Energy & Sustainability Statement

Island Site, Uxbridge

Prepared for Globe Exhibitions Limited

October 2024

envision

Revision	Date
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EXECUTIVE SUMMARY

1. This Sustainability and Energy Statement prepared by Envision on behalf of Globe Exhibitions Limited (The Applicant) and is submitted in support of a full planning application seeking consent for the demolition of the existing mixed-use industrial buildings which are in poor condition and the creation of 2no. new larger units, to suit modern tenant requirements, continuing with the same use class as flexible light industrial (Class E(g)(iii), general industrial (Class B2) and storage/distribution (Class B8).

2. The servicing and car parking will be reconfigured along with the relocation of the existing centrally located substation. This will provide better access & circulation for the new industrial units.

3. The primary purpose of this document is to explain how the scheme can meet with London Borough of Hillingdon's energy and sustainability policies. Envision has undertaken a review of the relevant policies and worked with the design team to determine and agree the relevance and approach that should be taken to fulfil each policy.

Summary of Sustainability Strategy

4. The scheme will be taken forward to meet relevant policies within the LB Hillingdon Local Plan Part 2 – Development Management Policies (2020). The scheme will deliver a series of sustainability measures which are compatible LB Hillingdon's requirements for sustainable design and construction:

- The development will affect habitats of negligible ecological importance. The enhancements and habitat creation proposed, including native species planting, will provide additional opportunities for biodiversity within the site.
- Based on the Air Quality Neutral assessment results, the impact of the proposed development with regards to the current relevant air quality objectives was considered to be not significant
- Water conservation measures including water efficient fittings throughout including dual flush WCs, efficiency measures on taps and showers
- Predicted delivery activity noise levels will be significantly below the existing background and ambient noise climate. The proposed development will be will be at least 9dB below the WHO night noise guideline value.
- Sustainable transport measures will be encouraged on site, including provision of cycling parking and promotion of cycling and walking
- The site lies in Flood Zone 1 (Low Risk). It was also found that the site has a low risk of flooding from surface water flooding.
- Simple Index Approach analysis concluded that the treatment train proposed for the SuDS strategy is adequate for the pollution hazard indices generated.

Summary of Energy Strategy

5. In line with Policy DMEI 2: Reducing Carbon Emissions, the applicant has sought to make the fullest contribution to minimising CO_2 emissions in line with the London Plan Energy Hierarchy and its associated targets. Envision has followed guidance as laid out in the GLA Guidance on Preparing Energy Assessments (2022).

6. To minimise energy consumption by the development and to ensure compliance with relevant energy policies, the following design measures are proposed and will need to be incorporated into the detailed design:

- Building fabric construction U-values significantly improved compared with standard Building Regulations U-values;
- Reduced Air Permeability, lower than standard Buildings Regulations;
- Reduction in solar gain through the use of lower g-values on glazing;
- HVAC system controls ensure installed equipment will be operating efficiently and to include automatic monitoring and targeting with alarms for out of range values;
- High efficiency LED lighting utilizing low-energy control systems such as daylight dimming and occupancy sensing in the office areas;
- High efficiency air-source heat pumps providing efficient space heating and cooling within the office areas, and;
- Renewable energy generation through the provision of a 75 kWp PV.

Carbon Savings Predicted

7. As seen in the table below, the development reduces CO_2 emissions by **8.7 tonnes.CO_2.year**, equal to a **37%** saving beyond the Part L 2021 baseline, thereby complying with adopted London Borough of Hillingdon and London Plan energy policies with regards to minimum CO_2 emission reductions for major developments.

Table A.1 – Final CO_2 reductions Chart

	Carbon Dioxide Emissions for non-domestic buildings (Tonnes CO_2 per annum)	
Baseline: Part L 2021 of the Building Regulations Compliant Development	23.3	
After energy demand reduction	19.7	
After heat network / CHP	19.7	
After renewable energy	14.7	
	Regulated domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	**(%)**
Savings from energy demand reduction	3.6	15%
Savings from heat network / CHP	0.0	0%
Savings from renewable energy	5.1	22%
Cumulative on-site savings	8.7	37%
Annual Savings from off-set payment	14.7	
(Tonnes CO2)		
Cumulative savings for off-set payment (over 30 Years)	441	
Carbon offset Payment (£95 per tonne)	**£ 41,895**	

8. Given the extent of the works proposed, the development is therefore considered to have made the fullest contribution to minimising CO_2 emissions in line with Policy DMEI 2 of Hillingdon Council's Local Plan.

1 INTRODUCTION

1.1 Envision has been appointed by Globe Exhibitions Limited (the Applicant) to produce a Sustainability and Energy Statement in support of a full planning application for the demolition of the existing mixed-use industrial buildings which are in poor condition and the creation of 2no. new larger units, to suit modern tenant requirements, continuing with the same use class as flexible light industrial (Class E(g)(iii), general industrial (Class B2) and storage/distribution (Class B8).

1.2 The servicing and car parking will be reconfigured along with the relocation of the existing centrally located substation. This will provide better access & circulation for the new industrial units.

Scope

1.3 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.

1.4 This statement is structured as follows:

- The remainder of this section provides a description of the site and the development proposals;
- Section 2 provides a description of the main sustainability and energy policies relevant to the application;
- Section 3 details the sustainable design measures incorporated into the design;
- Section 4 encompasses the Energy Statement, which outlines the measures proposed to decrease energy demand and carbon dioxide emissions during operation, as well as an assessment of overheating;
- Section 5 provides a concluding summary.

Site Location and Existing Situation

1.5 The site is located within the cul-de-sac of Eskdale Road and is part of the Uxbridge Industrial Park consisting of two Class B2 / B8 warehouses with a combined gross floor area of approximately 3,000 Sqm. The current service yard layout presents parking provision to the north, south, and west with gated access to the north and south. The site is bound on all sides by Eskdale Road. Uxbridge Industrial Park is situated to the south of central Uxbridge and near the M25.

1.6 The area is a mixture of commercial and industrial units and small linked access roads with extensive parking either side. The units in the area vary in size and scale building to building, due to the redevelopment of the area over the years.

1.7 The closest residential area is located to the east of the site adjacent to Cowley Mill Road.

1.8 The existing building forms part of a terrace of architecturally very different buildings which is typical of the buildings within the estate, with a mixture of style, scale, form and uses. Most

buildings in the local area have metal cladding facades, some elements of brickwork (facing or rendered) and metal roofs.

1.9 Overhead powerlines span North to South over the eastern side of the site.

1.10 The site is in between the River Colne running to the west of the estate and the Grand Union Canal running along the east.

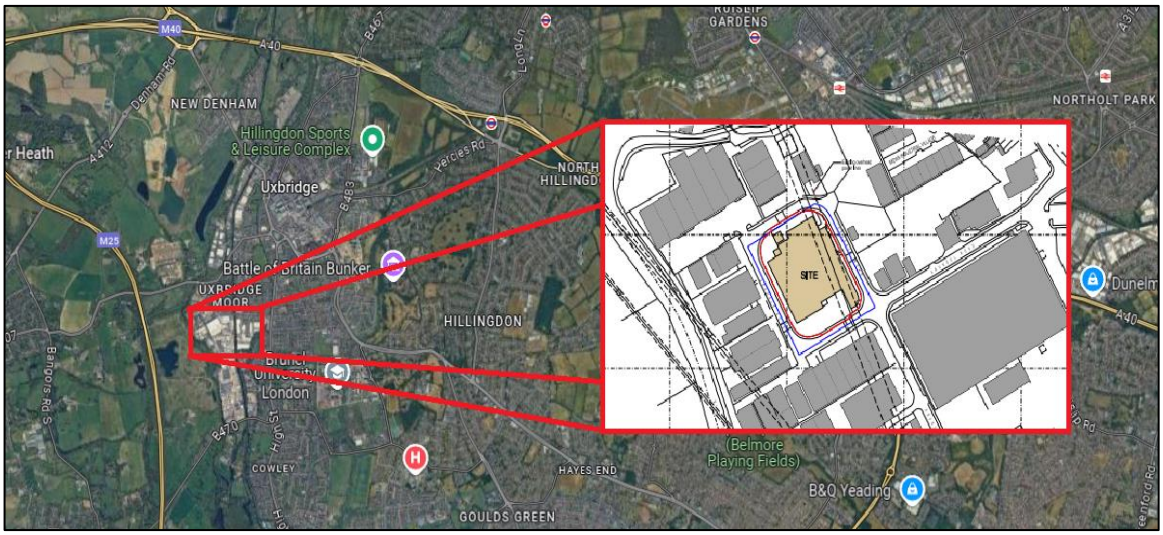

Figure 1.1 – Site Location

The Proposed Development

1.11 It is proposed to demolish the existing buildings occupying an area of approximately 3,000 Sqm, and replace with a new 2,794 Sqm flexible light industrial (Class E(g)(iii), general industrial (Class B2) and storage/distribution (Class B8) building with associated parking, landscaping and service yards. The building will be split equally into two units.

1.12 The onsite car parking provision is 26no. Spaces split between each unit including 2 reserved for Blue Badge Holders and 8no. with EV charging facilities. Secure covered cycle parking has been provided for 16no. Cycles (8no. for each unit).

1.13 The proposed development introduces alterations to the access arrangements with the erection of a continues fence line and introduction of pedestrian access and two heavy duty swing vehicle gates at the front of the building.

1.14 The proposed height of the building relates to the existing surrounding buildings but will achieve current tenant requirements for Industrial units.

1.15 The new units are typical of national Industrial design approach with separate pedestrian access and roller shutters for goods entrances, keeping a safe separation between uses.

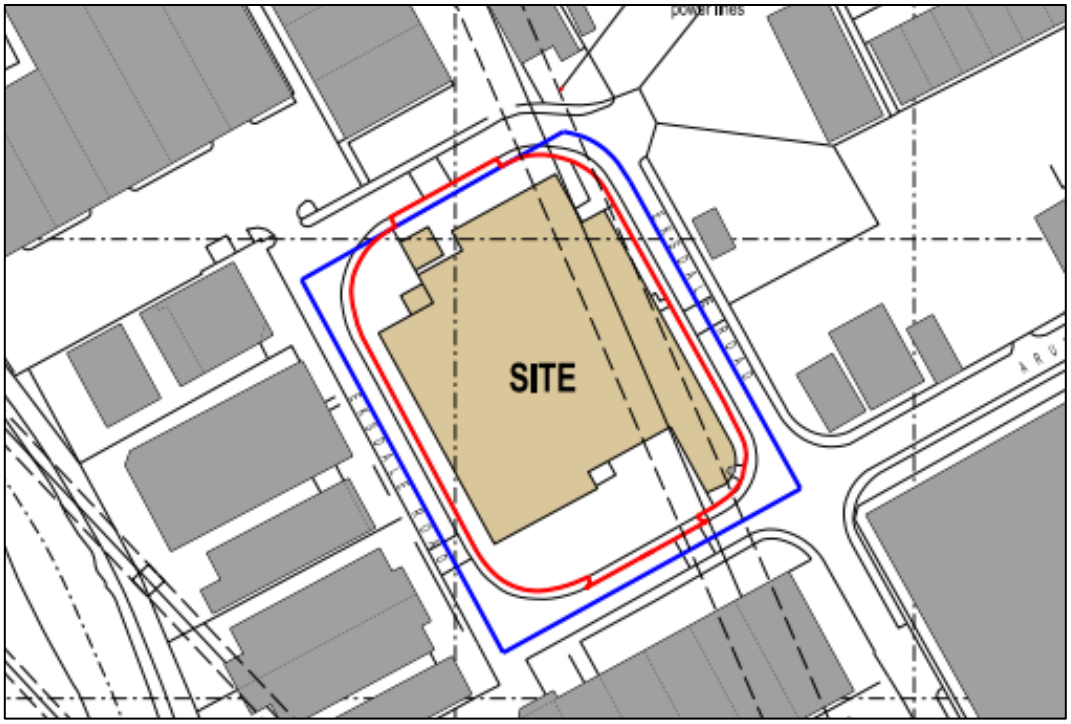

Figure 1.2 – Proposed Site Layout

2 SUSTAINABILITY & ENERGY POLICY CONTEXT

2.1 Many definitions of sustainable development exist, although the common objective for all is the integration of economic, social and environmental issues to ensure a better quality of life for people today, without compromising the needs of future generations. 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 National Planning Policy Framework was updated in December 2023 and sets out the government's planning policies for England and how these are expected to be applied. This revised Framework replaces the previous National Planning Policy Framework published in March 2012, revised in July 2018, updated in February 2019 and revised in July 2021.

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 The NPPF notes that the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk 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.

2.5 Furthermore, the NPPF sets out how local authority development plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term

implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating from rising temperatures

2.6 Planning plays a key role in helping shape places to achieve radical reductions in greenhouse gas emissions, minimising vulnerability and 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.

2.7 Recent changes have essentially rendered the Deregulation Act 2015 and the Written Ministerial Statement (WMS) ineffective, both of which previously restricted local planning authorities (LPAs) in their ability to establish independent energy efficiency standards. Additionally, the government has affirmed that there will be no amendments to the Planning and Energy Act 2008. Consequently, local councils now possess the authority to define and enforce their energy efficiency standards without violating government policy. Recent Planning Inspector reports, such as those for the Bath & North East Somerset Council in December 2022 and Cornwall Council in January 2023, confirm the diminishing relevance of the WMS dated March 25, 2015, suggesting that it has been superseded by subsequent developments.

London Borough of Hillingdon Planning Policy

2.8 The London Borough of Hillingdon is working towards its Local Plan Part 2 Development Management Policies and Site Allocations and Designations. These were adopted as part of the borough's development plan at Full Council on 16 January 2020. This replaces the Local Plan Part 2 Saved UDP Policies (2012).

Policy DMEI 2: Reducing Carbon Emissions

2.9 All developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with London Plan targets (this is a 15% reduction at 'Be-Lean Stage' and an overall 35% reduction beyond Part L with the balance offset).

2.10 All major development proposals must be accompanied by an energy assessment showing how these reductions will be achieved.

2.11 Proposals that fail to take reasonable steps to achieve the required savings will be resisted. However, where it is clearly demonstrated that the targets for carbon emissions cannot be met onsite, the Council may approve the application and seek an off-site contribution to make up for the shortfall.

Policy DMEI 3: Decentralised Energy

2.12 Requiring all major developments to be designed to connect to a District Energy Network and to connect to ones within 500 metres of the development.

Further Policies

2.13 Further policies relevant to the sustainability aspects of the application include DMEI 1 (Living Walls & Vegetation), DMEI 7 (Biodiversity Protection & Enhancement), DMEI 9 (Flood Risk), DMEI

10 (Water Efficiency) and DMEI 14 (Air Quality) which will be assessed against the development proposals.

GLA Guidance on Preparing Energy Assessments

2.14 The GLA guidance on preparing energy assessments (2022) provides a detailed methodology on how to demonstrate a reduction in CO_2 emissions for new development. The new guidance explains how London Plan policies apply now that Part L 2021 has taken effect, and the updates made to the GLA's carbon emissions reporting spreadsheet and how to determine the CO_2 emissions baseline under Part L 2021.

2.15 This explains the updates made to the GLA's carbon emissions reporting spreadsheet and how to determine the CO_2 emissions baseline under Part L 2021. This guidance document explains how to prepare an energy assessment to accompany strategic planning applications referred to the Mayor. Although primarily aimed at strategic planning applications, London boroughs are encouraged to apply the same structure for energy assessments related to non-referable applications and adapt it for relevant scales of development.

2.16 Applicant's in London must continue to meet the London Plan net zero carbon target by following the energy hierarchy (Policy SI 2), the heating hierarchy (Policy SI 3) and by maximising on-site carbon reductions. Planning applicants will be expected to demonstrate that at each stage of the energy hierarchy they have maximised opportunities for carbon reduction to achieve as close to zero as possible. An on-site carbon reduction of at least 35 per cent beyond Part L 2021 of building regulations should be achieved. Once it has been demonstrated that carbon reductions have been maximised, any remaining emissions to zero should be offset by a contribution to the relevant borough's carbon offset fund.

2.17 This sustainability and energy statement draws from this guidance, in particular for calculation of energy performance against the new building regulations.

2.18 In terms of major non-residential development, the guidance states that Initially, non-residential developments may find it more challenging to achieve significant on-site carbon reductions beyond Part L 2021 to meet both the energy efficiency target and the minimum 35 per cent improvement. This is because the new Part L baseline now includes low carbon heating for non-residential developments but not for residential developments. However, planning applicants will still be expected to follow the energy hierarchy to maximise carbon savings before offsetting is considered.

3 SUSTAINABILITY STATEMENT

3.1 This section includes a review of the scheme against the relevant policies in section 2.13 and identifies a series of practical measures that would be brought forward in design and construction which contribute to the developments' sustainability.

Ecology

3.2 The proposed development will not result in any impacts to statutory designated sites. Three non-statutory sites: London's Canals SINC, Little Britain SINC and Frays River at Uxbridge Moor SINC were assessed, and no impacts are anticipated as a result of development, as long as standard best practice is followed to control impacts via air, run-off, and other pollutants. These are to be incorporated into a CEMP

3.3 The development will affect habitats of negligible ecological importance. The enhancements and habitat creation proposed, including native species planting, will provide additional opportunities for biodiversity within the site.

3.4 The brick annex building which will be demolished has a confirmed day roost used by at least five soprano pipistrelle bots.

3.5 Once the roost has been fully characterised and it is established how bots are using the building during the peak season, a detailed bat mitigation strategy will be designed with the client and will fully mitigate for the loss of the roost, whether maternity, mating or day roost If Natural England grants a licence, and a maternity roost is confirmed, works will be timed to be outside of maternity season and take between March-April and September/October. An appropriate mitigation strategy will be put in place pre and post-development, such as a bat tower made up of bat bricks and boxes, or bat boxes attached to the proposed building

3.6 Should vegetation or the building on the site be removed during the core nesting bird season (March-August, inclusive), a pre-works check by an ECOW would be required to determine whether active birds' nests are present

3.7 The proposals would result in a net gain of 0.03 habitat units and 0:15 hedgerow units. This is a percentage gain of 40.4% in habitat units and 0.15 hedgerow units. A HMMP to ensure the long-term management of the proposed habitat enhancements is expected to be secured via a suitable worded planning condition

3.8 In conclusion, in anticipation of the implementation of any necessary mitigation, the proposed development will be compliant with relevant planning policies the NPPF, London Plan Policies G1, G5 and G6, the Hillingdon Local Plan policies EM1, EM7, DMEI 7, which seek to protect biodiversity, as well as legislation with regard to ecology.

3.9 For further information refer to Tyler Grange's Ecological Impact Assessment.

Pollution Control

Air Quality

3.10 BWB conducted a qualitative construction phase dust assessment was undertaken in accordance with Institute of Air Quality Management guidance and the Greater London Authority and measures were recommended to minimise emissions during construction activities. With the implementation of these mitigation measures the impact of construction phase dust emissions was considered to be 'not significant' in accordance with Institute of Air Quality Management guidance and Greater London Authority guidance.

3.11 The proposed development trip generation was screened using the Institute of Air Quality Management and Environmental Policy Implementation Community (previously Environmental Protection UK) guidance two stage screening process, to determine whether a detailed road traffic emissions impact assessment was required. The proposed development trip generation did not exceed the relevant screening criteria and therefore detailed dispersion modelling of development-generated road traffic was not undertaken.

3.12 An Air Quality Neutral Assessment was undertaken to compare building and transport emissions from the proposed development with Greater London Authority benchmarks. Oxides of nitrogen and particulate matter emissions from the proposed buildings and additional vehicle trips generated by the proposed development were assessed to be below the benchmarked thresholds. The development was considered to be air quality neutral in terms of both building and transport emissions.

3.13 Based on the assessment results, the impact of the proposed development with regards to the current relevant air quality objectives was considered to be not significant. No mitigation is required but measures included in the development that can be considered beneficial to air quality include the provision of photovoltaic panels, electric vehicle charging points and a Travel Plan resulting in an improved and more sustainable scheme compared to the existing site premises.

3.14 For further information refer to BWB's Air Quality Assessment.

Noise

3.15 Sharps Redmore has carried out a noise assessment for a proposed new industrial unit at Eskdale Road, Uxbridge.

3.16 An environmental noise survey has been carried out to establish the existing ambient and background noise levels. The results of the survey have been used to set criteria against which the impact of noise the proposed development on the surrounding noise sensitive receptors can be determined.

3.17 Noise criteria have been recommended based on the guidance in BS 4142.

3.18 The impact of noise from delivery activity has been considered. Daytime (and night time) predicted delivery activity noise levels will be significantly below the existing background and ambient noise climate. For noise that may occur at night the main consideration are maximum levels associated with vehicle movements and unloading activity. Maximum noise levels have

been predicted using SoundPLAN computer modelling software and will be at least 9dB below the WHO night noise guideline value. The WHO guidelines are considered to be the lowest observed adverse effect level (LOAEL) and therefore it is concluded that noise levels from delivery activity would be indicative of low impact, and hence comply with the requirement of the NPPF to avoid significant adverse impact. There is no technical noise reason justification for the local authority to seek to restrict operating hours at the proposal site.

3.19 In conclusion having assessed the noise impact against national design guidance, including BS 4142:2014 and WHO Guidelines for Community Noise, the proposed development would comply with the requirements of paragraph 191 of the National Planning Policy Framework, to avoid significant adverse impact.

Light Pollution

3.20 The site is within an urban area and is considered to be in Zone E4 – Urban area, characterised as having 'high district brightness' according to the Institute of Lighting Engineers Guidance Notes for the Reduction of Obtrusive Light (2021). This sets limits for vertical illuminance and upward light ratios (ULR).

3.21 The scheme proposes LED lighting throughout the car parking, service yards and over the loading bays which meet will meet external lighting requirements. The lighting would be controlled via programmable controller for dawn / dusk timings. This will prevent the lighting being operational when there is adequate daylight and the lighting could be programmed to be off for a set period if required.

Flood Risk and Sustainable Drainage

3.22 Environment Agency mapping shows that the site lies in Flood Zone 1 (Low Risk). It was also found that the site has a low risk of flooding from surface water flooding.

3.23 The site is at risk of flooding from reservoir failure, but only if the reservoir failure and river flooding happen simultaneously. If the level of the rivers is normal, then the probability of flooding due to reservoir failure is low. The site does not lie within Critical drainage area.

3.24 The site is considered 'less vulnerable' with respect to flood risk in line with NPPF guidelines. The proposed development is not required to undertake the exception test as less vulnerable uses are deemed 'appropriate development' in Flood Zone 1.

3.25 A below ground attenuation tank is proposed to attenuate surface water flows from the site, which will then pump at a restricted rate of 3L/s into the Aqua Filter before connecting to existing public sewer in Eskdale Road to the west. From here, it is assumed that the flow will outfall into the River Colne. Further site investigation during the detailed design stage is required to determine the existing discharge method and route of surface water leaving the site.

3.26 Through the implementation of the tank, and other proprietary systems, the flood risk assessment has concluded that the proposed development neither increases the potential for flood risk or flooding from the site. The Simple Index Approach analysis concluded that the treatment train proposed for the SuDS strategy is adequate for the pollution hazard indices generated.

3.27 For more information refer to Furness Consulting Engineers' SuDS Strategy & Flood Risk Assessment.

Water Efficiency

3.28 Policy DMEI 10 – Whilst B2/ B8 uses are generally low consumers of water, the whole London Plan area is supplied water by Thames Water, which is considered to be seriously stressed. Water use will be controlled as far as possible through water specification, including:

- Water efficient fittings throughout, including dual flush WCs, efficiency measures on taps and showers.

3.29 The proposed development will also provide an integrated approach to surface water run-off attenuation.

Sustainable Transport

3.30 Sustainable transport promotes the use of public transport, cycling and walking in advance of private care use. A Travel Statement and Framework Travel Plan have been produced by TTP Consulting as part of the planning application.

Access on Foot

3.31 There are footways along one or both sides of Eskdale Road within the Estate with dropped kerbs and tactile paving provided at access point into units.

3.32 There are footways along one or both sides of roads within the local area that includes Ashley Road, Arundle Road and Eskdale Road, with street lighting at regular intervals. The local area does however suffer from inappropriate parking which occurs along the adjacent streets with many cars parked half on / half off the footway thereby restricting access, particularly for less abled persons. It is understood that some of the inappropriate parking is a result of the closure of a nearby off-street car park.

3.33 Setting aside the above, the footways facilitate access to nearby facilities including bus stops along with residential areas.

3.34 For more information refer to TPP Consulting's Transport Statement.

Access by Bicycle

3.35 It is generally accepted that cycling is a sustainable mode of travel for journeys up to 8km in length, although in London, longer journeys are more commonplace, with factors such as health, weather and access to a car along with journey purpose influencing a person's choice to cycle.

3.36 Figure 2.3 of TPP Consulting's Transport Statement shows the 5km and 8km cycling catchment from the Site which shows that Uxbridge, Cowley, Hillingdon and Ickenham are within a 5km cycle, with Langley, West Drayton and parts of Ruislip within an 8km cycle.

Access by Public Transport

3.37 The proposed development falls just outside the scope TFL's WebCAT public transport accessibility tool, however the surrounding area to the east of the site has a rating of 1B, meaning the site has poor public accessibility.

3.38 The closest bus stop which is the Cowley Mill Road / St Johns Road located approximately 550m to the north is served by northbound buses on Routes 3 and 583 and provides access to Uxbridge Town Centre and Rail Station; southbound buses are available from the stop a further 50m north which provide access to Slough and Heathrow Bus Station. Both stops are provided with seating and shelter.

3.39 The nearest station is Uxbridge which is located approximately 1.7km (21-minute walk) northeast of the Site on the High Street. The station provides access to Metropolitan and Piccadilly lines. The station provides step free access to all platforms.

- The Metropolitan Lines provides access towards Liverpool Street, Kings Cross St Pancras, Baker Street and Harrow on the Hill with trains departing every 3 – 12 minutes.
- The Piccadilly Line provides access towards Rayners Lane, Green Park and Cockfosters with trains departing every 5 – 10 minutes.

Travel Plan

3.40 The table below sets out a draft Action Plan which will be revised, if necessary, following each Travel Plan Monitoring and Review. For more information on the travel plan actions please refer to TPP Consulting's framework Travel Plan.

Action	Target	Funding	Measure	Responsibility
Provision of Cycle Parking	Prior to opening Unit	Landlord	On completion of the development	Landlord
Maintenance of Cycle Parking	Ongoing	Occupier	Condition of cycle parking	Occupier
Appointment of TPC	Prior to opening Unit	Occupier	TPC appointed	Occupier
Production of Travel Plan	Prior to opening Unit	Occupier	Travel Plan	TPC / Occupier
Production of Welcome Pack	Prior to opening Unit	Landlord	Completed Welcome Pack	Landlord
Updating Welcome Pack	Annually	Occupier	Updated Welcome Pack	Occupier
Launch of Travel Plan	Within 1 months of the Unit opening	Occupier	Travel Plan Launched	TPC / Occupier
Welcome Pack issued to staff	Prior to commencement of employment	Occupier	Staff received Welcome Pack	TPC
Baseline Travel Survey (Year 0)	Within 3 months of Unit opening	Occupier	Receipt of survey results	TPC
Update Travel Plan	Within 1 month of receipt of survey	Occupier	Updated Travel Plan	TPC
Promote walking & cycling	Ongoing with focus on summer months	Occupier	NA	TPC

Figure 3.1: Travel Plan Action Plan

4 ENERGY STATEMENT

4.1 Policy DMEI 2 – Reducing Carbon Emissions of Hillingdon Council's Local Plan requires all major development, to demonstrate how it is making the fullest contribution to minimising carbon dioxide emissions in accordance with the London Plan energy hierarchy:

- Be Lean: use less energy and manage demand during operation;
- Be Clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly;
- Be Green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.

Methodology

4.2 London Plan policy SI 2 sets a 'zero carbon' target for major non-domestic development. The 'Zero Carbon' requires the development to achieve at least a **35 per cent reduction** in regulated carbon dioxide emissions (beyond Part L 2021) on-site with a minimum 15% saving at Be-Lean Stage. The remaining regulated carbon dioxide emissions, to 100 per cent, are to be off-set through a cash in lieu contribution to the London Borough of Hillingdon to be ring fenced to secure delivery of carbon dioxide savings elsewhere.

4.3 In line with the requirements of the London Plan (2021), the predicted CO_2 emissions presented in this report have been calculated using the **GLA Spreadsheet** provided in Appendix II.

4.4 Compliance with Volume 2 of Building Regulations 2021 is provided via the BRUKL documents in Appendix I.

4.5 In accordance with NCM guidance, The appropriate methodology for calculating energy performance and compliance with Part L of the Building Regulations is through a Simplified Building Energy Model (SBEM). The SBEM was produced using DesignBuilder software version 7.2.0.032, which is a Department of Communities and Local Governments (DCLG) approved software and methodology for undertaking SBEM.

Establishing the Target Emission Rate (TER)

4.6 The total emissions savings calculated in this report for the development is expressed against a Building Regulation 2021 Target Emission Rate. This is the Baseline against which the measures implemented must show an improvement.

4.7 The Target Emission Rates for the development have been established using DCLG approved methodology and software.

4.8 The calculated carbon emissions and total energy demand for the Target Emission Rate are illustrated below. The calculated figure demonstrates a Building Regulations 2021 compliant model – arrived at using GLA Spreadsheet.

Table 4.1 – Target CO_2 emissions

Unit	Total Floor Area (m^2)	TER	Total Target CO_2 ($tn.CO_2.yr$)	TPER	Total Target Primary Energy (kWh.yr)
Island Site Units 1&2	2,896.3	8.06	23.34	86.58	250,761

4.9 The figures of **23.34 $tn.CO_2.yr$ and 86.58 kWh/m^2** are the target that must be reached and improved upon by the proposals in this Energy Assessment in order to comply with Building Regulations Volume 2 2021. This will be achieved through the implementation of fabric efficiency, energy-reduction and carbon-saving measures as outlined in the ensuing sections.

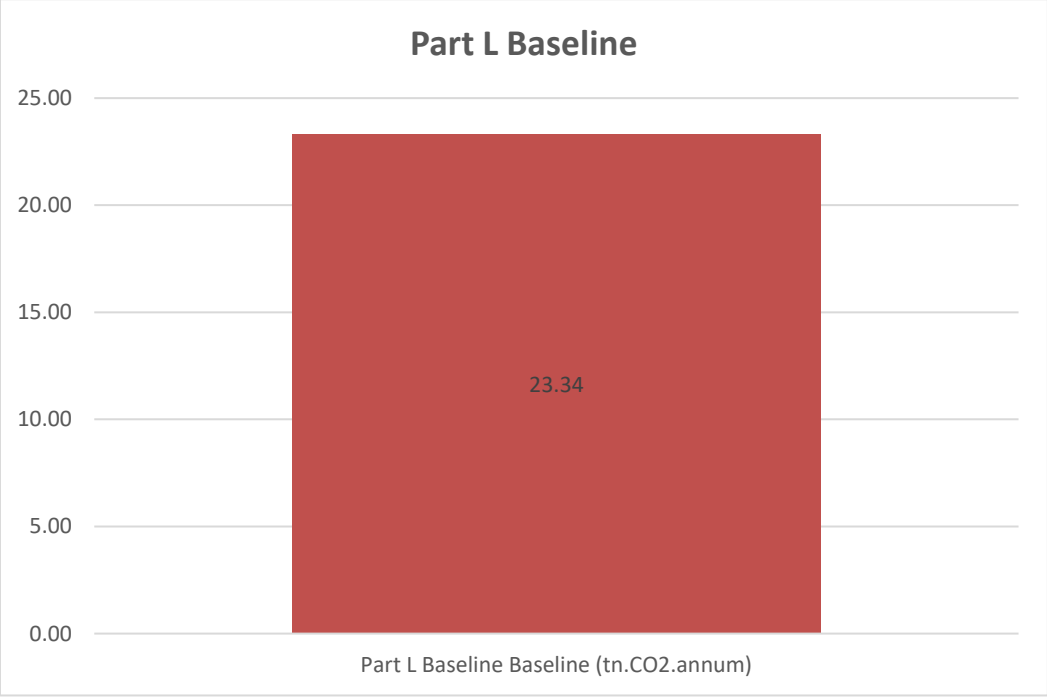

Fig 4.1 – Target CO_2 emissions

Applying the London Plan Energy Hierarchy: Stage 1 – Be Lean

4.10 The London Plan outlines a 'fabric first' approach to reducing the carbon footprint of London's built environment. This is achieved through buildings using less energy by improving u-values, air-tightness and lighting efficiency amongst others. This is the first step to consider in reducing a building's carbon emissions before the efficient delivery of power, heat or renewables are considered by a design team.

Fabric Efficiency

4.11 U-Values, are used to measure how effective elements of a buildings fabric are as insulators. That is, how effective they are at preventing heat from transmitting between the inside and the outside of a building. Very broadly, the better (i.e. lower) the U-value of a buildings fabric, the less energy is required to maintain comfortable conditions inside the building. The following U-Values are proposed for the development;

Table 4.2 – Proposed U-Values

Elements	New Building Elements: U-Values – W/m² K	Comment
External Wall	0.18	n/a
Partition Wall	0.26	Walls adjoining to unheated warehouse
Mezzanine Floor	0.22	Floor above unheated warehouse
Ground Floor	0.14	n/a
Roof	0.14	n/a
External Windows	1.4	G-value 0.4 assumed Light Transmittance 0.65 assumed
Rooflights	1.3	G-value 0.3 assumed Light Transmittance 0.6 assumed
Vehicle Access Doors	1.3	n/a
External Solid Doors	1.3	n/a

Air Permeability

4.12 The designed Air Permeability Rate (APR) has been set at 5 $m^3/h.m^2$ @ 50Pa for the entire development.

Lighting Strategy

4.13 This energy demand will be limited by the application of more efficient lighting, photocell daylight control and use of LED lighting throughout. The following lighting design requirements are therefore stipulated;

Table 4.3 –Lighting Datasheet

Lighting zone	Luminaire Lumens / Circuit Watt	Light Output Ratio	Photocell Dimming (Parasitic Power – W/m²)	Occupancy Sensing (Parasitic Power – w/m²)
Offices	115	1	Yes (0.1)	Yes (0.1)
Ancillary Areas (Stairwell/WC/Store)	115	1	No	Yes (0.1)
Warehouse Areas	150	1	Yes (0.1)	Yes (0.1)

Ventilation Strategy

4.14 The ventilation strategy will be designed to meet with occupant and client requirements across the activity zones in the development, whilst maintaining the energy efficiency needed to lower carbon emissions. The following strategy is proposed:

Table 4.4 – Summary of Ventilation Strategy

Ventilation Zone	System	Specific Fan Power	Heat Recovery (Efficiency)
Office	Supply/Extract AHU	1.4	85%
WC	Extract Only (Remote)	0.3	No

Space & Water Heating

4.15 In line with the 'GLA guidance on preparing Energy Assessments', the heating strategy will include low carbon and/or renewable technologies, the CO_2 emission improvements of these are accounted for in the 'Be Clean' and 'Be Green' stages of the energy hierarchy.

4.16 To demonstrate improvements at the 'Be Lean' stage the notional building system type and performance values specified in Part L 2021 baseline have been used. In the office area, served by an Air Source Heat Pump, a system coefficient of performance (SCOP) of 2.64 has been used.

4.17 The direct electric point of use domestic hot water (DHW) system, and areas serviced by direct electric panel heaters have used an SCOP of 1 at the 'Be Lean' stage.

Be Lean Stage CO_2 Reductions

4.18 The following tables and graphs represent the Be-Lean improvements for the proposed development over the Target Emission Rate (TER) baseline emissions – calculated using SAP 10.2 emission factor. In line with the GLA's energy assessment guidance (2022), the electricity generated by solar PV in the notional building has been discounted at the 'Be Lean' stage.

Table 4.5 – Be-Lean Emissions

Unit	Total Floor Area (m^2)	BER	Total CO2 (tn.CO2.yr) – (- Notional PV)	BPER	Total Building Primary Energy (kWh.yr) (- Notional PV)
Island Site Units 1&2	2,896.3	7.63	19.75	81.8	218,642
		Difference over Baseline	3.6		32,120
		% Difference	**15%**		**13%**

4.19 As detailed above, the measures as taken at 'Be-Lean' stage would result in a **15%** reduction in regulated CO_2 emissions over the Part L 2021 Target Emission Rate.

4.20 The development complies with Policy SI 2 of the London Plan (2021), which mandates a minimum of 15% 'Be-Lean' savings. Analysing data from table 4.5 on Be-Lean emissions reveals that the development achieves an 15% improvement.

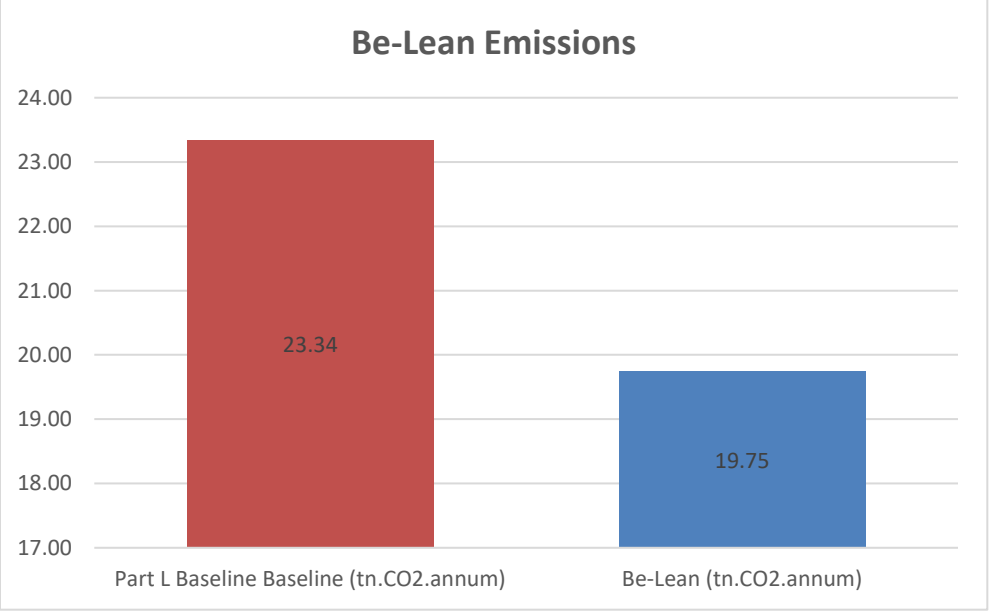

Fig 4.2 – Be-Lean Stage Reductions

Applying the London Plan Energy Hierarchy: Stage 2 – Be Clean

4.21 Policy DMEI 2 of the Hillingdon Local Plan requires all major developments to be designed to connect to a District Energy Network, and to connect to ones within 500m of the development.

Connection to existing heating or cooling networks

4.22 As indicated by the London heat map displaying the site and nearby existing/proposed heat centres available to the site, 'Uxbridge and Brunel Uni' (Proposed) is the closest one, situated approximately 1,477 meters away. As this proposed network is over 500m away from the proposed development, no plans to connect with to this network are taking place, in line with Policy DMEI 2 point C of the Hillingdon Local Plan.

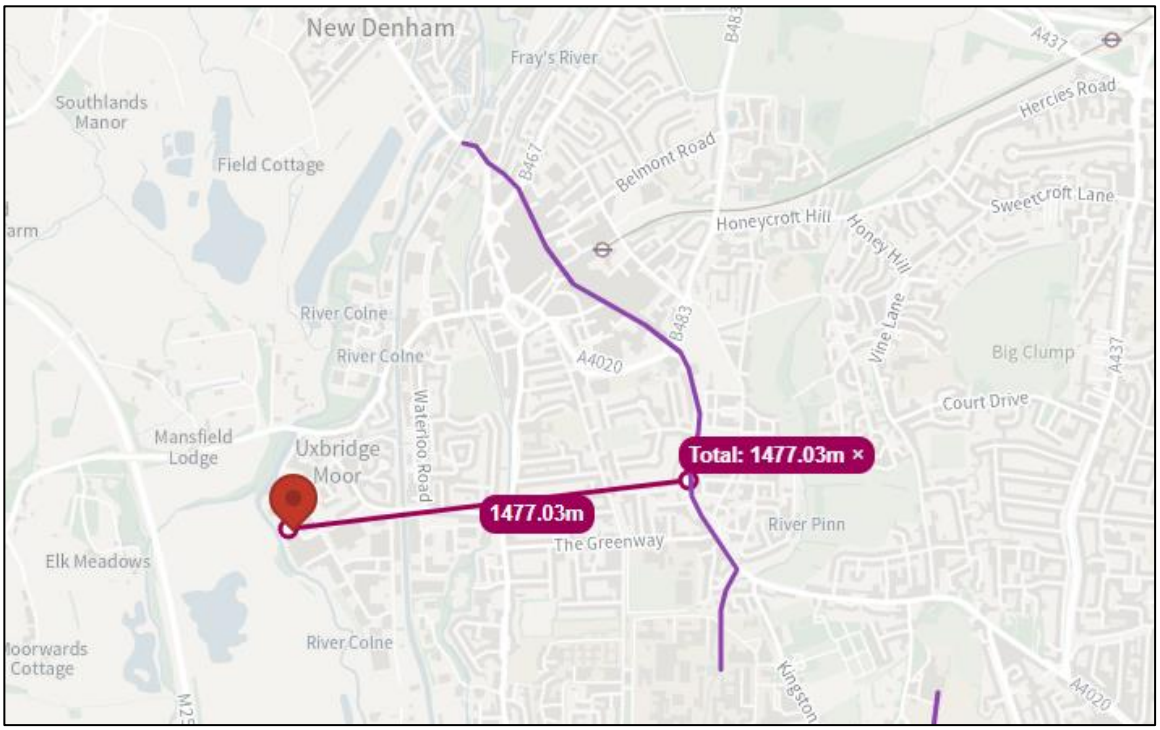

Fig 4.3- Local Heat Map

Applying the London Plan Energy Hierarchy: Stage 3 – Be Green

4.23 An analysis of low carbon/renewable technologies was undertaken to determine which would be suitable for application in a development of this size and nature. This determined that the renewable systems deemed to be the most suitable for the development is the use of air-source heat pumps providing renewable heating to the office areas, and roof mounted PV.

Low-Carbon/Renewable Technology System 1 – Air-Source Heat Pumps

4.24 The first low-carbon/renewable energy proposed for the development is an air-source heat pump (ASHP) serving the office areas within the building. ASHPs with the following specifications have been assumed:

- The proposed ASHP is a conventional VRF air source heat pump system and will serve the office areas;
- The ASHP will be selected to operate on R32 or R410a which is an F-Gas compliant refrigerant;
- Cooling plant will have a minimum Energy Efficiency Ratio (EER) of 5 [1] and SEER of 7;
- The ASHP will have a minimum COP of 4.0 for heating;
- HVAC system controls installed will be operating efficiently and to include automatic monitoring and targeting with alarms for out of range values as well as local time and temperature control.

4.25 The back-of-house heating (as detailed in the Be-Lean section) will consist of heating provided by an direct electric panel heaters. Hot water will be provided by instantaneous point-of-use systems.

Low-Carbon/Renewable Technology System 2 – PV (Photovoltaic) Array

4.26 The second low-carbon/renewable energy proposed for the development is a Photovoltaic (PV) array. The proposed PV will be roof mounted. The building design will provide suitable penetrations /risers to allow the roof mounted inverter to be wired back to a distribution board and G59 intake meter arrangement.

4.27 Included in the table below is a break-down of the proposed PV array:

Table 4.14 – PV Array Details

Unit	PV kWp	PV No Panels	PV Area in m^2	PV Generation in (Kwh.annum)
1&2	75	174	340	58,331

4.28 This energy assessment has identified a roof mounted PV array of 75 kWp will generate 58,331 kWh [2] of renewable electricity per annum and will result in a reduction of 7,509 kg CO_2 per annum (calculated using GLA Spreadsheet).

[1] No EER available on system selection at present. To be ratified at detail-design.
[2] This is the generation requirement of the PV to be provided to PV manufacturers

4.29 The energy assessment assumed 174 no. 430 Watt PV panels, each measuring 1722mm (l) x 1134mm (w).

Be-Green CO_2 Reductions

4.30 The following tables and graphs represent the Be-Green improvements for the development over the Target Emission Rate (TER) baseline emissions, calculated using SAP 10 emission factors:

Table 4.15 –Be-Green Improvement over TER

Unit	Total Floor Area (m^2)	BER	Total CO_2 ($tn.CO_2.yr$)	BPER	Total Building Primary Energy (kWh.yr)
Unit 1 A & B	2,896.3	5.07	14.68	52.60	150,781
		Be-Green Savings	5.06		67,860
		% Difference	**22%**		**31%**
		Difference over Baseline	8.66		99,980
		% Difference	**37%**		**40%**

4.31 As detailed above, the measures as taken at this stage would result in a **37%** reduction in the new-build regulated CO_2 emissions over the Building Regulations Part L 2021 Target Emission Rate, calculated using GLA Spreadsheet , thereby in compliance with the requirements of Policy DMEI 2 of the London Borough of Hillingdon Local Plan.

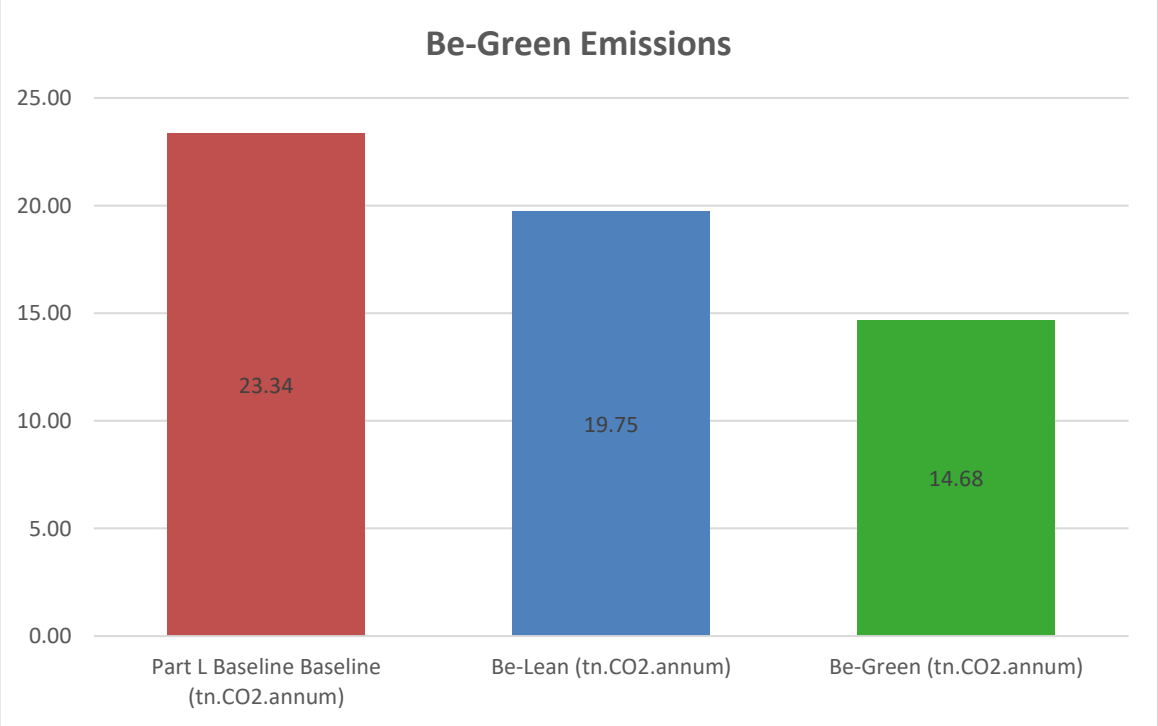

Fig 4.4 –Be-Green Reductions

Final CO_2 Reduction Charts & Carbon Offset Payment

4.32 In accordance with the 'GLA guidance on preparing energy assessments', the final carbon emissions and predicted savings are presented below for the entire development. Also included is the predicted carbon offset payment for the development. The final table represents the site wide regulated carbon dioxide emissions and savings.

Table 4.16 – Final CO_2 reductions

	Carbon Dioxide Emissions for non-domestic buildings (Tonnes CO_2 per annum)	
Baseline: Part L 2021 of the Building Regulations Compliant Development	23.3	
After energy demand reduction	19.7	
After heat network / CHP	19.7	
After renewable energy	14.7	
	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	**(%)**
Savings from energy demand reduction	3.6	15%
Savings from heat network / CHP	0.0	0%
Savings from renewable energy	5.1	22%
Cumulative on-site savings	8.7	37%
Annual Savings from off-set payment	14.7	-
(Tonnes CO2)		
Cumulative savings for off-set payment (over 30 Years)	441	-
Carbon offset Payment (£95 per tonne)	**£41,895**	-

4.33 In order to bring the development carbon savings up to 100%, the remaining carbon emissions are to be offset through a carbon offset payment. As detailed above, the carbon offset payment, priced at £95 per tonne of CO_2 per year (over 30 years) to be paid via a S106 to LB Hillingdon is **£41,895.**

5 CONCLUSION

5.1 Envision has been appointed by Globe Exhibitions Limited (the Applicant) to produce a Sustainability and Energy Statement incorporating a BREEAM review in support of a full planning application for the demolition of the existing mixed-use industrial buildings which are in poor condition and the creation of 2no. new larger units, to suit modern tenant requirements, continuing with the same use class as flexible light industrial (Class E(g)(iii), general industrial (Class B2) and storage/distribution (Class B8).

5.2 The servicing and car parking will be reconfigured along with the relocation of the existing centrally located substation. This will provide better access & circulation for the new industrial units.

5.3 The most relevant policy when considering the energy and sustainability of the application are Policy DMEI 2 (Reducing Carbon Emissions) and Policy DMEI 3 (Dencentralised Energy) of the LB Hillingdon Local Plan.

9. The scheme will deliver a series of sustainability measures which are compatible LB Hillingdon's requirements for sustainable design and construction. Section 3 contains a sustainability statement which covers the following topics:

- The development will affect habitats of negligible ecological importance. The enhancements and habitat creation proposed, including native species planting, will provide additional opportunities for biodiversity within the site.
- Based on the Air Quality Neutral assessment results, the impact of the proposed development with regards to the current relevant air quality objectives was considered to be not significant
- Water conservation measures including water efficient fittings throughout including dual flush WCs, efficiency measures on taps and showers
- Predicted delivery activity noise levels will be significantly below the existing background and ambient noise climate. The proposed development will be will be at least 9dB below the WHO night noise guideline value.
- Sustainable transport measures will be encouraged on site, including provision of cycling parking and promotion of cycling and walking
- The site lies in Flood Zone 1 (Low Risk). It was also found that the site has a low risk of flooding from surface water flooding.
- Simple Index Approach analysis concluded that the treatment train proposed for the SuDS strategy is adequate for the pollution hazard indices generated.

5.4 In addition, the measures as detailed in Section 4 of this report will deliver:

- A **15%** reduction in CO_2 emissions beyond a Part L 2021 baseline at the **'Be Lean'** Stage;

- Overall reduction, at the **'Be Green'** stage, in CO2 emissions beyond a Part L 2021 baseline of **37%;**
- The remaining carbo emissions will be offset via a carbon offset payment, priced at £95 per tonne of CO_2 per year (over 30 years) to be paid via a S106 to LB Hillingdon, totalling **£41,895.**

APPENDIX I – BRUKLS FOR DEVELOPMENT

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Island Site - Be Lean

As designed

Date: Fri Sep 27 10:48:41 2024

Administrative information

Building Details

Address:

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews Fitzrovia, London, W1T 1AF

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.2.0

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

Foundation area [m²]: 319.49

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	8.06	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	7.63	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	86.58	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	81.8	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.29	1.64	01. FF 1 - Open Office_P_8
Floors	0.18	0.17	0.22	01. FF 1 - Open Office_F_14
Pitched roofs	0.16	0.14	0.14	01. FF 1 - Open Office_R_5
Flat roofs	0.18	0.14	0.14	01. FF 1 - Open Office_R_3
Windows** and roof windows	1.6	1.4	1.4	01. FF 1 - Open Office_G_11
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.3	1.3	00. GF 1 - Stairs_D_9
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

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

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

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

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

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	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- Be Lean SplitSys

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	7	-	-	-
Standard value	2.5*	N/A	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.					

2- Panel Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Point of Use

	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
01. FF 1 - Open Office	-	-	-	-	1.4	-	-	-	-	0.85	N/A
01. FF 2 - Open Office	-	-	-	-	1.4	-	-	-	-	0.85	N/A
00. GF 1 - Circulation 1	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - Changing w Showers	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 1 - WCs 1	-	-	0.3	-	-	-	-	-	-	-	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
01. FF 1 - WCs	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 1 - WCs 2	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 1 - WCs 3	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - Changing w Showers	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs 1	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs 2	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs 3	-	-	0.3	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
00. GF 1 - Unit 1	150	-	-
01. FF 1 - Plant	115	-	-
00. GF 2 - Unit 2	150	-	-
01. FF 2 - Plant	115	-	-
01. FF 1 - Open Office	115	-	-
01. FF 2 - Open Office	115	-	-
00. GF 1 - Circulation 1	115	-	-
00. GF 1 - Cupboard	115	-	-
00. GF 1 - Stairs	115	-	-
00. GF 1 - Lift	115	-	-
00. GF 1 - Circulation	115	-	-
00. GF 1 - WC 1	115	-	-
00. GF 1 - Changing w Showers	115	-	-
00. GF 1 - WC 2	115	-	-
00. GF 1 - WC	115	-	-
01. FF 1 - Lift	115	-	-
01. FF 1 - Circulation	115	-	-
01. FF 1 - WCs 1	115	-	-
01. FF 1 - WCs	115	-	-
01. FF 1 - Stairs	115	-	-
01. FF 1 - WCs 2	115	-	-
01. FF 1 - WCs 3	115	-	-
00. GF 2 - Circulation 1	115	-	-
00. GF 2 - Cupboard	115	-	-
00. GF 2 - Stairs	115	-	-
00. GF 2 - Lift	115	-	-
00. GF 2 - Circulation	115	-	-
00. GF 2 - WC 1	115	-	-

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
00. GF 2 - Changing w Showers	115	-	-
00. GF 2 - WC 2	115	-	-
00. GF 2 - WC	115	-	-
01. FF 2 - Lift	115	-	-
01. FF 2 - Circulation	115	-	-
01. FF 2 - WCs 1	115	-	-
01. FF 2 - WCs	115	-	-
01. FF 2 - Stairs	115	-	-
01. FF 2 - WCs 2	115	-	-
01. FF 2 - WCs 3	115	-	-

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?
00. GF 1 - Unit 1	NO (-48.7%)	NO
00. GF 2 - Unit 2	NO (-48.7%)	NO
01. FF 1 - Open Office	NO (-6.8%)	NO
01. FF 2 - Open Office	NO (-6.8%)	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]	2896.3	2896.3
External area [m^2]	8444.5	8444.5
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	2816.52	2594.91
Average U-value [W/m^2K]	0.33	0.31
Alpha value* [%]	5.57	29.25

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

Building Use

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

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

	Actual	Notional
Heating	13.97	9.08
Cooling	0.64	0.8
Auxiliary	0.79	0.89
Lighting	5.66	5.41
Hot water	32.53	48.49
Equipment*	31.21	31.21
TOTAL**	**53.58**	**64.67**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	0	6.31
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*6.31*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	218.02	269.62
Primary energy [kWh_{PE}/m^2]	81.8	86.58
Total emissions [kg/m^2]	7.63	8.06

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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	163.5	40.1	0	0	0	0	0	0	0
	Notional	177.8	78.8	0	0	0	0	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	63.1	132.8	7.1	7.4	5.8	2.46	4.97	2.64	7
	Notional	89.7	147.4	9.4	9.3	3.8	2.64	4.4	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	285	30.3	99	0	2.1	0.8	0	1	0
	Notional	295.4	70.3	61.2	0	4.2	1.34	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Island Site - Be Green

As designed

Date: Fri Sep 27 10:50:25 2024

Administrative information

Building Details

Address:

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews Fitzrovia, London, W1T 1AF

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.2.0

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

Foundation area [m²]: 319.49

The CO_2 emission and primary energy rates of the building must not exceed the targets

Target CO_2 emission rate (TER), $kgCO_2/m^2annum$	8.06	
Building CO_2 emission rate (BER), $kgCO_2/m^2annum$	5.07	
Target primary energy rate (TPER), kWh_{PE}/m^2annum	86.58	
Building primary energy rate (BPER), kWh_{PE}/m^2annum	52.06	
Do the building's emission and primary energy rates exceed the targets?	BER =< TER	BPER =< TPER

The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

Fabric element	$U_{a\text{-}Limit}$	$U_{a\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.29	1.64	01. FF 1 - Open Office_P_8
Floors	0.18	0.17	0.22	01. FF 1 - Open Office_F_14
Pitched roofs	0.16	0.14	0.14	01. FF 1 - Open Office_R_5
Flat roofs	0.18	0.14	0.14	01. FF 1 - Open Office_R_3
Windows** and roof windows	1.6	1.4	1.4	01. FF 1 - Open Office_G_11
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.3	1.3	00. GF 1 - Stairs_D_9
Vehicle access & similar large doors	1.3	-	-	No external vehicle access doors
High usage entrance doors	3	-	-	No external high usage entrance doors

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

$U_{a\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m²K)]

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

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

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

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

Air permeability	Limiting standard	This building
$m^3/(h.m^2)$ at 50 Pa	8	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- Be Green SplitSys

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	4	7	-	-	-
Standard value	2.5*	N/A	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.					

2- Panel Heaters

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

1- Point of Use

	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**
01. FF 1 - Open Office	-	-	-	-	1.4	-	-	-	-	0.85	N/A
01. FF 2 - Open Office	-	-	-	-	1.4	-	-	-	-	0.85	N/A
00. GF 1 - Circulation 1	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - Changing w Showers	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 1 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 1 - WCs 1	-	-	0.3	-	-	-	-	-	-	-	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
01. FF 1 - WCs	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 1 - WCs 2	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 1 - WCs 3	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - Changing w Showers	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
00. GF 2 - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs 1	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs 2	-	-	0.3	-	-	-	-	-	-	-	N/A
01. FF 2 - WCs 3	-	-	0.3	-	-	-	-	-	-	-	N/A

General lighting and display lighting	General luminaire	Display light source	
Zone name	Efficacy [lm/W]	Efficacy [lm/W]	Power density [W/m²]
Standard value	95	80	0.3
00. GF 1 - Unit 1	150	-	-
01. FF 1 - Plant	115	-	-
00. GF 2 - Unit 2	150	-	-
01. FF 2 - Plant	115	-	-
01. FF 1 - Open Office	115	-	-
01. FF 2 - Open Office	115	-	-
00. GF 1 - Circulation 1	115	-	-
00. GF 1 - Cupboard	115	-	-
00. GF 1 - Stairs	115	-	-
00. GF 1 - Lift	115	-	-
00. GF 1 - Circulation	115	-	-
00. GF 1 - WC 1	115	-	-
00. GF 1 - Changing w Showers	115	-	-
00. GF 1 - WC 2	115	-	-
00. GF 1 - WC	115	-	-
01. FF 1 - Lift	115	-	-
01. FF 1 - Circulation	115	-	-
01. FF 1 - WCs 1	115	-	-
01. FF 1 - WCs	115	-	-
01. FF 1 - Stairs	115	-	-
01. FF 1 - WCs 2	115	-	-
01. FF 1 - WCs 3	115	-	-
00. GF 2 - Circulation 1	115	-	-
00. GF 2 - Cupboard	115	-	-
00. GF 2 - Stairs	115	-	-
00. GF 2 - Lift	115	-	-
00. GF 2 - Circulation	115	-	-
00. GF 2 - WC 1	115	-	-

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
00. GF 2 - Changing w Showers	115	-	-
00. GF 2 - WC 2	115	-	-
00. GF 2 - WC	115	-	-
01. FF 2 - Lift	115	-	-
01. FF 2 - Circulation	115	-	-
01. FF 2 - WCs 1	115	-	-
01. FF 2 - WCs	115	-	-
01. FF 2 - Stairs	115	-	-
01. FF 2 - WCs 2	115	-	-
01. FF 2 - WCs 3	115	-	-

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?
00. GF 1 - Unit 1	NO (-48.7%)	NO
00. GF 2 - Unit 2	NO (-48.7%)	NO
01. FF 1 - Open Office	NO (-6.8%)	NO
01. FF 2 - Open Office	NO (-6.8%)	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]	2896.3	2896.3
External area [m^2]	8444.5	8444.5
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	5	5
Average conductance [W/K]	2816.52	2594.91
Average U-value [W/m^2K]	0.33	0.31
Alpha value* [%]	5.57	29.25

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

Building Use

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

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

	Actual	Notional
Heating	13.76	9.08
Cooling	0.64	0.8
Auxiliary	0.79	0.89
Lighting	5.66	5.41
Hot water	32.53	48.49
Equipment*	31.21	31.21
TOTAL**	**53.38**	**64.67**

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

Energy Production by Technology [kWh/m^2]

	Actual	Notional
Photovoltaic systems	20.14	6.31
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*20.14*	*6.31*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	218.02	269.62
Primary energy [kWh_{PE}/m^2]	52.06	86.58
Total emissions [kg/m^2]	5.07	8.06

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 SSEEF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] No Heating or Cooling										
	Actual	163.5	40.1	0	0	0	0	0	0	0
	Notional	177.8	78.8	0	0	0	0	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	63.1	132.8	4.7	7.4	5.8	3.73	4.97	4	7
	Notional	89.7	147.4	9.4	9.3	3.8	2.64	4.4	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	285	30.3	99	0	2.1	0.8	0	1	0
	Notional	295.4	70.3	61.2	0	4.2	1.34	0	----	----

Key to terms

Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

APPENDIX II – GLA CALCULATION SPREADSHEET

NON-RESIDENTIAL CO_2 ANALYSIS (PART L2)

					Baseline		'Be Lean'	'Be Clean'	'Be Green'			Baseline		'Be Lean'			'Be Clean'			'Be Green'	
	Building Use	Model Area	Number of units	Total area represented by model	BRUKL TER	BRUKL Displaced electricity (-)	BRUKL BER	BRUKL BER	BRUKL BER			Part L 2021 CO_2 emissions	Energy saving/generation technologies	Part L 2021 CO_2 emissions	Part L 2021 CO_2 emissions with Notional PV savings	'Be Lean' savings	Part L 2021 CO_2 emissions	Part L 2021 CO_2 emissions with Notional PV savings	'Be Clean' savings	Part L 2021 CO_2 emissions	'Be Green' savings
		(m²)		(m²)	($kgCO_2$ / m²)	(kWh / m²)	($kgCO_2$ / m²)	($kgCO_2$ / m²)	($kgCO_2$ / m²)			($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)	($kgCO_2$ p.a.)
	ISU	2896.3	1	2896.3	8.06	-6.31	7.63	7.63	5.07			23,344	-2,352.88	22,098.77	19,746	3,598	22,099	19,746	0	14,684	5,062
	Sum		1	2,896	8.1	-6.3	7.6	7.6	5.1			*23,344*	*-2,353*	*22,098*	*19,746*	*3,598*	*22,098*	*19,746*	*0*	*14,684*	*5,062*
	SITE-WIDE ENERGY CONSUMPTION AND CO_2 ANALYSIS																				
	Total Sum			2,896	-	-	-	-	-			*23,344*	*-2,353*	*22,098*	*19,746*	*3,598*	*22,098*	*19,746*	*0*	*14,684*	*5,062*

	Carbon Dioxide Emissions for non-residential buildings (Tonnes CO_2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2021 of the Building Regulations Compliant Development	23.3	
After energy demand reduction (be lean)	19.7	
After heat network connection (be clean)	19.7	
After renewable energy (be green)	14.7	

	Regulated non-residential carbon dioxide savings	
	Tonnes CO_2 per annum	(%)
Be lean: savings from energy demand reduction	3.6	15%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	5.1	22%
Total Cumulative Savings	**8.7**	**37%**
Annual savings from off-set payment	14.7	-
	(Tonnes CO_2)	
Cumulative savings for off-set payment	**441**	-
Cash in-lieu contribution (£)	**41,850**	