

127A LOVEROCK ROAD, READING
ENERGY ASSESSMENT

Project:

127A Loverock Road, Reading

Document:

Planning Stage – Energy Assessment

Client:

PSK

Author:

Adrian DeFalco

TLP Project No:

C8375



Thornley & Lumb Partnership Ltd

Building Services Consultant Engineers

216 Tower Bridge Road
London
SE1 2UP

Tel: +44 (0) 20 7520 9355

Website: www.thornleylum.co.uk

Document Control

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Project	127A Loverock Road
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PART L 2013 ENERGY ASSESSMENT FOR BREEAM ENE01 COMPLIANCE



PROJECT	127A Loverock Rd, Reading	TLP JOB NUMBER	C8375
CLIENT	PSK	DATE	06.12.2022

1. Introduction

The purpose of this report is to ascertain at RIBA Stage 2 the inputs required to the Part L compliance calculations in order to meet BREEAM ENE01 Excellent minimum standard, and to help meet planning condition 22:

Prior to commencement, full details of the proposed Photovoltaics and solar water heating shall be submitted to and agreed in writing by Reading Borough Council.

Details are to include:

- Locational plans
- Dimensions (elevational plans would be useful)
- Specifications

2. Shell and Core Calculation

The calculation has been run as a Shell & Core 'As Built stage'. This fully excludes shell fixed building services from the calculations.

Should the shell areas be provided with fixed building services by the tenant, a further calculation for Part L compliance will be required at the time of fit out.

As agreed with PSK Part L 2013 method has been utilised for this calculation. Level 5 IESVE software has been used.

3. Inputs

The following inputs have been utilised in order to meet the required target.

Building Fabric and Architectural Design

Element	As Designed Specification – Element Description	Key Variable
External Solid Floor	IESVE Default Construction 0.25 W.m ⁻² .K ⁻¹	0.25 W.m ⁻² .K ⁻¹
External Wall	IESVE Default Construction 0.18 W.m ⁻² .K ⁻¹	0.18 W.m ⁻² .K ⁻¹
Roof	IESVE Default Construction 0.12 W.m ⁻² .K ⁻¹	0.12 W.m ⁻² .K ⁻¹
Party Floor ¹	IESVE Default Construction ² 0.18 W.m ⁻² .K ⁻¹	0.18 W.m ⁻² .K ⁻¹
Party Wall ¹	IESVE Default Construction ² 0.26 W.m ⁻² .K ⁻¹	0.26 W.m ⁻² .K ⁻¹

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Element	As Designed Specification – Element Description	Key Variable
Doors – Pedestrian Doors	IESVE Default Construction 0.12 W.m ⁻² .K ⁻¹	1.30 W.m ⁻² .K ⁻¹
Doors – Glazed Doors	Double glazed door 1.8 W.m ⁻² .K ⁻¹	1.4 W.m ⁻² .K ⁻¹
Glazing Windows	Double glazing u-value 1.40 g-value 0.40	1.40 W.m ⁻² .K ⁻¹ 0.40 G-Value
Vehicle access doors	IESVE Default Construction 1 W.m ⁻² .K ⁻¹	1 W.m ⁻² .K ⁻¹
Air Pressure Testing	Part L 2013 max. allowable air permeability rate: 5.0 m ³ .h ⁻¹ .m ⁻²	3.0 m ³ .h ⁻¹ .m ⁻²

1 – Party Wall and Floor between the Office and Warehouse Unit

2 – Figures selected from [Table 4.1 of Part L 2021](#) “Limiting U-Values for new or replacement elements...”

Mechanical Building Services Engineering Design

Space Heating & Comfort Cooling

Location	System Type	SCOP	SEER	EER
Circulation	Electric Panel Heater	1	-	-
Office	VRF: ASHP - PUMY-P250YBM	4.22	6.51	3.41
Toilet	Electric Panel Heater	1	-	-
Warehouse	-	-	-	-

Ventilation

Location	System Type	Specific Fan Power W.(l.s ⁻¹) ⁻¹	Heat Recovery Efficiency %	Fan Location
Circulation	-	-	-	-
Office	MVHR – LGH-100RVX-E	1.51	0.80	-
Toilet	Extract Fan (8 ac.h ⁻¹)	0.50	-	Remote
Warehouse	-	-	-	-

**PART L 2013 ENERGY ASSESSMENT FOR BREEAM ENE01
COMPLIANCE**



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Hot Water Services HWS

System	Type	
Hot Water System	Direct Electric Immersion – Stand Alone Water Heater	-
Hot Water Storage	Electric Megaflo. 70l. Delivery Efficiency: 1	70 litres 60 mm insulation

Lighting

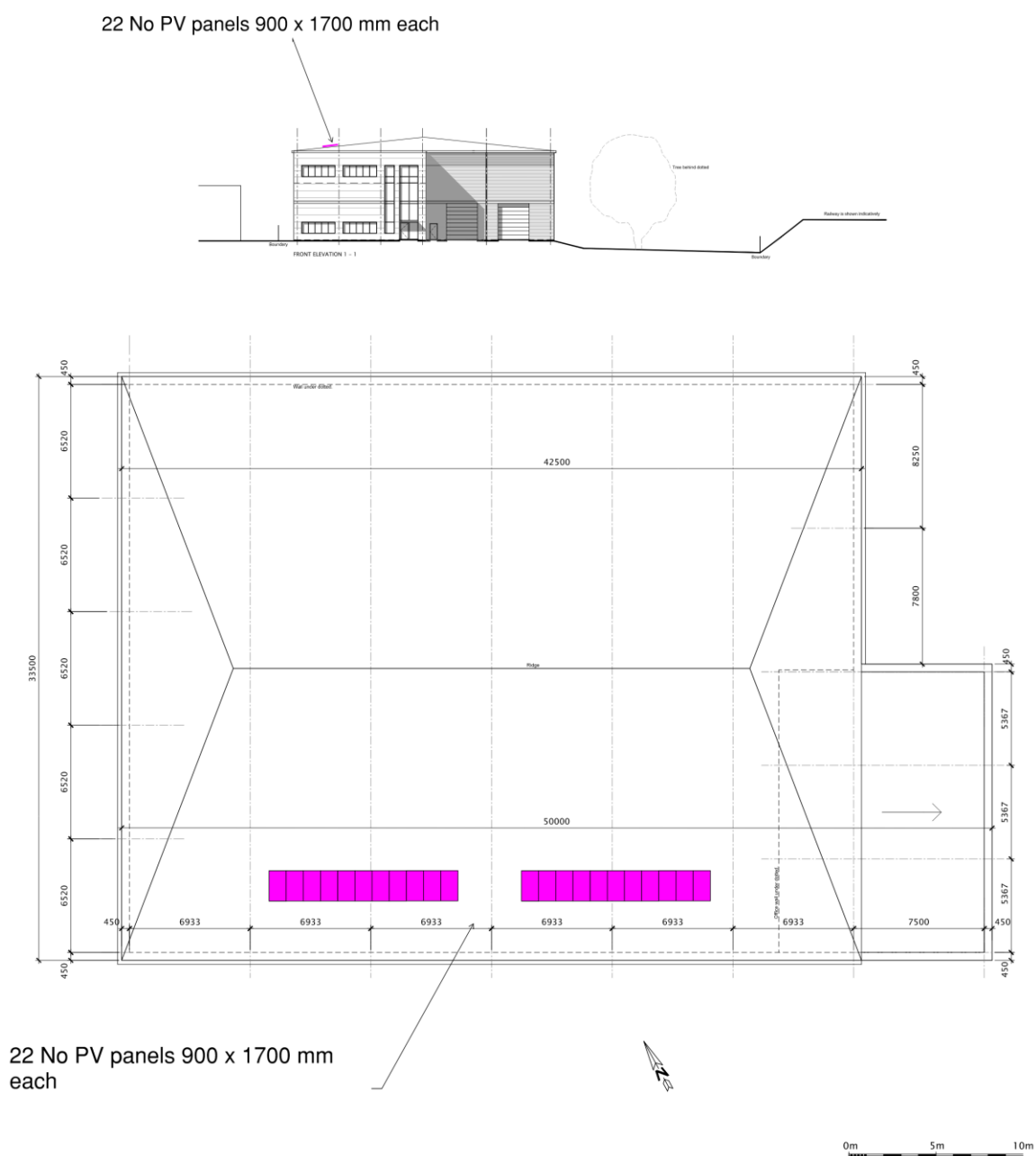
Location	Power Density $\text{W.m}^{-2} \cdot 100\text{lux}^{-1}$	Lighting Level Lux	Lighting Control	W/m^2
Circulation	2	100	Auto on/off with daylight photoelectric dimming	2
Office	1.3	500	Absence detection (manual auto on/off) with daylight photoelectric dimming	6.5
Toilet	3.75	200	Auto on/off	7.5
Warehouse	N/A	N/A	N/A	N/A

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Renewables

Renewables	33m ² of 21% efficient south facing solar photovoltaic panels	-
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In order to meet the ENE01 target the location of the required solar PV panels are shown below. It should be noted that due to very low predicted hot water consumption the provision of solar thermal hot water is not proposed.



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4. Results

Target Emission Rate: 33.8 kgCO₂/m²/annum

Building Emission Rate: 13.4 kgCO₂/m²/annum

Saving: 60% over target emission for shell and core.

BREEAM ENE01 Credits: 7

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BRUKL / EPC OUTPUTS – SHELL AND CORE

BRUKL Output Document HM Government Compliance with England Building Regulations Part L 2013

Project name **Shell and Core**

C8375 Loverock Road v1 As built

Date: Mon Nov 21 15:54:05 2022

Administrative information

Building Details

Address: Address 1, City, Postcode

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.15

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.15

BRUKL compliance check version: v5.6.b.0

Certifier details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Criterion 1: The calculated CO₂ emission rate for the building must not exceed the target

CO ₂ emission rate from the notional building, kgCO ₂ /m ² .annum	33.8
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	33.8
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	13.4
Are emissions from the building less than or equal to the target?	BER ≤ TER
Are as built details the same as used in the BER calculations?	Separate submission

Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

Building fabric

Element	U _o Limit	U _o Calc	U _o Calc	Surface where the maximum value occurs*
Wall**	0.35	0.18	0.18	WR000001:Surf[0]
Floor	0.25	0.25	0.25	WR000001:Surf[17]
Roof	0.25	0.12	0.12	WR000001:Surf[9]
Windows***, roof windows, and rooflights	2.2	1.4	1.4	WR000001:Surf[11]
Personnel doors	2.2	1.4	1.4	WR000001:Surf[1]
Vehicle access & similar large doors	1.5	1	1	WR000001:Surf[5]
High usage entrance doors	3.5	1.4	1.4	0F000003:Surf[1]

U_o Limit = Limiting area-weighted average U-values [W/(m²K)]

U_o Calc = Calculated area-weighted average U-values [W/(m²K)]

U_o Calc = Calculated maximum individual element U-values [W/(m²K)]

* There might be more than one surface where the maximum U-value occurs.

** 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.

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

Air Permeability	Worst acceptable standard	This building
m ³ /(h.m ²) at 50 Pa	10	3

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Area [m ²]	238.7	238.7		A1/A2 Retail/Financial and Professional services
External area [m ²]	4761	4761		A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
Weather	LON	LON		B1 Offices and Workshop businesses
Infiltration [m ³ /hm ² @ 50Pa]	3	7		B2 to B7 General Industrial and Special Industrial Groups
Average conductance [W/K]	1043.21	1510.57	100	B8 Storage or Distribution
Average U-value [W/m ² K]	0.22	0.32		G1 Hotels
Alpha value* [%]	10	10		C2 Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				C2 Residential Institutions: Residential schools
				C2 Residential Institutions: Universities and colleges
				C2A Secure Residential Institutions
				Residential apses
				D1 Non-residential Institutions: Community/Day Centre
				D1 Non-residential Institutions: Libraries, Museums, and Galleries
				D1 Non-residential Institutions: Education
				D1 Non-residential Institutions: Primary Health Care Building
				D1 Non-residential Institutions: Crown and County Courts
				D2 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	29.2	53.06
Cooling	6.24	7.2
Auxiliary	5.56	4
Lighting	9.53	16.57
Hot water	3.21	3.3
Equipment*	33.72	33.72
TOTAL**	53.74	84.12

* 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 generation, if applicable.

Energy Production by Technology [kWh/m²]

	Actual	Notional
Photovoltaic systems	26.49	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	212.43	320.01
Primary energy* [kWh/m ²]	160.86	162.81
Total emissions [kg/m ²]	13.4	33.8

* Primary energy is net of any electrical energy displaced by CHP generation, if applicable.

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Energy Performance Certificate

Non-Domestic Building



Loverock Road
Reading

Certificate Reference Number:
2063-8435-6727-7228-3720

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



Net zero CO₂ emissions

A 0-25

B 26-50

C 51-75

D 76-100

E 101-125

F 126-150

G Over 150

Less energy efficient

39

This is how energy efficient the building is.

Technical information

Main heating fuel: Grid Supplied Electricity
Building environment: Air Conditioning
Total useful floor area (m²): 1656.775
Building complexity: Level 5
Building emission rate (kgCO₂/m² per year): 23.32
Primary energy use (kWh/m² per year): 149.66

Benchmarks

Buildings similar to this one could have ratings as follows:

23 If newly built

63 If typical of the existing stock