

Normandy Way, Bodmin

Commercial Warehouses

Treveth Commercial LLP

Energy Statement: Part L Compliance

P01

November '23



1. Introduction	3
1.1 <i>Site Location</i>	3
1.2 <i>Proposed Development</i>	3
2. Part L Compliance Modelling	4
2.1 <i>Introduction</i>	4
2.2 <i>Calculation Methodology</i>	5
2.3 <i>Modelling Parameters</i>	5
2.4 <i>WC Thermal Performance</i>	6
3. Results	7
4. Conclusion	7
5. Appendix 1 – BRUKL Output (Part L 2021)	8

Revision	Purpose of Issue	Edited	Reviewed	Date
P01	Initial Issue	GW	DH	Nov'23

1. Introduction

This energy statement has been prepared to summarise the results of the energy modelling to demonstrate compliance with Approved Document L, Conservation of fuel and power, Volume 2: Buildings other than dwellings (2021). It details the intended building fabric, the proposed services strategies and recommendations in order for the development to comply. The building has been modelled using IES, Virtual Environment, SBEM compliance (2021), an approved modelling package.

1.1 Site Location

The proposed development is located on a brownfield site adjacent to Normandy Way, positioned at the entrance of Walker Lines Industrial Site and is bordered by existing industrial and office developments as illustrated in Figure 1.



Figure 1 - Site Location (Google Maps)

1.2 Proposed Development

The proposed development comprises of 1no. new build linear block, providing 7no. 130sqm single storey units, with 20no. communal parking spaces. It is intended the units will provide unheated warehouse/industrial space, with heating provisions limited to the WC area only.

An image of the proposed site and floor plan is shown in Figure 2 and 3.



Figure 2 - Proposed Site Plan

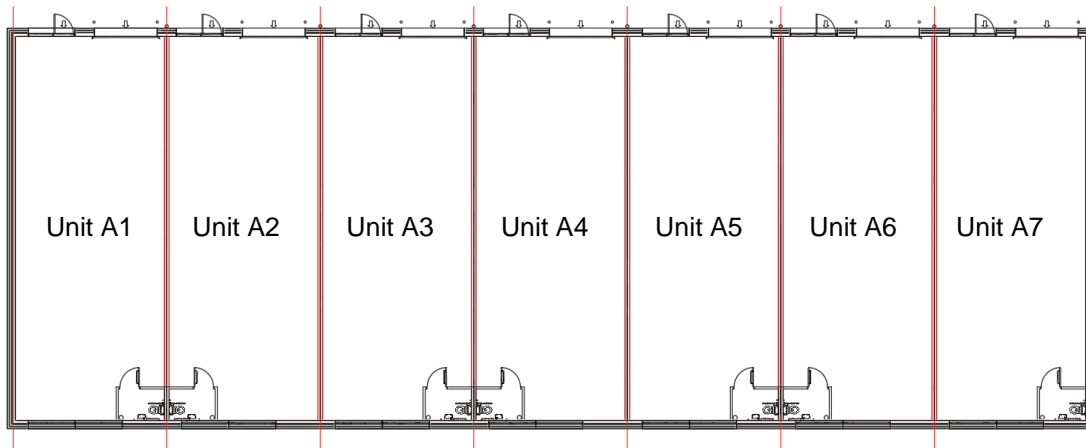


Figure 3 - Proposed Floor Plan

2. Part L Compliance Modelling

2.1 Introduction

The proposed building will need to meet the standards set by Building Regulations Approved Document Part L Conservation of Fuel and Power, Volume 2: Buildings other than Dwellings (2021). This document specifically addresses the requirements for energy efficiency compliance in non-domestic buildings.

Five criteria must be achieved in order to comply with Building Regulations. This energy statement details compliance with Criteria 1, 2 and 3. Criteria 4 and 5 will require post construction testing and demonstration.

- a. Criterion 1 – The predicted rate of carbon dioxide emissions from the building (BER – Building Carbon Dioxide Emission Rate) is not greater than the target rate (TER – Target Carbon Dioxide Emission Rate).
- b. Criterion 2 – Reasonable provision has been made to limit heat gains and losses through the fabric of the building, and energy efficient fixed building services and appropriate controls have been specified.
- c. Criterion 3 – The building has appropriate passive control measures to limit solar gains and limit or eliminate the need for air conditioning.
- d. Criterion 4 / 5 – The performance of the building, as built, is consistent with the prediction made in the BER. As designed performance is based on the systems and equipment specified. Changes of manufacturer or equipment and value engineering changes may affect as built performance.

2.2 Calculation Methodology

In order to calculate the energy performance, a thermal model has been built in the latest IES Virtual Environment software, with the government approved SBEM Compliance tool used to calculate the energy performance of the building and demonstrate compliance with Building Regulations Part L2.

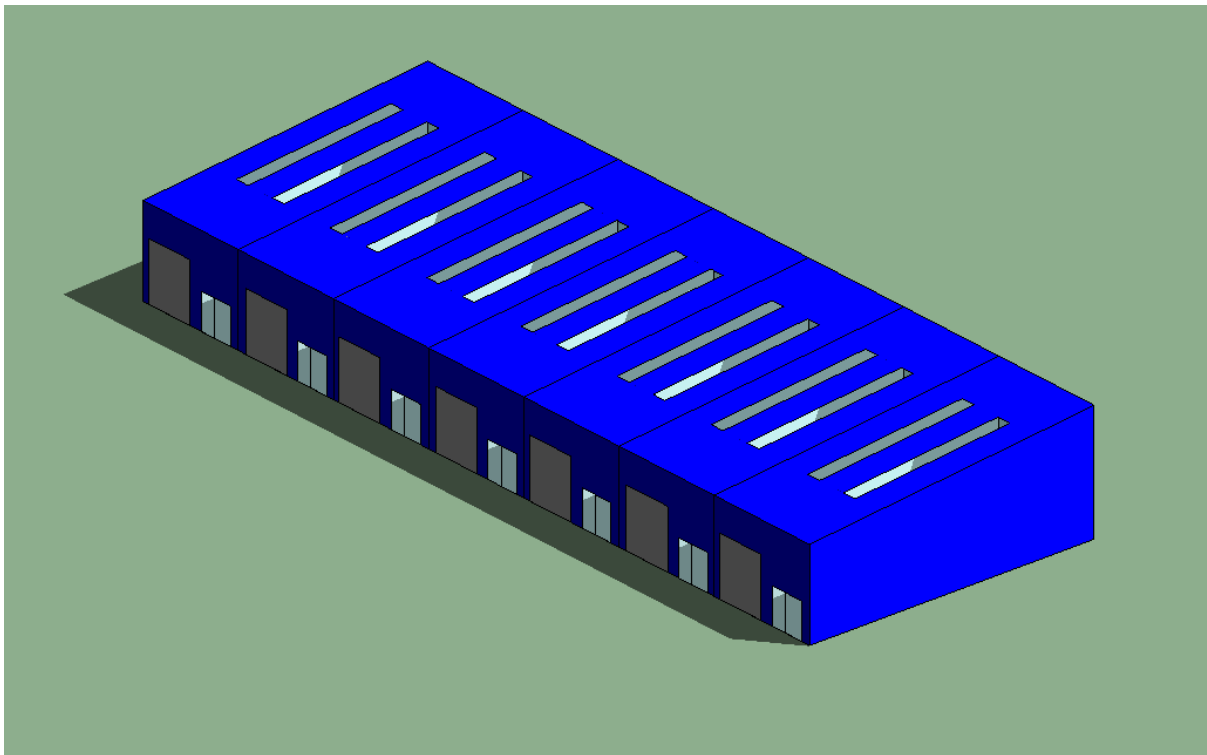


Figure 4 - Image of IES model

2.3 Modelling Parameters

The following building fabric and building services strategy as agreed with the project team have been assigned within the respective areas:

Fabric Details	
Walls	0.19 W/m ² K or better
Ground/Exposed Floor	0.18 W/m ² K or better

Fabric Details	
Roof	0.16 W/m ² K
Glazing	1.60 W/m ² K or better
Glazing G Value	0.5
Doors	1.40 W/m ² K or better
Air Permeability	7 m ³ /(h.m ²) at 50 Pa or better

Table 1 - Building Fabric Parameters

Main Warehouse	
Heating	Unheated
Lighting	100 Lm/W (with controls)
Domestic Hot Water	Electric point-of-use (no storage)
Ventilation	No ventilation

Table 2 - Building Services Parameters (Warehouse)

WC	
Heating	Electric Panel Heaters
Lighting	100 Lm/W (with controls)
Domestic Hot Water	Electric point-of-use (no storage)
Ventilation	Extract only, SFP 0.3 (W(l/s))

Table 3 - Building Services Parameters (WC)

On-site generation	
Photovoltaic Panels	2.0 kWp (per unit), south-west facing

Table 4 - PV Generation

2.4 WC Thermal Performance

The modelling has demonstrated the requirement to maintain the thermal envelope between heated and unheated spaces. Consequently, enhancements are needed to the partition specification between the WC and the main warehouse, aiming for a U-value of 0.19 W/m²K for walls and 0.16 W/m²K for the ceiling. This improvement is intended to prevent undue heat loss to the adjoining warehouse.

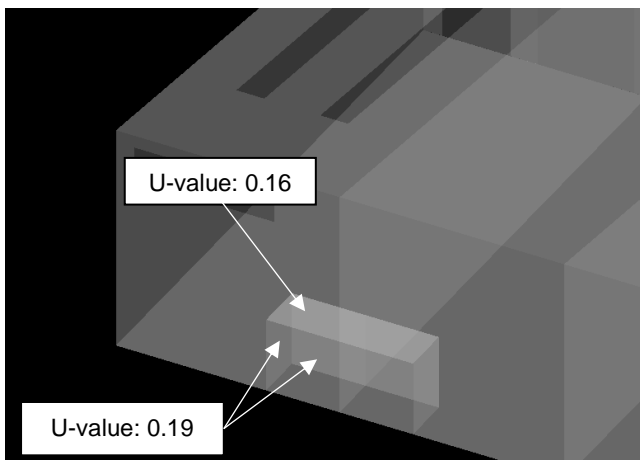


Figure 5 - WC Thermal Performance

3. Results

The outlined building and services strategy, as detailed in this energy statement, achieves the Building Emission Rate (BER) and Target Emission Rate (TER) as shown in figure 6. These findings are specific to one unit but are applicable to all units, relying on the provision of 2.0 kWp (approximately 10m²) of photovoltaic (PV) panels.

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	2.25
Building CO ₂ emission rate (BER), kgCO ₂ /m ² :annum	1.44
Target primary energy rate (TPER), kWh _{eq} /m ² :annum	23.72
Building primary energy rate (BPER), kWh _{eq} /m ² :annum	14.37
Do the building's emission and primary energy rates exceed the targets?	BER =< TER BPER =< TPER

Figure 6 - CO₂ and Primary Energy Result

4. Conclusion

It should be noted that the Part L compliance modelling has been carried out on the assumption that the main warehouse space is unheated as per the client brief. If this strategy were to change and heating was to be installed within the main warehouse space, this would significantly change the energy signature of the building. If this is the case, we would recommend that Part L compliance modelling is carried out prior to construction to ensure the proposed building fabric and heating system still achieves compliance. It is likely that energy efficient technologies such as heat pumps would be necessary in this scenario.

5. Appendix 1 – BRUKL Output (Part L 2021)

Project name

Normandy Way - Commercial Warehouses

As designed

Date: Mon Nov 27 20:28:39 2023

Administrative information

Building Details

Address: Normandy Way, Bodmin, PL31 1EX

Certifier details

Name: Gavin Wright

Telephone number: 01752 425647

Address: Expedite, Melville Building, Royal William Yard, Plymouth, PL1 3RP

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.23

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

Foundation area [m²]: 3.65

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	2.25
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	1.44
Target primary energy rate (TPER), kWh _{PE} /m ² .annum	23.72
Building primary energy rate (BPER), kWh _{PE} /m ² .annum	14.37
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	0.17	0.19	SC000000_W4
Floors	0.18	0.18	0.18	SC000000_F
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.16	0.16	SC000000_C_A0
Windows** and roof windows	1.6	-	-	No external windows/roof-windows
Rooflights***	2.2	-	-	No external rooflights
Personnel doors [^]	1.6	-	-	No external personnel doors
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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	7

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	135.7	135.7
External area [m ²]	601	601
Weather	PLY	PLY
Infiltration [m ³ /hm ² @ 50Pa]	7	5
Average conductance [W/K]	352.34	193.47
Average U-value [W/m ² K]	0.59	0.32
Alpha value* [%]	43.95	41.88

* 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	5.42	4.25
Cooling	0	0
Auxiliary	0.11	0.14
Lighting	9.03	9.28
Hot water	4.12	4.12
Equipment*	29.96	29.96
TOTAL**	18.68	17.79

* 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	9.67	1.96
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>9.67</i>	<i>1.96</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	576.71	357.45
Primary energy [kWh _{PE} /m ²]	14.37	23.72
Total emissions [kg/m ²]	1.44	2.25