Thermal Modelling & Compliance Report

For

Proposed VMU and External Works, Whaley Road, Barnsley

On Behalf Of

RULA DEVELOPMENTS

DOCUMENT NUMBER: NT1297-AGL-ZZ-XX-T-J-0001					
REV	DESCRIPTION	CHECKED		STATUS	DATE
		DESIGN	QA		
P01	Issued for Planning	S Shaw	A Cope	S4	23.07.26
P02	Issued for Planning	S Shaw	A Cope	S4	29.07.26

Anderson Green Ltd
Unit C4
Park Lane Business Centre
Basford
Nottingham
NG6 0DW

T: 0115 975 4141
Visit: AndersonGreen.co.uk

Contents

1.0 Executive Summary

This project consists of an Industrial Vehicle Manufacturing Unit (VMU), with an office, lab space, and break room, as well as WCs and ancillary spaces, at Whaley Road, Barnsley. The predicted Thermal Modelling and Compliance achievements for the proposed development are as follows:

1.1 Building Regulations Part L2 inc. PV

This building complies with Part L2A 2021 with an actual building emissions rate **(BER)** demonstrating a **15%** reduction in carbon emissions in comparison with the notional building target emissions rate (**TER**).

Criterion 1	kgCO2/m²/yr.
Target emission rate (TER)	1.66
Building emissions rate (BER)	1.41
BER ≤ TER	Yes
Percentage Improvement	15%
EPC	**A11**

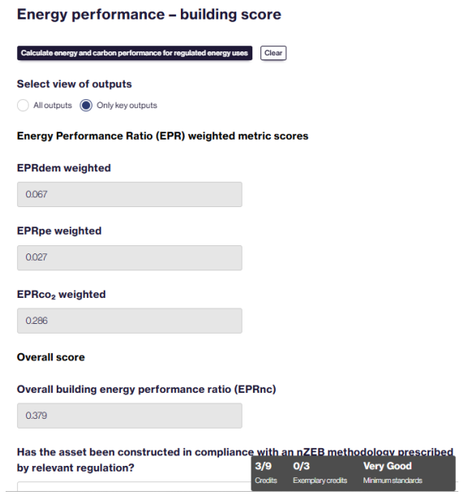
PV Element	Details
Peak output kWp	17.25
Approx area of PV array m²	75
Available roof space m²	1,484
Annual electrical generation kWh	14,170

1.2 Construction values and air test

Construction Element	U-Value W/m²K
Roof	0.16
External Wall	0.26
Ground Floor	0.18
Internal Partitions (Office/WH)	0.26
Windows	1.6
Roof Window	1.3
Glazed Doors	1.6
Pedestrian Doors	1.6
Vehicle Access Door	1.3
Air Permeability m³/(h.m²)@50Pa	3

Glazing Properties	G-value	LT
Windows	0.34	0.71
Glazed doors	0.35	0.71
Roof Window	0.62	0.6

1.3 BREEAM Ene01



1.4 Ene 04 Low Carbon Design

This report concludes that the proposed passive design measures (daylight dimming, improved U-values, improved air tightness) provide a reduction in energy consumption. The results graph highlights the improvement in energy saving. The results indicate the most appropriate LZC solutions for this building type and function is PV, providing a significant reduction in energy and carbon. All other renewable technologies reviewed have been discounted due to spatial, economic, or technical viability as detailed herein.

1.5 BREEAM V7 Summary

A minimum BREEAM 'Very Good' is being targeted. The proposed design for the construction, building services and sustainability systems would secure the following credits.

BREEAM Credit (Shell and Core)	Available	Achieved
Ene 01 Energy Performance (Part L)	9 + 3 exemplary	3
Ene 04 Low Carbon Design	5	3

2.0 Introduction

Project	Detail
Project name	Haughton Main
Address 1	1 Whaley Road
Town	Barnsley
Post code	S75 1FJ
Part L2	2021
PLANNING	-
BREEAM V7	Very Good
Weather file	Leeds
Orientation	57
Building Type	Industrial
Area m²	1616.9
Air test m³hm² @ 50pa	3
Client	Rula
Architect	aja architects
RIBA Stage	2
Analysis Stage	Design

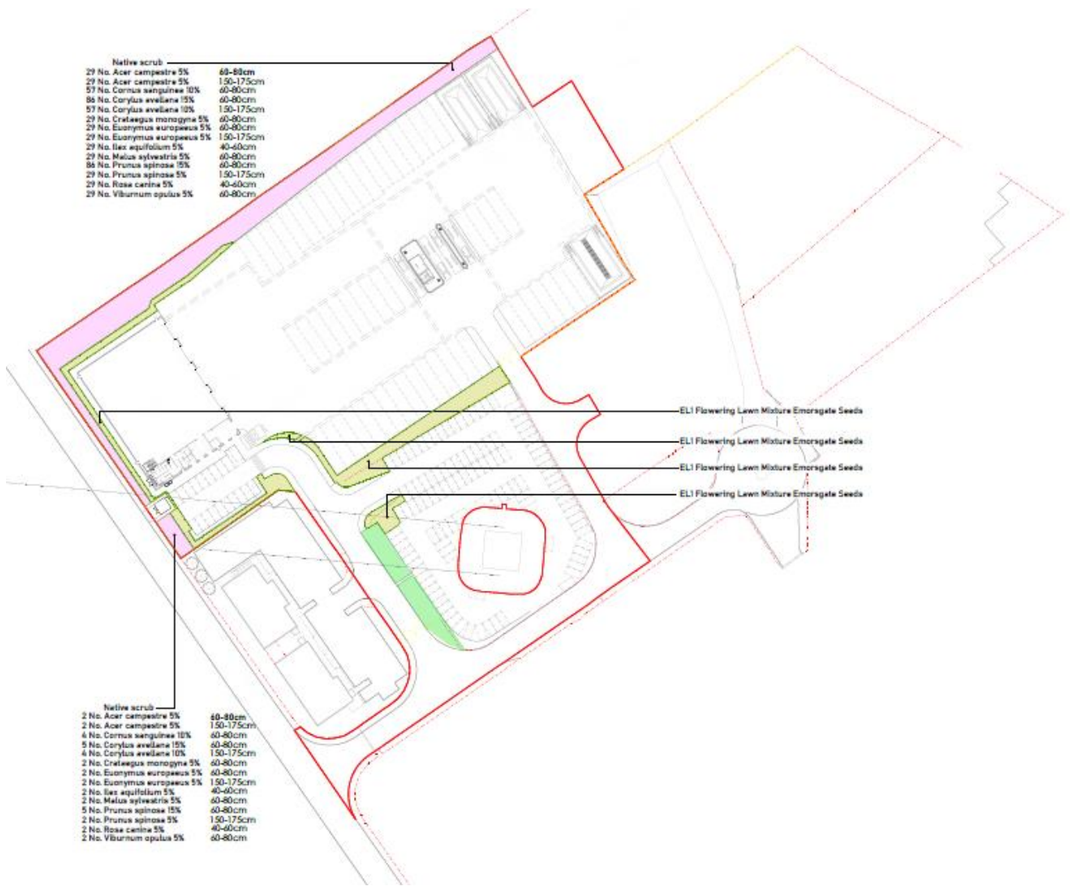
Energy Engineer	Sophie Shaw
Accreditation Number	-
Software Used	IES
Software Version	ve2025.2.0.0
BRUKL Engine	v6.1.e.1

This project consists of an Industrial Vehicle Manufacturing Unit at Whaley Road, Barnsley. The building consists of the VMU, an office, lab space, break room, and ancillary spaces, including showers, as well as two external vehicle washing bays.

For the proposed development, Anderson Green have been commissioned to produce the thermal modelling and compliance calculations to satisfy BREEAM and Building Regulations requirements as detailed below:

- Building Regulation Part L Compliance (EPC)
- Ene 04 Low carbon design

Site Plan



3.0 Construction details

3.1 Introduction

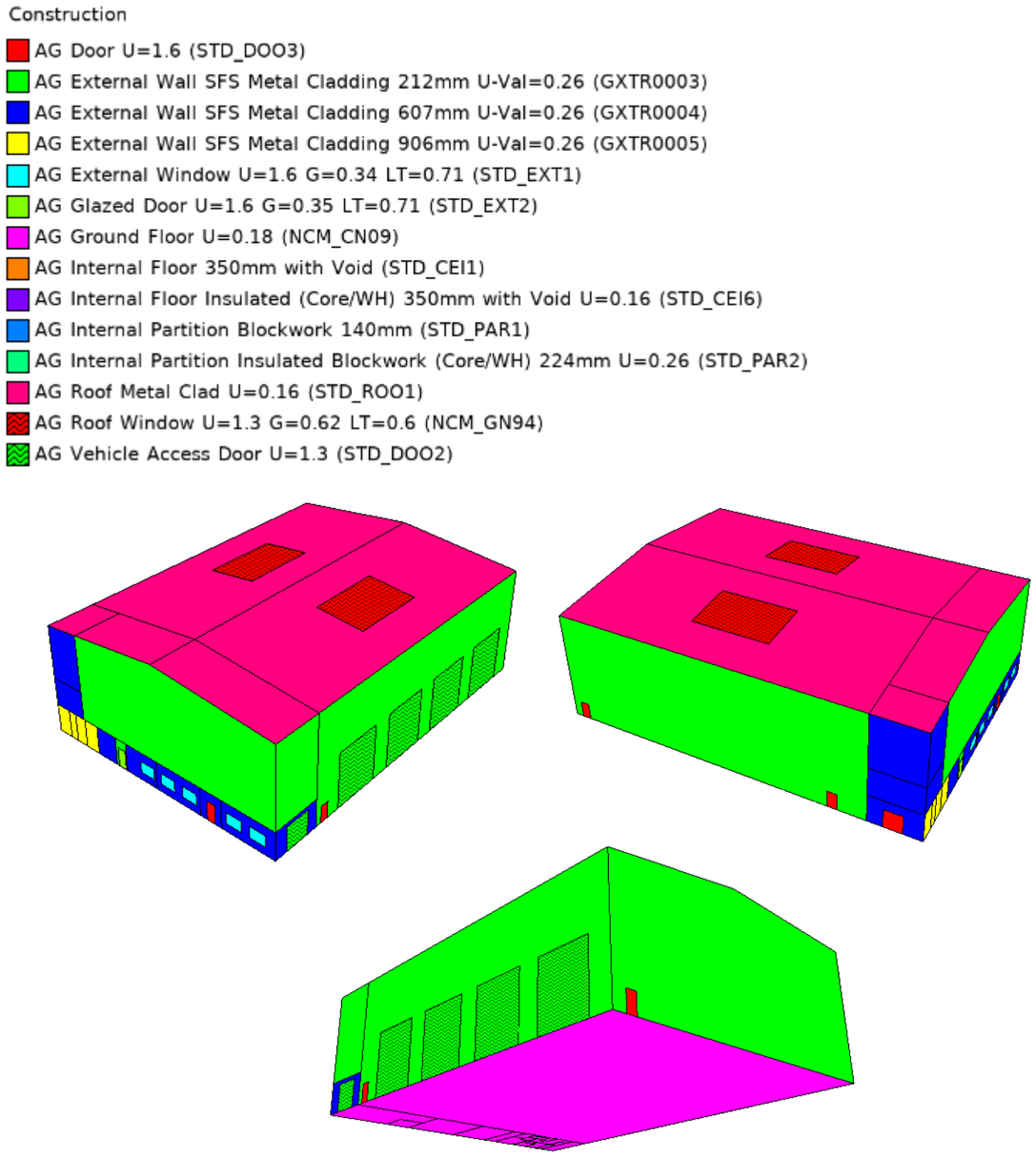
The development constructions on which the thermal modelling and compliance assessments are based upon are, in summary, as follows.

3.2 Construction summary

Construction Element	U-Value W/m²K	Detail
Roof	0.16	-
External Wall	0.26	Metal cladding
Ground Floor	0.18	-
Internal Partitions (Office/WH)	0.26	Insulation added to internal partitions between core & unheated warehouse, and plant riser & WCs (not included in plans)
Windows	1.6	-
Roof Window	1.3	-
Glazed Doors	1.6	-
Pedestrian Doors	1.6	-
Vehicle Access Door	1.3	-
Air Permeability m³/(h.m²)@50Pa	3	-

Glazing Properties	G-value	LT
Windows	0.34	0.71
Glazed doors	0.35	0.71
Rooflight	0.62	0.6

3.3 Construction Images



4.0 Building Services

4.1 Introduction

The building services on which the thermal modelling and compliance assessments are based upon are, in summary, as follows.

4.2 Metering

Metering & Management		Notes
Lighting	Yes	Assumed
HVAC	Yes	Assumed
Out of range	Yes	Assumed
PFC	>0.95	Assumed

4.3 Heating, ventilation, and air-conditioning (HVAC)

HVAC	REF	Zone	Model	SCOP	SEER	SFP (W/l/s)	HR	Duty (ach)	Detail
Heating /Cooling	VRV & Nat Vent	Break Room Office Lab Space	TBC	4.2	7.6				-
	VRV & Extract only	WCs Showers	TBC	4.2		0.5			-
Heating	EPH & Nat Vent	Entrance Corridor WC Lobbies	TBC	1.0					-
Ventilation	As above								

4.4 Domestic hot water services (DHWS)

DHW	Storage	Zone	Model	SCOP	Losses kWh/l/d	Dist. loss W/m	Circ. Length m	Pump power W	Detail
ELEC POINT OF USE	60L	Building	TBC	1.0	0.050	-	-	-	-

4.5 Lighting

REF	Zone	Model	Lm/W	Occ	DL	LOR
A	Warehouse Mezzanine	TBC	120	Pres		100%
B	Key Store Plant Room	TBC	100	Man		100%
C	Office Lab Space	TBC	100	Abs	Dim	100%
D	Break Room	TBC	100	Pres	Dim	100%
E	Circ/WC	TBC	100	Pres		100%

Abs – Absence sensor
Man – Manual switch
Pres – Presence (PIR)
Dim – Daylight Dimming

4.6 Renewables

PV	Area (m^2)	Quantity	Module	Efficiency	Orientation	kWp	Inclination
Indicative	75	37.5	425W	23.0%	237	17.25	6 degrees
Inverter	**Model**	**Efficiency**	**PV KWh/m^2/yr**	**Energy Gen KWh/yr.**	**CO2 saving kgCO2/yr.**	**kgCO2/kWh**	
Inverter 1	TBC	98%	189	14,170	1800	0.127	

5.0 Building Regulations UK Part L

5.1 Introduction

All new buildings in the UK are required to demonstrate compliance with Part L of the Building Regulations UK, and the main aim of a Part L assessment is to reduce the carbon emissions associated with the heating and lighting of new buildings and to improve the overall energy efficiency of the building fabric.

An Energy Performance Certificate (EPC) is produced for all new and refurbished buildings indicating the relative performance of the building against new and existing building stock. The EPC is officially lodged on a central government register www.ndepcregister.com.

5.2 Methodology

A Building Regulation UK Part L (BRUKL) provides a comparison between the proposed development 'actual; and a 'notional' building.

The 'notional' building has similar geometry and building services as the proposed building; however, it includes a fixed set of standard criteria with regards to glazing areas, u-values, plant efficiencies and services strategies. These are defined in the National Calculation Methodology (MCM).

The Part L software tools utilise a set of NCM templates for standard inputs based on the building type and room activity i.e., occupancy densities, hours of operation, internal temperatures, domestic hot water use, air flow rates, lux levels, etc. There is an allowance for equipment gains to calculate heating and cooling demands, however, other "unregulated" energy uses such as small power, servers, external lighting, lifts, etc. are not included in the results.

A dynamic simulation model (DSM) has been created, and a Level 5 energy assessment has been undertaken to assess the development against the requirements of Building Regulations Part L2A.

5.3 Results

The proposed development is a new build non-domestic dwelling, therefore it needs to comply with the BRUKL standards. The building achieves an A-rated EPC.

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

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	1.66	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	1.41	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	17.61	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	14.47	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

Please note, in the BRUKL, there is a reporting issue with IES, wherein the SFPs are in the B column rather than the D column on the BRUKL.

5.3.1 Criterion 1- TER/BER

This building **PASSES** the Part L2A compliance assessment, confirming that the Building Emission Rate (BER) is less than or equivalent to the carbon emissions of the notional building set by the Target Emissions Rating (TER).

5.3.2 Criterion 2 – Design limits

To achieve compliance with Criterion 2 of Part L2A, the performance of the building fabric u-values, air permeability and building services should be no worse than design limits.

This building **PASSES** the design limit check. As detailed in the BRUKL certificate, the building fabric and fixed building services achieve compliance with Part L as they are no worse than the design limits.

5.3.3 Criterion 3 – Solar gain

To achieve compliance with Criterion 3 of Part L2A, the occupied spaces in the building should have appropriate passive control measures to limit the solar gains.

The VMU exceeds the solar gains check – consider revising the roof windows.

Energy Performance Certificate

HM Government

Non-Domestic Building

1, Whaley Road
Barnsley
S75 1FJ

Certificate Reference Number:
0774-5975-1668-1276-7513

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

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m^2):	1616.262
Building complexity:	Level 5
Building emission rate ($kgCO_2/m^2$per year):	1.41
Primary energy use (kWh_{pe}/m^2per year):	14.47

Benchmarks

Buildings similar to this one could have ratings as follows:

13 If newly built

51 If typical of the existing stock

6.0 Hea 01 Daylight

Section not used.

7.0 Hea 05 Thermal comfort

Section not used.

8.0 Ene 02 Predicted Operational Energy

Section not used

9.0 Ene 04 Low Carbon Design

9.1 Introduction

A BREEAM V7 Ene 04 Low carbon design credits analysis has been produced to provide a detailed understanding of the potential design measures.

These credits aim to reduce energy demand and the installation of local low and zero carbon energy generation technologies to reduce carbon emissions.

The credits available, which are to be reviewed, are as follows:

- Building form optimisation (One credit)
- Fabric performance optimisation (Two credits)
- Low and zero carbon energy generation technologies (Two credits)

9.2 Methodology

An assessment of passive Fabric performance optimisation opportunities has been undertaken prior to a review of high efficiency (LZC) alternative systems to ensure a maximisation of energy efficiency and energy reduction prior to the introduction of alternative systems.

The reduction in energy demand is measured by comparing the demand for heating and cooling for the actual building compared to standard practice. Where standard practice is a version of the actual building with a fabric specification set by limiting/maximum permissible Part L values.

The DSM model assesses the response of the building engineering services and constructions to determine the total energy consumption and carbon emissions for compliance analysis against Part L2A 2021 of the Building Regulations.

The study has been undertaken using the latest IES Virtual Environment version VE compliance software.

The simulation uses the national calculation methodology (NCM) activities database and covers the whole year for the building.

All LZC technologies considered for detailed analysis are assessed within this report.

9.3 Criteria

9.3.1 Building form optimisation

The project team carries out an analysis of the site and proposed development during the Concept Design stage (RIBA Stage 2 or equivalent) to explore the effect of building form on energy demand.

The Building Form analysis considers the following:

1. Building layout
2. Building orientation
3. Building form
4. Daylighting strategy
5. Ventilation strategy

The building uses passive design measures to reduce the total heating, cooling, mechanical ventilation and lighting loads and energy consumption in line with the findings of the passive design analysis, and the analysis demonstrates a reduction in the total energy demand as a result.

9.3.2 Fabric performance optimisation

The project team carries out an analysis of the proposed development to explore the impact of alternative fabric specifications on the building's demand for heating and cooling.

The Fabric Performance analysis considers the following:

1. Fabric insulation
2. Thermal mass to store heat or coolth
3. Air tightness
4. Solar gains

Additional credits are available for implementing fabric performance measures which reduce the overall building heating and cooling energy demand by ≥ 5% or ≥ 10% compared to minimum values set by building regulations.

OR

Demonstrate that the fabric specification has minimised the demand for heating and cooling. Fabric performance is optimised where a change in the value of any of the fabric parameters in either direction would lead to an increase in the total heating and cooling demand.

9.3.3 LZC energy generation technologies

A feasibility study has been carried out by the completion of the Concept Design stage (RIBA Stage 2 or equivalent) by an energy specialist to establish the most appropriate recognised local (on-site or near-site) low or zero carbon (LZC) energy source(s) for the building/development.

LZC technologies have been specified for the building in line with the recommendations of this feasibility study.

Additional credits are available if the energy generated by the installed LZC energy generation technologies meet the following targets:

1. Where photovoltaic (PV) panels are the only LZC energy generation technology installed, the electricity generated is equal to, or exceeds, that generated by reference PV panels covering 50% of the ground floor area. Note: A reference PV panel has a rated peak power output of 0.2 kWp/m², is oriented horizontally, with no or very little overshading, and with strongly ventilated or forced ventilated modules.
2. Where photovoltaic (PV) panels are the only LZC energy generation technology installed, the electricity accounts for ≥ 60% of the building's annual electricity consumption. Note: Where energy consumption has been predicted for Ene02, these values should be used to determine the proportion of the building's predicted energy consumption that is generated by LZC technologies. Otherwise, energy consumption estimates may be derived from simple energy modelling results (including NCM calculations), benchmarks, data for similar projects, or simple engineering calculations.

9.5 Building Form Optimisation

Building form optimisation	Overview	Site-specific analysis	Included
Building layout, orientation and form	The building layout, orientation and form can be utilised to maximise the use of prevailing wind, solar gain, and natural daylight for energy reduction. Orientate perpendicular to the prevailing wind with openings windows on both sides. Brise Soleil to block high level summer sun and reduce cooling requirement.	**Building orientation, layout and form is dictated by site constraints.**	No
Daylight strategy	Maximise the number and size of windows and roof lights to reduce electrical lighting requirement.	**Good glazing included to all occupied areas. Daylight linked lighting to all occupied areas.**	Yes
Ventilation strategy	Reduce the requirement of mechanical ventilation and cooling by maximising natural ventilation through openable windows, doors, louvres, and wind catchers. Natural ventilation via opening windows to assist in the reduction of ventilation requirements for fresh air and cooling.	**Natural Ventilation utilised in all occupied areas. Mechanical ventilation used only where required (ie. Mech exhaust in WCs and Shower areas, and S&E in VMU).**	Yes

9.6 Fabric Performance Optimisation

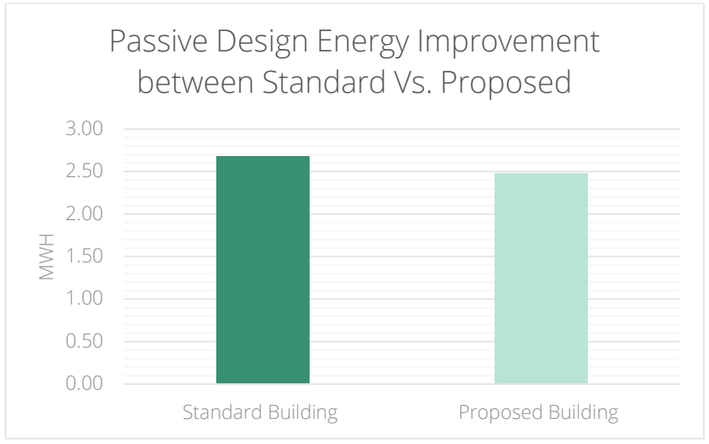
Fabric performance optimisation	Overview	Site-specific analysis	Included
Fabric insulation	Maximise insulation and increase window performance. Increase insulation to better than notional building standard.	**U-values equal to Part L Limiting U-values**	No
Thermal mass	Building materials with high thermal mass absorb and retain heat, slowing the rate at which the sun heats a space and the rate at which a space loses heat when the sun is gone. Provide high thermal mass in the floor slab/walls/roof.	**Medium weight building construction**	No
Air tightness	Increase air tightness to minimise heat losses.	**Air tightness aim is reduced to 3.**	Yes
Solar gains	Optimisation of window performance, with sizing and internal/external shading.	**Windows are designed not to substantially increase the heating needed in the winter. And simultaneously, internal shading is included to not have excess solar gains in the summer.**	Yes

9.7 LZC design

LZC design	Overview	Site specific	Included
Wind turbine	Turbine/generator converts wind energy to electrical power. Turbines available with outputs from 600W to 2MW.	**Suburban area not suitable for large turbine.**	No
Solar hot water heating	Solar collectors (flat plate or tube) transfer energy into transfer liquid to a closed loop twin coil hot water cylinder. Ideally located south facing roof.	**Sufficient roof space, although fairly low hot water demand. Further consideration required depending on end user demand.**	No
Photovoltaics	Converts sunlight to DC electrical power. Requires inverter to convert to DC. Ideally located south facing roof. Wide range of building types, schools, offices, hotels etc. Site with good access to solar radiation.	**Roof space available for system consideration.**	Yes
Community heating	Utilises waste heat from process such as large scale power generation where the majority of heating comes from waste heat.	**No local community or district heating system.**	No
CHP - natural gas	Generates both electricity and heat using fossil or renewable fuels.	**Changes to carbon emissions factors make the gas fired CHP options unviable.**	No
Biomass heating	Uses plant-derived organic material. Can produce heat or biogas depending on technology.	**Insufficient storage space and access for delivery.**	No
Fuel cells	Hydrogen fuel cells used to store energy from any renewable technologies.	**Insufficient installation/ storage space Relatively low heating requirement.**	No

9.8 Results – Fabric performance optimisation

This report concludes that the proposed passive design measures (daylight dimming, improved u-values & air tightness) provide a **7.5%** reduction in energy consumption compared to a standard building.



9.9 Results – LZC energy generation technologies

9.9.1 PV System

The results indicate the most appropriate LZC solutions for this building type and function are PV, providing a significant reduction in energy and carbon. The potential area of roof for PV (subject to structural assessment) would be as follows:

PV Element	Details
Peak output kWp	17.25
Approx area of PV array m²	75
PV Panel qty	37.5
Annual electrical generation kWh/yr	14,170

The previous indicative arrays have been included in the concept design and will be subject to design review.

The additional credits available have been reviewed; however, they are not achievable:

Where photovoltaic (PV) panels are the only LZC energy generation technology installed, the electricity generated is equal to, or exceeds, that generated by reference PV panels covering 50% of the ground floor area.

The reference PV panels for the buildings, which have a rated peak power output of 0.2 kWp/m², are equal to = 0.2 kWp/m² * (1616.9*50%) = 161.69kWp. As the building included a peak of 17.25 kWp, this credit is not achieved.

The alternative for meeting the additional credit is similarly not achievable, as the electricity from the PV does not account for ≥ 60% of the building's annual electricity consumption. 60% of the electricity consumption is 68,013*0.6 = 40,808KWh/yr, while electricity generated by PV is 14,170 kWh/yr. This credit is not achieved.

9.10 Conclusion

3 out of 5 BREEAM Credits achieved for Ene04.

10.0 Conclusion

This project consists of an Industrial Vehicle Manufacturing Unit (VMU), with an office, lab space, and break room, as well as WCs and ancillary spaces, at Whaley Road, Barnsley. The predicted Thermal Modelling and Compliance achievements for the proposed development are as follows:

10.1 Building Regulations Part L2 inc. PV

This building complies with Part L2A 2021 with an actual building emissions rate **(BER)** demonstrating a **15%** reduction in carbon emissions in comparison with the notional building target emissions rate (**TER**).

Criterion 1	kgCO2/m²/yr.
Target emission rate (TER)	1.66
Building emissions rate (BER)	1.41
BER ≤ TER	Yes
Percentage Improvement	15%
EPC	**A11**

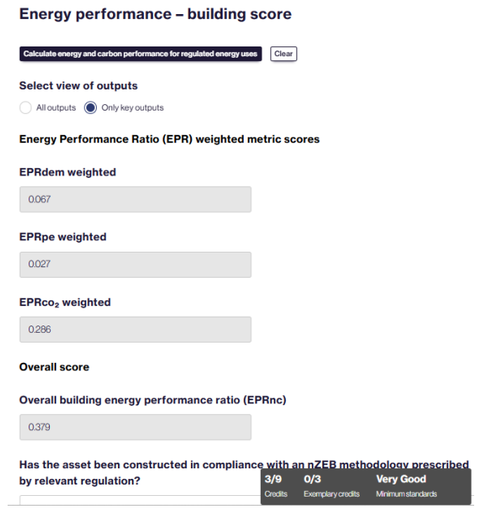
PV Element	Details
Peak output kWp	17.25
Approx area of PV array m²	75
Available roof space m²	1,484
Annual electrical generation kWh	14,170

10.2 Construction values and air test

Construction Element	U-Value W/m²K
Roof	0.16
External Wall	0.26
Ground Floor	0.18
Internal Partitions (Office/WH)	0.26
Windows	1.6
Roof Window	1.3
Glazed Doors	1.6
Pedestrian Doors	1.6
Vehicle Access Door	1.3
Air Permeability m³/(h.m²)@50Pa	3

Glazing Properties	G-value	LT
Windows	0.34	0.71
Glazed doors	0.35	0.71
Roof Window	0.62	0.6

10.3 BREEAM Ene01



10.4 Ene 04 Low Carbon Design

This report concludes that the proposed passive design measures (daylight dimming, improved U-values, improved air tightness) provide a reduction in energy consumption. The results graph highlights the improvement in energy saving. The results indicate the most appropriate LZC solutions for this building type and function is PV, providing a significant reduction in energy and carbon. All other renewable technologies reviewed have been discounted due to spatial, economic, or technical viability as detailed herein.

10.5 BREEAM V7 Summary

A minimum BREEAM 'Very Good' is being targeted. The proposed design for the construction, building services and sustainability systems would secure the following credits.

BREEAM Credit (Shell and Core)	Available	Achieved
Ene 01 Energy Performance (Part L)	9 + 3 exemplary	3
Ene 04 Low Carbon Design	5	3

11.0 Appendices

11.1 Ene 04 Tables

ENERGY SUMMARY FOR ENE04

	Standard Building	
	NCM heating energy (MWh)	NCM cooling energy (MWh)
Summed total	2.597	0.0786

	Proposed Building	
	NCM heating energy (MWh)	NCM cooling energy (MWh)
Summed total	2.386	0.0899

Passive - Standard Building	
2.68	
Passive - Proposed Building	
2.48	**7.5%**

% Reduction in building energy demand

11.2 Certificates

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name **Shell and Core**

Proposed VMU & External Works Whaley Road

As designed

Date: Wed Jul 22 15:14:30 2026

Administrative information

Building Details

Address: 1, Whaley Road, Barnsley, S75 1FJ

Certifier details

Name: Sophie Shaw

Telephone number: 01159754141

Address: Unit C4, Park Lane Business Centre, Basford, Nottingham, NG60DW

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.31

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.31

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

Foundation area [m²]: 170

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

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	1.66	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	1.41	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	17.61	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	14.47	
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	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.26	0.26	WR000002:Surf[20]
Floors	0.18	0.18	0.18	WR000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	WR000002:Surf[9]
Windows** and roof windows	1.6	1.34	1.6	WR000003:Surf[1]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.6	1.6	WR000004:Surf[1]
Vehicle access & similar large doors	1.3	1.3	1.3	WR000012:Surf[1]
High usage entrance doors	3	-	-	No high usage entrance doors in building

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

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

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

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

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

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

Air permeability	Limiting standard	This building
m³/(h.m²) 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	YES
Whole building electric power factor achieved by power factor correction	>0.95

1- 01a EPH + Nat

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	0	-	-
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- 02b VRF + Nat

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.2	7.6	0	-	-
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.					

3- 02c VRF + Ext

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.2	7.6	0	-	-
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- 00 POU

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.05
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		
Male WC 1	-	-	0.5	-	-	-	-	-	-	-	N/A

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

Shell and core configuration

Zone	Assumed shell?
Entrance Corridor	NO
Canteen/Break Room	NO
Office	NO
Male WC 1	NO
Male WC Lobby	NO
Male WC	NO
Male Shower	NO
Dis. WC	NO
WC Lobby	NO
Female WC Lobby	NO
Male WC 2	NO
Drivers Key Store	NO
Lab Space	NO
Enclosed Plant Room	NO
Female WC 1	NO
Female WC	NO
Female Shower	NO
Plant Riser	NO
Warehouse	NO
Mezzanine	NO

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
Entrance Corridor	100	-	-
Canteen/Break Room	100	-	-
Office	100	-	-
Male WC 1	100	-	-
Male WC Lobby	100	-	-
Male WC	100	-	-
Male Shower	100	-	-
Dis. WC	100	-	-
WC Lobby	100	-	-

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
Female WC Lobby	100	-	-
Male WC 2	100	-	-
Drivers Key Store	100	-	-
Lab Space	120	-	-
Enclosed Plant Room	100	-	-
Female WC 1	100	-	-
Female WC	100	-	-
Female Shower	100	-	-
Plant Riser	100	-	-
Warehouse	120	-	-
Mezzanine	120	-	-

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?
Canteen/Break Room	NO (-41.9%)	NO
Office	NO (-61%)	NO
Male WC 1	N/A	N/A
Male WC	N/A	N/A
Male Shower	N/A	N/A
Dis. WC	N/A	N/A
Male WC 2	N/A	N/A
Lab Space	NO (-39.3%)	NO
Female WC 1	N/A	N/A
Female WC	N/A	N/A
Female Shower	N/A	N/A
Warehouse	YES (+68.7%)	NO
Mezzanine	NO (-13.3%)	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?	NO
Are any such measures included in the proposed design?	YES

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	1616.3	1616.3
External area [m²]	5196	5196
Weather	LEE	LEE
Infiltration [m³/hm²@ 50Pa]	3	5
Average conductance [W/K]	1527.87	1754.75
Average U-value [W/m²K]	0.29	0.34
Alpha value* [%]	27.48	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
98	**Offices and Workshop Businesses**
	General Industrial and Special Industrial Groups
2	**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	1.49	1.51
Cooling	0.06	0.08
Auxiliary	0.08	0.09
Lighting	9.86	5.19
Hot water	6.94	5.95
Equipment*	23.65	23.65
TOTAL**	**18.43**	**12.82**

* 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	8.77	1.04
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*8.77*	*1.04*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	15.41	14.08
Primary energy [kWh_{PE}/m²]	14.47	17.61
Total emissions [kg/m²]	1.41	1.66

HVAC Systems Performance

System Type		Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	148.3	5.3	10.5	0.3	4.4	3.91	5.4	4.2	7.6
	Notional	142.6	10.1	14.3	0.6	5	2.78	4.63	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	163.3	0	45.4	0	0	1	0	1	0
	Notional	169	0	33.3	0	0	1.41	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	136.8	14.8	9.7	0.8	0	3.91	5.4	4.2	7.6
	Notional	115.1	16.1	11.5	1	0	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

Energy Performance Certificate

Non-Domestic Building

HM Government

1, Whaley Road
Barnsley
S75 1FJ

Certificate Reference Number:
0774-5975-1668-1276-7513

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

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m^2):	1616.262
Building complexity:	Level 5
Building emission rate ($kgCO_2/m^2$ per year):	1.41
Primary energy use (kWh_{PE}/m^2 per year):	14.47

Benchmarks

Buildings similar to this one could have ratings as follows:

13 If newly built

51 If typical of the existing stock

Administrative information

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

Assessment Software:	Virtual Environment v7.0.31 using calculation engine ApacheSim v7.0.31
Property Reference:	UPRN-000000000000
Assessor Name:	Sophie Shaw
Assessor Number:	ABCD123456
Accreditation Scheme:	Information not available
Assessor Qualifications:	NOS5
Employer/Trading Name:	Anderson Green Ltd
Employer/Trading Address:	5 Park Lane, Park Lane Business Centre, Nottingham, NG6 0DW, United Kingdom
Issue Date:	22 Jul 2026
Valid Until:	21 Jul 2036 (unless superseded by a later certificate)
Related Party Disclosure:	Not related to the owner

Recommendations for improving the energy performance of the building are contained in the associated Recommendation Report: 9138-7600-6085-2079-9474

About this document and the data in it

This document has been produced following an energy assessment undertaken by a qualified Energy Assessor, accredited by Information not available. You can obtain contact details of the Accreditation Scheme at Information not available.

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

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

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

Opportunity to benefit from a Green Deal on this property

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

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