

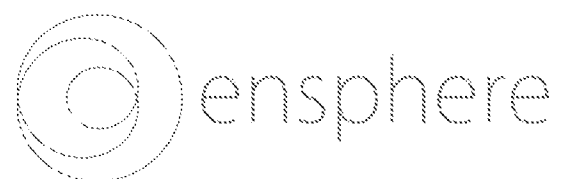
Oldlands Farm, Bognor Regis

Sustainability & Energy Statement

Ensphere Group Ltd on behalf of
Hanbury (PM) Limited



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Oldlands Farm, Bognor Regis

Sustainability & Energy Statement

Client Name: Hanbury (PM) Limited

Document Reference: 19-E024-002

Project Number: 19-E024

Quality Assurance Approval Status

This document has been prepared and checked in accordance with Ensphere Group Ltd's Quality Management System.

Issue:	Version:	Prepared by:	Reviewed by:	Date:
Final	V2	Pete Jeavons	Pete Jeavons	March 2019

Sustainability	Energy	Climate Change	Socio-Economic
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1. Executive Summary

- 1.1 This Sustainability and Energy Statement presents the sustainability credentials for a proposed scheme at Oldlands Farm, Steyning Way, Bognor Regis, PO22 9NN.
- 1.2 The report has been written with regards to the pre-commencement requirements of Condition 16 of the planning permission (ref: BE/61/13/).
- 1.3 The report concludes that the pre-commencement sustainability and energy requirements have been implemented in line with planning policy and Condition 16 of the planning permission.

2. Introduction

- 2.1 Ensphere Group Ltd was commissioned by Hanbury (PM) Limited to produce a Sustainability & Energy Statement for the proposed redevelopment of Oldlands Farm, Steyning Way, Bognor Regis, PO22 9NN.

Permitted Development

- 2.2 A hybrid application (ref: BE/61/13/) has been granted for:
- Full planning application for access road and flood compensation area;
 - Outline application for 33,116 sqm of mixed use commercial and industrial uses, comprising A1, A3, A5, B1 and B8 with associated works and landscaping.

Condition 16

- 2.3 The permission was subject to a number of conditions; some of which related to the full application only others to the outline part.
- 2.4 The following Condition was listed as relevant to the outline matters within the planning application:

Condition 16

Prior to the commencement of construction of a phase, written evidence will be submitted to and approved in writing by the Local Planning Authority that the development is registered with a BREEAM certification body and a pre-assessment report (or a design stage certificate with interim rating if available) has been submitted indicating that the development can achieve the BREEAM level "Very Good". The documentation will include an energy plan showing that a minimum of 10 percent of on-site energy will be produced by low and zero carbon technologies. The statement shall be approved by the Local Planning Authority and the building should be constructed in accordance with the detailed scheme.

Prior to the occupation of each phase of the development a post construction review statement for that phase shall be submitted by the applicant including a BRE certified BREEAM final assessment and associated paper work and approved in writing by the Local Planning Authority.

Reason: To reduce carbon dioxide and other greenhouse gas emissions and adapt to climate change in accordance with Policy GEN21 of the adopted Arun District Local Plan.

Report Objective

- 2.5 The objective of the Sustainability & Energy Statement is to address the pre-commencement requirements of Condition 16.

3. BREEAM Pre-Assessment

Registration

- 3.1 The Site has been registered (ref: BREEAM-0077-9579) with the BRE by Ensphere Group Ltd for assessment against BREEAM New Construction 2018 (the current version of BREEAM); with consideration given to the industrial credits.

BREEAM Assessor & BREEAM AP

- 3.2 The BREEAM Assessor and BREEAM AP on this project is:
- Pete Jeavons, Ensphere Group Ltd, 52 Grosvenor Gardens, London, SW1W 0AU, pjeavons@enspheregroup.com; 020 7846 9041 (Assessor No. ENSP-PJ06 & AP No. BREEAMAP0356).

Minimum Standards for a "Very Good" BREEAM rating level

Table 3.1 Minimum Standards

BREEAM Issue	Minimum Standards
Man03: Responsible construction practices	One credit (responsible construction management)
Man 04: Commissioning and handover	One credit (commissioning-test schedule and responsibilities)
Man 04: Commissioning and handover	Criterion 11 (Building User Guide)
Man05: Aftercare	One credit (commissioning-implementation)
Ene01: Reduction of energy use and carbon emissions	Four credits (Energy performance)
Ene 02: Energy monitoring	One credit (first sub-metering credit)
Wat 01: Water consumption	One credit
Wat 02: Water monitoring	Criterion 1 only (water meter on mains water supply)
Mat 03: Responsible sourcing of construction products	Criterion 1 only (responsibly sourced timber)
Wst03: Operational waste	One credit

Pre-Assessment

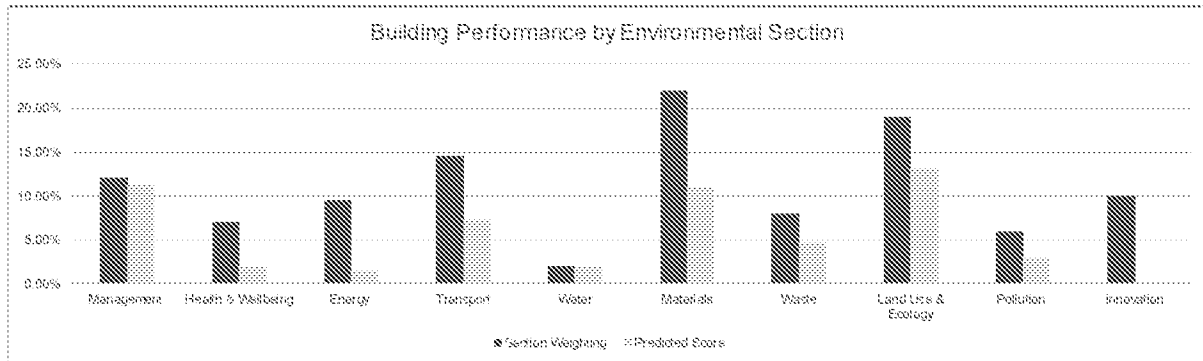
- 3.3 The following comprise a summary of the targeted credits:

Issue ID	Description	Aim	Available Credits	Predicted Credits	Available Score	Predicted Score
Man01	Project brief and design	Encouraging an integrated design process and considering BREEAM performance targets early to influence decision-making and optimise building performance, while avoiding unnecessary costs.	4	4	3.20%	3.20%
Man02	Life cycle cost and service life planning	Promoting the business case for sustainable buildings through the enhanced understanding of capital cost. Improving design, specification, maintenance and operation, by encouraging the use of life cycle costing.	4	4	3.20%	3.20%
Man03	Responsible Construction Practices	Encouraging construction sites to be managed in an environmentally and socially considerate and responsible manner. Monitoring to encourage continuous improvements and utility consumption reduction.	6	6	4.80%	4.80%
Man04	Commissioning and handover	Encouraging a well-managed handover and commissioning process, which will ensure building services and fabric defects are identified and rectified. Ensuring that the building responds to the needs of the occupants.	1	0	0.80%	0.00%
Man05	Aftercare	Encouraging aftercare support during the first year of the building operation, to ensure the building operates in accordance with the design intent and in response to the building occupants' needs.	0	0	0.00%	0.00%
Hea01	Visual comfort	Providing occupants with the conditions that facilitate good visual comfort by designing out the potential for glare, achieving good practice daylight factors and having an adequate view out. Designing internal and external lighting systems to provide appropriate illuminance (lux) levels, thereby giving a more comfortable environment for occupants. Internal lighting is zoned to allow for occupant control.	3	0	3.00%	0.00%
Hea02	Indoor air quality	Facilitating good indoor air quality by considering indoor air pollution early in the design process so that a mitigation strategy can be put in place. Managing harmful emissions from construction products by specifying finishes and products that have been tested in accordance with the appropriate standards. Specifying an appropriate ventilation strategy that maintains good indoor air quality.	0	0	0.00%	0.00%
Hea03	Safe containment in laboratories	This is no longer assessed as a separate issue within BREEAM UK New Construction 2018.	0	0	0.00%	0.00%
Hea04	Thermal comfort	Thermal modelling informs the building design to provide a comfortable thermal environment that considers current climatic conditions, and projected climate change scenario conditions. Giving occupants control over their environment through appropriate temperature control strategies and thermal zoning.	0	0	0.00%	0.00%
Hea05	Acoustic performance	Enabling occupants to experience best practice acoustic performance levels appropriate to the functional activities in occupied spaces.	1	0	1.00%	0.00%
Hea06	Security	Designing the building to consider and take into account security needs to ensure occupants safety and wellbeing.	1	1	1.00%	1.00%
Hea07	Safe and healthy surroundings	Providing external site areas that are safe for occupant use. Enhancing the wellbeing of building users by giving access to an outdoor space.	2	1	2.00%	1.00%
Ene 01	Reduction of energy use and carbon emissions	Encouraging the design of energy efficient buildings with energy performance above national building regulations. Encouraging the accurate modelling of operational energy consumption.	9	0	6.58%	0.00%
Ene02	Energy monitoring	Helping to identify and reduce high energy demands where possible by accurate measurement of the energy consumption of the building by end use.	0	0	0.00%	0.00%
Ene03	External lighting	Reducing the building's energy consumption through the specification of energy efficient external lighting.	1	1	0.73%	0.73%
Ene04	Low carbon design	Reducing the building's energy consumption through the adoption of passive design solutions, free cooling and low or zero carbon (LZC) energy sources.	3	1	2.19%	0.73%
Ene05	Energy efficient cold storage	Reducing the building's operational greenhouse gas emissions (CO ₂ -eq) through the design, installation and commissioning of energy efficient refrigeration systems.	0	0	0.00%	0.00%
Ene06	Energy efficient transportation systems	Reducing the building's energy consumption by specifying the optimum number and size of energy efficient transportation systems.	0	0	0.00%	0.00%
Ene07	Energy efficient laboratory systems	Reducing the building's operational greenhouse gas emissions (CO ₂ -eq) by specifying best practice energy efficient laboratory equipment.	0	0	0.00%	0.00%
Ene08	Energy efficient equipment	Demonstrating a meaningful reduction in the total unregulated energy demand of the building by using energy efficient equipment.	0	0	0.00%	0.00%
Tra01	Transport assessment and travel plan	Recognising developments in proximity to good public transport networks, thereby helping to reduce transport-related pollution and congestion.	2	2	2.42%	2.42%
Tra02	Sustainable transport measures	Recognising developments in close proximity of, and accessible to, local amenities which are likely to be frequently required and used by building occupants.	10	4	12.08%	4.83%

Wat01	Water consumption	Reducing the demand for potable water through the provision of efficient sanitary fittings, rainwater collection and water recycling systems.	0	0	0.00%	0.00%
Wat02	Water monitoring	Specification of water meters to allow for management and monitoring of water use in the building. This encourages reductions in water use by identifying areas of high usage and investigating potential causes.	1	1	1.00%	1.00%
Wat03	Water leak detection	Reducing the unintended water consumption due to leaks by installing leak detection systems and flow control devices.	1	1	1.00%	1.00%
Wat04	Water efficient equipment	Reducing water consumption for non-domestic scale, non-sanitary water uses by specifying efficient systems and improving the design efficiency of any water-using processes.	0	0	0.00%	0.00%
Mat01	Environmental impacts from construction products - Building life cycle assessment (LCA)	Reducing buildings' environmental life cycle impacts through conducting Life Cycle Assessment and integrating its outcomes in the design decision-making process.	7	3	11.00%	4.71%
Mat02	Environmental impacts from construction products - Environmental Product Declarations (EPD)	To encourage availability of robust and comparable data on the impacts of construction products by rewarding the specification of products with environmental products declarations.	1	1	1.57%	1.57%
Mat03	Responsible sourcing of construction products	Recognising and encouraging responsible sourcing of construction products. This includes the source of products and the intermediary companies processing and transporting the product to site.	4	1	6.29%	1.57%
Mat04	Insulation	This is no longer assessed as a separate issue within BREEAM UK New Construction 2018.	0	0	0.00%	0.00%
Mat05	Designing for durability and resilience	Increasing the lifespan of the building through designing for durability and protection from degradation and specifying appropriate construction products.	1	1	1.57%	1.57%
Mat06	Material efficiency	Encouraging the reduction of environmental impacts through optimising the use of materials during all stages of the project.	1	1	1.57%	1.57%
Wst01	Construction waste management	Improving resource efficiency through developing a pre-demolition audit and a Resource Management Plan, maximising the recovery of material during demolition and diverting non-hazardous waste from landfill.	5	5	4.00%	4.00%
Wst02	Use of recycled and sustainably sourced aggregates	Encouraging the use of recycled or secondary aggregate or aggregate types with lower environmental impact to reduce waste and optimise material efficiency.	1	0	0.80%	0.00%
Wst03	Operational Waste	Encouraging the diversion of operational waste from landfill through the provision of space and facilities allowing the segregation and storage of recyclable waste.	1	1	0.80%	0.80%
Wst04	Speculative finishes (Offices only)	Specification of floor and ceiling finishes only where agreed with the occupant or, for tenanted areas where the future occupant is unknown, installation in a show area only, to reduce wastage.	0	0	0.00%	0.00%
Wst05	Adaptation to climate change	Encouraging consideration and implementation of measures to mitigate the impact of more extreme weather conditions arising from climate change over the lifespan of the building.	1	0	0.80%	0.00%
Wst06	Design for disassembly and adaptability	Encouraging consideration and implementation of measures design options related to adaptability and disassembly, which can accommodate future changes to the use of the building and its systems over its lifespan.	2	0	1.60%	0.00%
LE01	Site selection	Recognising the reuse of previously developed and contaminated land where appropriate remediation has taken place.	2	0	2.92%	0.00%
LE02	Identifying and understanding the risks and opportunities for the project	Identifying and understanding the ecological risks and opportunities associated with the site to inform the determination of the strategic outcome for the site.	2	2	2.92%	2.92%
LE03	Managing negative impacts on ecology	Recognition of steps taken to avoid impacts on existing site ecology as far as possible.	3	3	4.38%	4.38%
LE04	Change and enhancement of ecological value	Recognition of steps taken to enhance site ecology.	4	2	5.85%	2.92%
LE05	Long term ecology management and maintenance	Encouraging the long term maintenance and management of ecology on site to ensure both new and existing ecological features continue to thrive.	2	2	2.92%	2.92%
Poi01	Impact of refrigerants	Rewarding buildings that reduce the impact of refrigerant gas emissions.	0	0	0.00%	0.00%
Poi02	Local air quality	Recognising buildings which limit their impact on local air quality, by consideration of the combustion plant and fuel used on site.	0	0	0.00%	0.00%
Poi03	Flood and surface water management	Rewarding buildings and their sites that limit on-site and off-site local flooding and hence the damage this can cause.	5	2	5.00%	2.00%
Poi04	Reduction of night time light pollution	Avoiding or reducing the impact of night time light pollution, through careful design and specification of light sources.	1	1	1.00%	1.00%
Poi05	Reduction of noise pollution	Avoiding or reducing the impact of external noise from the building.	0	0	0.00%	0.00%
Inn01	Innovation	Test out new ideas which, if successful, could change the status quo of the industry. Allow the industry to explore new opportunities and evolve its processes.	10	0	10.00%	0.00%

BREEAM Rating
Total Score

Very Good
55.87%



	Available Score	Predicted Score	Section Weighting	Predicted Score
Management	15	14	12.00%	11.20%
Health & Wellbeing	7	2	7.00%	2.00%
Energy	13	2	9.50%	1.46%
Transport	12	6	14.50%	7.25%
Water	2	2	2.00%	2.00%
Materials	14	7	22.00%	11.00%
Waste	10	6	8.00%	4.80%
Land Use & Ecology	13	9	19.00%	13.15%
Pollution	6	3	6.00%	3.00%
Innovation	10	0	10.00%	0.00%

4. Energy Strategy

4.1 The energy strategy follows the Energy Hierarchy, on the basis that it is preferable to firstly minimise carbon dioxide emissions through reduced energy demand; prior to considering low carbon and renewable energy supply options.

4.2 The tiers of the Energy Hierarchy are:

Be Lean	Demand Reduction
Be Clean	Use Energy More Efficiently
Be Green	Use Renewable Energy

4.3 Where opportunities to improve the efficiency of the design have been maximised, consideration is then given to the second principle whereby priority is given to the efficient use of energy. This is on the basis that low carbon technologies can be cost-effective and provide significant carbon savings when compared to conventional technologies.

4.4 The third principle of the hierarchy promotes the use of renewable technologies. Whilst these technologies can be relatively expensive to install, they do offer the potential to significantly reduce carbon emissions.

Proposed Strategy

4.5 The building has been modelled using SBEM and the As Built Building Regulations Part L output report has been reviewed, which confirms the following (equal to or better than Table 5 of Approved Document L2A):

- External Wall U-Value (warehouse) 0.35W/m²/K;
- External Wall U-Value (showroom) 0.20W/m²/K;
- Ground Floor U-Value (warehouse) 0.25W/m²/K;
- Ground Floor U-Value (showroom) 0.15W/m²/K;
- Roof U-Value (warehouse) 0.25W/m²/K;
- Roof U-Value (showroom) 0.13W/m²/K;
- Window U-Value 1.4 W/m²/K;
- Measured air permeability 5m³/(h.m²) at 50Pa;
- Energy efficient lighting;

- Incorporation of Air Source Heat Pumps (ASHPs) to supply space heating and hot water in the showrooms; well in excess of 10% of the site's predicted energy needs.

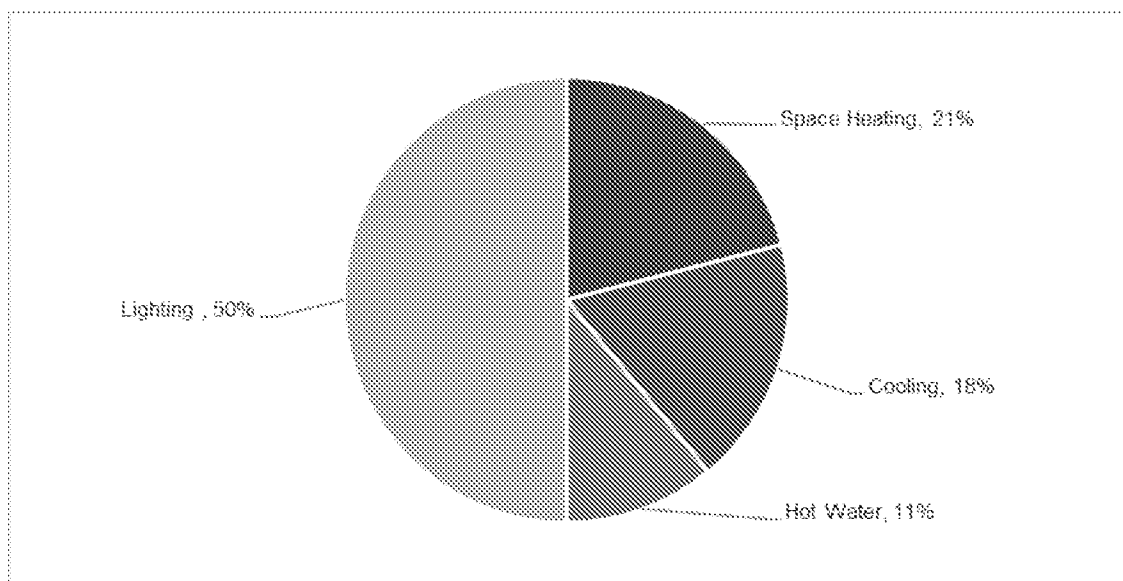
4.6 A copy of the BRUKL report is appended to this report for reference.

Renewables

4.7 In line with the planning requirements, a minimum of 10 percent of on-site energy will be produced by low and zero carbon technologies (ASHPs).

4.8 The energy production figure has been calculated for all buildings on the site under a single calculation on the basis that the condition applies site wide. First, the consumption data was converted to demand data by modelling all energy producing equipment with 100% efficient electric systems.

4.9 Total site-wide energy demand was estimated at 219,634kWh/yr; of which space heating represented 45,359kWh/yr. The application of ASHPs to the entire site heating demand means that ~21% of on-site energy will be produced by a zero carbon technology.

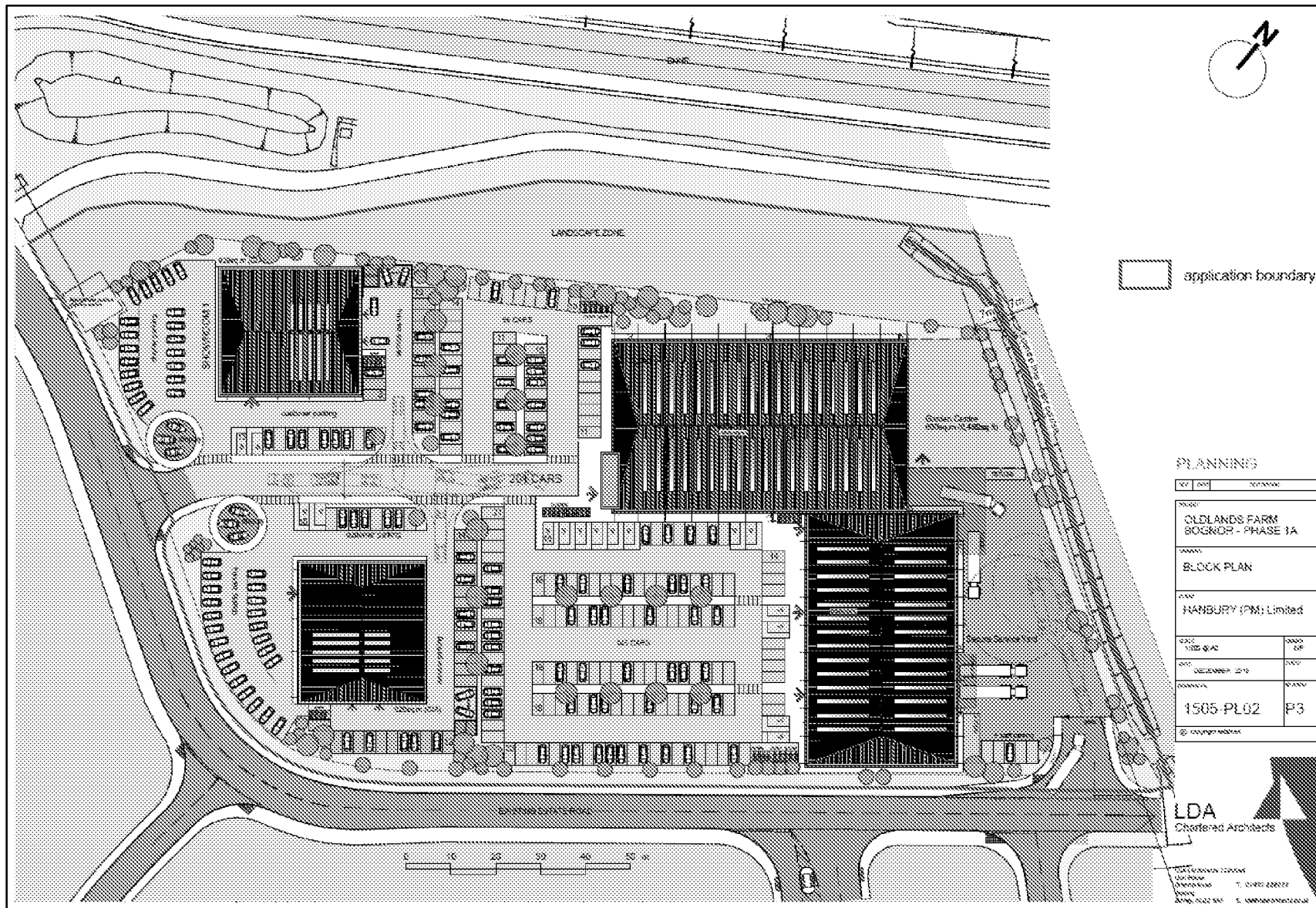


5. Summary

- 5.1 This Sustainability & Energy Statement responds to the pre-commencements requirements of Condition 16 associated with the outline matters for permission ref: BE/61/13/.
- 5.2 The report has confirmed that the site is registered with the BRE and includes a pre-assessment demonstrating where credits are currently targeted.
- 5.3 Energy modelling has also been undertaken, which demonstrates that at least 10% of the on-site energy will be produced by low and zero carbon technologies (ASHPs).
- 5.4 On the basis of the above and information included herein, the pre-commencement requirements of Condition 16 are considered satisfied.

Appendices

A. Site Plan



B. SBEM Outputs (With ASHP)

SBEM Main Calculation Output Document

Thu Mar 14 11:49:11 2019

v5.4.b.0

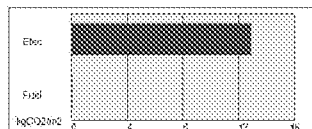
Building name

Oldlands Farm (with renewables)

Building type: B8 Storage or Distribution

SBEM is an energy calculation tool for the purpose of assessing and demonstrating compliance with Building Regulations (Part L for England and Wales, Section 6 for Scotland, Part F for Northern Ireland, Part L for Republic of Ireland, and Building Bye-laws Jersey Part 11) and to produce Energy Performance Certificates and Building Energy Ratings. Although the data produced by the tool may be of use in the design process, SBEM is not intended as a building design tool.

Building Energy Performance and CO2 emissions

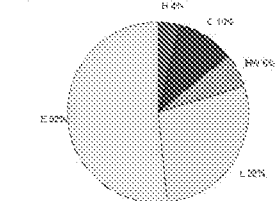


0 kWh/m2 offsetted by the use of renewable sources

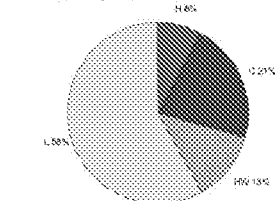
Building area is 7460.43 m2

Annual Energy Consumption

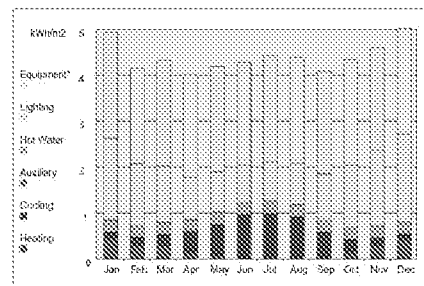
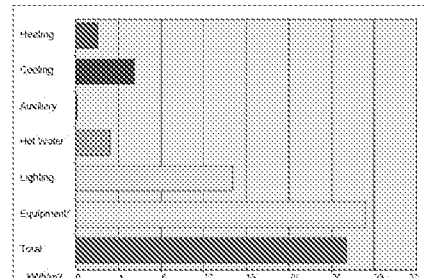
(Pie chart including Equipment and use)



(Pie chart excluding Equipment and use)

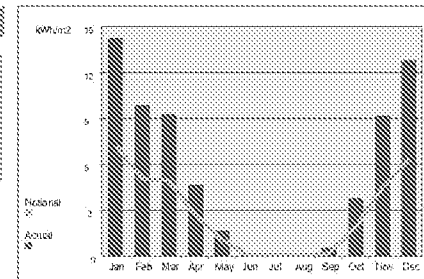
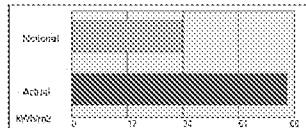


(* Although energy consumption by equipment is shown in the graphs for comparison, this excludes fossil fuels included in the total needs of the building or the calculation of the ratings

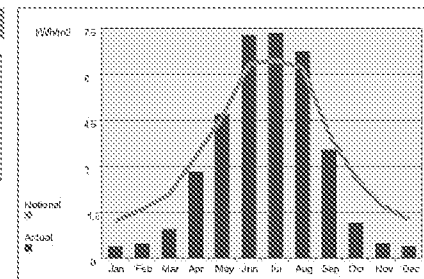
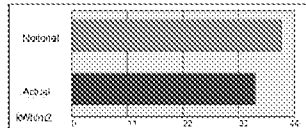


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Annual Heating Demand



Annual Cooling Demand



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BRUKL Output Document

HM Government
Compliance with England Building Regulations Part L 2013

Project name

Oldlands Farm (with renewables) As designed

Date: Thu Mar 14 11:49:12 2019

Administrative information

Building Details

Address: Address 1, Address 2, Bognor, Postcode

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.4 b.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.1.0

BRUKL compliance check version: v5.4 b.0

Certifier details

Name: Pete Jeavons

Telephone number: Phone

Address: 52 Grosvenor Gardens, London, SW1W 0AU

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	17.6
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	17.6
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	12.8
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 (W/m ² .K)	U _o (W/m ² .K)	U _o (W/m ² .K)	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	GF000001_WB
Floor	0.25	0.15	0.15	GF000001_F
Roof	0.25	0.13	0.13	GF000001_C
Windows***, roof windows, and rooflights	2.2	1.6	1.8	GF000001_C_OG
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	2.5	-	-	"No external high usage entrance doors"

U_o (W/m².K) = U_o (W/m².K) = U_o (W/m².K)

U_o (W/m².K) = U_o (W/m².K) = U_o (W/m².K)

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

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

*** Display windows and similar glazing are excluded from the U-value check.

N.B. Weather not ventilates (inc. smoke vents) not summery peck basins are included or checked against the lining standards by tool tool.

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Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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- ASHP

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.1%	2.8%	-	-	-
Standard value	2.5%	2.6%	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system

NO

* Standard values are for all types >12 kW output, except air-source and gas engine heat pumps. For types <12 kW output, refer to BS 14895 for building standards.

1- SYST0002-DHW

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

2- SYST0001-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	-
Standard value	N/A	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
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 supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

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	1.9	1.6	0.5	1.1	0.5	1		
Warehouse Units 2-4	-	-	-	-	-	-	-	-	-	-	N/A
Warehouse Unit 1 Mezzanine	-	-	-	-	-	-	-	-	-	-	N/A
Warehouse Unit 1 GF	-	-	-	-	-	-	-	-	-	-	N/A
Showroom GF	-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine	0.3	-	-	-	-	-	-	-	-	-	N/A
Office Mezzanine	-	-	-	-	-	-	-	-	-	-	N/A
Corridor Mezzanine	-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine	0.3	-	-	-	-	-	-	-	-	-	N/A
Showroom GF	-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine	0.3	-	-	-	-	-	-	-	-	-	N/A

Zone name	ID of system type	SFP [W/(l/s)]										HR efficiency	
		A	B	C	D	E	F	G	H	I	J	Zone	Standard
	Standard value	0.3	1.1	0.5	1.9	1.8	0.5	1.4	0.5	1	1		
Office Mezzanine		-	-	-	-	-	-	-	-	-	-	-	N/A
Corridor Mezzanine		-	-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine		0.3	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
Warehouse Units 2-4		100	80	22	8064
Warehouse Unit 1 Mezzanine		100	-	-	5058
Warehouse Unit 1 GF		100	-	-	10266
Showroom GF		-	80	22	10132
WC Mezzanine		-	80	-	43
Office Mezzanine		80	-	-	344
Corridor Mezzanine		-	80	-	160
WC Mezzanine		-	80	-	138
Showroom GF		-	80	22	10132
WC Mezzanine		-	80	-	43
Office Mezzanine		80	-	-	344
Corridor Mezzanine		-	80	-	160
WC Mezzanine		-	80	-	138

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Warehouse Units 2-4	YES (-28.5%)	NO
Warehouse Unit 1 Mezzanine	YES (-114.5%)	NO
Warehouse Unit 1 GF	YES (-13.8%)	NO
Showroom GF	YES (-34.3%)	NO
WC Mezzanine	N/A	N/A
Office Mezzanine	N/A	N/A
Corridor Mezzanine	N/A	N/A
WC Mezzanine	N/A	N/A
Showroom GF	YES (-37.6%)	NO
WC Mezzanine	N/A	N/A
Office Mezzanine	N/A	N/A
Corridor Mezzanine	N/A	N/A
WC Mezzanine	N/A	N/A

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{typ}	U _{min}	Surface where the minimum value occurs*
Wall	0.23	0.2	GF000001_W6
Floor	0.2	0.15	GF000001_F
Roof	0.15	0.13	GF000001_C
Windows, roof windows, and rooflights	1.5	1.4	GF000001_W5_O0
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U _{typ} = Typical individual element U-values [W/m ² K]			U _{min} = Minimum individual element U-values [W/m ² K]
* There might be one or more surfaces where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m ³ /(h.m ²) at 50 Pa	5	8.88

C. SBEM Outputs (Without ASHP)

SBEM Main Calculation Output Document

Thu Mar 14 11:51:42 2019

v5.4.b.0

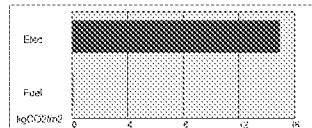
Building name

Oldlands Farm (without renewab

Building type:BB Storage or Distribution

SBEM is an energy calculation tool for the purpose of assessing and demonstrating compliance with Building Regulations (Part L for England and Wales, Section 6 for Scotland, Part F for Northern Ireland, Part L for Republic of Ireland, and Building Bye-laws Jersey Part 11) and to produce Energy Performance Certificates and Building Energy Ratings. Although the data produced by the tool may be of use in the design process, SBEM is not intended as a building design tool.

Building Energy Performance and CO2 emissions

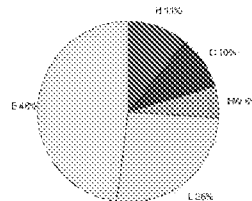


UgG/Gloss2 is reduced by the use of renewable sources

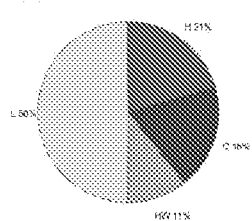
Building area is 7460.43 m2

Annual Energy Consumption

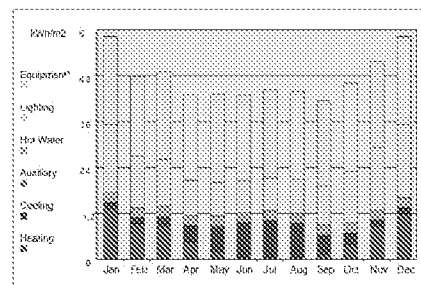
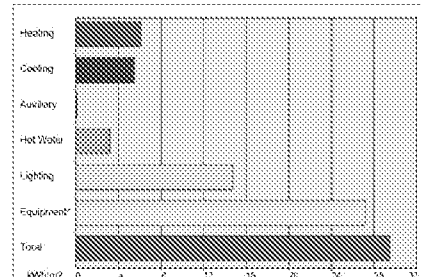
(This chart including Equipment end-use)



(This chart including Equipment end-use)

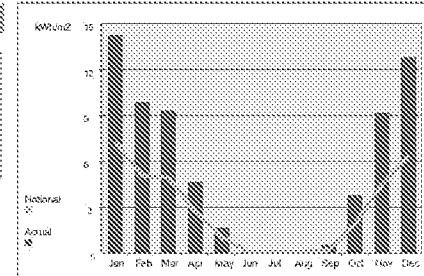
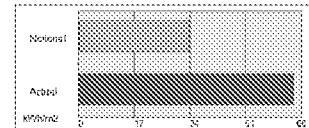


(*) All on-site energy consumption by equipment is shown in the graphs by sub-section. But if none had not been included in the final results of the building or the calculation of the ratings.

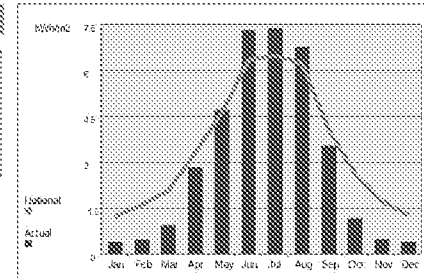
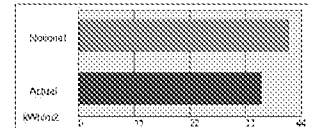


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Annual Heating Demand



Annual Cooling Demand



Page 2 of 2

BRUKL Output Document

Compliance with England Building Regulations Part L 2013



Project name

Oldlands Farm (without renewables) As designed

Date: Thu Mar 14 11:51:42 2019

Administrative information

Building Details

Address: Address 1, Address 2, Bognor, Postcode

Owner Details

Name: Name

Telephone number: Phone

Address: Street Address, City, Postcode

Certification tool

Calculation engine: SBEM

Calculation engine version: v5.4 b.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.10

BRUKL compliance check version: v5.4 b.0

Certifier details

Name: Pata Jeavons

Telephone number: Phone

Address: 62 Grosvenor Gardens, London, SW1W 0AU

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	17.6
Target CO ₂ emission rate (TER), kgCO ₂ /m ² .annum	17.6
Building CO ₂ emission rate (BER), kgCO ₂ /m ² .annum	14.9
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 _g Limit	U _g Calc	U _g Calc	Surface where the maximum value occurs*
Wall**	0.35	0.2	0.2	GF000001_W6
Floor	0.25	0.15	0.15	GF000001_F
Roof	0.25	0.13	0.13	GF000001_G
Windows***, roof windows, and rooflights	2.2	1.5	1.8	GF000001_C_O6
Personnel doors	2.2	-	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	2.5	-	-	"No external high usage entrance doors"
U_g Limit = Limiting area-weighted average U-values [W/m²K] U_g Calc = Calculated area-weighted average U-values [W/m²K] U_g 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 for the test does not apply to curtain walls whose lining standard is similar to that for windows. *** Double windows and similar glazing are excluded from the U-value check. N.B. Double roof ventilators (i.e. smoke vents) not containing panel beams are monitored or checked against the limiting standards by the user.				
Air Permeability	Worst acceptable standard	This building		
m ³ /(h.m ²) at 50 Pa	10	8.08		

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Building services

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

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- ASHP (Copy)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	2.54	-	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system: NO

* Standard values for all types >12 kW output, seasonal absorption and gas engine heat pumps. For types <12 kW output, refer to EN 14825 for building standards.

1- SYST0002-DHW

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

2- SYST0001-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	Hot water provided by HVAC system	-
Standard value	N/A	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
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 supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

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	1.9	1.6	0.5	1.1	0.5	1		
Warehouse Units 2-4	-	-	-	-	-	-	-	-	-	-	N/A
Warehouse Unit 1 Mezzanine	-	-	-	-	-	-	-	-	-	-	N/A
Warehouse Unit 1 GF	-	-	-	-	-	-	-	-	-	-	N/A
Showroom GF	-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine	0.3	-	-	-	-	-	-	-	-	-	N/A
Office Mezzanine	-	-	-	-	-	-	-	-	-	-	N/A
Corridor Mezzanine	-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine	0.3	-	-	-	-	-	-	-	-	-	N/A
Showroom GF	-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine	0.3	-	-	-	-	-	-	-	-	-	N/A

Page 2 of 7

Zone name	ID of system type	SFP [W/(l/s)]									HR efficiency	
		A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
Office Mezzanine		-	-	-	-	-	-	-	-	-	-	N/A
Corridor Mezzanine		-	-	-	-	-	-	-	-	-	-	N/A
WC Mezzanine		0.3	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name		Luminaire	Lamp	Display lamp	
	Standard value	60	80	22	
Warehouse Units 2-4		100	-	-	5064
Warehouse Unit 1 Mezzanine		100	-	-	5058
Warehouse Unit 1 GF		100	-	-	10266
Showroom GF		-	80	22	10132
WC Mezzanine		-	80	-	43
Office Mezzanine		80	-	-	344
Corridor Mezzanine		-	80	-	160
WC Mezzanine		-	80	-	138
Showroom GF		-	80	22	10132
WC Mezzanine		-	80	-	43
Office Mezzanine		80	-	-	344
Corridor Mezzanine		-	80	-	160
WC Mezzanine		-	80	-	138

Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
Warehouse Units 2-4	YES (-38.5%)	NO
Warehouse Unit 1 Mezzanine	YES (-114.3%)	NO
Warehouse Unit 1 GF	YES (-13.8%)	NO
Showroom GF	YES (-34.3%)	NO
WC Mezzanine	N/A	N/A
Office Mezzanine	N/A	N/A
Corridor Mezzanine	N/A	N/A
WC Mezzanine	N/A	N/A
Showroom GF	YES (-37.6%)	NO
WC Mezzanine	N/A	N/A
Office Mezzanine	N/A	N/A
Corridor Mezzanine	N/A	N/A
WC Mezzanine	N/A	N/A

Criterion 4: The performance of the building, as built, should be consistent with the calculated BER

Separate submission

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Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place

Separate submission

EPBD (Recast): Consideration of alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	NO
Is evidence of such assessment available as a separate submission?	NO
Are any such measures included in the proposed design?	NO

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use
	Actual	Notional	
Area [m ²]	7460.4	7460.4	29 KVAZ Retail Protocol and Professional services
External area [m ²]	18095	18095	A 100,000 sqm building with a standard 100,000 sqm footprint
Weather	SOU	SOU	60 Miles and 6000 ft, 1000 ft, 1000 ft
Infiltration [m ³ /h/m ² @ 50 Pa]	8	5	60 Miles and 6000 ft, 1000 ft, 1000 ft
Average conductance [W/K]	1.1527.6	5777.37	60 Miles and 6000 ft, 1000 ft, 1000 ft
Average U-value [W/m ² K]	0.84	0.32	60 Miles and 6000 ft, 1000 ft, 1000 ft
Alpha value* [%]	4.58	25.78	60 Miles and 6000 ft, 1000 ft, 1000 ft

* Percentage of the building's average heat transfer coefficient relative to the notional building.

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	6.05	2.72
Cooling	5.44	4.25
Auxiliary	0.06	0.08
Lighting	14.66	25.28
Hot water	3.17	3.67
Equipment*	27.11	27.11
TOTAL**	29.44	36

* Energy used by equipment does not count towards the total for comparison to existing emissions.
** Total is net primary electrical energy delivered 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

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	363.18	289.49
Primary energy* [kWh/m ²]	86.42	101.16
Total emissions [kg/m ²]	34.9	17.6

* Primary energy is net primary electrical energy delivered by CHP generators, if applicable.

HVAC Systems Performance

System Type	Heat dem MJ/m ²	Cool dem MJ/m ²	Heat con kWh/m ²	Cool con kWh/m ²	Aux con kWh/m ²	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling									
Actual	302.2	102.5	0	0	0	0	0	0	0
Notional	138.2	131.6	0	0	0	0	0	---	---
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	79.8	136.7	21.1	18.9	0.3	0.83	3.8	1	4.08
Notional	83.8	191.1	9.4	14.7	0.3	2.43	3.6	---	---

Legend

Heat dem [MJ/m ²]	= Heating energy demand
Cool dem [MJ/m ²]	= Cooling energy demand
Heat con [kWh/m ²]	= Heating energy consumption
Cool con [kWh/m ²]	= Cooling energy consumption
Aux con [kWh/m ²]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity profile used)
Cool SSEER	= Cooling system seasonal efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

Building fabric

Element	U _{typ}	U _{min}	Surface where the minimum value occurs*
Wall	0.23	0.2	GF000001_W6
Floor	0.2	0.15	GF000001_F
Roof	0.15	0.13	GF000001_C
Windows, roof windows, and rooflights	1.5	1.4	GF000001_W6_O0
Personnel doors	1.5	-	"No external personnel doors"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"

U_{typ} = Typical individual element U-values [W/m²K]

U_{min} = Minimum individual element U-values [W/m²K]

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

Air Permeability	Typical value	This building
m ³ /(h.m ²) at 50 Pa	5	8.58

D. General Notes

The report is based on information available at the time of the writing and discussions with the client during any project meetings. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by Ensphere Group Ltd for inaccuracies in the data supplied by any other party.

The review of planning policy and other requirements does not constitute a detailed review. Its purpose is as a guide to provide the context for the development and to determine the likely requirements of the Local Authority.

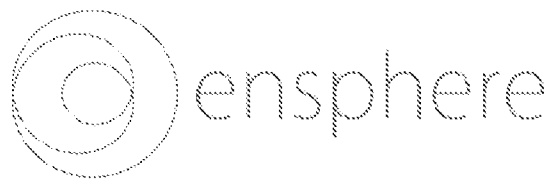
No site visits have been carried out, unless otherwise specified.

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Ensphere Group Ltd
52 Grosvenor Gardens, London, SW1W 0AU

