1	0
Notional	321.6	0	63.3	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	249.4	0	86.6	0	21.9	0.8	0	1	0
Notional	224.3	0	44.2	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	226.2	46.2	74.1	2.6	6.1	0.85	4.97	0.91	7
Notional	123.5	84.1	37.9	5	1.8	0.91	4.63	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	211.9	39.3	69.4	3.1	6.1	0.85	3.55	0.91	5
Notional	107.5	62	33	3.7	1.8	0.91	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 11 - Lean

As designed

Date: Fri Jun 06 14:14:40 2025

Administrative information**Building Details**

Address: Unit 11, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 142.26**The CO₂ emission and primary energy rates of the building must not exceed the targets****The building does not comply with England Building Regulations Part L 2021**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.27
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	7.13
Target primary energy rate (TPER), kWh _{eq} /m ² annum	26.07
Building primary energy rate (BPER), kWh _{eq} /m ² annum	60.76
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	XX000011:Surf[7]
Floors	0.18	0.18	0.18	XX000011:Surf[0]
Pitched roofs	0.16	0.16	0.16	11000014:Surf[10]
Flat roofs	0.18	0.16	0.16	11000014:Surf[9]
Windows** and roof windows	1.6	1.6	1.6	XX000011:Surf[1]
Rooflights***	2.2	1.3	1.3	11000014:Surf[4]
Personnel doors [^]	1.6	1.6	1.6	11000014:Surf[17]
Vehicle access & similar large doors	1.3	1.3	1.3	11000014:Surf[1]
High usage entrance doors	3	1.6	1.6	XX000011:Surf[3]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	5	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.91	7	0	-	0.7
Standard value	0.93*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for gas single boiler systems <=2 MW output and overall for multi-boiler systems. For single boiler systems >2 MW or any individual boiler in a multi-boiler system, limiting efficiency is 0.88.					

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I		
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
11-00-04 - Accessible WC / Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
11-00-05 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
11-00-06 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
11-00-07 - Undercroft (Perimeter)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-00-08 - Undercroft (Internal)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-01-03 - Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
11-01-04 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
11-01-05 - Office (North West)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-01-06 - Office (West)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-01-07 - Office (Internal)		-	-	-	1.1	-	-	-	-	-	-	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
11-00-01 - Entrance Lobby		95	-	-
11-00-02 - Stairs		95	-	-
11-00-03 - WC Lobby		95	-	-
11-00-04 - Accessible WC / Shower		95	-	-
11-00-05 - WC		95	-	-
11-00-06 - WC		95	-	-
11-00-07 - Undercroft (Perimeter)		95	-	-
11-00-08 - Undercroft (Internal)		95	-	-
11-00-09 - Riser		95	-	-
11-00-10 - Warehouse		95	-	-
11-00-11 - Store		95	-	-
11-01-01 - Stairs		95	-	-
11-01-02 - Landing		95	-	-
11-01-03 - Shower		95	-	-
11-01-04 - WC		95	-	-
11-01-05 - Office (North West)		95	-	-
11-01-06 - Office (West)		95	-	-
11-01-07 - Office (Internal)		95	-	-

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?
11-00-07 - Undercroft (Perimeter)	NO (-63%)	NO
11-00-08 - Undercroft (Internal)	NO (-55.9%)	NO
11-00-10 - Warehouse	NO (-3.5%)	NO
11-01-05 - Office (North West)	NO (-80.7%)	NO
11-01-06 - Office (West)	NO (-81.9%)	NO
11-01-07 - Office (Internal)	NO (-90.2%)	NO

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]	905.3	905.3
External area [m ²]	2249.6	2249.6
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	607.07	704.02
Average U-value [W/m ² K]	0.27	0.31
Alpha value* [%]	25.15	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	25.37	13.46
Cooling	0.57	0.89
Auxiliary	1.81	1.01
Lighting	11.09	8.77
Hot water	4.91	3.71
Equipment*	33.38	33.38
TOTAL**	43.76	27.83

* 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/m²]

	Actual	Notional
Photovoltaic systems	0	8.73
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	0	8.73

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	84.25	70.18
Primary energy [kWh _{PE} /m ²]	60.76	26.07
Total emissions [kg/m ²]	7.13	3.27

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	379.3	0	131.7	0	0	0.8	0	1	0
Notional	343.9	0	67.7	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	241.6	0	83.9	0	21.9	0.8	0	1	0
Notional	235.4	0	46.4	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	187.7	44.9	61.5	2.5	6.1	0.85	4.97	0.91	7
Notional	120.9	76.9	37.1	4.6	1.8	0.91	4.63	---	---
[ST] Split or multi-split system, [HS] LTHW boiler, [HFT] Natural Gas, [CFT] Electricity									
Actual	210.8	40.9	69	3.2	6.1	0.85	3.55	0.91	5
Notional	100.9	64.7	31	3.9	1.8	0.91	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

APPENDIX 3 – BRUKL Output Documents (Green Building)

Project name

Unit 1

As designed

Date: Wed Jun 04 13:22:35 2025

Administrative information

Building Details

Address: Unit 1, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.28
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.26
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.79
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-7.23
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	01000000:Surf[2]
Floors	0.18	0.18	0.18	01000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	01000000:Surf[38]
Windows** and roof windows	1.6	1.6	1.6	01000000:Surf[4]
Rooflights***	2.2	1.3	1.3	01000000:Surf[40]
Personnel doors ^Δ	1.6	1.6	1.6	01000000:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	01000000:Surf[24]
High usage entrance doors	3	1.6	1.6	01000000:Surf[25]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
01-00-02 - Accessible WC		0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
01-00-01 - Warehouse		95	-	-
01-00-02 - Accessible WC		95	-	-

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?
01-00-01 - Warehouse	NO (-9.1%)	NO

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]	168.5	168.5
External area [m ²]	657.3	657.3
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	233.92	223.57
Average U-value [W/m ² K]	0.36	0.34
Alpha value* [%]	25.23	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	11.54	5.22
Cooling	0	0
Auxiliary	0.49	0.62
Lighting	11.49	8.08
Hot water	5.82	3.9
Equipment*	29.98	29.98
TOTAL**	29.34	17.82

* 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/m²]

	Actual	Notional
Photovoltaic systems	35	2.04
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	35	2.04

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	33.23	26.49
Primary energy [kWh _{PE} /m ²]	-7.23	23.79
Total emissions [kg/m ²]	-0.26	2.28

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1052.5	0	365.5	0	15.6	0.8	0	1	0
Notional	839.2	0	165.3	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 2

As designed

Date: Wed Jun 04 16:33:03 2025

Administrative information**Building Details**

Address: Unit 2, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.6**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.28
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.42
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.75
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-9.05
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	02000003:Surf[8]
Floors	0.18	0.18	0.18	02000003:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	02000003:Surf[2]
Windows** and roof windows	1.6	1.6	1.6	02000003:Surf[13]
Rooflights***	2.2	1.3	1.3	02000003:Surf[1]
Personnel doors [^]	1.6	1.6	1.6	02000003:Surf[7]
Vehicle access & similar large doors	1.3	1.3	1.3	02000003:Surf[10]
High usage entrance doors	3	1.6	1.6	02000003:Surf[12]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
02-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	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
02-00-01 - Warehouse		95	-	-
02-00-02 - Accessible WC		95	-	-

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?
02-00-01 - Warehouse	NO (-17%)	NO

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]	181.2	181.2
External area [m ²]	580.6	580.6
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	173.72	207
Average U-value [W/m ² K]	0.3	0.36
Alpha value* [%]	25.27	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	10.95	5.27
Cooling	0	0
Auxiliary	0.48	0.61
Lighting	11.53	7.97
Hot water	5.73	3.9
Equipment*	29.98	29.98
TOTAL**	28.7	17.75

* 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/m²]

	Actual	Notional
Photovoltaic systems	35.62	2
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	35.62	2

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	31.54	26.75
Primary energy [kWh _{PE} /m ²]	-9.05	23.75
Total emissions [kg/m ²]	-0.42	2.28

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1020.5	0	354.4	0	15.6	0.8	0	1	0
Notional	865.4	0	170.4	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 3

As designed

Date: Wed Jun 04 16:53:41 2025

Administrative information**Building Details**

Address: Unit 3, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.8**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.39
Target primary energy rate (TPER), kWh _{eq} /m ² annum	20.89
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-7.82
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	03000001:Surf[13]
Floors	0.18	0.18	0.18	03000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	03000001:Surf[17]
Windows** and roof windows	1.6	1.6	1.6	03000001:Surf[1]
Rooflights***	2.2	1.3	1.3	03000001:Surf[18]
Personnel doors [^]	1.6	1.6	1.6	03000001:Surf[25]
Vehicle access & similar large doors	1.3	1.3	1.3	03000001:Surf[28]
High usage entrance doors	3	1.6	1.6	03000001:Surf[29]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
03-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	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
03-00-01 - Warehouse		95	-	-
03-00-02 - Accessible WC		95	-	-

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?
03-00-01 - Warehouse	NO (-7.5%)	NO

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]	271.8	271.8
External area [m ²]	951.7	951.7
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	300.47	313.77
Average U-value [W/m ² K]	0.32	0.33
Alpha value* [%]	25.2	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	8.11	3.7
Cooling	0	0
Auxiliary	0.33	0.42
Lighting	9.78	7.2
Hot water	5.39	3.94
Equipment*	29.94	29.94
TOTAL**	23.61	15.27

* 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/m²]

	Actual	Notional
Photovoltaic systems	29.52	1.39
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	29.52	1.39

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	23.35	18.8
Primary energy [kWh _{PE} /m ²]	-7.82	20.89
Total emissions [kg/m ²]	-0.39	2

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1094.1	0	379.9	0	15.6	0.8	0	1	0
Notional	880.9	0	173.5	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 4

As designed

Date: Thu Jun 05 09:49:56 2025

Administrative information**Building Details**

Address: Unit 4, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.29
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.3
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.91
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-7.48
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	04000009:Surf[2]
Floors	0.18	0.18	0.18	04000009:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	04000009:Surf[39]
Windows** and roof windows	1.6	1.6	1.6	04000009:Surf[5]
Rooflights***	2.2	1.3	1.3	04000009:Surf[37]
Personnel doors [^]	1.6	1.6	1.6	04000009:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	04000009:Surf[19]
High usage entrance doors	3	1.6	1.6	04000009:Surf[20]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
04-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
04-00-01 - Warehouse		95	-	-
04-00-02 - Accessible WC		95	-	-

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?
04-00-01 - Warehouse	NO (-19.3%)	NO

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]	190.7	190.7
External area [m ²]	730.5	730.5
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	250.21	247.16
Average U-value [W/m ² K]	0.34	0.34
Alpha value* [%]	25.31	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	11.16	5.39
Cooling	0	0
Auxiliary	0.44	0.55
Lighting	11.53	7.81
Hot water	5.69	3.92
Equipment*	29.97	29.97
TOTAL**	28.82	17.66

* 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/m²]

	Actual	Notional
Photovoltaic systems	34.59	1.81
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>34.59</i>	<i>1.81</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	32.14	27.35
Primary energy [kWh _{PE} /m ²]	-7.48	23.91
Total emissions [kg/m ²]	-0.3	2.29

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1151.9	0	400	0	15.6	0.8	0	1	0
Notional	980	0	193	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 5

As designed

Date: Thu Jun 05 09:59:15 2025

Administrative information**Building Details**

Address: Unit 5, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.22
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.42
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.16
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-8.52
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	05000001:Surf[2]
Floors	0.18	0.18	0.18	05000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	05000001:Surf[23]
Windows** and roof windows	1.6	1.6	1.6	05000001:Surf[5]
Rooflights***	2.2	1.3	1.3	05000001:Surf[19]
Personnel doors ^Δ	1.6	1.6	1.6	05000001:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	05000001:Surf[11]
High usage entrance doors	3	1.6	1.6	05000001:Surf[4]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
05-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	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
05-00-01 - Warehouse		95	-	-
05-00-02 - Accessible WC		95	-	-

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?
05-00-01 - Warehouse	NO (-13.9%)	NO

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]	182	182
External area [m ²]	603	603
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	188.84	210.88
Average U-value [W/m ² K]	0.31	0.35
Alpha value* [%]	25.18	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	9.64	4.83
Cooling	0	0
Auxiliary	0.46	0.58
Lighting	11.06	7.94
Hot water	5.74	3.91
Equipment*	29.97	29.97
TOTAL**	26.89	17.26

* 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/m²]

	Actual	Notional
Photovoltaic systems	33.31	1.89
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>33.31</i>	<i>1.89</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	27.76	24.54
Primary energy [kWh _{PE} /m ²]	-8.52	23.16
Total emissions [kg/m ²]	-0.42	2.22

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	949.9	0	329.8	0	15.6	0.8	0	1	0
Notional	839.6	0	165.3	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 6

As designed

Date: Thu Jun 05 10:21:31 2025

Administrative information

Building Details

Address: Unit 6, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.17
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.26
Target primary energy rate (TPER), kWh _{eq} /m ² annum	22.7
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-6.53
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	06000001:Surf[2]
Floors	0.18	0.18	0.18	06000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	06000001:Surf[23]
Windows** and roof windows	1.6	1.6	1.6	06000001:Surf[6]
Rooflights***	2.2	1.3	1.3	06000001:Surf[19]
Personnel doors [^]	1.6	1.6	1.6	06000001:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	06000001:Surf[4]
High usage entrance doors	3	1.6	1.6	06000001:Surf[5]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
06-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	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
06-00-01 - Warehouse		95	-	-
06-00-02 - Accessible WC		95	-	-

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?
06-00-01 - Warehouse	NO (-18.7%)	NO

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]	193.1	193.1
External area [m ²]	639.6	639.6
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	196.38	221.64
Average U-value [W/m ² K]	0.31	0.35
Alpha value* [%]	25.16	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	9.13	4.56
Cooling	0	0
Auxiliary	0.43	0.54
Lighting	11.13	7.83
Hot water	5.68	3.92
Equipment*	29.96	29.96
TOTAL**	26.36	16.86

* 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/m²]

	Actual	Notional
Photovoltaic systems	31.4	1.78
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	31.4	1.78

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	26.28	23.17
Primary energy [kWh _{PE} /m ²]	-6.53	22.7
Total emissions [kg/m ²]	-0.26	2.17

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	954	0	331.3	0	15.6	0.8	0	1	0
Notional	840.9	0	165.6	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 7

As designed

Date: Thu Jun 05 10:35:24 2025

Administrative information**Building Details**

Address: Unit 7, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 5.32**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.24
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.29
Target primary energy rate (TPER), kWh _{eq} /m ² annum	23.43
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-7.05
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	07000001:Surf[1]
Floors	0.18	0.18	0.18	07000001:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	07000001:Surf[24]
Windows** and roof windows	1.6	1.6	1.6	07000001:Surf[8]
Rooflights***	2.2	1.3	1.3	07000001:Surf[20]
Personnel doors [^]	1.6	1.6	1.6	07000001:Surf[3]
Vehicle access & similar large doors	1.3	1.3	1.3	07000001:Surf[6]
High usage entrance doors	3	1.6	1.6	07000001:Surf[7]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Electric Heating S1 (U1-7)

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.058
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
07-00-02 - Accessible WC	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	-	N/A

General lighting and display lighting		General luminaire	Display light source	
Zone name		Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
	Standard value	95	80	0.3
07-00-01 - Warehouse		95	-	-
07-00-02 - Accessible WC		95	-	-

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?
07-00-01 - Warehouse	NO (-9.9%)	NO

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]	206.6	206.6
External area [m ²]	783.5	783.5
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	234.19	262.71
Average U-value [W/m ² K]	0.3	0.34
Alpha value* [%]	25.19	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	9.83	5.11
Cooling	0	0
Auxiliary	0.4	0.51
Lighting	10.63	7.67
Hot water	5.62	3.93
Equipment*	29.96	29.96
TOTAL**	26.48	17.22

* 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/m²]

	Actual	Notional
Photovoltaic systems	31.91	1.67
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>31.91</i>	<i>1.67</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	28.31	25.96
Primary energy [kWh _{PE} /m ²]	-7.05	23.43
Total emissions [kg/m ²]	-0.29	2.24

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] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	1099.6	0	381.8	0	15.6	0.8	0	1	0
Notional	1008.4	0	198.6	0	19.8	1.41	0	----	----
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 8

As designed

Date: Thu Jun 05 14:33:10 2025

Administrative information**Building Details**

Address: Unit 8, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 79.88**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.56
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.47
Target primary energy rate (TPER), kWh _{ep} /m ² annum	36.74
Building primary energy rate (BPER), kWh _{ep} /m ² annum	-13.47
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	09000034:Surf[20]
Floors	0.18	0.18	0.18	09000034:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	0900001A:Surf[11]
Windows** and roof windows	1.6	1.6	1.6	09000034:Surf[1]
Rooflights***	2.2	1.3	1.3	0900001A:Surf[12]
Personnel doors ^Δ	1.6	1.6	1.6	0900001A:Surf[5]
Vehicle access & similar large doors	1.3	1.3	1.3	0900001A:Surf[1]
High usage entrance doors	3	1.6	1.6	09000034:Surf[18]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	5	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.3	7	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
08-00-04 - Accessible WC / Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-00-05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-00-06 - Undercroft	-	-	-	1.1	-	-	-	-	-	-	N/A	
08-01-03 - Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-01-04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
08-01-05 - Office (North-East)	-	-	-	1.1	-	-	-	-	-	-	N/A	
08-01-06 - Office (East)	-	-	-	1.1	-	-	-	-	-	-	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
08-00-01 - Entrance Lobby	-	95	-	-
08-00-02 - Stairs	-	95	-	-
08-00-03 - WC Lobby	-	95	-	-
08-00-04 - Accessible WC / Shower	-	95	-	-
08-00-05 - WC	-	95	-	-
08-00-06 - Undercroft	-	95	-	-
08-00-07 - Riser	-	95	-	-
08-00-08 - Warehouse	-	95	-	-
08-00-09 - Store	-	95	-	-
08-01-01 - Stairs	-	95	-	-
08-01-02 - Landing	-	95	-	-
08-01-03 - Shower	-	95	-	-
08-01-04 - WC	-	95	-	-
08-01-05 - Office (North-East)	-	95	-	-
08-01-06 - Office (East)	-	95	-	-

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?
08-00-06 - Undercroft	NO (-54.8%)	NO
08-00-08 - Warehouse	NO (-39.2%)	NO
08-01-05 - Office (North-East)	NO (-64.8%)	NO
08-01-06 - Office (East)	NO (-64.1%)	NO

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]	476.2	476.2
External area [m ²]	1310.8	1310.8
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	406.16	429.39
Average U-value [W/m ² K]	0.31	0.33
Alpha value* [%]	25.18	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	29.88	14.86
Cooling	0.35	0.31
Auxiliary	1.91	1.33
Lighting	13.18	9.47
Hot water	4.92	3.45
Equipment*	31.76	31.76
TOTAL**	50.25	29.44

* 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/m²]

	Actual	Notional
Photovoltaic systems	60.98	5.15
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>60.98</i>	<i>5.15</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	134.62	97.86
Primary energy [kWh _{PE} /m ²]	-13.47	36.74
Total emissions [kg/m ²]	-0.47	3.56

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	504.8	0	175.3	0	0	0.8	0	1	0
Notional	389.8	0	76.8	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	291.6	0	101.2	0	21.9	0.8	0	1	0
Notional	276.6	0	54.5	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	346.2	36.3	24	2	6.1	4.01	4.97	4.3	7
Notional	203.7	35.5	20.4	2.1	1.8	2.78	4.63	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	343.2	29.7	40.9	2.3	6.1	2.33	3.55	2.5	5
Notional	227.6	23.6	22.8	1.4	1.8	2.78	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 9

As designed

Date: Thu Jun 05 14:49:43 2025

Administrative information**Building Details**

Address: Unit 9, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 86.45**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	3.19
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.39
Target primary energy rate (TPER), kWh _{eq} /m ² annum	32.95
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-11.74
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	09000000:Surf[20]
Floors	0.18	0.18	0.18	09000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	09000019:Surf[20]
Windows** and roof windows	1.6	1.6	1.6	09000000:Surf[1]
Rooflights***	2.2	1.3	1.3	09000019:Surf[21]
Personnel doors ^Δ	1.6	1.6	1.6	09000019:Surf[4]
Vehicle access & similar large doors	1.3	1.3	1.3	09000019:Surf[1]
High usage entrance doors	3	1.6	1.6	09000000:Surf[18]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	5	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.3	7	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I			
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard	
09-00-04 - Accessible WC / Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-00-05 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-00-06 - Undercroft	-	-	-	1.1	-	-	-	-	-	-	N/A	
09-01-03 - Shower	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-01-04 - WC	-	-	0.5	-	-	-	-	-	-	-	N/A	
09-01-05 - Office (South-East)	-	-	-	1.1	-	-	-	-	-	-	N/A	
09-01-06 - Office (East)	-	-	-	1.1	-	-	-	-	-	-	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
09-00-01 - Entrance Lobby		95	-	-
09-00-02 - Stairs		95	-	-
09-00-03 - WC Lobby		95	-	-
09-00-04 - Accessible WC / Shower		95	-	-
09-00-05 - WC		95	-	-
09-00-06 - Undercroft		95	-	-
09-00-07 - Riser		95	-	-
09-00-08 - Warehouse		95	-	-
09-00-09 - Store		95	-	-
09-01-01 - Stairs		95	-	-
09-01-02 - Landing		95	-	-
09-01-03 - Shower		95	-	-
09-01-04 - WC		95	-	-
09-01-05 - Office (South-East)		95	-	-
09-01-06 - Office (East)		95	-	-

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?
09-00-06 - Undercroft	NO (-56.4%)	NO
09-00-08 - Warehouse	NO (-12.4%)	NO
09-01-05 - Office (South-East)	NO (-59%)	NO
09-01-06 - Office (East)	NO (-69.4%)	NO

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]	524.3	524.3
External area [m ²]	1430	1430
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	452.93	464.86
Average U-value [W/m ² K]	0.32	0.33
Alpha value* [%]	25.24	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	26.4	12.04
Cooling	0.44	0.79
Auxiliary	1.89	1.25
Lighting	11.75	9.15
Hot water	4.89	3.52
Equipment*	32.19	32.19
TOTAL**	45.37	26.75

* 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/m²]

	Actual	Notional
Photovoltaic systems	54.73	4.94
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>54.73</i>	<i>4.94</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	122.67	87.67
Primary energy [kWh _{PE} /m ²]	-11.74	32.95
Total emissions [kg/m ²]	-0.39	3.19

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	483.2	0	167.8	0	0	0.8	0	1	0
Notional	352.2	0	69.4	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	283.2	0	98.3	0	21.9	0.8	0	1	0
Notional	248.7	0	49	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	299.3	44.4	20.8	2.5	6.1	4.01	4.97	4.3	7
Notional	154.2	85.7	15.4	5.1	1.8	2.78	4.63	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	306.4	33.7	36.5	2.6	6.1	2.33	3.55	2.5	5
Notional	156.3	56.6	15.6	3.4	1.8	2.78	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 10

As designed

Date: Thu Jun 05 14:12:42 2025

Administrative information

Building Details

Address: Unit 10, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 130.04The CO₂ emission and primary energy rates of the building must not exceed the targets

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.8
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.36
Target primary energy rate (TPER), kWh _{eq} /m ² annum	29.14
Building primary energy rate (BPER), kWh _{eq} /m ² annum	-9.92
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	11000020:Surf[5]
Floors	0.18	0.18	0.18	11000020:Surf[0]
Pitched roofs	0.16	0.16	0.16	10000006:Surf[20]
Flat roofs	0.18	0.16	0.16	10000006:Surf[24]
Windows** and roof windows	1.6	1.6	1.6	11000020:Surf[1]
Rooflights***	2.2	1.3	1.3	10000006:Surf[21]
Personnel doors ^Δ	1.6	1.6	1.6	10000006:Surf[4]
Vehicle access & similar large doors	1.3	1.3	1.3	10000006:Surf[1]
High usage entrance doors	3	1.6	1.6	11000020:Surf[3]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	5	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.3	7	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I		
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
10-00-04 - Accessible WC / Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
10-00-05 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
10-00-06 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
10-00-07 - Undercroft (Perimeter)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-00-08 - Undercroft (Internal)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-01-03 - Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
10-01-04 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
10-01-05 - Office (South West)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-01-06 - Office (West)		-	-	-	1.1	-	-	-	-	-	-	N/A
10-01-07 - Office (Internal)		-	-	-	1.1	-	-	-	-	-	-	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
10-00-01 - Entrance Lobby		95	-	-
10-00-02 - Stairs		95	-	-
10-00-03 - WC Lobby		95	-	-
10-00-04 - Accessible WC / Shower		95	-	-
10-00-05 - WC		95	-	-
10-00-06 - WC		95	-	-
10-00-07 - Undercroft (Perimeter)		95	-	-
10-00-08 - Undercroft (Internal)		95	-	-
10-00-09 - Riser		95	-	-
10-00-10 - Warehouse		95	-	-
10-00-11 - Store		95	-	-
10-01-01 - Stairs		95	-	-
10-01-02 - Landing		95	-	-
10-01-03 - Shower		95	-	-
10-01-04 - WC		95	-	-
10-01-05 - Office (South West)		95	-	-
10-01-06 - Office (West)		95	-	-
10-01-07 - Office (Internal)		95	-	-

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?
10-00-07 - Undercroft (Perimeter)	NO (-68.4%)	NO
10-00-08 - Undercroft (Internal)	NO (-64.5%)	NO
10-00-10 - Warehouse	NO (-3.6%)	NO
10-01-05 - Office (South West)	NO (-65%)	NO
10-01-06 - Office (West)	NO (-77.8%)	NO
10-01-07 - Office (Internal)	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]	794.1	794.1
External area [m ²]	1990.7	1990.7
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	588.06	630.16
Average U-value [W/m ² K]	0.3	0.32
Alpha value* [%]	25.17	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	19.47	9.16
Cooling	0.56	0.93
Auxiliary	1.88	1.1
Lighting	11.43	9.03
Hot water	4.7	3.65
Equipment*	33.27	33.27
TOTAL**	38.03	23.86

* 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/m²]

	Actual	Notional
Photovoltaic systems	45.85	4.51
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>45.85</i>	<i>4.51</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	98.59	73.7
Primary energy [kWh _{PE} /m ²]	-9.92	29.14
Total emissions [kg/m ²]	-0.36	2.8

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	433.8	0	150.6	0	0	0.8	0	1	0
Notional	321.6	0	63.3	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	249.4	0	86.6	0	21.9	0.8	0	1	0
Notional	224.3	0	44.2	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	226.2	46.2	15.7	2.6	6.1	4.01	4.97	4.3	7
Notional	123.5	84.1	12.3	5	1.8	2.78	4.63	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	211.9	39.3	25.3	3.1	6.1	2.33	3.55	2.5	5
Notional	107.5	62	10.8	3.7	1.8	2.78	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

Project name

Unit 11

As designed

Date: Thu Jun 05 14:01:27 2025

Administrative information**Building Details**

Address: Unit 11, Reading,

Certifier details

Name: Aaron Batten

Telephone number:

Address: Unit 22 Basepoint Business Centre, 1 Winnall Valley Road, Winchester, SO23 0LD

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.27

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.27

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

Foundation area [m²]: 142.26**The CO₂ emission and primary energy rates of the building must not exceed the targets**

Target CO ₂ emission rate (TER), kgCO ₂ /m ² annum	2.74
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	-0.49
Target primary energy rate (TPER), kWh _{ep} /m ² annum	28.55
Building primary energy rate (BPER), kWh _{ep} /m ² annum	-10.79
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-Limit}	U _{a-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.26	0.26	XX000011:Surf[7]
Floors	0.18	0.18	0.18	XX000011:Surf[0]
Pitched roofs	0.16	0.16	0.16	11000014:Surf[10]
Flat roofs	0.18	0.16	0.16	11000014:Surf[9]
Windows** and roof windows	1.6	1.6	1.6	XX000011:Surf[1]
Rooflights***	2.2	1.3	1.3	11000014:Surf[4]
Personnel doors ^Δ	1.6	1.6	1.6	11000014:Surf[17]
Vehicle access & similar large doors	1.3	1.3	1.3	11000014:Surf[1]
High usage entrance doors	3	1.6	1.6	XX000011:Surf[3]

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

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

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

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

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

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

Building services

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

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	>0.95

1- Electric Heating S1

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Electric Heating S1 (Vent)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0.2	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- AC Heating & Cooling S3 (BREGs)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.5	5	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

4- AC Heating & Cooling S2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.3	7	0	-	0.7
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

1- Electric Heating S1

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.007
Standard value	1	N/A

Zone-level mechanical ventilation, exhaust, and terminal units

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

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type	A	B	C	D	E	F	G	H	I		
	Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
11-00-04 - Accessible WC / Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
11-00-05 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
11-00-06 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
11-00-07 - Undercroft (Perimeter)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-00-08 - Undercroft (Internal)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-01-03 - Shower		-	-	0.5	-	-	-	-	-	-	-	N/A
11-01-04 - WC		-	-	0.5	-	-	-	-	-	-	-	N/A
11-01-05 - Office (North West)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-01-06 - Office (West)		-	-	-	1.1	-	-	-	-	-	-	N/A
11-01-07 - Office (Internal)		-	-	-	1.1	-	-	-	-	-	-	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
11-00-01 - Entrance Lobby		95	-	-
11-00-02 - Stairs		95	-	-
11-00-03 - WC Lobby		95	-	-
11-00-04 - Accessible WC / Shower		95	-	-
11-00-05 - WC		95	-	-
11-00-06 - WC		95	-	-
11-00-07 - Undercroft (Perimeter)		95	-	-
11-00-08 - Undercroft (Internal)		95	-	-
11-00-09 - Riser		95	-	-
11-00-10 - Warehouse		95	-	-
11-00-11 - Store		95	-	-
11-01-01 - Stairs		95	-	-
11-01-02 - Landing		95	-	-
11-01-03 - Shower		95	-	-
11-01-04 - WC		95	-	-
11-01-05 - Office (North West)		95	-	-
11-01-06 - Office (West)		95	-	-
11-01-07 - Office (Internal)		95	-	-

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?
11-00-07 - Undercroft (Perimeter)	NO (-63%)	NO
11-00-08 - Undercroft (Internal)	NO (-55.9%)	NO
11-00-10 - Warehouse	NO (-3.5%)	NO
11-01-05 - Office (North West)	NO (-80.7%)	NO
11-01-06 - Office (West)	NO (-81.9%)	NO
11-01-07 - Office (Internal)	NO (-90.2%)	NO

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]	905.3	905.3
External area [m ²]	2249.6	2249.6
Weather	SWI	SWI
Infiltration [m ³ /hm ² @ 50Pa]	3	5
Average conductance [W/K]	607.07	704.02
Average U-value [W/m ² K]	0.27	0.31
Alpha value* [%]	25.15	10

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	15.78	8.65
Cooling	0.57	0.89
Auxiliary	1.81	1.01
Lighting	11.09	8.77
Hot water	4.91	3.71
Equipment*	33.38	33.38
TOTAL**	34.17	23.03

* 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/m²]

	Actual	Notional
Photovoltaic systems	42.43	4.05
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>42.43</i>	<i>4.05</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	84.25	70.18
Primary energy [kWh _{PE} /m ²]	-10.79	28.55
Total emissions [kg/m ²]	-0.49	2.74

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 SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	379.3	0	131.7	0	0	0.8	0	1	0
Notional	343.9	0	67.7	0	0	1.41	0	---	---
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	241.6	0	83.9	0	21.9	0.8	0	1	0
Notional	235.4	0	46.4	0	25	1.41	0	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	187.7	44.9	13	2.5	6.1	4.01	4.97	4.3	7
Notional	120.9	76.9	12.1	4.6	1.8	2.78	4.63	---	---
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity									
Actual	210.8	40.9	25.1	3.2	6.1	2.33	3.55	2.5	5
Notional	100.9	64.7	10.1	3.9	1.8	2.78	4.63	---	---
[ST] No Heating or Cooling									
Actual	0	0	0	0	0	0	0	0	0
Notional	0	0	0	0	0	0	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

APPENDIX 4 – Draft EPC Certificates

Energy Performance Certificate

Non-Domestic Building



Unit 1
Meadow Road
Reading

Certificate Reference Number:
4439-0885-7259-2080-5438

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+

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m ²):	168.510
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.26
Primary energy use (kWh _e /m ² per year):	-7.23

Benchmarks

Buildings similar to this one could have ratings as follows:	
15	If newly built
60	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 2
Meadow Road
Reading

Certificate Reference Number:
3058-9139-5109-8018-6777

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+

◀ -3

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m ²):	181.200
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.42
Primary energy use (kWh _e /m ² per year):	-9.05

Benchmarks

Buildings similar to this one could have ratings as follows:

15	If newly built
59	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 3
Meadow Road
Reading

Certificate Reference Number:
8048-0052-1249-0008-5545

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+

◀ -3

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m ²):	271.800
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.39
Primary energy use (kWh _e /m ² per year):	-7.82

Benchmarks

Buildings similar to this one could have ratings as follows:

14	If newly built
55	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 4
Meadow Road
Reading

Certificate Reference Number:
1718-2577-8203-7671-0861

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+

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m ²):	190.650
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.3
Primary energy use (kWh _e /m ² per year):	-7.48

Benchmarks

Buildings similar to this one could have ratings as follows:	
15	If newly built
59	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 5
Meadow Road
Reading

Certificate Reference Number:
8573-6909-3763-4513-6375

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+

◀ -3

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m ²):	182.040
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.42
Primary energy use (kWh _e /m ² per year):	-8.52

Benchmarks

Buildings similar to this one could have ratings as follows:

14	If newly built
58	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 6
Meadow Road
Reading

Certificate Reference Number:
9518-1456-0329-8302-8705

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+

◀ -2

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m ²):	193.110
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.26
Primary energy use (kWh _e /m ² per year):	-6.53

Benchmarks

Buildings similar to this one could have ratings as follows:

14	If newly built
58	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 7
Meadow Road
Reading

Certificate Reference Number:
8839-1405-2637-3756-5747

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+

◀ -2

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Heating and Mechanical Ventilation
Total useful floor area (m ²):	206.640
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.29
Primary energy use (kWh _e /m ² per year):	-7.05

Benchmarks

Buildings similar to this one could have ratings as follows:

14	If newly built
58	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 8
Meadow Road
Reading

Certificate Reference Number:
0492-5021-9331-5506-2068

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+

◀ -2

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m ²):	476.167
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.47
Primary energy use (kWh _e /m ² per year):	-13.47

Benchmarks

Buildings similar to this one could have ratings as follows:

14	If newly built
55	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 9
Meadow Road
Reading

Certificate Reference Number:
9798-0797-8290-3127-0410

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+

◀ -2

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m ²):	524.317
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.39
Primary energy use (kWh _e /m ² per year):	-11.74

Benchmarks

Buildings similar to this one could have ratings as follows:

13	If newly built
54	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 10
Meadow Road
Reading

Certificate Reference Number:
8007-5340-9533-0909-2137

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+

◀ -2

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m ²):	794.051
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.36
Primary energy use (kWh _e /m ² per year):	-9.92

Benchmarks

Buildings similar to this one could have ratings as follows:

13	If newly built
51	If typical of the existing stock

Energy Performance Certificate

Non-Domestic Building



Unit 11
Meadow Road
Reading

Certificate Reference Number:
1147-9904-8722-2836-7841

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+

◀ -2

This is how energy efficient the building is.

Net zero CO₂ emissions



Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m ²):	905.271
Building complexity:	Level 5
Building emission rate (kgCO ₂ /m ² per year):	-0.49
Primary energy use (kWh _e /m ² per year):	-10.79

Benchmarks

Buildings similar to this one could have ratings as follows:

12	If newly built
50	If typical of the existing stock