

Sustainability & Energy Statement

Sovereign Industrial Estate, Knowsley

Prepared for Davos Property Developments Ltd
October 2023



envision

Revision	Date
A	19 th October 2023

Author	Signature
Yahia Kheder	
Checked & Authorised	Signature
Simon Rainsford	

London Office 0207 486 0680

Oxford Office 01865 598698

contact@envisioneco.com

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1. INTRODUCTION

1.1 This Sustainability and Energy Statement has been prepared by Envision on behalf of Davos Property Development Ltd. (Hereafter referred as The Applicant) and is submitted in support of a full planning application seeking consent for the reconfiguration and refurbishment of existing industrial buildings (Class E(g), B2 and B8), carpark and access, and erection of retail unit (Class E) with external display area, along with access and servicing arrangements, car parking, landscaping and associated works (Hereafter referred as The Proposed Development). The site is located on Land at Sovereign Industrial Estate, Wilson Road, Huyton.

Scope

1.2 The primary purpose of this statement is to explain how best practice sustainable design and construction measures would be incorporated in the Proposed Development to ensure alignment with local planning policy.

1.3 This statement is structured as follows:

- The remainder of this section provides a description of the site and the Proposed Development proposal;
- Section 2 provides a description of the main sustainability and energy policies relevant to the application;
- Section 3 explains the sustainable design measures integral to the scheme;
- Section 4 includes the Energy Statement, including measures proposed to reduce the Proposed Development's energy demand and carbon emissions;
- Section 5 provides a concluding summary.

Location and existing situation

1.4 The site is located on land at Sovereign Industrial Estate, 1.7km south east of Huyton Centre and 11km east of Liverpool City Centre. The site currently comprises car parking and warehouses with an existing access road from Wilson Road.

1.5 Further industrial warehouses lie to the north of the site with a residential area stretching to the north west. The wider area is a mix of commercial and industrial units to the north and east and residential dwellings to the west and south.

1.6 Immediately south of the site is the A5080 Cronton Road which runs west to east and links to Wilson Road. 320m beyond this the M62 motorway runs east to west.

1.7 To the east of the site, across Wilson Road, there is a hotel and restaurant and the Paramount Business Park.



Figure 1.1 – 3D Google earth snip of the Proposed Development's site location

The Proposed Development

- 1.8 The planning application proposes the reconfiguration and refurbishment of existing industrial buildings (Class E(g), B2 and B8) alongside the construction of a new Home Bargains retail store which will be facilitated by the demolition of an existing single storey ancillary offices on the site. These offices will be relocated in the refurbished warehouses A and B as illustrated in Figure 1.2.
- 1.9 The Home Bargains Store will measure approximately 2,396 m² with garden centre, car parking spaces and service yard. Vehicle access into the new Home Bargains Store will be re-configured from Cronton Road.

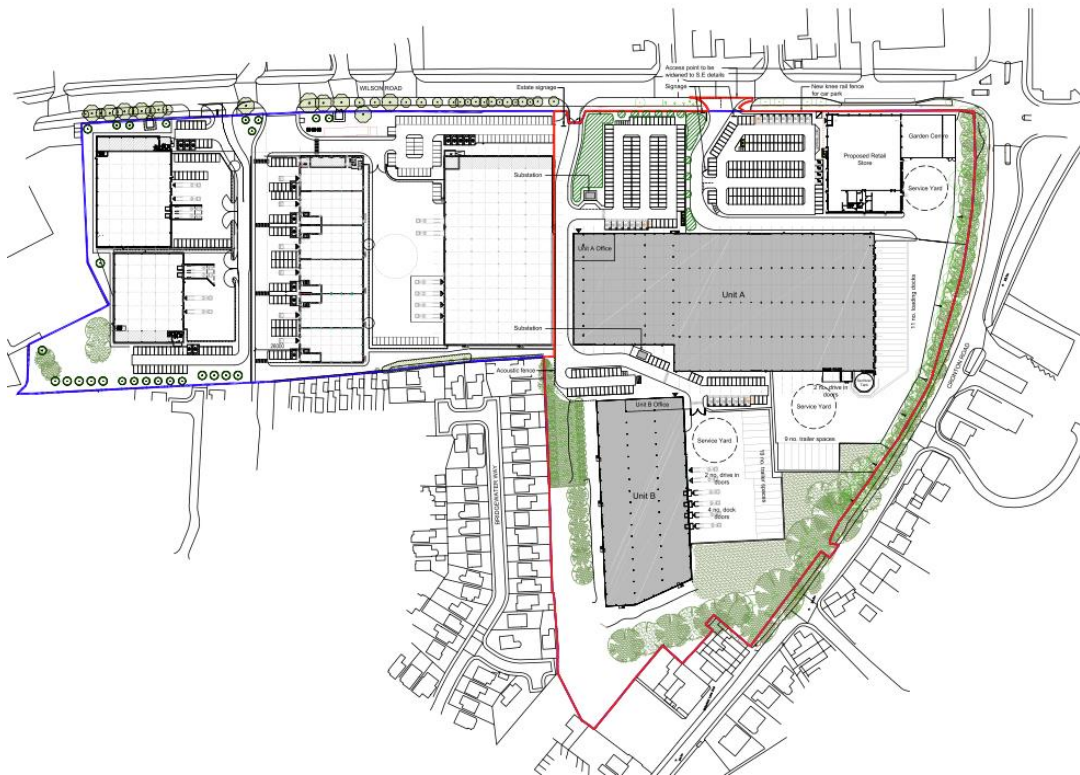


Figure 1.2 - General Site Layout (Drawing courtesy of aew architects)

2. SUSTAINABILITY & ENERGY POLICY CONTEXT

- 2.1 A key mechanism for delivering the principles of sustainable development lies within the UK planning system, which is implemented through national guidance and local planning policies. A review of all the relevant policy, regulatory and energy guidance documents was undertaken to gain an understanding of the guiding requirements for sustainability.

National Planning Policy Framework

- 2.2 The revised National Planning Policy Framework (NPPF) was published on 20th July 2021. This replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018, and updated in February 2019. It sets out the framework for all planning policy in England and how these policies are expected to be applied. 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.
- 2.3 The NPPF sets out a presumption in favour of sustainable development, and the need to support economic growth through the planning system. 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):
- 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;
 - 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
 - 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.
- 2.4 Planning plays a key role in providing resilience to the impacts of climate change and supporting the delivery of renewable and low carbon energy and associated infrastructure. This is central to the economic, social, and environmental dimensions of sustainable development. The NPPF does not include detailed measures on sustainable design codes and standards to apply, although expects that when setting any local requirement for a building's sustainability, local planning authorities should do so in a way consistent with the national technical standards.

- 2.5 The NPPF has recently been subject to a further consultation – the Levelling-up and Regeneration Bill: Reforms to National Planning Policy (published 22nd December 2022). The consultation proposes further policy objectives, including to achieve Better Environmental Outcomes: Planning can make an important contribution to conserving and enhancing the natural environment, and the vitally important task of mitigating and adapting to climate change.

Knowsley Local Plan Core Strategy

- 2.6 The most relevant policies when considering a scheme's sustainability are those outlined within local development documents. The Council are working to the adopted Knowsley Core Strategy (2016).

Policy CS2 – Development Principles

- 2.7 New development in Knowsley and the preparation of subsequent stages of the Local Plan will be expected to support the following development principles:

- *Principle 1 - Promote sustainable economic development, tackle the causes of deprivation and disadvantage and narrow the gap between the richest and poorest neighbourhoods.*
- *Principle 2 - Reduce carbon emissions and adapt to the effects of climate change.*
- *Principle 3 - Reduce the need to travel and increase accessibility.*
- *Principle 4 - Recognise environmental limits, protect and enhance environmental assets, enhance local character and promote quality of place.*

Policy CS22 - Sustainable and Low Carbon Development

- 2.8 New development will be required to meet high standards of sustainable design and construction and minimise carbon emissions. This should be achieved by:

- *Designing new buildings for flexible uses throughout their lifetime;*
- *Avoiding the creation of adverse local climate conditions by using natural systems to avoid internal overheating and excessive heat generation;*
- *Ensuring developments are comfortable and safe for users;*
- *Making the most effective and sustainable use of water, aggregates and other resources;*
- *Limiting energy use by incorporating high standards of insulation, heat retention, natural ventilation and passive solar techniques;*
- *Landscaping (including measures such as green walls or roofs) to create shelter and reduce any heat island effect;*
- *Using sustainable materials from local suppliers where possible;*
- *Supplying energy efficiently and incorporating decentralised energy systems, using renewable and low carbon energy where feasible;*
- *Managing flood risk, including through the use of Sustainable Drainage Systems (SuDS) and flood resilient design for infrastructure and property; and*
- *Promoting sustainable waste practices in new and existing developments.*

Low Carbon Development, Community Energy Fund and Allowable Solutions:

- 2.9 *Government targets for carbon reduction in new development are expected to be implemented through updates to the Building Regulations. Where it is not technically feasible or economically viable to meet the requirements on site, contributions to the Council's Community Energy Fund may be accepted as one of a range of options under the Government's proposed 'Allowable Solutions' mechanism. The Fund will be used to support carbon reduction initiatives in Knowsley and potentially the wider Liverpool City Region.*

Sustainable Construction Targets

- 2.10 *Local targets for sustainability in relation to specific development areas or sites may be outlined in the Local Plan: Site Allocations and Development Policies. The site is not located in one of these areas.*

Priority Zones and Decentralised Energy Networks

- 2.11 *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;*
- *Be designed to enable future connectivity in terms of proposed site layout, infrastructure and heating provision, including consideration of connections at a later date or phase.*

- 2.12 *Subject to opportunity and need, additional 'Priority Zones' may be identified in the Local Plan: Site Allocations and Development Policies. The site is not located in one of these areas.*

Policy CS23 Renewable and Low Carbon Infrastructure

- 2.13 *The Council will support proposals that will produce and distribute decentralised, low carbon and renewable energy, provided that they do not cause significant harm (in terms of their number, scale, siting or cumulative impacts) to:*

- *Natural resources, biodiversity, geodiversity, water and air quality and, landscape character;*
- *Aviation and transport safety;*
- *Historical and cultural assets;*
- *Public amenity and living conditions; or*
- *Openness and amenity of the Green Belt, except in very special circumstances.*

- 2.14 *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. Proposals resulting in an unacceptable impact must be mitigated by appropriate measures agreed by the Council.*

Policy CS24 – Managing Flood Risk

- 2.15 *All development which is within or otherwise affects an area of flood risk or is larger than one hectare in size shall be accompanied by a site-specific Flood Risk Assessment (FRA).*
- 2.16 *New development shall include flood mitigation measures, where necessary, to manage flood risk associated with or caused by the development. These measures shall be derived from the Strategic Flood Risk Assessment (SFRA), relevant FRA(s) or a local strategy for flood risk management.*
- 2.17 *The drainage of new development shall be designed to reduce surface water run-off rates to those associated with a green-field site by treating it at its source.*

Building Regulations

- 2.18 The relevant building regulations are approved document **is *Approved Document L, Volume 2: Buildings other than dwellings*** which gives guidance on how to comply with Part L of Schedule 1 to the Building Regulations and the energy efficiency requirements for buildings other than dwellings. The current regulations were amended in 2021 and are approximately 27% more challenging the previous regulations which were in place the Local Plan was prepared. This sustainability and energy statement makes reference to alignment with the latest regulations throughout.

3 SUSTAINABILITY STATEMENT

3.1 This section provides an account of the sustainability benefits of the Proposed Development, and how relevant policy has been addressed in the development proposals.

- Climate Change Mitigation;
- Climate Adaptation;
- Materials & Waste;
- Ecology; and
- Sustainable Transport.

Climate Change Mitigation

3.2 The Proposed Development involves the reconfiguration and refurbishment of existing industrial buildings on the site and the construction of a new build retail unit to be occupied by Home Bargains. Policy **CS22** requires new development to meet high standards of sustainable design and construction and minimise carbon emissions. The proposed 'new development' involves the construction of the retail store.

3.3 In line with Policy **CS22**, Envision has undertaken an energy assessment for the new Home Bargains unit by considering how it can be designed to achieve compliance with Building Regulations standards as required by policy CS22. To ensure full compliance with Building Regulations, the Proposed Development will incorporate a range of energy efficiency features, including:

- Limiting the heat gains and losses via efficient fabric thermal performance.
- Air tight building envelope.
- Delivering energy efficiently via efficient Air Source Heat Pumps.

3.4 During this planning stage, the new retail unit would result in an overall **23%** reduction in CO₂ emissions & **24%** reductions in primary energy when compared to the Part L Notional building.

3.5 The refurbished industrial buildings are not considered as new development for the purposes of building regulations and would not trigger consequential improvements, however the amendments to the buildings (i.e., the new thermal elements) would be required to meet the minimum efficiency standards of Part L 2021 requirements as established in the energy assessment in this report. The alignment with building regulations standards set out by this report for the refurbished and reconfigured units is in full alignment with Policy CS22.

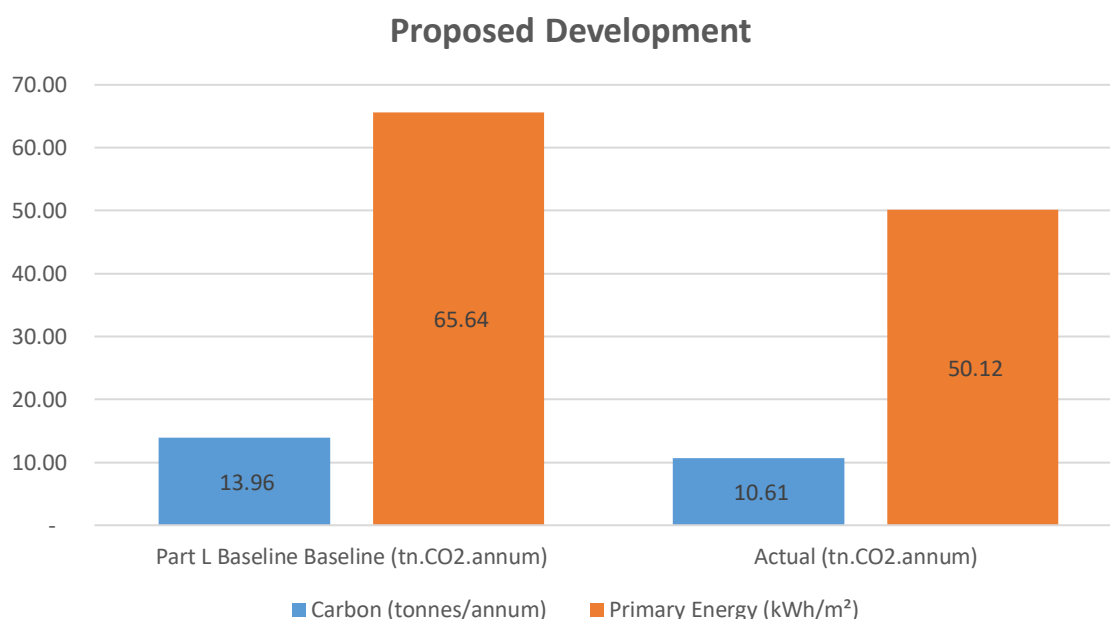


Figure 3.1. Reductions over Part L 2021 for the new build retail unit

Climate Adaptation

- 3.6 According to the UK Climate Impact Programme, the inevitable consequences of climate change will be higher levels of winter rainfall have, often in increasingly heavy rainfall events leading to more flooding and damage to buildings and infrastructure, as well as hotter and dryer summers, leading to heat stress and drought. Annual average UK temperature was 0.9°C higher during the period 2005-2014 compared with 1961-1990. In addition to carbon reduction, there is a need to ensure that the built environment is adaptable and resilient to the projected risks.
- 3.7 Policy CS22 requires new development to avoid the creation of adverse local climate conditions by using natural systems to avoid internal overheating and excessive heat generation. It also requires landscaping to reduce urban heat and the use of Sustainable Drainage Systems (SuDS) and flood resilient design for infrastructure and property.
- 3.8 Whilst the proposal to reuse the buildings as far as possible, which restricts certain measures to be implemented in full, the following is noted regarding the site.

Table 3.1– Climate Change Adaptation Appraisal

Identified Consequence	Likely Impacts	Design Measures
Higher Temperatures	1 Higher day time peaks in temperature	In general, due to the uses proposed, the buildings are not considered to be at high risk from overheating. The new retail store will be designed to maintain comfortable thermal conditions throughout the year through good
	2 Higher night time lows in temperature	
	3 Higher winter temperatures	
	4 Enhanced urban heat island effect	

	5 Reduced air quality (e.g., increase in summer ozone episodes)	thermal insulation and appropriately sized HVAC systems. The existing warehouses are proposed to be retained. New office areas will generally north where the risk of overheating will be limited. The large volume in the warehousing will reduce the impact of high temperatures through stratification.
Drier Summers and Droughts	1 Reduced water availability/shortages 2 Reduced water quality 3 Reduced soil moisture content/increased subsidence 4 Changes in biodiversity 5	Drought can lead to increases in dust alongside degradation in external landscaping. The garden centre will include rainwater harvesting and water conservation measures will be fitted to the buildings subject to refurbishment. New landscaping proposed for the site will be drought tolerant.
Sea Temperature Rise	1 Sea Level Rise 2 Increased Sea Surge height	Not considered relevant. The FRA considers all risks from flooding and concludes this is not a concern for the site.
Increased Precipitation	1 More rainfall in winter 2 Heavier rain/hail/snow in winter and summer (BUT less snow projected) 3 Increased river flooding 4 Increased urban drainage flooding 5 Physical and mental health issues caused by longer term aspects of flooding	A Flood Risk and Drainage Statement has been prepared by Adept Consulting Engineers. The site is located in an area of low flood risk. The proposed development incorporates a drainage strategy to attenuate water with cellar attenuation tanks located underneath the car parks. These are designed based on a 1:100 year event, plus 40% allowance.
Higher Wind Speeds	1 Increased storm damage 2 Outage of emergency, infrastructure and transportation services	The site is not considered to be critical, and no emergency generators are considered necessary, save for the sprinkler system for fire protection. The buildings will be constructed from a robust palette of materials to reduce the impact of storm damage.

Materials & Waste Management

- 3.9 Policy CS22 requires new development to use sustainable materials from local suppliers where possible and promote sustainable waste practices in new and existing developments.
- 3.10 The Proposed Development will be constructed from a steel frame, manufactured offsite and delivered to the site in a kit of parts for final assembly on site. The use of structural steel frames and concrete floors ensures that materials are strong, robust and provide a long life with minimal maintenance, which can be reused or recycled at the end of life. Where possible all materials will be procured from local suppliers and the main contractor will be selected from either within the

region or who has previous experience working within the locality to leverage existing supply chains.

3.11 The applicant will require the contractor to operate an established set of sustainable construction principles, aligned with BREEAM standards:

1. Legal & Sustainable Timber – All timber and timber-based products used during the construction of the project will be legal and sustainable timber, i.e., FSC/PEFC certified.
2. Responsible Procurement – The contractor will be expected to maintain their own responsible procurement plan, ensuring that materials used can demonstrate alignment with standards such as BES 6001 – Responsible Sourcing of Construction Products, and have Environmental Product Declarations (EPDs).
3. Sustainable Waste Management – Principles of the Waste Hierarchy will be reflected during the construction and operational phases. The contractor will be required to achieve high levels of landfill diversion, targeting a minimum 90% of non-demolition waste (by tonnage), which aligns with BREEAM standards. In operation, all waste generated by deliveries and general store operations is collected daily by the delivery truck and returned to the distribution centre for recycling / disposal. Packaging from stock is sorted between plastic and cardboard in the store and loaded in to the delivery cages in the back of house storage area daily ready to be returned to the central distribution centre on the next day's delivery. General waste from the store is treated in the same manner. The operational waste strategy for the industrial units will be occupier driven, however sufficient waste segregation and storage will be made available for their use.
4. Environmental Management in Construction – The contractor is to operate an Environmental Management System demonstrating as a company there are robust environmental management practices in place. This will include measures to record and monitor energy, water, and movement of vehicles during construction with the objective to put in place effective controls. In addition, at all times the contractor is to implement best practice pollution prevention policies and procedures on site in accordance with previous Environment Agency Best practices - Working at construction and demolition sites: PPG6, Pollution Prevention Guidelines.

3.12 In addition to the above, the developed design will ensure protection of exposed elements, therefore minimising the frequency of replacement and maximising materials optimisation. This will include measures to protect the buildings from vehicle movements.

Ecology

- 3.13 An extended Phase 1 habitat survey has been undertaken by Amenity Tree. The habitat on site comprises of scattered trees, semi natural woodland, amenity grassland, scrub, introduced shrub and building including areas of hard standing access. The general walkover did not identify any protected habitats or species on site, however further surveys including bat surveys have been undertaken. The proposed development includes the introduction of new landscaping which will be native and ecologically beneficial.
- 3.14 A Biodiversity Net Gain assessment has been undertaken. Based on the existing site conditions, biodiversity net gain is expected to be achieved with a 102% positive change in habitat units across the site.

Sustainable Transport

- 3.15 The planning application is submitted with a Transport Assessment and Travel Plan undertaken by Rappor. The principal objective of the Travel Plan is to promote and provide alternative sustainable modes of transport and to ensure staff are fully aware of the sustainable travel options available to them.
- 3.16 The Travel Strategy has demonstrated the following:
- A review of the local highway network and accident data indicates that there are no inherent / apparent local highway safety issues;
 - The application site is sustainably located and accessible to a range of services and amenities in addition to public transport linkages;
 - Access to the application site will be retained via amended access arrangement to be located in approximately the same location as existing;
 - The existing internal site layout / operation shall be reconfigured and has been demonstrated to operate efficiently, as demonstrated by swept path analysis of vehicles and is therefore concluded to be appropriate to serve the application site;
 - Parking provision for cars, including accessible spaces, motorcycle spaces and EV Charging are in accordance with KC ECT SPD.
 - Cycle Parking provision is in accordance with KC ECT SPD.
 - Forecast trip attraction and net trip impact indicates a minor increase during the weekday network peak periods, and the Saturday peak period, when existing flows on the local highway network are lower.

4 ENERGY STATEMENT

- 4.1 This section demonstrates how the Proposed Development demonstrates compliance with the requirements of Building Regulations Part L and Policy **CS22 & CS23 of Knowsley Local Plan Core Strategy (2016)**.
- 4.2 The Proposed Development involves a combination of new building and refurbishment work. The refurbishment and reconfiguration of the industrial units and the reprovision of office areas within that space are required to meet the minimum thermal and efficiency requirements of Section 6, Volume 2 of the Building Regulations 2021, although it has been confirmed by building control officers that no further 'consequential improvements' are required. The new construction must be built to a minimum standard of total energy performance.
- 4.3 The energy strategy for the Proposed Development has been set out to meet Building Regulations Part L 2021 requirements and improve on them where possible. The strategy adopts a best practice energy compliance hierarchy, thereby taking a future proofed approach to achieving carbon emission reductions. Following a fabric first approach, with an addition of low and zero carbon technologies, as set out within this assessment.

Approach

- 4.4 The following definitions should be understood throughout this strategy:
- Energy demand – the 'room-side' amount of energy which must be input to a space to achieve comfortable conditions. In the context of space heating, this is the amount of heat which is emitted by a radiator, or other heat delivery mechanism.
 - Energy consumption – the 'system-side' requirement for energy (fuel). In the context of a space heating system using a gas boiler, this is the amount of energy combusted (e.g., gas) to generate useful heat (i.e. the energy demand).
 - Regulated CO₂ emissions – the CO₂ emissions emitted as a result of the combustion of fuel, or 'consumption' of electricity from the grid, associated with regulated sources (those controlled by Part L of the Building Regulations).
 - Major Renovation - Defined in Regulation 35 as the renovation of a building where more than 25% of the surface area of the building envelope undergoes renovation.
 - Thermal Elements – defined in regulation 2(3) and 2(4) as any wall, floor, or roof which separates a thermally conditions part of the building from the external environment.
 - Consequential improvements¹ - Those energy efficiency improvements required by Regulation 28.
- 4.5 The best practice energy compliance hierarchy takes a step-by-step approach to energy requirements compliance, and carbon emission reductions.

¹ Consequential improvements don't apply to this planning application.

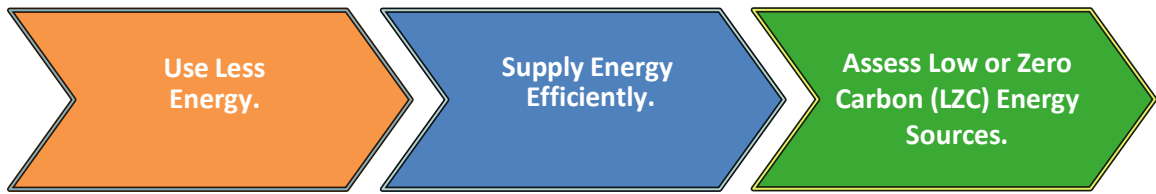


Figure 4.1 - The energy compliance hierarchy

4.6 The strategic approach to the design of the Proposed Development is:

- To control and reduce demand for energy through passive design measures.
- Further reductions are ensured through the specification of efficient building services to limit energy consumption, losses in energy supply, storage, and distribution.
- After the inclusion of passive design and energy efficiency measures, options have been investigated to reduce CO₂ emissions associated with local available decentralized energy supply in line with the local policy aspirations.
- Finally, the feasibility of LZC technologies has been investigated in line with the local policy aspirations.

Methodology

4.7 An approved Dynamic Building Simulation Modelling (DSM) package is used to demonstrate compliance with Part L 2021 Building Regulations for the newly constructed retail unit. The energy model provides the thermal performance of the proposed works to comply with the specified requirements in Building Regulations. The DSM was produced using DesignBuilder software version 7.2.0.032. DesignBuilder is a Department of Communities and Local Governments (DCLG) approved software and methodology for undertaking non-domestic energy calculations.

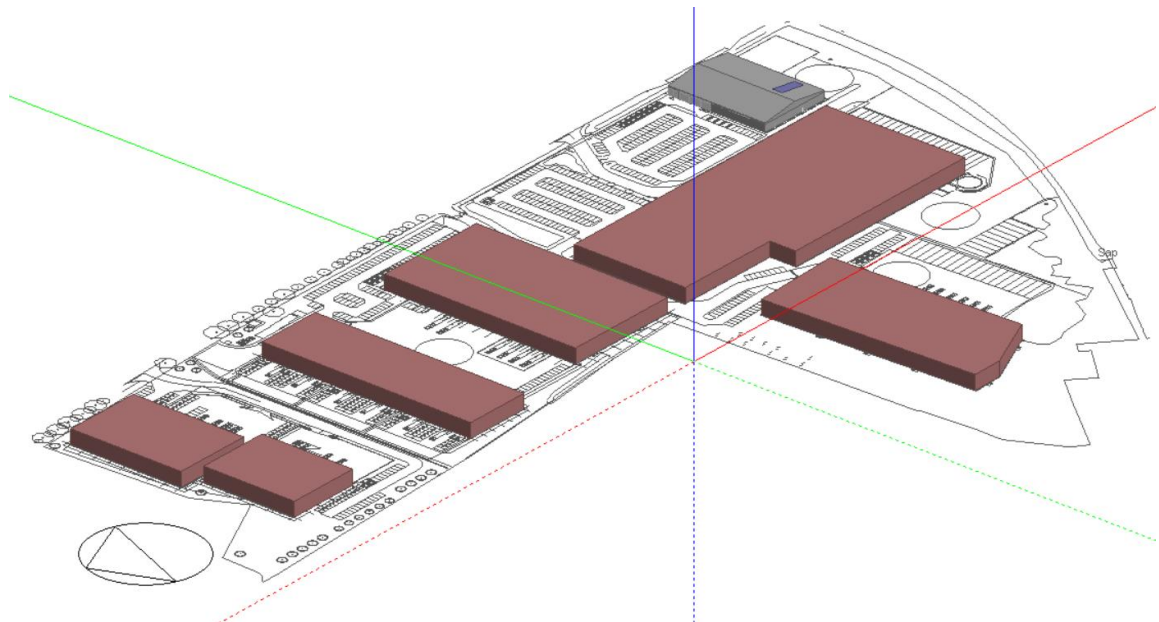


Figure 4.2 - Proposed Development and the surroundings model in Design Builder.

4.8 The following sections detail the passive design and energy efficiency measures that have been considered, and those that will be implemented for the new construction.

Step 1 - Establishing the Target Emission Rate

- 4.1 The National Calculation Methodology (NCM) provides the underlying method and the standard data sets necessary to calculate the annual energy use of a proposed building and compare it with the energy use of a 'notional' building of a similar type, under similar weather and environment circumstances. This is done by calculating the Target Emission Rate (TER) and comparing this with the Building Emission Rate (BER) for the proposed building. To comply with Part L 2021 criteria for new buildings, the BER must not be higher than the TER.
- 4.2 The total emissions savings calculated in this report are expressed against a Building Regulation 2021 TER. The calculated carbon emissions for the TER is illustrated below in Table 4.1. The calculated figures demonstrate a Building Regulations 2021 Part L fuel carbon factors.

Table 4.1 – Target CO₂ emissions for the Proposed Development

Unit	Total Modelled Floor Area (m ²)	SAP 10 TER	Total Target CO ₂ (tn.CO ₂ .yr)	Target Regulated Energy (kWh.yr)
HB Knowsley	2307.2	6.05	13.96	102,578.11
Total =			13.96	102,578.11

- 4.3 The figure of **13.96.tn.CO₂.yr** is the target that must be reached and improved upon in order to comply with the Building Regulations. This will be achieved through the implementation of fabric efficiency, energy-reduction and carbon-saving measures as outlined in the next sections.

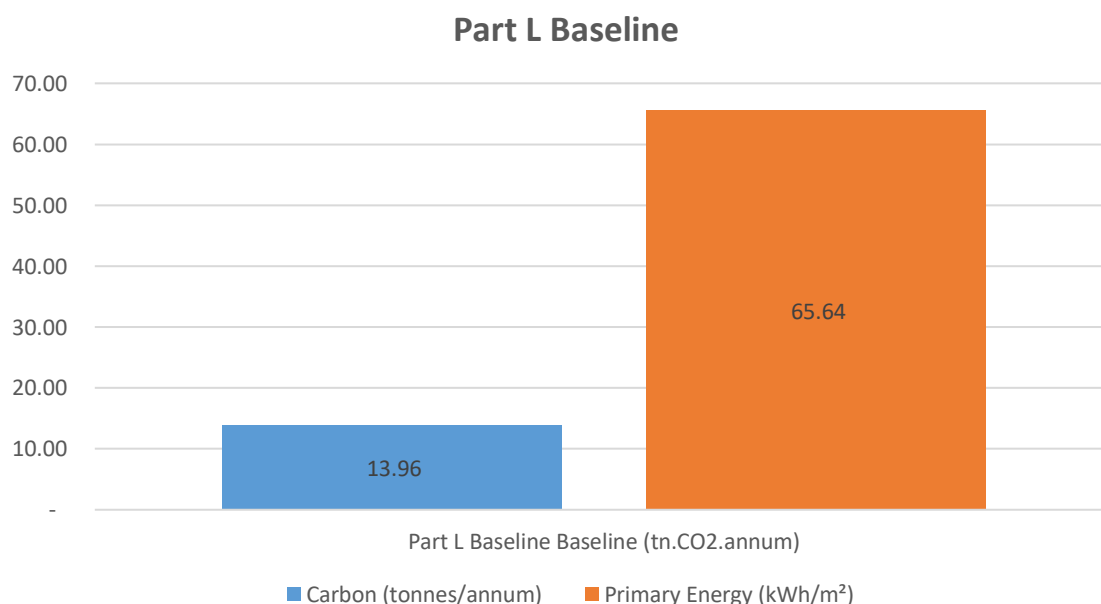
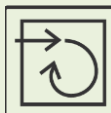
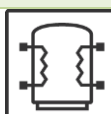


Fig 4.3 – Baseline target CO₂ emissions

Step 2 - Complying with Part L and Policy CS22

- 4.9 Following Part L 2021 instructions of limiting heat gains and losses, design priority was given to fabric performance and passive measures first. This energy strategy aims to reduce the energy demand initially by optimising the envelope and building services within the Proposed Development.
- 4.10 Passive Design measures are those which reduce the demand for energy within buildings, without consuming energy in the process. These are the most effective measures for reducing CO₂ emissions, such as wall insulation, is unlikely to deteriorate significantly with time, or be subject to change by future incoming occupier. In this sense, it is possible to have confidence that the benefits of these measures will continue at a similar level for the duration of their installation.

Table 4.2 – Targeted passive design measures

Description of the measure	
	Fabric performance A 'fabric first' approach has been taken in order to reduce the energy demand and CO₂ emissions from the Proposed Development. For the retail store, this means a well-insulated thermal envelope and a focus on making the buildings airtight as possible.
	Thermal insulation Reducing the thermal transmittance of the building envelope where appropriate will help to reduce both heating and cooling requirements and result in lower energy requirements.
	Glazing energy & light transmittance The retail unit will have glazing elements with good thermal performance.
	The above measures will be applied to the reconfigured industrial units as appropriate.
	Space heating (and cooling) The main heating and cooling to the new build retail unit will be supplied by a split system, which supplies heating through the intake ventilation air. In addition to electric units for BOH zones i.e., toilets, cash and staff rooms. The existing warehouses will remain unheated, however new office areas proposed will be serviced in a similar way through heat pumps and electric heating panels in core areas.
	Mechanical ventilation Mechanical ventilation with heat recovery is an important addition to the building services to maintain good indoor air quality by providing fresh air to the occupied areas. Coupled with a heat exchanger, the warmth in extracted air can be recovered and delivered to the supply air. Thus, mechanical ventilation with heat recovery reduces space heating demand.
	Domestic hot water (DHW) DHW consumption across the Proposed Development will be provided via electric heater.

	Lighting
The Proposed Development i.e., new retail unit and the relocated offices will be provided with low-energy, efficient LED light fittings. As well as reduced energy requirement that will be achieved by implementing these strategies, the contribution to the cooling requirements and internal heat gains will be reduced. This will further reduce the total energy consumption and CO₂ emissions.	

4.11 The following tables summarises the passive design and energy efficiency measures that are implemented in the design of the new construction.

Table 4.3 - Proposed specifications for new thermal elements in the new store and existing warehouses A&B²

Building element	Part L 2021 U-value ($W/m^2.K$)	Proposed U-value ($W/m^2.K$)	Notes
Floor	0.18	0.18	-
External Wall	0.26	0.26	Internal partition walls to unheated fit-out spaces should meet Part L minimum u-value of 0.26
Roof	0.18	0.18	Ceiling of Fit-out spaces to be also insulated as the external roof
Glazing	1.60	1.60	10% Frame factor 40% G-value 71% Light transmittance
Standard Doors	1.60	1.60	-
Air permeability (@50Pa ($m^3/(h.m^2)$))	8.00	4.50	Common APR value from similar as-built Home Bargains stores

Table 4.4 – Proposed HVAC & ventilation parameters

Zone	HVAC System	Ventilation type	Specific fan power (W/l-s)	Heat recovery seasonal efficiency _h
Sales floor	Split System	Mechanical	1.2	0.80
Bakery	No Heating/Cooling	Mechanical	1.2	0.80
Circulation	No Heating/Cooling	Natural	n/a	n/a
Stock & Stores	No Heating/Cooling	Natural	n/a	n/a
Toilet	BOH	Natural	0.3	n/a
Offices ³	BOH	Mechanical	1.2	0.80

Table 4.5 - Lightning parameters

Zone	Lamp efficacy (lumens/W)	Lamp type	Photo switching type ⁴
All Zones	120	LED	PH-Dimming or Switching

² Following PL 2021 guidance, new thermal elements in Warehouses A and B should follow the fabric specs in table 4.3.

³ Proposed office spaces in warehouse A and B should follow similar heating and ventilation strategy.

⁴ Further detailed lighting design controls will be available during the following detailed design stage.

Step 3 – Policy CS22 Decentralized Energy Networks

- 4.12 Policy CS22 encourages new development to make provisions to investigate available local means to connect to a decentralised energy network. The following section reviewed and summarised the considerations of the available district energy network options.
- 4.13 This stage of the energy assessment refers to the use of heat networks or on-site CHP in order to provide energy and reducing consumption from the national grid and gas networks, through the generation of electricity, heating and cooling on-site.
- 4.14 The ambition is to supply space heating and hot water demand from heat network systems that will reduce energy consumption and CO₂ emissions from connection to a centralised energy network, if applicable.

District heat networks

- 4.15 Figure 4.4 below illustrates an extract from the Association for Decentralised Energy and shows; the site, and any existing district heating schemes in vicinity. The proposed site is not in a proximity of any existing district heating schemes – the nearest being the Broadgreen Hospital Site. The available heat network is not sited in a location that would make connection viable from a carbon reduction perspective.

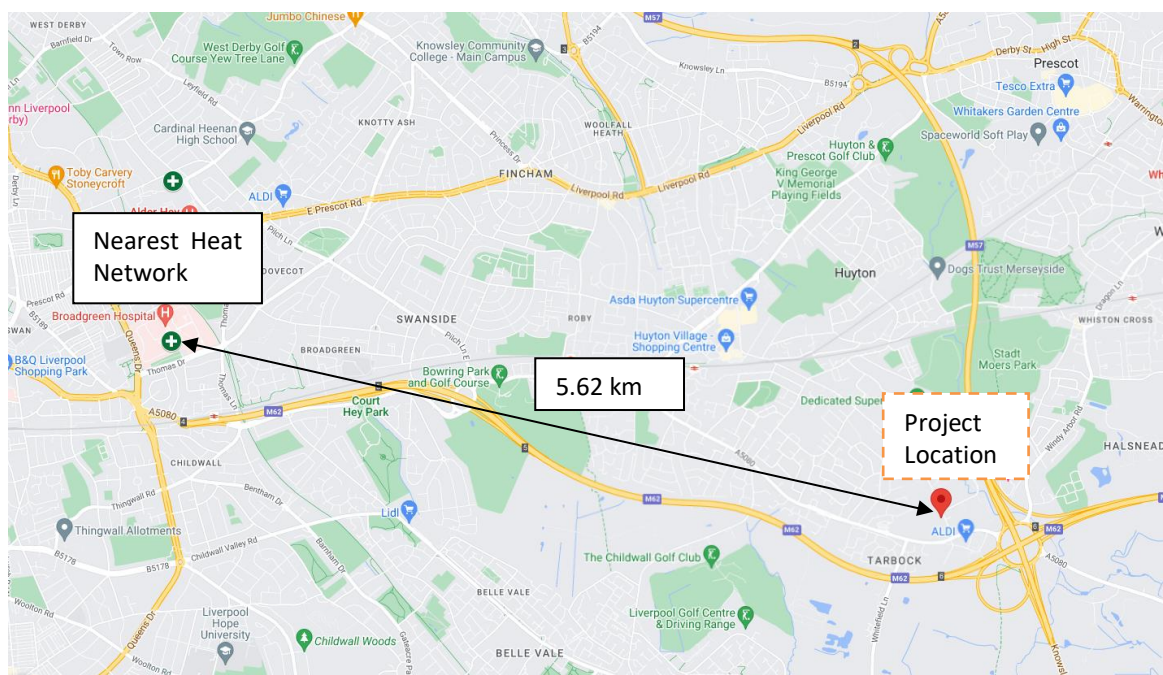


Figure 4.4 - Extract from Association for Decentralised Energy map showing the sources of existing district heating schemes in relation to the site of the Proposed Development.

- 4.16 The Proposed Development is not located near to a district energy network that is sited in a location that would make connection viable, nor is it within one of the two 'priority zones' identified by the local plan, which includes Knowsley Industrial Park and Knowsley Business Park.

Therefore, the development's energy strategy will follow guidance by maximising carbon savings from additional on-site measures, including fabric energy efficiency and renewable technologies.

Step 4 - Complying with Policy CS23

- 4.17 The final step of the energy compliance hierarchy explores the feasibility of Low Zero Carbon (LZC) technologies to allow for the production of renewable energy onsite in order to offer a further reduction in carbon emissions.

LZC technology assessment

- 4.18 LZC technologies harness energy from the environment and convert it to a useful form of a usable energy. According to schemes' site constraints, usually not all of LZC are commercially viable or suitable.
- 4.19 During the coming detailed design stage for the Proposed Development, a list of LZC systems will be examined for both their feasibility and ability to lower carbon emissions as possible. At this planning stage, the LZC deemed to be the most viable for the Proposed Development is ASHP.

Renewable Technology	Rating (out of 5)	Comment
Air/Water Source Heat Pump	*****	Implementing heat-pump technology brings the additional benefit of a shift towards combustion-free development, with the associated benefit to local air quality. A strategy that utilises ASHP has been deemed the most appropriate option for the Proposed Development, and this solution is expected to reduce carbon emissions considerably in real terms. For this reason, the technology has been included as the main heating and cooling source in the Proposed Development.

Air-Source Heat Pump for Space Heating & Cooling

- 4.20 The LZC technology assumed for the retail unit is an ASHP. ASHPs with the following specifications have been assumed to serve the retail unit:

Table 4.6 – Proposed ASHP specs

	Proposed System	Part L Backstop
ASHP for Heating and Cooling	Air Distribution VRF System. Heating COP/sCOP: 3.00 Cooling EER/SEER: 6.00	Air Distribution VRF System. Heating sCOP: 2.50 Cooling SEER: 5.00

- 4.21 The incorporation of the proposed renewable technology helped to achieve **23%** CO₂ reduction over the Notional TER.

CO₂ Emission reductions and Part L results.

4.22 The performance of the Proposed Development during this planning stage has been assessed against Part L 2021 of the Building Regulations, including both the TER and the TPER. The results are shown in Table 4.8 and demonstrate that compliance with Part L requirements has been deemed achievable. The Proposed Development's energy compliance calculations will need to be updated at detailed design stage.

Table 4.8 –Proposed Carbon and primary energy reductions.

Unit	Total Floor Area (m ²)	SAP 10 BER	Total CO2 (tn.CO ₂ .yr)	Building Regulated Energy (kWh.yr)	BPER	Total Building Primary Energy (kWh.yr)
HB Knowsley	2307.2	4.60	10.61	76,414.46	50.12	115,636.86
		Total =	10.61	76,414.46		115,636.86
		Difference over Baseline	3.35			35807.74
		% Difference	23.97%			23.64%

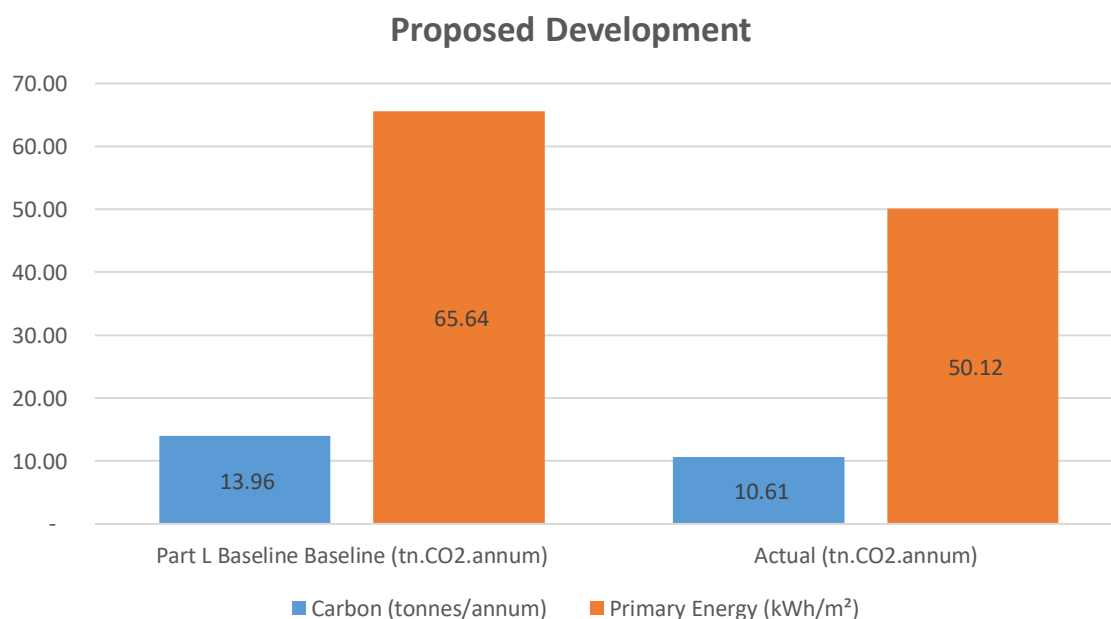


Figure 4.5 - Carbon reduction summary

5 CONCLUSION

- 5.1 This Sustainability and Energy Statement has been prepared by Envision on behalf of Davos Property Development Ltd. and is submitted in support of a full planning application seeking consent for the reconfiguration and refurbishment of existing industrial buildings (Class E(g), B2 and B8), carpark and access, and erection of retail unit (Class E) with external display area, along with access and servicing arrangements, landscaping and associated works
- 5.2 The Proposed Development will be brought forward to incorporate a range of sustainable design features in line with local Policy CS22. The scheme proposes to reuse and reconfigure existing industrial units which will deliver life cycle carbon savings over new development, whilst delivering a new retail store which will create local employment. The following sustainable design and construction measures are proposed:
- The Proposed Development will incorporate new efficient thermal elements with low air tightness levels. In addition to delivering the Proposed development's energy demand efficiently via an ASHP system. The new retail unit would result in an overall **23%** reduction in CO₂ emissions & **24%** reductions in primary energy when compared to Part L Notional building.
 - The refurbished and reconfigured industrial units would be designed to meet the requirements of Building Regulations for all new thermal elements and building systems installed. The applicant is also separately exploring how these units could be aligned with the BREEAM refurbishment and fit out standards (2014).
 - The scheme will be brought forward with a Construction Environmental Management Plan, addressing contractor performance and environmental management during the construction process.
 - The scheme incorporates sustainable transport measures, including cycle spaces and electric vehicle charging points. A Travel Plan has been developed which will aim to encourage a shift towards more sustainable transport options;
 - A new scheme of landscaping is proposed for the development and ecological enhancement measures. The scheme will introduce ecologically friendly landscaping, alongside bird and bat boxes. A 5 year landscape and ecological management plan is proposed to ensure these features establish.
 - The scheme incorporates measures to adapt to climate change. The site is within a low flood risk area and the development and will incorporate a sustainable drainage collection using a cellular storage tank, sized based on a 1:100 year event, plus a 40% allowance for climate change.
 - Water efficiency measures will be adopted in the new retail store and new sanitary equipment that is installed in the offices will be designed to similar standards, aligned with BREEAM Excellent criteria.

APPENDIX 1 – BRUKL REPORT

Project name

Home Bargains-Knowsley

As designed

Date: Thu Oct 12 10:02:58 2023

Administrative information

Building Details

Address: -, Knowsley, xx

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: EnergyPlus

Calculation engine version: "v9.4.0.002"

Interface to calculation engine: DesignBuilder DSM

Interface to calculation engine version: v7.2.0

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

Foundation area [m²]: 1988.78The 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	6
Building CO ₂ emission rate (BER), kgCO ₂ /m ² annum	4.6
Target primary energy rate (TPER), kWh _{PE} /m ² annum	65.64
Building primary energy rate (BPER), kWh _{PE} /m ² annum	50.12
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	0.26	0.26	Block 2 - Bakery_W_3
Floors	0.18	0.18	0.18	Block 2 - Bakery_E_0
Pitched roofs	0.16	-	-	No Exposed Roof in project
Flat roofs	0.18	0.18	0.18	Block 2 - Zone 2_R_1
Windows** and roof windows	1.6	1.6	1.6	Block 2 - Entrance_G_2_0
Rooflights***	2.2	-	-	No Rooflights in project
Personnel doors^	1.6	1.6	1.6	Block 2 - Stock Room_D_0
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

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

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

*** Values for rooflights refer to the horizontal position.

^ For fire doors, limiting U-value is 1.8 W/m²K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

Air permeability	Limiting standard	This building
m ³ /(h.m ²) at 50 Pa	8	4.5

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	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- BOH

	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

2- Split System

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	3	6	-	-	-
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					NO

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

1- Project 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	
Block 2 - Bakery	-	-	-	-	1.2	-	-	-	-	-	N/A	
Block 2 - Stock Room	0.3	-	-	-	-	-	-	-	-	-	N/A	
Block 2 - Meeting Room	-	-	-	-	1.2	-	-	-	-	0.8	N/A	
Block 2 - Toilet	0.3	-	-	-	-	-	-	-	-	-	N/A	
Block 2 - Toilet	0.3	-	-	-	-	-	-	-	-	-	N/A	
Block 2 - Circulation	-	-	-	-	1.2	-	-	-	-	-	N/A	
Block 2 - Staff Room	-	-	-	-	1.2	-	-	-	-	0.8	N/A	
Block 2 - Cash Office	-	-	-	-	1.2	-	-	-	-	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		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
Block 2 - Server Room	0.3	-	-	-	-	-	-	-	-	-	N/A
Block 2 - Sales Floor	-	-	-	-	1.2	-	-	-	-	0.8	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
Block 2 - Bakery		100	-	-
Block 2 - Stock Room		100	80	0
Block 2 - Store		100	80	0
Block 2 - Meeting Room		100	80	0
Block 2 - Toilet		100	80	0
Block 2 - Toilet		100	80	0
Block 2 - Circulation		100	80	0
Block 2 - Staff Room		100	80	0
Block 2 - Cash Office		100	80	0
Block 2 - Server Room		100	80	0
Block 2 - Entrance		100	80	0
Block 2 - Sales Floor		100	80	1.875

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?
Block 2 - Bakery	N/A	N/A
Block 2 - Stock Room	N/A	N/A
Block 2 - Store	N/A	N/A
Block 2 - Meeting Room	N/A	N/A
Block 2 - Circulation	N/A	N/A
Block 2 - Staff Room	N/A	N/A
Block 2 - Cash Office	N/A	N/A
Block 2 - Entrance	YES (+62.6%)	NO
Block 2 - Sales Floor	NO (-82.2%)	NO

Regulation 25A: Consideration of high efficiency 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

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m ²]	2307.2	2307.2
External area [m ²]	6403.1	6403.1
Weather	MAN	MAN
Infiltration [m ³ /hm ² @ 50Pa]	5	5
Average conductance [W/K]	1403.97	5309.42
Average U-value [W/m ² K]	0.22	0.83
Alpha value* [%]	25	10

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

Building Use

% Area Building Type

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

Energy Consumption by End Use [kWh/m²]

	Actual	Notional
Heating	4.18	20.2
Cooling	3.49	2.95
Auxiliary	5.59	3.23
Lighting	18.23	17.62
Hot water	1.63	1.63
Equipment*	20.59	20.59
TOTAL **	33.13	45.64

* 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	1.17
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
<i>Displaced electricity</i>	<i>0</i>	<i>1.17</i>

Energy & CO₂ Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m ²]	93.38	235.71
Primary energy [kWh _{PE} /m ²]	50.12	65.64
Total emissions [kg/m ²]	4.6	6.05

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] No Heating or Cooling										
	Actual	0	0	0	0	6.2	0	0	0	0
	Notional	0	0	0	0	7	0	4.4	----	----
[ST] Other local room heater - fanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity										
	Actual	28.9	0	10	0	5.3	0.8	0	1	0
	Notional	98.6	0	20.4	0	3.1	1.34	0	----	----
[ST] No Heating or Cooling										
	Actual	0	0	0	0	5.9	0	0	0	0
	Notional	0	0	0	0	4	0	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	46.9	64.4	4.7	4.2	5.5	2.8	4.26	3	6
	Notional	223.8	56.2	23.5	3.5	2.6	2.64	4.4	----	----

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