



Sustainability and Energy Statement

Knowsley Industrial Estate, Knowsley

March 2025



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Knowsley Industrial Estate, Knowsley

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Report Outline

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Executive Summary

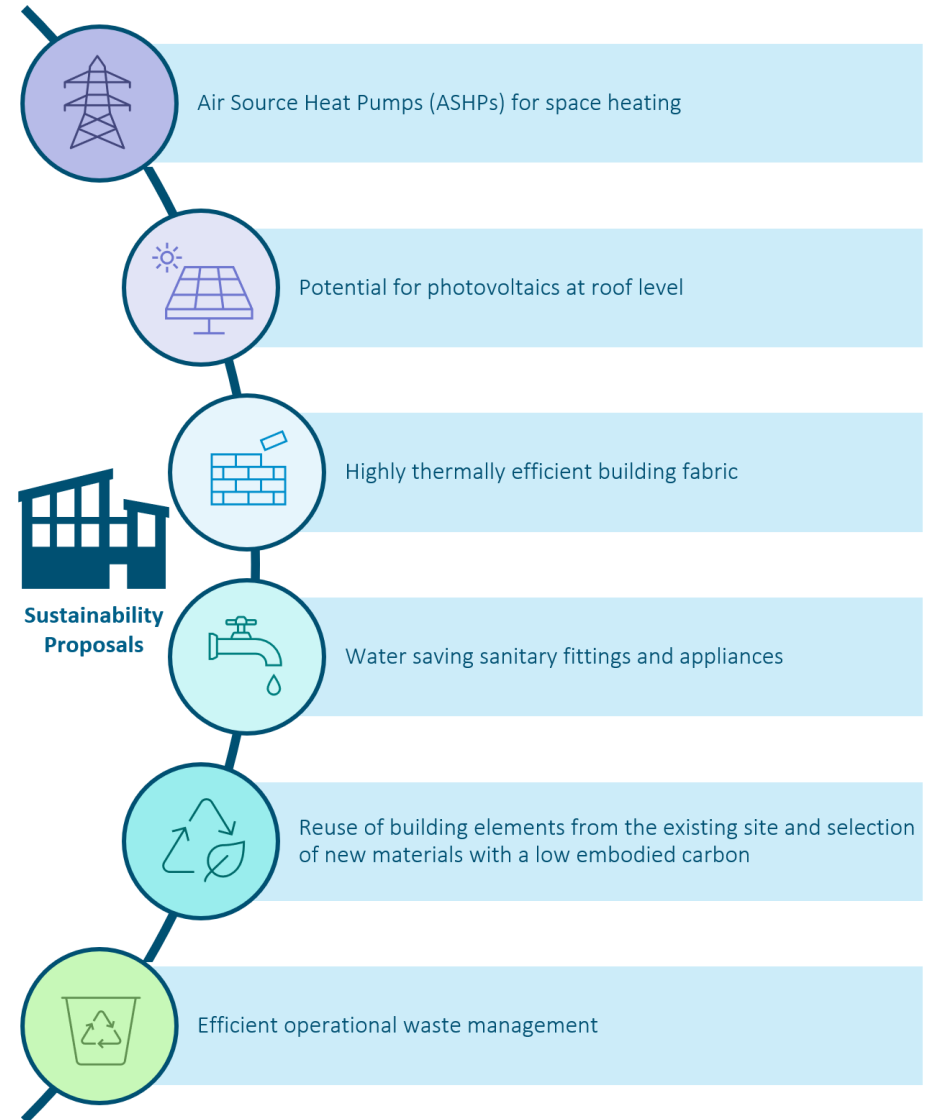
This Sustainability and Energy Statement presents the sustainability credentials for a proposed development at Knowsley Industrial Estate, Acornfield Rd, Liverpool, L33 7UG.

The proposals are for the redevelopment of the above site to provide a dedicated distribution warehouse, including new office spaces.

At a strategic level, the creation of new industrial space will enhance employment for local people, improve the local economy, increase the wealth and lifestyle of employed individuals and contribute to local business rates. The development is therefore considered to be beneficial to the local community and aligned with socio-economic objectives.

A range of sustainable design features are proposed, and construction will be responsibly managed to ensure minimal impact on the environment and local community. The proposed sustainable features include high performance building fabric and energy efficient lighting, services and equipment. An all-electric heating strategy is proposed with an Air Source Heat Pump (ASHP) on space heating in the office areas, and electric instantaneous hot water for water heating. An extent of Photovoltaics (PV) at roof level is also anticipated.

Overall, the proposals for the scheme are in line with the overarching principles of sustainable development as well as the policy requirements of the National Planning Policy Framework, and policies of the Council. When implemented, the scheme will provide an efficient and low carbon development.



1. Introduction

Ensphere Group Ltd was commissioned by Applied Nutrition to produce a Sustainability and Energy Statement for a proposed development at Knowsley Industrial Estate, Acornfield Rd, Liverpool L33 7UG.

Site and Surroundings

The application site (the 'Site') is located in the Knowsley Industrial Estate, in the northeast outskirts of Liverpool and north of Knowsley village, falling under the jurisdiction of the Knowsley Metropolitan Borough Council.

The site currently comprises of warehouses and commercial buildings along with a hardstanding carpark/ access road. Acornfield Road borders the site to the east and Ashcroft Road marks the southern end. The immediate surroundings are predominantly industrial and commercial with a mix of offices, warehouses and shops to the north and west of the proposed development.

In terms of transport, there is a bus stop approximately two-minute walk from the site on Acornfield Road, with other stops at circa 2.5 miles south of the site, serving over 4 routes towards the nearby city centre and Kirby borough residential areas and rail network. Additionally, Headbolt Lane rail station is located 3.2 miles west of the Site, providing direct connections to Liverpool Central and other destinations via the Merseyrail and northern rail networks.

Proposed Development

The proposals are for the redevelopment of the above site to provide a dedicated distribution warehouse, including new office spaces with the main warehouse space equating to circa 7,000 m². Works include dock and ground loading bay provision, along with sufficient turning areas for HGV access.

Report Objective

The objective of the Sustainability and Energy Statement is to outline how sustainability and the principles of sustainable development have been incorporated into the development proposals, as well as outline how energy efficiency, low carbon and renewable technologies have been considered as part of the energy and sustainability strategy.



Figure 1.1 – Map Showing the Location of the Proposed Development

2. Assessment Methodology

Sustainability & Sustainable Development

“Sustainability” is a broad concept generally used to describe the ability to perpetuate a particular state of being. It is widely used in the context of development and where there is potential for changing circumstances to cause an impediment to the perpetuation of a phenomenon.

The term is subjective, and the understanding of the concept is influenced by perceptions and aspirations. “Sustainability” is therefore variably defined but normally encapsulates a wide range of issues, often characterised by their relationship with the economy, society and the environment (the “three pillars” of sustainability).

These issues are not necessarily mutually exclusive and whilst they are often presented as such, technically, the economy is a function of society; and society concerns the interrelationships and behaviours of one species within the wider environment. Nevertheless, the identification and characterisation of these issues enables a better understanding of the things that matter in decision making, which enable a balance to be struck when priorities compete.

The term “sustainable development” is often used interchangeably with “sustainability”, but it is narrower in scope and seeks to promote the perpetuation of human advancement. The “Brundtland Report” (officially titled “Our Common Future” and written by the United Nations World Commission on Environment and Development, Chaired by Gro Harlem Brundtland in 1987), presents perhaps the most widely cited and understood interpretation of this concept:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”

The definition introduces the concept of “needs” and the generational timeframe for evaluating whether an action is sustainable or otherwise.

Analysis Methodology

Given the broad definitions associated with the terminology of “sustainability” and “sustainable development”, understanding how these concepts have been interpreted and incorporated into the local planning regime requires a review of the planning policy as well as the documents upon which the policy is based. The report therefore commences with an overview of the planning policy and other considerations.

An appraisal of the sustainability credentials of the scheme then follows. Structure is important when assessing sustainability due to the breadth of issues being considered; an approach has been created based upon the phases of the development cycle relevant to the planning decision making processes, with consideration given to the “three pillars” (discussed above) and requirements of policy.

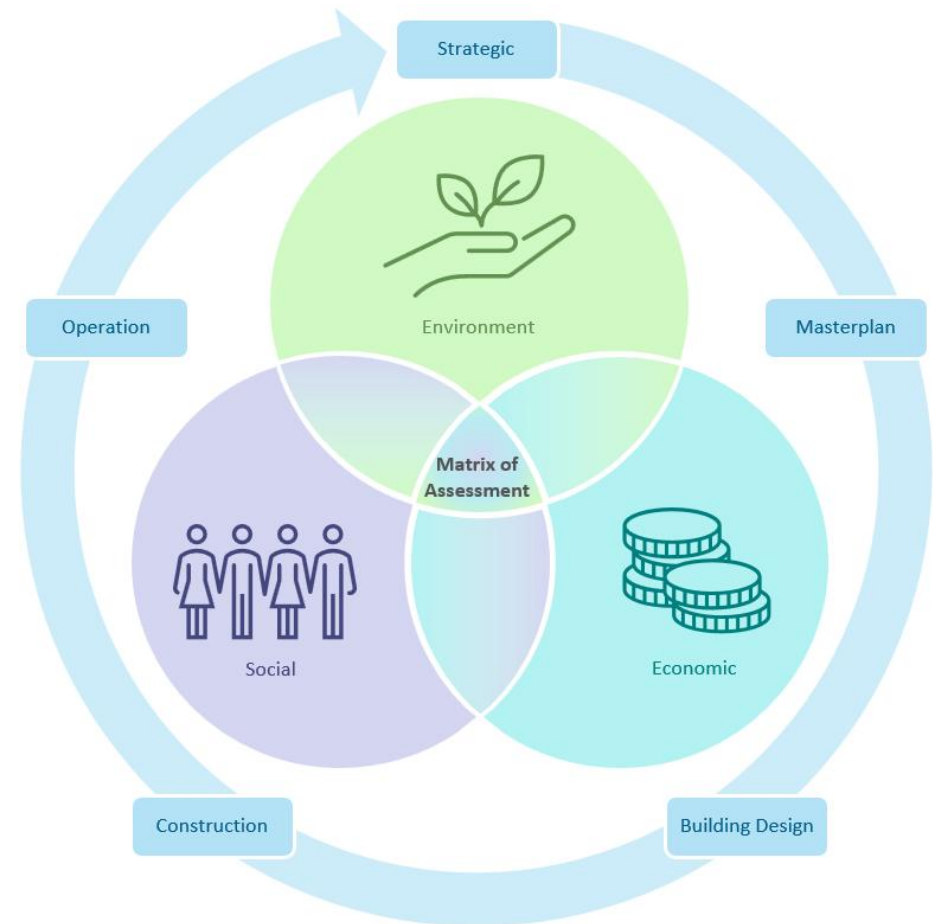


Figure 2.1 – Sustainability Assessment Matrix

It is recognised that the scale and nature of the scheme will affect the relative importance of the matrix dimensions and entries. For example, a single residential unit is unlikely to be viewed as having a major societal impact on the basis of its scale relative to its context. However, the societal implications of an urban extension may be much more significant. The emphasis is therefore case specific, and the assessment sections of this report seek to highlight the relevant factors in a suitably balanced manner.

3. Planning Context

Mitigation of greenhouse gas emissions associated with energy use is referenced throughout planning policy, with consideration given to relevant local policies and guidance, as per summarised in this section.



Figure 3.1 – Tiers of Key Relevant Planning Policy

National Context

National Planning Policy Framework (2024)

The National Planning Policy Framework (NPPF) was updated in December 2024. Paragraphs 7, 8 and 10 of the revised NPPF include reference to the following:

“The purpose of the planning system is to contribute to the achievement of sustainable development [...]. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. At a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being and environmental protection.

Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

- a. An economic objective - to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;*
- b. A social objective - to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering well-designed, beautiful and safe places, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and*
- c. An environmental objective - to protect and enhance our natural, built and historic environment, including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy. [...]*

So that sustainable development is pursued in a positive way, at the heart of the Framework is a presumption in favour of sustainable development”.

Chapter 14 of the NPPF includes consideration of climate change and the use and supply of renewable and low carbon energy. Paragraph 161 states:

“The planning system should support the transition to net zero by 2050 and full account of all climate impacts including overheating, water scarcity, storm and flood risks and coastal change. It should help to shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.”

Planning Practice Guidance (2016; updated 2024)

- Climate Change – Advises how planning can identify suitable mitigation and adaption measures in plan-making and the application process to address the potential for climate change.
- Design - Design affects how people interact with places and can affect a range of economic, social and environmental objectives. The guidance states that planning policies and decisions should seek to ensure that the physical environment supports these objectives.

- Natural Environment - Explains key issues in implementing policy to protect biodiversity, including local requirements.
- Renewable and Low Carbon Energy – The guidance is intended to assist local councils in developing policies for renewable energy in local plans and identifies the planning considerations for a range of renewable sources.

Local Context

Knowsley Local Plan: Core Strategy (2016)

The Core Strategy part of the Local Plan sets the strategic framework for the growth and development of Knowsley up to 2028 and beyond. It sets out how and where new development and regeneration should take place and will therefore promote, guide and manage the future development of the borough. The Plan covers housing, business, social and green infrastructure, transport and communications, environment, quality of the built environment and places and neighbourhoods.

The following policies are considered relevant to this report:

- [Policy CS11 \(Principal Regeneration Area – Knowsley Industrial and Business Parks\)](#) – Knowsley Industrial Park is identified as a ‘Priority Zone’ to promote the production of renewable, low carbon and decentralised energy.
- [Policy CS19 \(Design Quality and Accessibility in New Development\)](#) – To address the challenges of climate change and future changes in social, economic and environmental priorities, new development should integrate sustainable design principles, biodiversity, flood risk mitigation, waste recycling as well as energy and resource efficiency.
- [Policy CS22 \(Sustainable and Low Carbon Development\)](#) – New development will be required to meet high standards of sustainable design and construction and minimise carbon emissions. Government targets for carbon reduction in new development are expected to be implemented through updates to the Building Regulations. Local targets for sustainability in relation to specific development areas or sites may be outlined in the Local Plan: Site Allocations and Development Policies. Knowsley Industrial Park and Knowsley Business Park are identified as a ‘Priority Zone’. Within this area the Council and its partners will facilitate renewable and low carbon infrastructure by (subject to feasibility) requiring new development to make provision for connection to an existing or planned decentralised energy network, and futureproofing.
- [Policy CS23 \(Renewable and Low Carbon Infrastructure\)](#) – The Council will support proposals that will produce and distribute decentralised, low carbon and renewable energy. Proposals must be accompanied by information that shows how the local environment will be protected, and how the site will be restored when energy production ends.

- [Policy SD1 \(Sustainable Development\)](#) – The council will work proactively with applicants jointly to find solutions which mean proposals can be approved wherever possible, and to secure development that improves economic, social and environment conditions in the area.

4. Sustainable Design Proposals

This section presents an overview of the proposed sustainable design features for the scheme.

Materials & Waste

The materials strategy for the development shall consider lifecycle environmental impacts, durability, responsible sourcing and pre-fabrication potential, with a view to optimising materials utilisation and safeguarding natural resources.

- Consideration shall be given to embodied carbon as part of the materials selection process, in addition to other factors such as structural properties, aesthetics and cost. As a minimum, reference shall be made to the BRE's Green Guide to Specification for the major elements (walls, floors, roof) where applicable, with a view to targeting products with a predominantly 'A' or 'A+' rating.
- All timber and timber-based products should be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of forestry Certification (PEFC) source.
- A preference will also be given to products and suppliers which can demonstrate operation within the structure of a formal Environmental Management System (e.g., BS EN ISO 14001, EMAS, BES 6001) on the basis that environmental risks and impacts should be better controlled.
- The energy strategy has been created in consideration of the Energy Hierarchy, as well as the Carbon Compliance Pyramid outlined in Policy CS22 (Sustainable and Low Carbon Development) of the Knowsley Local Plan (2016), by prioritising fabric first, passive design and landscaping measures to minimise energy demand for heating, lighting and cooling.
- Durability will form part of the design with features incorporated to ensure robustness and reduced risk of damage. This is to ensure longevity and reduced need for maintenance.
- Circular economy principles will be applied with consideration given to how the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life.
- The developer will also endeavour to avoid the use of materials with a high VOC (volatile organic compound) content; therefore, ensuring an improved air quality for the completed development.
- The operational waste strategy comprises provision of dedicated space of adequate size and in convenient locations for storage of general refuse, recyclables and food waste. Storage will be considerate of the Building Regulations and Council requirements.

Water and Drainage

The Development would ensure the efficient use of natural resources (including water), including making the most of natural systems both within and around buildings through:

- Water saving fittings and appliances shall be installed to limit water consumption levels.
- The development will incorporate suitable sustainable drainage systems (SuDS) to reduce the volume of water run-off over the building's lifecycle.
- Drainage systems and wastewater discharge shall be designed in line with best practice guidance, eliminate any pollution risks for watercourses underground water.

Transport

The nearest bus stop is approximately a two-minute walk from the site on Acornfield Road, with additional stops located around 2.5 miles south, serving over four routes to the nearby city centre, Kirkby borough residential areas, and the rail network. Additionally, Headbolt Lane Rail Station, 3.2 miles west of the site, provides direct connections to Liverpool Central and other destinations via the Merseyrail and Northern rail networks.

Energy

Energy Modelling

Energy modelling has been undertaken using the simulation software IES 2024.0.1.0. to establish likely emissions associated with the operation of the building and to demonstrate compliance with Part L of the Building Regulations.

To develop the energy strategy, an indicative model has been modelled representing the whole development as shown in figure below.

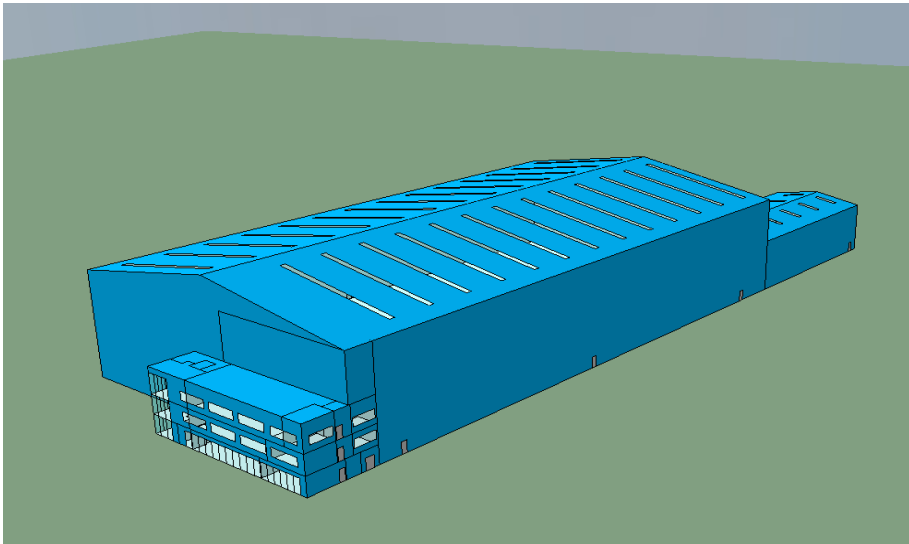


Figure 4.1– IES VE ModelIT 3D Model View of the Proposed Development

Energy Hierarchy

The assessment methodology 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. The tiers of the Energy Hierarchy are shown in the following figure.

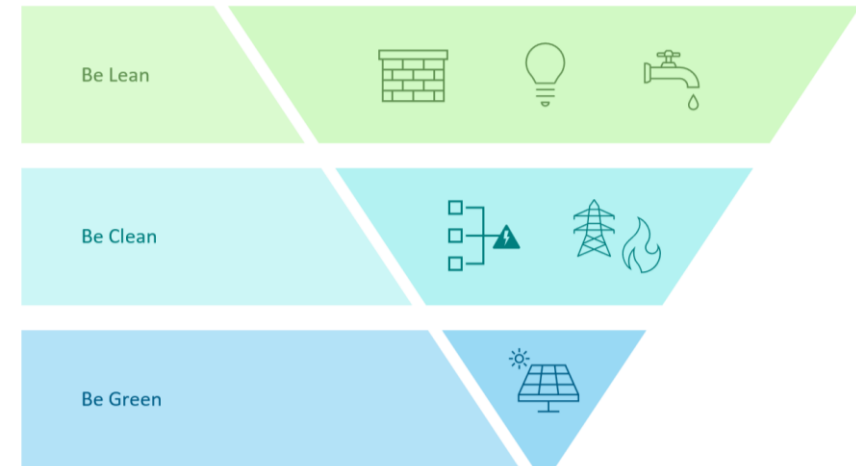


Figure 4.2 – Energy Hierarchy

Where opportunities to improve the efficiency of the design have been maximised to reduce energy demands (Be Lean), consideration is then given to the second principle whereby priority is given to local energy resources, as well as supplying energy efficiently and potentially cleanly (subject to the fuel source) by connecting to district heating networks (Be Clean).

The third principle of the hierarchy promotes the use of producing, storing and using renewable energy on-site (Be Green). Whilst these technologies can be relatively expensive to install, they do offer the potential to significantly reduce carbon emissions.

The following sections of the report review the planning policy requirements prior to establishing a baseline from which the principles of the Energy Hierarchy are applied.

Demand Reduction

As the proposals comprise a redevelopment, the design has explored measures to reduce demand and optimise opportunities for energy savings from the openings and building fabric as follows:

It is intended that the performance of the building fabric will incorporate relatively low U-values to reduce the rate at which the building loses heat, preserving the heat within the space and reducing the requirement for mechanical heating. The U-values for the basic building elements shall be enhanced compared to minimum Building Regulations standards (updated 2021); indicative upper limits are given below for the office accommodation. Other enhanced U-values will be used for the main warehouse space in line with Building Regulations.

Table 4.1 – Part L Limiting U-Values (Improved Level) for Existing Elements in Existing Buildings, Proposed Building Fabric U-Values (Indicative)

Fabric Element	U-Value Part L (W/m ² K)	U-Value Proposed (W/m ² K)
External Wall	0.26	0.2
Roof (Flat/Pitched)	0.18/0.16	0.16
Exposed Floor	0.18	0.16
Rooflights	2.2	1.6
Windows (G-value 0.40)	1.6	1.4
Doors (Pedestrian/Vehicle access)	1.6/1.3	1.3

- A good level of air tightness is proposed at approximately 5m³/h/m² is targeted, meaning that air infiltration between the internal and the external environment will be largely controlled and space heating demand further reduced.
- Thermal bridging is the penetration of the insulation layer by a highly conductive non-insulating material allowing rapid heat transfer from an interior to exterior environment (and vice versa). In well insulated buildings, as much as 30% of heat loss can occur through thermal bridges. The building fabric shall be constructed so that there are no reasonably avoidable thermal bridges in the insulation layers caused by gaps within the various elements. The building fabric shall be constructed so that there are no reasonably avoidable thermal bridges in the insulation layers caused by gaps within the various elements.
- Whilst it is anticipated the units will have the option of natural ventilation, mechanical ventilation (with heat recovery) as well as potentially comfort cooling, will also be incorporated into certain areas (e.g. office spaces) in order to preserve heat during colder months and to maintain suitable thermal comfort levels.
- Good internal air quality will be achieved through the creation of a building envelope with a low air permeability; meaning that the building fabric will reduce the infiltration of pollution from the external environment.
- At this stage, detailed lighting design calculations have not yet been undertaken, but lighting design is intended to be highly efficient and in excess of Building Standards requirements. It is intended that lighting efficacy shall be in excess of 120 lumens/circuit Watt (likely LED).

- The external lighting strategy shall be designed to minimise light spillage and nighttime light pollution in line with the ILP's Guidance notes for the reduction of obtrusive light; low illuminance levels, fittings and controls shall be employed accordingly.
- Time and temperature controls by suitable arrangement will be installed, in order to maximise the efficiency of the heating system.

Low Carbon / Renewable Technology Options Appraisal

The Amendment Regulations and accompanying Approved Documents L: Volumes 1 and 2 have recently been published by the Ministry of Housing, Communities & Local Government. These contain revised carbon conversion factors to address the carbon intensity projections from the National Grid, with consideration given to the rapidly reducing emission rates associated with electricity in the context of the energy strategy. The newly adopted factors (SAP10.2) are presented below in relation to the previous SAP2012 and SAP10 factors, demonstrating the continued trend of electricity decarbonisation.

Table 4.2 – Carbon Factors (kgCO₂e/kWh) SAP2012, SAP10 and SAP10.2

Fuel	SAP2012	SAP10	SAP10.2
Gas	0.216	0.210	0.210
Electricity	0.519	0.233	0.136

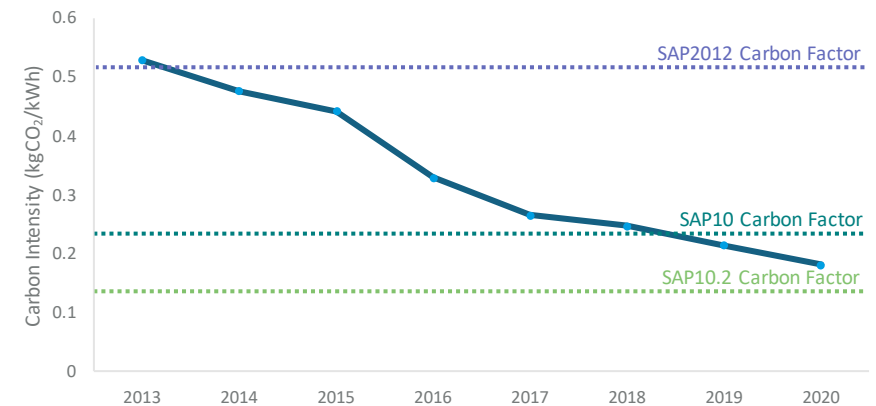


Figure 4.3 – Carbon Intensity of Electricity Generation in Great Britain from 2013 to 2020 (Source: NESO, 2024.¹), Relative to Carbon Factors Used for Building Regulation Compliance

¹ NESO, 2024, *The Road to Zero Carbon* (<https://www.neso.energy/about/our-progress-towards-net-zero/road-zero-carbon-report>)

Renewable and low carbon technology options have therefore been considered in the context of the decarbonisation of the Grid as follows:

- **Combined Heat & Power (CHP)** – Whilst the development would have heat demand, which could be satisfied using CHP, this technology has historically been considered “low carbon” on the basis of the offsetting of Grid electricity and associated carbon. With a significantly reduced quantum of offset carbon anticipated going forward (due to the grid decarbonisation), the technology will likely prove more carbon intensive than a conventional gas-fired boiler on the basis that (a) carbon savings will be negligible or non-existent; and (b) the overall efficiency of CHP is generally lower than conventional boilers. The technology is therefore not proposed.
- **Air Source Heat Pump (ASHP)** – This technology is considered technically feasible and a good option for this scale of development. ASHPs are therefore proposed on space heating in the office spaces, to limit carbon emissions associated with the development in operation.
- **Biomass** – This technology is rejected on the basis that the use of biomass would require regular deliveries and combustion of the material would likely impact local air quality; furthermore, carbon associated with the processing and transport of material is ignored within the carbon calculation, meaning that actual emissions are much higher.
- **Ground Source Heat Pump (GSHP)** – The technology is presently rejected on the basis that there are uncertainties concerning the thermal properties of the ground and testing and installation costs are likely to be more expensive than the ASHP alternative.
- **Photovoltaics (PV)** – An extent of roof area is available, which could be used for solar collectors. An array of PV will therefore likely be installed; however, this will need to be considered in the context of other demands on the roof area (e.g. plant equipment, roof lights etc). This is considered above and beyond policy requirements and will be confirmed by a PV specialist as the design progresses.
- **Solar Thermal** – whilst technically feasible in a limited capacity, the technology is not preferred on the basis that distributing the gained heat on a development of this scale and nature is costly and inefficient. Furthermore, the technology is normally applied to hot water, for which the demand is anticipated to be low.
- **Wind Turbines** – this technology is rejected on the basis of the built up surroundings, and likely turbulence and sub-optimal wind speeds.

District Energy Networks (DEN)

The term “district energy” applies to the energy distribution network, rather than the origins of the energy and the extent of any carbon savings will be largely determined by the energy source and heat losses on the network. In the absence of an existing DEN in close proximity to the Site and that the source of the heat is likely higher carbon than alternatives, it is not proposed to accommodate DEN as part of the energy strategy.

Overheating Mitigation

The issue of overheating will likely need detailed and considered assessment at a later stage of design on the basis that, as buildings become progressively better sealed and insulated, the potential for overheating increases. The following is, nevertheless, relevant and should be considered in conjunction and interrelationship with the ventilation strategy, to ensure thermal comfort for occupants and energy savings:

- Solar control glazing shall be considered for the rooflights and the elevations most affected; the precise specification of glazing types for windows is to be based upon further analysis at later stages so that the appropriate balance is found between limiting summer heat gains without compromising daylight harvesting and winter solar gains.
- Thermal mass and internal occupant-controlled shading elements will be considered at the more detailed design stage along with heat reflective finishes of the external building surfaces.

Heat losses from the Hot Water and Low Temperature Hot Water (LTHW) distribution network are considered to be a significant source of potential overheating in well insulated buildings. This issue can be a significant factor affecting comfort and will therefore need full consideration during the detailed design of the mechanical systems. Attention will be given to:

- The positioning of the distribution network and its potential impact on surrounding spaces.
- The implementation of combined passive/active ventilation systems for air exhaust of spaces into corridors and to the outside.
- Maximising the natural ventilation potential of spaces.
- The performance of the insulation, with calculations undertaken assessing heat losses from the pipework relative to the heat losses from the spaces.

5. Sustainable Construction Proposals.

It is recognised that the construction industry has the potential to cause significant environmental impacts through resource use, waste generation and pollution. It is therefore proposed to manage the construction phase in a sustainable manner to ensure that these impacts are reduced.

Local Employment & Sourcing

- Products and materials will be sourced locally, where possible. Priority will also be given to the local population in terms of the jobs created during construction.

Responsible Construction Practices

- The scheme will be registered with the Considerate Constructors Scheme to ensure that the contractor carries out the construction operations in a safe and considerate manner, with due regard to residents, road users, the workforce and the environment.
- It is expected that the principal contractor for the project shall also operate a third party certified Environmental Management System (EMS), demonstrating sound management and systematic control of environmental impacts.

Materials Optimisation and Waste

- The Site Waste Management Plan (SWMP) will detail the design measures towards optimum use of materials, set specific targets for construction and demolition waste generation and appropriate mechanisms/protocols for segregating waste on-site and monitoring overall waste management.

Pollution Prevention

- The Environment Agency's (EA) Pollution Prevention Guidelines (PPG) shall be followed; works will also be in line with the Environment Agency's 'Building a Better Environment' (2013), a guide for developers.
- Best practice methods for minimising the formation of dust and emissions from construction activities shall be implemented, as appropriate to the specific site and proposed activities. The contractor shall comply with the BRE Code of Practice to control dust from construction and demolition activities.
- Appropriate measures shall be implemented to minimise risks of watercourse and underground water pollution, in line with EA's PPG 5 Works in, near or liable to affect watercourses. Specific measures should be outlined in the contractor's CEMP

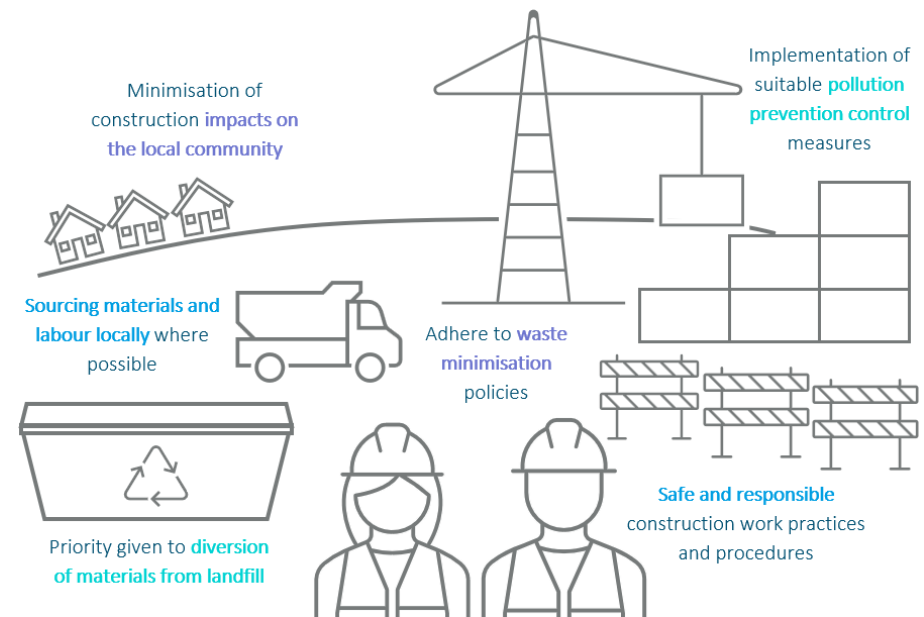


Figure 5.1 – Illustration of Sustainable Construction Practices

6. Summary

This Sustainability and Energy Statement provides an overview as to how the proposed scheme contributes to sustainable development in the context of the strategic, design and construction considerations.

Sustainability is a broad concept and covers a range of environmental, social and economic considerations. A review of the policies outlined within the Knowsley Local Plan (2016) has identified a number of requirements relating to sustainable development. Of these, [Policy CS19 \(Design Quality and Accessibility in New Development\)](#), [Policy CS22 \(Sustainable and Low Carbon Development\)](#) and [Policy CS23 \(Renewable and Low Carbon Infrastructure\)](#) are considered most pertinent to this report.

The proposals are for the redevelopment of the site to provide a dedicated distribution warehouse, including new office spaces.

A range of sustainable design and construction features are proposed including:

- Highly thermally efficient building fabric for new elements.
- ASHPs for space heating.
- Electric Instantaneous system on hot water.
- Potential for roof mounted PV.
- Highly efficient lighting.
- Water saving sanitary fittings and appliances to deliver a water efficient development.
- The use of materials with a low lifecycle environmental impact and embodied energy.
- Consideration of the principles of Secured by Design.
- Efficient construction and operational waste management.

Overall, the proposals for the scheme are in line with the overarching principles of sustainable development as well as the policy requirements of the planning authority. When implemented, the scheme will provide an efficient and low carbon development.

Appendices

A. Proposed Floor Plans

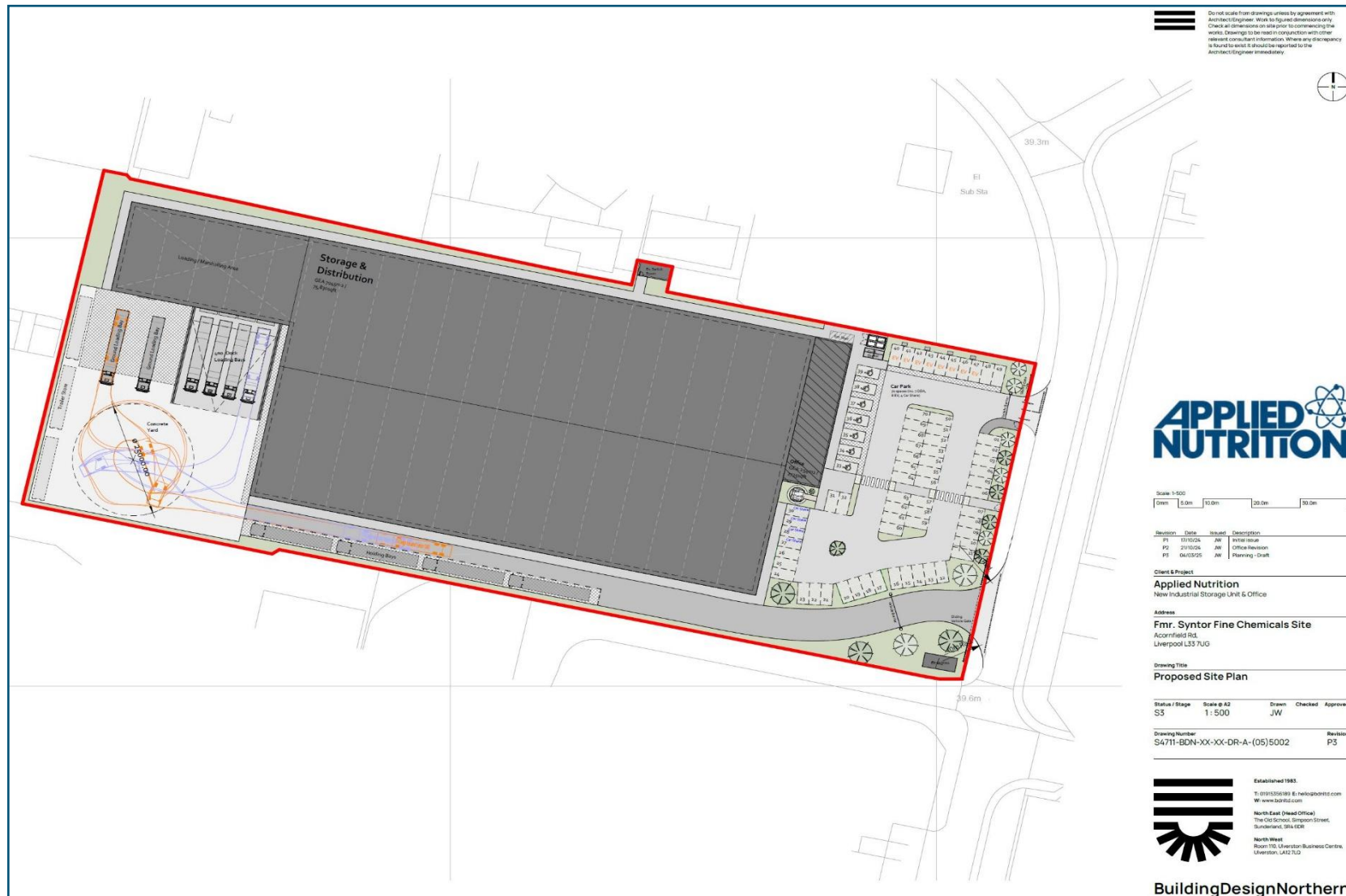


Figure A.1. – Proposed Site Plan (Provided by Building Design Northern)



B. Indicative Energy Model Outputs (Proposed)

BRUKL Output Document HM Government Compliance with England Building Regulations Part L 2021

Project name

Knowsley Industrial Estate_Proposed As designed

Date: Thu Mar 13 15:12:57 2025

Administrative information

Building Details

Address: Acornfield Road, Knowsley Industrial Estate,
Liverpool, L33 7UG

Certifier details

Name: Pete Jeavons
Telephone number: +44 (0) 20 7846 9040
Address: 55a Catherine Place, London, SWY1E 6DY

Certification tool

Calculation engine: SBEM
Calculation engine version: v6.1.e.2
Interface to calculation engine: Virtual Environment
Interface to calculation engine version: v7.0.27
BRUKL compliance module version: v6.1.e.1Foundation area [m²]: 332.35

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	1.46
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	1.44
Target primary energy rate (TPER), kWh _e /m ² annum	15.57
Building primary energy rate (BPER), kWh _e /m ² annum	15.43
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 _{s-Limit}	U _{s-Calc}	U _{i-Calc}	First surface with maximum value
Walls*	0.26	0.2	0.2	G_000005_W2_A0
Floors	0.18	0.16	0.16	G_000005_F
Pitched roofs	0.16	-	-	No heat loss pitched roofs
Flat roofs	0.18	0.16	0.16	01000007_C_A0
Windows** and roof windows	1.6	1.4	1.4	GC000001_W1_O0
Rooflights***	2.2	-	-	No external rooflights
Personnel doors ^Δ	1.6	1.3	1.3	0100000D_W2_O0
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

U_{s-Limit} = Limiting area-weighted average U-values [W/(m²K)]U_{s-Calc} = Calculated area-weighted average U-values [W/(m²K)]U_{i-Calc} = Calculated maximum individual element 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.

^Δ 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	5

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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	>0.95

1- ASHP (Space)

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3.5	5	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system	YES				

* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

1- SYST0002-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		Zone	Standard
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1			
G_Shower/Change	0.3	-	-	-	-	-	-	-	-	-	-	N/A
G_Shower	0.3	-	-	-	-	-	-	-	-	-	-	N/A
02_Kitchenette	0.3	-	-	-	-	-	-	-	-	-	-	N/A
01_Kitchenette	0.3	-	-	-	-	-	-	-	-	-	-	N/A
01_W/C	0.3	-	-	-	-	-	-	-	-	-	-	N/A
G_W/C	0.3	-	-	-	-	-	-	-	-	-	-	N/A
02_W/C	0.3	-	-	-	-	-	-	-	-	-	-	N/A

General lighting and display lighting

Zone name	General luminaire	Display light source	
	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m ²]
Standard value	95	80	0.3
G_Shower/Change	110	-	-
G_Shower	110	-	-
G_Locker	110	-	-

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General lighting and display lighting		General luminaire		Display light source	
Zone name	Standard value	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]	
G_Circulation Area	110	-	-	-	
G_Reception	110	100	1.35		
01_Boardroom	110	-	-	-	
01_Circulation Area	110	-	-	-	
02_Meeting Room	110	-	-	-	
02_Kitchenette	110	-	-	-	
02_Circulation Area	110	-	-	-	
02_Executive Office	110	-	-	-	
01_Kitchenette	110	-	-	-	
01_Executive Office	110	-	-	-	
01_W/C	110	-	-	-	
01_Office	110	-	-	-	
01_Circulation Area	110	-	-	-	
02_Meeting Room	110	-	-	-	
G_Gym	110	-	-	-	
G_Office	110	-	-	-	
G_Circulation Area	110	-	-	-	
G_W/C	110	-	-	-	
G_Circulation Area	110	-	-	-	
01_Breakout Space	110	-	-	-	
02_Executive Office	110	-	-	-	
02_Executive Office	110	-	-	-	
02_Open Plan Office	110	-	-	-	
02_Circulation Area	110	-	-	-	
02_Breakout Space	110	-	-	-	
02_W/C	110	-	-	-	
01_Meeting Room	110	-	-	-	
G_Storage	180	-	-	-	
G_Storage	180	-	-	-	
G_Plant	110	-	-	-	
G_Storage	180	-	-	-	
G_Plant	110	-	-	-	
03_Storage	180	-	-	-	

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?
G_Shower/Change	N/A	N/A
G_Shower	N/A	N/A
G_Locker	N/A	N/A
G_Circulation Area	N/A	N/A
G_Reception	NO (-29.1%)	NO
01_Boardroom	NO (-84.3%)	NO
01_Circulation Area	N/A	N/A

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Zone	Solar gain limit exceeded? (%)	Internal blinds used?
02_Meeting Room	N/A	N/A
02_Kitchenette	N/A	N/A
02_Circulation Area	N/A	N/A
02_Executive Office	N/A	N/A
01_Kitchenette	N/A	N/A
01_Executive Office	NO (-70.4%)	NO
01_W/C	N/A	N/A
01_Office	NO (-66.8%)	NO
01_Circulation Area	N/A	N/A
02_Meeting Room	N/A	N/A
G_Gym	NO (-65.6%)	NO
G_Office	NO (-30.7%)	NO
G_Circulation Area	NO (-69.6%)	NO
G_W/C	N/A	N/A
G_Circulation Area	N/A	N/A
01_Breakout Space	NO (-40.7%)	NO
02_Executive Office	NO (-70.4%)	NO
02_Executive Office	NO (-74.4%)	NO
02_Open Plan Office	NO (-68.1%)	NO
02_Circulation Area	N/A	N/A
02_Breakout Space	NO (-37.2%)	NO
02_W/C	N/A	N/A
01_Meeting Room	N/A	N/A
G_Storage	YES (+28.5%)	NO
G_Storage	NO (-19.2%)	NO
G_Storage	N/A	N/A
03_Storage	N/A	N/A

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

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Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters		Building Use	
	Actual	Notional	% Area Building Type
Floor area [m ²]	8041.3	8041.3	Retail/financial and Professional Services
External area [m ²]	24046.4	24046.4	Restaurants and Cafes/Drinking Establishments/Takeaways
Weather	MAN	MAN	3 Offices and Workshop Businesses
Infiltration [m ³ /hm ² @ 50Pa]	5	5	General Industrial and Special Industrial Groups
Average conductance [W/K]	5826.88	7771.71	97 Storage or Distribution
Average U-value [W/m ² K]	0.24	0.32	Hotels
Alpha value* [%]	7.9	14.91	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

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	1.53	1.82
Cooling	0.31	0.89
Auxiliary	0.01	0.01
Lighting	3.53	4.97
Hot water	5.01	5.01
Equipment*	32.78	32.78
TOTAL **	10.39	12.69

* 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	2.21
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	0	2.21

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	239.23	340.68
Primary energy [kWh _{PE} /m ²]	15.43	15.57
Total emissions [kg/m ²]	1.44	1.46

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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 SSEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] ASHP, [KWT] Electricity, [CWT] Electricity										
	Actual	152	33.7	12.3	2.5	0.1	3.43	3.74	3.5	5
	Notional	139.2	69.6	14.6	7.2	0.1	2.64	2.7	----	----
[ST] No Heating or Cooling										
	Actual	184.2	62.6	0	0	0	0	0	0	0
	Notional	279.3	80.1	0	0	0	0	0	----	----

Key to terms

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 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

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