



Energy Statement

Kersia UK Food & Beverage Pilsworth Factory Extension

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1.0 / Executive Summary

This Energy statement is intended to support the planning application for Kersia UK's proposed facility extension at Pilsworth Bury in reference to 'Places for Everyone Joint Development Plan Document' as part of GMCA planning. The statement and the design approach adhere to the Energy hierarchy of Be Lean, Be Clean, Be Green.

The building has been evaluated according to the requirements of Building Regulations Part L 2021: Volume 2. These regulations aim to achieve a 27% reduction in carbon emissions from the current Part L2A 2013 regulations, which are assumed to apply to the original build.

This document presents how the proposed facility extension at Pilsworth Bury can meet the requirements of Planning and Building Regulations Part L using the Energy Hierarchy.

The proposed units utilise passive design techniques and follow the principles of a 'Fabric First' approach. This approach invests the construction budget in the building fabric rather than relying solely on renewable energy technologies. The design team has taken a holistic approach to the development, ensuring that the building services installations complement the fabric and structure.

This development also includes a large photovoltaic (PV) array for the facility extension, an air source heat pump (ASHP) for office space heating and cooling, and low-energy lighting (LED) to ensure efficient energy use within the buildings. These technologies are supplemented with a substantial number of electric vehicle charging bays to encourage staff to reduce their carbon footprint.

2.0 / Introduction

McKee Associates were appointed to produce an energy strategy statement for the proposed development at for Kersia UK's proposed facility extension at Pilsworth Bury

Kersia UK is located at Pilsworth, Bury as part of the Kersia group. The proposed extension is intended to be an extension of their current operation, operating in a similar manor to the existing site. Kersia group purchase high volumes of hazardous chemicals then mix and distribute from this site.

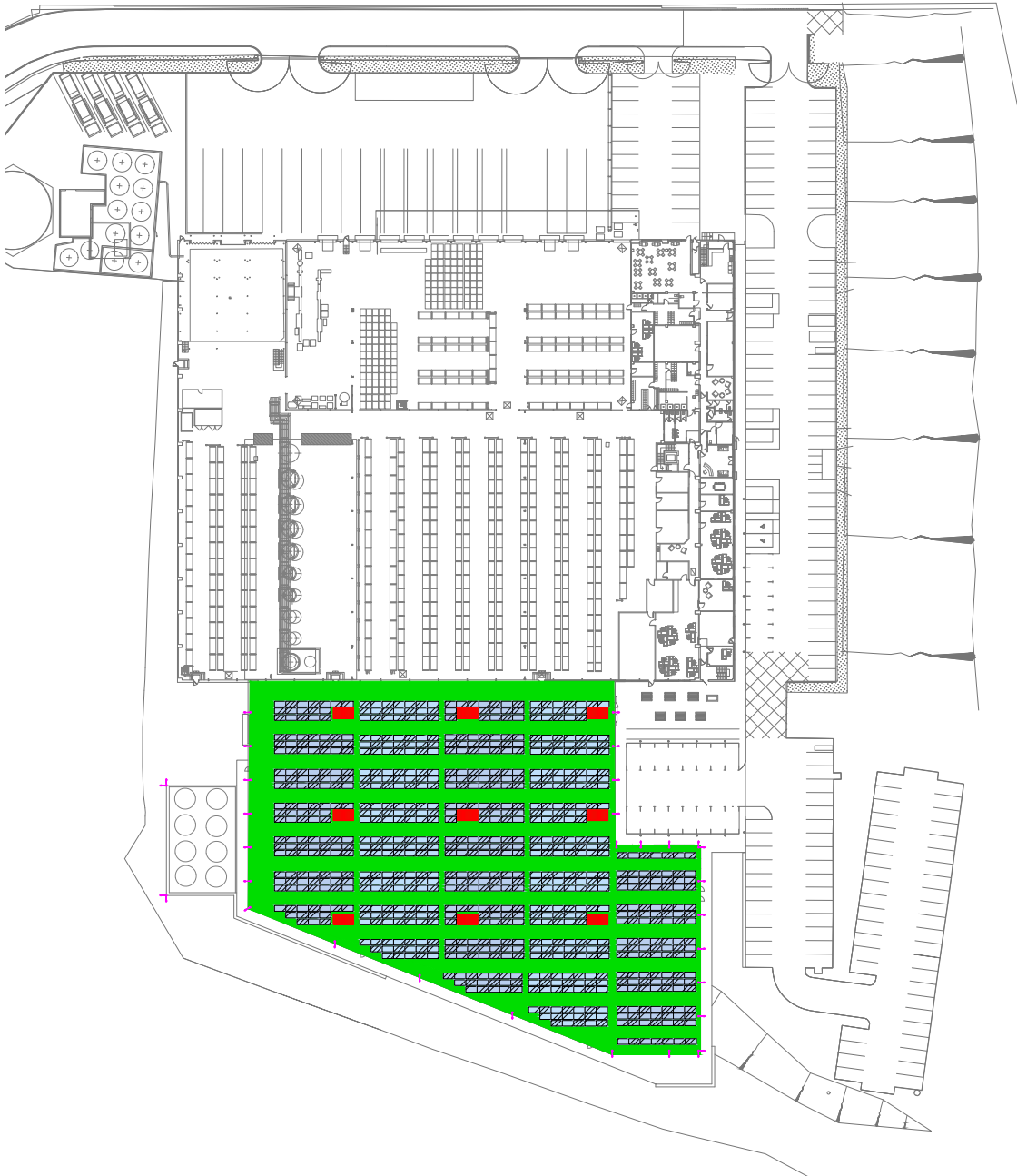
For context, this document should be read in conjunction with Fletcher Rae architects package along with both the mechanical and electrical tender drawings along with the associated schedules.

The proposed new Kersia production facility is a double-storey steel frame building containing new production zone, mixing / blending tanks, chemical storage, powder mixing, small packaging zone and staff offices / welfare. Externally there are new product tanks, mechanical plant zones and a substantial area for electrical vehicle charging and solar PV.

As appose to increasing the gas supply and usage, the proposed extension will drive towards an all-electric future factory with the installation of a new network substation on the northeast corner of the site.

This statement has been prepared to outline the energy strategy with a view to futureproofing the development for future usage to generally reduce the need for fossil fuels in line with GMCA Local Planning Guide.

Site Plan and Building Design



3.0 / Policy and Legislation

This Energy statement is intended to support the planning application for Kersia UK's proposed facility extension at Pilsworth Bury in reference to 'Places for Everyone Joint Development Plan Document' as part of GMCA planning. The statement and the design approach adhere to the Energy hierarchy of Be Lean, Be Clean, Be Green.

The Places for Everyone Plan took effect and became part of the statutory development plan for each of the nine PfE authorities on March 21, 2024.

Places for Everyone is a long-term plan of nine Greater Manchester districts (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan) for jobs, new homes, and sustainable growth. It has been published by the GMCA on behalf of the nine districts.

The plan is a joint development plan of the nine districts which will determine the kind of development that takes place in their boroughs, maximising the use of brownfield land and urban spaces while protecting Green Belt land from the risk of unplanned development.

It will also ensure all new developments are sustainably integrated into Greater Manchester's transport network or supported by new infrastructure.

Policy JP-S2: The aim of delivering a carbon-neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions, will be supported through a range of measures including:

1. Promoting the retrofitting of existing buildings with measures to improve energy efficiency and generate renewable and low carbon energy, heating and cooling;
2. Promoting the use of life cycle cost and carbon assessment tools to ensure the long-term impacts from development can be captured;
3. Taking a positive approach to renewable and low carbon energy schemes, particularly schemes that are led by, or meet the needs of local communities;
4. Increasing the range of nature-based solutions including carbon sequestration through the restoration of peat-based habitats, woodland management, tree-planting and natural flood management techniques;
5. An expectation that new development will, unless it can be demonstrated that it is not practicable or financially viable;
 - a. Be net zero carbon which applies:
 - from adoption– to regulated operational carbon emissions;
 - from 2028 - to all emissions 'in construction'.

From 2025 development should also calculate and minimise carbon emissions from unregulated emissions alongside regulated emissions.

Development proposals should set out how this has been achieved in an energy statement in accordance with the energy hierarchy, which in order of importance seeks to:

- i. Minimise energy demand;
- ii. Maximise energy efficiency;
- iii. Use renewable energy;
- iv. Use low carbon energy; and
- v. Utilise other energy sources.

From 2025 any residual carbon emissions that cannot be fully mitigated on-site should be offset, in agreement with the relevant local planning authority through a financial contribution to a carbon offset fund. As an interim measure, development should be consistent with the 2022 Part L Building Regulations unless superseded by changes to building regulations and/or national or local planning policies.

b. Incorporate adequate electric vehicle charging points, in line with Part S of the Building Regulations, unless superseded by relevant Local Plan policies, to future proof for the likely long-term demand, taking account of the potential maximum energy demand for the site;

c. Where practicable, prioritise connection to a renewable energy/heating/cooling network in the first instance or a low carbon energy/heating/cooling network that is adaptable to non-fossil fuels at a later date;

d. In residential developments, achieve energy demand reductions in terms of space heat demand; hot water energy demand and the delivery of on-site renewable energy generation, in accordance with Table 5.1. For renewable energy generation priority should be given to PV installation where technically feasible, alternative technologies will be appropriate where the equivalent generation is evidenced.

e. For non-residential developments, achieve at least BREEAM excellent standard (or equivalent) for the 'Ene 01 – reduction of energy use and carbon emissions' category rising to 'BREEAM outstanding' equivalent for ENE 01 from 2028.

f. Include a detailed energy statement to demonstrate via site relevant evidence how the development has sought to maximize reductions in carbon emissions in line with relevant policy targets, including the minimisation of overheating risks and appropriate measures for post occupancy evaluation. Whole life cycle emissions should be considered where possible.

Districts may set out specific carbon emission reduction and energy demand targets within Local Plans.

The construction plan for the development will follow the Building Regulation Part L 2021 – Volume 2, which requires the majority of the site to be built with energy-efficient materials and principles. The development will prioritise minimizing energy demand by using high-quality materials and design features that meet the required fabric standards of Part L 2021, including low U-Values, good air tightness, and careful detailing to prevent thermal bridging. The goal is to maximize passive gains through the form, layout, and orientation of the building. Once demand reduction is achieved, low/zero carbon technologies powered by non-fossil fuel energy sources will be used to meet the remaining energy demand before renewable energy technologies, such as Solar PV employed.

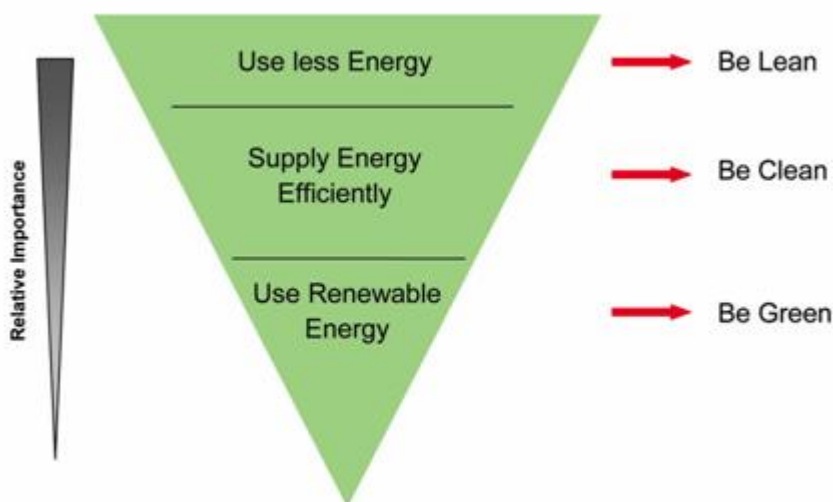
4.0 / Energy Hierarchy

The energy hierarchy is a set of principles that guide the development and decision-making process for energy-related matters. It aims to strike a balance between the need to optimise environmental and economic benefits while incorporating energy efficiency. This approach is widely accepted amongst many councils and ensures that developments meet the council's objectives.

Be Lean – create an energy efficient building

Be Clean – address the efficiencies of the services strategy

Be Green – include Low or Zero Carbon technology to further reduce efficiencies



It is generally accepted that the most practical and financially feasible strategy for reducing carbon emissions is to focus on energy efficiency and low-carbon technologies. The industry agrees that these measures have the greatest impact on offsetting CO2 emissions. Therefore, it makes sense to prioritise enhanced mitigation through these measures first, followed by the use of renewable energy technologies as a secondary approach to lower the primary energy requirements of a building.

4.1 / Be Lean

The key to achieving low-carbon and energy-efficient buildings lies in prioritising the 'fabric first' principle. This principle acknowledges that the most effective way to reduce carbon emissions is by minimising the demand for heat and power. This can be done by ensuring that the building fabric and services are well-insulated and energy-efficient.

Element	Part L 2021 Limiting Value	Proposed Building Extension Area
Floors (W/m ² K)	0.18	0.15
Walls (W/m ² K)	0.26	0.22
Roof (W/m ² K)	0.16	0.16
Windows (W/m ² K)	1.6	1.6
Doors (W/m ² K)	1.6	1.6
Air permeability (m ³ /h.m ² @ 50Pa)	8	8

Table 1 – Building Fabric U value (W/(m².K)) for new extension and improvement over 2021 Part L limiting value

In review of the values above, there has been a clear effort from the architect to reduce the U-Values below the standard set in Part L guidance. The above values have been extracted from the Brukl calculation which is appended within this document for reference.

In an effort to reduce artificial lighting outputs and operating durations, the architect has also included a considerable quantity of roof lights throughout the extended factory area. These can be seen on the layout plan within the document (between the solar array).

4.2 / Be Clean

After reducing the initial heating and cooling demand through the 'Be Lean' stage of the Energy Hierarchy, the remaining energy demand should be met in an efficient way to further decrease energy consumption and carbon emissions. In order to achieve compliance with the requirements of Planning and Building Regulations Part L, buildings can be serviced efficiently as demonstrated in the following tables. However, it is the responsibility of individual tenants to ensure compliance with these requirements before carrying out any fit-out works.

System	System Parameters
Mechanical Ventilation	Mechanical Heat Recovery Ventilation (MVHR)
Specific Fan Power	c. 1.0 W/l/s
Heat Recovery Efficiency	circa. 80%
Space Heating	VRF PLA-ZM50EA2 Heating efficiency – 4.9 Cooling efficiency – 4.9 Direct electric panel heating store rooms Efficiency – 100%
Water Heating	Direct electric water heater
Lighting	LED Lighting - 95 lm/W average luminaire efficacy

Table 2 – Building Services Parameters – Office Areas

System	System Parameters
Mechanical Ventilation	Extract Only (MEV)
Specific Fan Power	c. 1.0 W/l/s
Space Heating	Main Space - Cabinet Heaters Efficiency – 92% Work Stations – Radiant Heaters Efficiency – 100%
Water Heating	Direct electric water heater
Lighting	LED Lighting - 95 lm/W average luminaire efficacy

Table 3 – Building Services Parameters – Workshop Areas

4.3 / Be Green

Generating low-carbon energy onsite is the final stage of the energy hierarchy. This approach can significantly reduce dependence on fossil fuels, minimize energy losses during transmission, and enhance energy security and connectivity.

LOW / ZERO CARBON TECHNOLOGY	TYPICAL PAY BACK PERIOD	LIFE EXPECTANCY	SPATIAL REQUIREMENTS	PLANNING REQUIREMENTS	TECHNOLOGY ADOPTED	COMMENTS / REASONING
HYDRO POWER	N/A	N/A	N/A	N/A	NO	This site is not suitable and technically unfeasible.
COMBINED HEAT & POWER	15 - 20 years	10 - 15 years	Large plant space required for heavy plant.	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	NO	A CHP to serve this building would need significant noise treatment to meet the requirements. The heating loads of the building are not suitable to support this technology.
GROUND / WATER SOURCE HEAT PUMPS	6 - 10 years	15 - 20 years	Deep boreholes or Large external area (e.g. Sports field) required.	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	NO	Low end of payback can only be achieved with high cooling load. High capital cost involved, and extensive ground works required. Economically unfeasible
AIR SOURCE HEAT PUMPS	15 - 20 years	15 - 20 years	External plant area required.	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	YES	This technology has been adopted for the areas it is suitable such as office space. Adequate space externally and internal plant allowed within external planning design.

Cont.

LOW / ZERO CARBON TECHNOLOGY	TYPICAL PAY BACK PERIOD	LIFE EXPECT-ANCY	SPATIAL REQUIREMENTS	PLANNING REQUIREMENTS	TECHNOLOGY ADOPTED	COMMENTS / REASONING
WIND POWER	20 years	12 - 15 years	Large base or supporting structure.	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	NO	This technology is likely to cause shadowing and flicker, to the surrounding buildings. The site wind speeds are unlikely to support a substantial wind powered installation. This site is not suitable and technically unfeasible.
BIOMASS	10 - 15 years	15 - 20 years	Large plant and fuel storage space required at ground level.	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	NO	The site layout requires considerations for dedicated fuel delivery routes and storage. Fuel delivery increases carbon footprint. The logistic issues make this technology unfeasible given site congestion.
PHOTOVOLTAICS	8 - 12 years	15 - 20 years	Structurally supported roof space required with maintained access.	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	YES	This technology has been adopted for the new extension section of the building. Feed in tariffs make this technology commercially viable.
SOLAR THERMAL	15 - 20 years	15 years	Structurally supported roof space required with maintained access.	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	NO	Roof space better utilised for Photovoltaics given the inconsistent hot water profile onsite.
RAINWATER HARVESTING	TBC	20 - 30 years	Water storage required at or below ground	McKee Associates are unaware of any planning requirement which would preclude the use of this technology.	NO	Economically Unfeasible. The building's WC / grey water load profile is unlikely to result in a worthwhile investment. Grey water cannot be used for process given the product profile.

5.0 / Conclusion

This energy statement has been created following the guidance from the relevant policy documents outlined in section 4.

The statement includes energy assessments and the subsequent potential energy strategy has been prepared such that it demonstrates compliance with the requirements set out within the 'The Places for Everyone Plan' took effect and became part of the statutory development plan for each of the nine PfE authorities on March 21, 2024.

An Energy Hierarchy approach with a focus on sustainable building design and energy efficiency measures has been used to assess the viability of integrating Low or Zero Carbon (LZC) technologies into the building. SBEM calculations have been created for the new extension building on site to determine the various energy hierarchy carbon figures and improvements required to ensure compliance with Part L regulations.

The energy statement emphasises the importance of energy-efficient design to reduce predicted carbon dioxide emissions. The statement outlines the minimum proposals for the building structure, which exceeds the minimum Building Regulations requirements to reduce heat loss through conduction and air infiltration.

To reduce the scheme's carbon footprint, various renewable solutions have been considered, with heat pump technology and Photovoltaics technology being regarded as the most viable solution. These technologies, combined with natural light, low-energy lighting, and new electric vehicle charging spaces, will achieve greater efficiency improvements and bring us closer to our zero-carbon target. The proposed details of the renewable technologies installed are listed below;

A new Photovoltaics installation has been proposed and included within the Brukl document based on a full proposed rooftop installation rated at 278kWp. The system is proposed with space left for maintenance, access, roof lights and AOV's. This system will feedback to the central infrastructure directly reducing the current draw from the network, during out-of-hours excess generation will be exported to the network.

A new Air Source Heat Pump installation has been proposed and included within the Brukl document based on the office space hot water supply and demand. A 6kW Ecodan unit will be installed with supporting hot water cylinder to supply the extension zone hot water.

A new Electric Vehicle Charging array has been proposed to encourage staff to adopt a low carbon approach to commuting. The new installation is based on 15no. new chargers serving 30no. Electric Vehicle Charging 7kW bays.

In respect to Policy JP-S2 extracted from 'The Places for Everyone Plan' section 5e, we would propose that BREEAM is not required on the basis that this is an open extension to an existing non-BREEAM compliant building and would therefore be limited in its effectiveness in respect to energy.

6.0 / Appendix 1 – Extension Brukl Document

Over Page

BRUKL Output Document



Compliance with England Building Regulations Part L 2021

Project name

Kersia Factory Extension

As designed

Date: Wed Apr 03 10:01:05 2024

Administrative information

Building Details

Address: Pilsworth Industrial Estate, Bury, BL9 8RD

Certifier details

Name: Neville Duggan

Telephone number: 07974 193 039

Address: Peter House, Oxford Street, Manchester, M1 5AN

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.24

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

Foundation area [m²]: 2126.43

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	12.6
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	8.72
Target primary energy rate (TPER), kWh _{PE} /m ² annum	54.92
Building primary energy rate (BPER), kWh _{PE} /m ² annum	25.29
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	0.22	0.22	XT000003_W-1
Floors	0.18	0.15	0.15	XT000002_F
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.16	0.16	XT000000_C
Windows** and roof windows	1.6	1.6	1.6	XT000003_W-1_O0
Rooflights***	2.2	1.6	1.6	XT000000_C_O0
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/(m ² K)] U _a -Calc = Calculated area-weighted average U-values [W/(m ² K)] U _i -Calc = Calculated maximum individual element U-values [W/(m ² K)] * 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/m ² K 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

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	<0.9

1- VRF PLA-ZM50EA2

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4.9	7.6	-	-	-
Standard value	N/A	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- Warehouse - Gas Fired Cabinet Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	0.97	-	0.4	-	-
Standard value	0.91	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

3- Electric Panel heater

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
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- SYST0001-DHW

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

2- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	-
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
Extension - Control Room	-	-	-	-	2	-	-	-	-		0.8	N/A

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		
Extension - Office	-	-	-	-	2	-	-	-	-	0.8	N/A
Extension - Warehouse	0.3	-	-	-	-	-	-	-	-	-	N/A
Extension - Warehouse	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
Extension - Control Room		95	-	-
Extension - Office		95	-	-
Extension - Battery		95	-	-
Extension - Plant		95	-	-
Extension - Stairs		95	-	-
Extension - Corridor		95	-	-
Extension - WC		95	-	-
Extension - Warehouse		95	-	-
Extension - Warehouse		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?
Extension - Control Room	NO (-48.1%)	NO
Extension - Office	NO (-10.8%)	NO
Extension - Battery	N/A	N/A
Extension - Plant	N/A	N/A
Extension - Stairs	N/A	N/A
Extension - Corridor	N/A	N/A
Extension - WC	NO (-86.7%)	NO
Extension - Warehouse	NO (-10.8%)	NO
Extension - Warehouse	NO (-12.5%)	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]	4252.9	4252.9
External area [m ²]	9890	9890
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	8	5
Average conductance [W/K]	2295.64	3333.19
Average U-value [W/m ² K]	0.23	0.34
Alpha value* [%]	10.79	19.2

* 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
	General Industrial and Special Industrial Groups
100	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	63.58	73.65
Cooling	0.2	0.13
Auxiliary	2.17	2.74
Lighting	4.7	3.96
Hot water	4.25	4.25
Equipment*	30.24	30.24
TOTAL**	74.89	84.72

* 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	45.76	31.36
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>45.76</i>	<i>31.36</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	239.41	311.75
Primary energy [kWh _{PE} /m ²]	25.29	54.92
Total emissions [kg/m ²]	8.72	12.6

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] Split or multi-split system, [HS] ASHP, [HFT] Natural Gas, [CFT] Electricity										
	Actual	50.9	175.6	3.1	9	8.3	4.57	5.4	4.9	7.6
	Notional	129.9	94.4	42	6	3.8	0.86	4.4	----	----
[ST] Multiburner radiant heaters, [HS] Radiant heater, [HFT] Natural Gas, [CFT] Electricity										
	Actual	186.6	43.8	61.6	0	2	0.84	0	0.97	0
	Notional	232.7	74.3	75.2	0	2.7	0.86	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	301.4	50.2	104.7	0	2.1	0.8	0	1	0
	Notional	311.6	82.3	64.6	0	2.8	1.34	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