HOARE LEA

M&S Store.
Ruislip.
Marks and Spencer plc.

SUSTAINABILITY
STAGE 2 REPORT – PART L 2021

REVISION P01 – 17 NOVEMBER 2025

STAGE 2

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
P00	31/10/2025	Draft issue for comment	C. Grady	O. Bialas	G. Jones
P01	17/11/2025	Planning issue	A. Leversedge	O. Bialas	G. Jones

Project number: 56/00094
Document reference: 5600094-HLE-XX-XX-RP-ST-357000-M&S Part L compliance -Stage 2-P01.docx

Contents.

Executive summary.

This report has been prepared by Hoare Lea on behalf of Marks and Spencer plc.

The purpose of this report is to demonstrate whether the proposed refurbishment of a former Homebase retail unit into an M&S retail unit located at Victoria Retail Park, Ruislip meets the requirements of the Part L 2021 Building regulations. At RIBA Stage 3 the model will be updated to reflect design progression.

The proposed mechanical services strategy utilises a high efficiency centralised air-based system with Variable Refrigerant Flow (VRF) providing space heating and cooling to the food hall. Space heating and cooling is provided to the clothing & home retail areas via a split system. Ventilation is provided to the building by a central Air Handling Unit (AHU) with heat recovery via a thermal wheel. The domestic hot water is provided by local instantaneous water heaters. There is no provision for PV.

Summary of performance
Table 1 provides a summary of the performance of the assessed areas against the criteria required for Part L2 2021 compliance. The following metrics from Part L 2021 have been assessed:

- Target CO_2 Emission Rate (TER)
- Building CO_2 Emission Rate (BER)
- Target Primary Energy Rate (TPER)
- Building Primary Energy Rate (BPER)

As shown, all spaces assessed can achieve the Part L carbon and primary energy criterion with a considerable margin.

Results - Part L 2021 assessment
Table 1: Summary of Part L results.

Target Emission Rate (TER):	6.94 kg.CO_2/m^2
Building Emission Rate (BER):	3.83 kg.CO2/m2
Percentage variance:	44.7%
Target Primary Energy Rate (TPER):	55.07 kWh/m2
Building Primary Energy Rate (BPER):	41.32 kWh/m2
Percentage Variance:	25%
Energy Performance Certificate (EPC) rating	A - 12

Energy strategy
Results are also presented in this report following the energy hierarchy. The energy hierarchy approach will be adopted for the energy strategy for the planning application at the next stage.

For the Lean, Clean, Green hierarchy, compliance with Part L 2021 emissions baseline can be achieved through passive design and energy efficiency measures alone, with a small margin. There is no reduction in emissions at the Be Clean step at this stage, as there is no available district heat network available.

There is further reduction in emissions at Be Green when accounting for the centralised air-based system.

This meets the minimum criteria for planning policy.

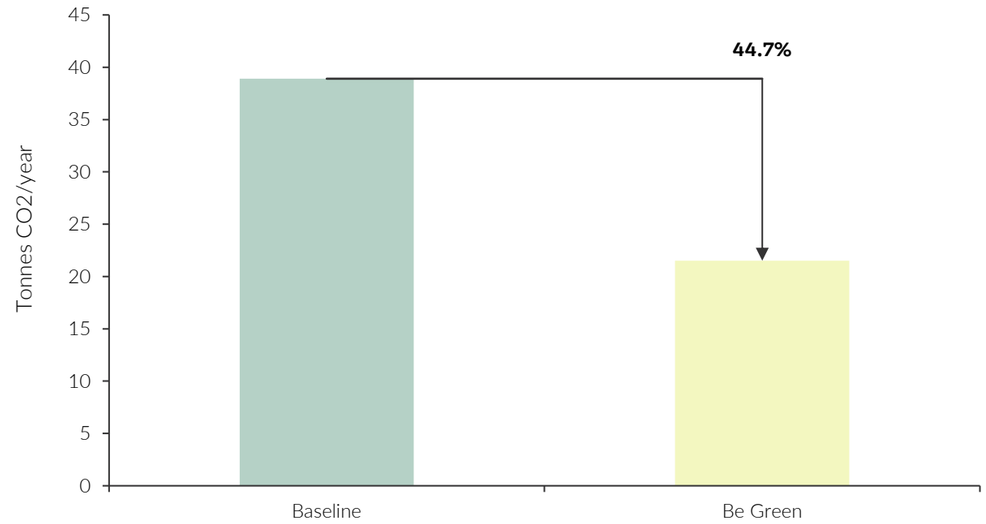


Figure 1: Percentage reduction in CO_2 emissions over Part L 2021 for M&S retail unit.

The results and achieved performance are based on the parameters outlined within this report.

1. Introduction.

Hoare Lea has been appointed by Marks and Spencer plc to undertake a Part L 2021 report to determine whether the proposed M&S retail unit development achieves compliance against the Part L 2021 Regulations.

1.1 Modelling introduction.

The Stage 2 analysis has been based on the architectural drawings received 12/09/2025.

The figure below shows the updated 3D IES model produced and used in the study.

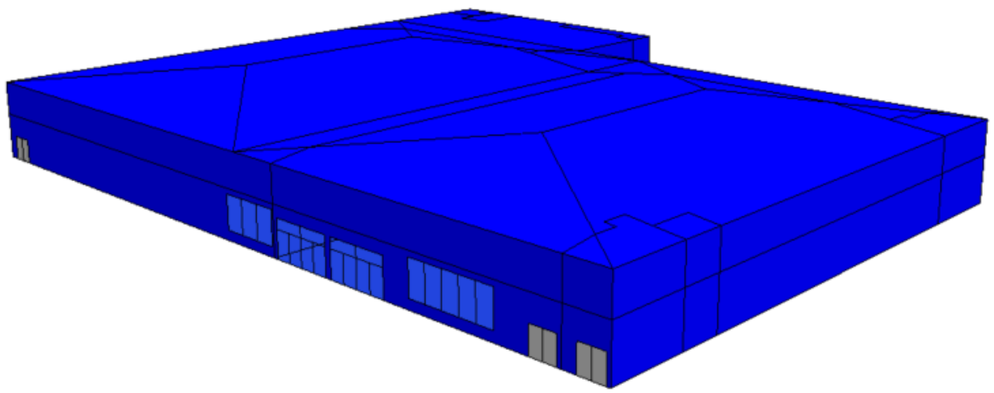
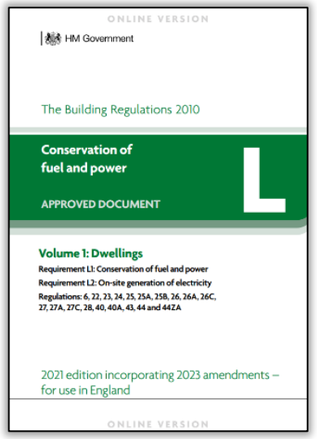


Figure 2: Image of the updated 3D IES Model, based on drawings received 12/09/2025.

The Stage 2 model was assessed utilising the Stage 2 mechanical and electrical services strategy as advised by the MEP engineers, Sigma.

1.2 Building Regulations Part L2.

The results presented in this report are on the basis of Building Regulations Part L2 2021 calculations undertaken on the assessed areas and consider the regulated carbon emissions and primary energy rate.



Building Regulations Part L2 2021 requires that a betterment over the Target Emission Rate (TER) and Target Primary Energy (TPER) is achieved for overall compliance. The TER and TPER can be achieved via a combination of passive design and energy efficiency measures, as well as Low or Zero Carbon (LZC) technologies.

The results are based on the parameters for building fabric and services outlined within this report. It is the responsibility of the design team to validate and ensure these parameters can be achieved and are subsequently included in relevant specification documents.

Limitations

The appraisals within the strategy are based on the Building Regulations Part L 2021 calculation methodology and should not be understood as a predictive assessment of likely future performance.

Occupants may operate their systems differently, and/or the weather may be different from the assumptions under Part L approved calculation methods, leading to differing energy requirements.

Unregulated Energy and Carbon

The Part L compliance assessment only takes into account regulated energy uses (i.e. lighting, heating, cooling and ventilation) and does not consider unregulated energy uses. Unregulated sources include 'plug-in' consumption from items such as televisions, computers and fridge-freezers, etc. In the context of commercial buildings, unregulated sources extend to 'process' or equipment loads such as lifts and external building illumination.

Simulation tool

The Part L2 assessment was undertaken using IES Virtual Environment software which is approved for use in assessing the performance of buildings in accordance with the Building Regulations Part L.

EPC

An EPC must be produced upon sale or let of non-dwellings and is valid for 10 years, and EPC will rank the building in terms of an energy efficiency via an Asset Rating.

2. Initial Part L 2021 calculation parameters.

The Part L 2021 assessment has been undertaken with the following calculation parameters to determine compliance with Approved Document Part L 2021 for the project.

2.1 Site Location.

The development is situated at Victoria Retail Park, Ruislip, and the nearest TRY weather file to the site location is the London Heathrow weather file.

2.2 Fabric and Construction.

Optimising the development's fabric is seen to be the most robust and effective way to improve energy efficiency and in turn reduce carbon emissions whilst also impacting thermal comfort.

The performance of the envelope i.e. material performance is unlikely to deteriorate significantly with time and therefore the benefits of these measures will continue at a similar performance for the duration of their installation.

The current values used are as indicated by the architects and the fabric performance details are detailed below:

Table 2: Target Building Fabric Performance.

Building element	Target performance
Air permeability ($m^3/h.m^2$ at (50Pa))	8.00
External wall U-value ($W/m^2.K$) – Retained element	0.35
Windows ($W/m^2.K$) – inclusive of frame	1.20
G-value	0.40
Visible light transmittance	76%
Roof U-value (W/m^2K) – Retained element	0.16
Ground Floor U-value (W/m^2K) – Retained element	0.25
Pedestrian Door ($W/m^2.K$)	1.60
High Usage Door ($W/m^2.K$)	1.20
Vehicle access door ($W/m^2.K$)	1.60

2.3 Heating, cooling & ventilation systems.

The system parameters regarding the heating, cooling and ventilation for the proposed development are listed below.

Table 3: Heating, cooling and ventilation systems.

	Detail	Units	Sys 1	Sys 2	Sys 3	Sys 4	_DHW
	System Name/Description	-	VRF + central AHU	Split system + central AHU	Air distribution + Central MVHR	Air distribution + Central MVHR	-
	UK NCM System Type	-	VRF	Split or multi-split system	Constant volume system (variable fresh air rate)	Constant volume system (variable fresh air rate)	-
Heating	Heat Source	-	Electric – Air	Electric – Air	Electric – Air	Electric – Air	Direct Electric
Heating	Fuel Type	-	Elec	Elec	Elec	Elec	Elec
Heating	Generator Seasonal Efficiency (SCOP)	%	350	350	341	341	100
Cooling	System Type	-	Electric – Air	Electric – Air	Electric – Air	-	-
Cooling	Fuel Type	-	Elec	Elec	Elec	-	-
Cooling	Generator Seasonal Efficiency Ratio (SEER)	%	500	500	500	-	-
Cooling	Generator Nominal Efficiency Ratio (EER)	%	350	350	350	-	-
Cooling	Does it Qualify for ECAs	Y/N	-	-	-	-	-
Adjustment & Metering	Ductwork Air Leakage CEN Classification	-	Class C	Class C	Class C	Class C	-
Adjustment & Metering	AHU Air Leakage CEN Classification	-	Class L2	Class L2	Class L2	Class L2	-
Adjustment & Metering	System Specific Fan Power (SFP)	W/l/s	1.60	1.60	1.80	1.80	-
Adjustment & Metering	Pump Type	-	-	-	Constant speed	Variable speed differential sensor in system	-
Adjustment & Metering	Does the System have Provision for Metering	Y/N	Y	Y	Y	Y	Y
Adjustment & Metering	Does the Metering Warn "Out of Range" Values?	Y/N	Y	Y	Y	Y	Y
Ventilation	Cooling / Ventilation Mechanism	-	Air Conditioning	Air Conditioning	Air Conditioning	Mech vent	-
Ventilation	Air Supply Mechanism	-	Central balanced A/C / Mech Vent	Central balanced A/C / Mech Vent	Central balanced A/C / Mech Vent	Central balanced A/C / Mech Vent	-
Ventilation	Heat Recovery Type	-	Thermal Wheel	Thermal Wheel	Plate heat exchanger	Plate heat exchanger	-
Ventilation	Heat Recovery Seasonal Efficiency	%	80	80	82	82	-
Ventilation	Demand Control Ventilation	-	-	-	-	-	-
Ventilation	Mechanical Exhaust Extract Flow Rate	Ac/hr	-	-	-	-	-
Ventilation	Exhaust Specific Fan Power	W(l/s)	-	-	-	-	-
Ventilation	Supply Specific Fan Power (Room)	W(l/s)	N/A – calculated through total VRF SFP	-	-	-	-

2.4 System assignment.

Table 4: System assignment.

Template Name	Main System	Aux. Vent System	DHW System	SFP (W/(l/s)
Retail areas – Clothing & Home	Sys 2	As main system	_DHW	As table above
Retail areas – Foodhall	Sys 1	As main system	_DHW	As table above
Warehouse – Stock room	Sys 4	As main system	_DHW	As table above
Stair/ Circulation	Sys 4	As main system	_DHW	As table above
Colleague BOH	Sys 3	As main system	_DHW	As table above
Stores e.g. cleaners	None	None	_DHW	As table above

2.5 Domestic hot water systems.

Table 5: DHW Information.

	Detail	Units	DHW
	Generator type	-	Electric point of use
	Delivery efficiency	%	100
Storage	Storage system	Y/N	N
	Storage volume	l	N/A
	Storage losses	kWh/l/day	N/A

2.6 Photovoltaics.

Table 6: PV Information.

Photovoltaics	Unit	Site Wide
Estimated Required Yield	kWh	-
Approx. Area	m^2	-
Module Efficiency^	%	-
Azimuth^	º	-
Shading Factor^	-	-
Inclination^	º	-

2.7 Lighting parameters.

Table 7: Lighting parameters.

Specific Lighting System/Area/Room Group	Lighting Gains				
	Installed Power Density (W/m2/ 100lux)*	Design Illuminance (lux)	Lamp Efficacy (lm/W)	Display Lamp Efficacy (lm)	Time Switch?
Retail areas – Clothing & Home	-	300	110	80	Automatic-on-dimmed
Retail areas – Foodhall	-	300	110	80	Automatic-on-dimmed
Warehouse – Stock room	-	100	110	-	Automatic-on-dimmed
Stair/ Circulation	-	100	110	-	Automatic-on-dimmed
Colleague BOH	-	300	110	-	Automatic-on-dimmed
Stores e.g. cleaners	-	100	110	-	Automatic-on-off

* Lighting Controls are defined as follows:

Auto On – Auto Off: Specifies presence detection sensors within the space which automatically switches lighting on when occupants are detected and switches lighting off when the space is detected to be unoccupied.
Manual On – Auto Off: Specifies absence detection sensors within the space. Lighting is required to be manually switched on. Automatically switches lighting off when the space is detected to be unoccupied.

3. Breakdown of Part L 2021 compliance assessment.

The results indicate that the initial Stage 2 assessment of the proposed M&S retail unit shows an improvement over the criteria outlined in Criterion 1 of the Building Regulations Part L 2021.

The Building Emission Rate of 3.83 kg.CO_2/m^2 is less than the Target Emission Rate of 6.94 kg.CO_2/m^2.

The development surpasses the requirements of the Building Regulations Part L 2021, giving the development a total betterment of over 44.7%.

In addition, the proposed development also achieves the primary energy metric, with a percentage improvement of 25%.

Table 8: Summary of Part L 2021 compliance.

	M&S Hall
Target emission rate (kgCO_2/m^2/year):	6.94 kg.CO_2/m^2
Building emission rate (kgCO_2/m^2/year):	3.83 kg.CO2/m2
Percentage betterment:	44.7%
Target primary energy rate (kWh/m^2/year)	55.07 kWh/m2
Building primary energy rate (kWh/m^2/year)	41.32 kWh/m2
Percentage betterment	25%
Energy Performance Certificate (EPC) rating	A - 12

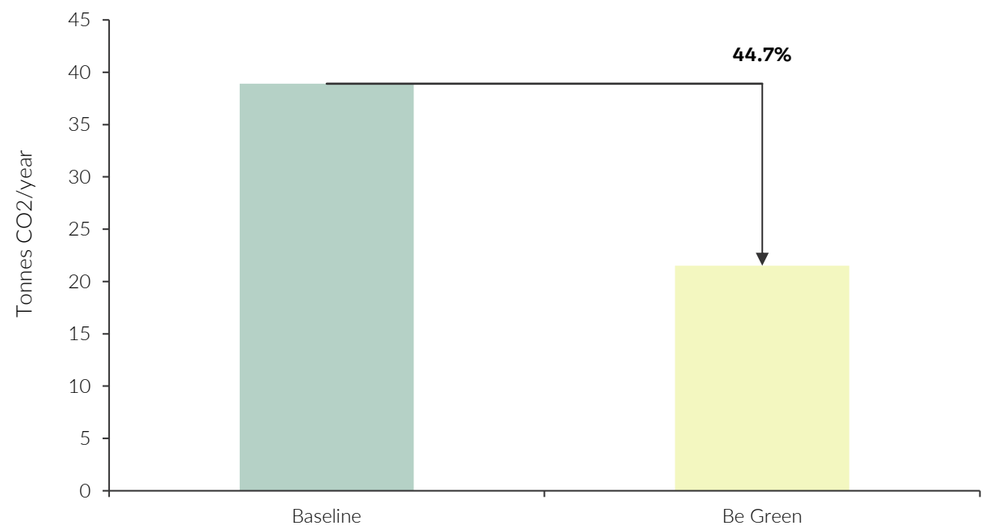


Figure 3: Results in Tonnes CO_2/year.

4. Conclusion

This Part L report has been prepared on behalf of Marks and Spencer PLC to determine whether the Class E(a) Retail Use achieves compliance against the Part L 2021 Regulations.

Combining efficient fabric design and building services, results in the regulated carbon emission rates shown in Table 9 demonstrating that compliance has been achieved for the 2021 Building Regulations Criteria.

This chart indicates that the proposed M&S Retail Unit will achieve over a 44.7% reduction over the existing buildings Part L 2021 emission rate dependent on such parameters being met during detailed design, procurement, and installation, and so achieves compliance and will meet with the planning requirements set out in the local plan.

Table 9: Summary of Part L results.

Target Emission Rate (TER):	6.94 kg.CO_2/m^2
Building Emission Rate (BER):	3.83 kg.CO2/m2
Percentage variance:	44.7%
Target Primary Energy Rate (TPER):	55.07 kWh/m2
Building Primary Energy Rate (BPER):	41.32 kWh/m2
Percentage Variance:	25%
Energy Performance Certificate (EPC) rating	A - 12

Appendix A – BRUKL output.

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

M&S Ruislip - Stage 2 - rev01 — As designed

Date: Mon Nov 17 14:30:05 2025

Administrative information

Building Details

Address:

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.28

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.28

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

Foundation area [m²]: 2828.31

The CO_2 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), $kgCO_2/m^2.annum$	3.41	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	3.83	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	36.74	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	41.32	
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	$U_{i\text{-}Limit}$	$U_{i\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.35	0.35	L0000000:Surf[3]
Floors	0.18	0.25	0.25	L0000000:Surf[0]
Pitched roofs	0.16	-	-	No pitched roofs in building
Flat roofs	0.18	0.16	0.16	L0000012:Surf[0]
Windows** and roof windows	1.6	1.2	1.2	L0000005:Surf[2]
Rooflights***	2.2	-	-	No roof lights in building
Personnel doors^	1.6	1.6	1.6	L0000000:Surf[1]
Vehicle access & similar large doors	1.3	-	-	No vehicle access doors in building
High usage entrance doors	3	-	-	No high usage entrance doors in building

$U_{i\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]
$U_{i\text{-}Calc}$ = 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
$m^3/(h.m^2)$ at 50 Pa	8	8

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	5610.5	5610.5
External area [m²]	9158.1	9158.1
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	8	3
Average conductance [W/K]	2273.22	2144.76
Average U-value [W/m²K]	0.25	0.23
Alpha value* [%]	24.96	10

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

% Area	Building Type
100	**Retail/Financial and Professional Services**
	Restaurants and Cafes/Drinking Establishments/Takeaways
	Offices and Workshop Businesses
	General Industrial and Special Industrial Groups
	Storage or Distribution
	Hotels
	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	5.61	4.2
Cooling	1.89	2.25
Auxiliary	4.69	4.93
Lighting	14.15	11.95
Hot water	1.52	1.44
Equipment*	19.25	19.25
TOTAL**	**27.86**	**24.77**

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

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	96.81	79.41
Primary energy [kWh_{PE}/m^2]	41.32	36.74
Total emissions [kg/m²]	3.83	3.41

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

M&S Ruislip - Stage 2 - Existing

As designed

Date: Tue Oct 14 14:48:24 2025

Administrative information

Building Details

Address:

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: Apache

Calculation engine version: 7.0.28

Interface to calculation engine: IES Virtual Environment

Interface to calculation engine version: 7.0.28

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

Foundation area [m^2]: 2828.31

The CO_2 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), $kgCO_2/m^2.annum$	3.48	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	6.94	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	24.99	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	55.07	
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
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Rooflights***	2.2	-	-	No roof lights in building
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High usage entrance doors	3	-	-	No high usage entrance doors in building

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

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** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.
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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	10

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Infiltration [m^3/hm^2@ 50Pa]	10	3
Average conductance [W/K]	2329.01	2144.76
Average U-value [W/m^2K]	0.25	0.23
Alpha value* [%]	24.97	10

* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Building Use

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

Energy Consumption by End Use [kWh/m^2]

	Actual	Notional
Heating	19.31	11.24
Cooling	1.79	2.25
Auxiliary	4.74	4.93
Lighting	14.2	11.95
Hot water	1.52	1.44
Equipment*	19.25	19.25
TOTAL**	**41.56**	**31.81**

* Energy used by equipment does not count towards the total for consumption or calculating emissions.
** Total is net of any electrical energy displaced by CHP generators, if applicable.

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	12.38
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*12.38*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	103.26	79.41
Primary energy [kWh_{PE}/m^2]	55.07	24.99
Total emissions [kg/m^2]	6.94	3.48

Appendix B – EPC output.

Energy Performance Certificate
Non-Domestic Building

HM Government

Certificate Reference Number:
0757-8746-0923-1655-6674

This certificate shows the energy rating of this building. It indicates the energy efficiency of the building fabric and the heating, ventilation, cooling and lighting systems. The rating is compared to two benchmarks for this type of building: one appropriate for new buildings and one appropriate for existing buildings. There is more advice on how to interpret this information in the guidance document *Energy Performance Certificates for the construction, sale and let of non-dwellings* available on the Government's website at www.gov.uk/government/collections/energy-performance-certificates.

Energy Performance Asset Rating

More energy efficient

A+

Net zero CO_2 emissions

A 0-25
B 26-50
C 51-75
D 76-100
E 101-125
F 126-150
G Over 150

12 — This is how energy efficient the building is.

Less energy efficient

Technical information

Main heating fuel:	Grid Supplied Electricity
Building environment:	Air Conditioning
Total useful floor area (m^2):	5610.493
Building complexity:	Level 5
Building emission rate ($kgCO_2/m^2$ per year):	3.69
Primary energy use (kWh_{PE}/m^2 per year):	39.91

Benchmarks

Buildings similar to this one could have ratings as follows:

11 — If newly built
45 — If typical of the existing stock

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