Energy Report

14 Blackburn Road

Report Prepared for:

Issue Date: 24.03.2023

IN2 Project. No.: L22014

Rev.01

Revision History

Date	Revision	Description
21.03.2023	00	Draft issue
24.03.2023	01	Updated Post NRF Comments

Registered Office: 52 Elmwood Avenue, Belfast, Bt96az, Northern Ireland.

Company Registration No.: NI069190

Contents

1.0 The Application

This Energy Strategy, prepared by IN2 Engineering, is submitted on behalf of Hampstead Asset Management Ltd ('HAML') and Builder Depot Limited ('BDL') (together 'the Applicant') to accompany an application for full planning permission for the development at 14 Blackburn Road, London, SW6 1RZ ('the Site').

1.1 The Proposed Site

The Site is occupied by various warehouses (between one and two storeys). The Site is bound along its northern edge by Blackburn Road and railway land to the south (serving the Metropolitan and Jubilee lines between West Hampstead Underground Station and Finchley Road). The West Hampstead Underground Station, together with retail facing on to West End Lane, lies to the west of the Site.

Opposite the site are a number of developments, including the part 6 part 8 storey iQ Student Accommodation (at Haywood House, Blackburn Road), the three storey Clockwork Factory, as well as five x three storey residential properties closer to the West End Lane end of Blackburn Road. The Clockwork Factory is subject to a new planning application, which seeks consent for three residential buildings of up to nine storeys in height.

To the northeast, the Site is bound by a pocket of industrial land and two commercial units owned and operated by Audi. Further to the east of the Site comprises the O2 Shopping Centre, which contains a mix of uses including retail units, community uses and restaurants, two large commercial superstores and associated car parking.

The Site contains no listed buildings and is not within a Conservation Area however it neighbours the South Hampstead Conservation Area, located to the south of the Site. Although not currently an allocated site, the Site sits within the West Hampstead Interchange Area and a Call for Sites application has been submitted.

The Site has the benefit of an implemented scheme, consented in 2004 under planning permission with reference PWX0202103 dated 6 January 2004 (the '2004 Permission'), which will provide 14 residential units within a western block, as well as a four storey eastern block, comprising two storeys of warehouse floorspace and two storeys of office floorspace (the 'Implemented Development').

To add three additional floors of commercial floorspace to the eastern block forming part of the Implemented Development, the Applicant seeks full planning permission for the following description of development (herein 'the Proposed Development'):

"The erection of three floors of commercial floorspace (Use Class Eg), together with cycle parking, and associated works."

In tandem, the Applicant has submitted a section 73 application to alter conditions attached to the 2004 Permission to substitute certain drawings authorised by the 2004 Permission in order to provide for the additional three storeys to be constructed on the eastern block as part of the Proposed Development. The section 73 application also seeks consent for certain internal changes within the eastern block to suit the Applicant's operational needs, as well as improvements to external fenestration. . The description of development for the section 73 application is as follows:

"Variation of Condition 2 (approved plans) pursuant to planning permission [PWX0202103] dated 06.01.2004 for Redevelopment of whole site by the erection of a 4 storey eastern block comprising two Class B8 and eight Class B1 units with associated service yard, together with a 4 storey plus basement western block comprising 8 dwellinghouses and 6 self-contained flats with associated underground car parking. Changes include: revisions to ground floor elevation and roof plan" (referred to as the 'S73 Development').

This Energy Report has been prepared in support of the application for full planning permission and the section 73 application. It does not, however, consider the western (residential) block, as this is to remain as consented by the 2004 Permission, save for minor changes. Please see the submitted Design and Access Statement for further details. References in this report to the "Development" are references to the eastern block forming part of the section 73 Development and the Proposed Development.

Figure 1.1 Existing Site

1.2 Aim

The aim of this Energy Strategy is to detail a robust energy demand reduction and supply strategy to enable the Development to meet the policy targets.

1.3 Approach

This Energy Strategy follows the Mayor of London's energy hierarchy (London Plan (2021)): 'Be Lean, Be Clean, Be Green'.

The strategic approach to the design of the Development has been to reduce demand for energy prior to the consideration of integrating Low or Zero Carbon (LZC) technologies, since controlling demand is the most effective way of reducing energy requirements and CO2 emissions.

Calculations demonstrating the energy requirements and associated CO2 have been carried out using EDSL TAs which is approved for use when carrying out calculation for Building Regulation compliance.

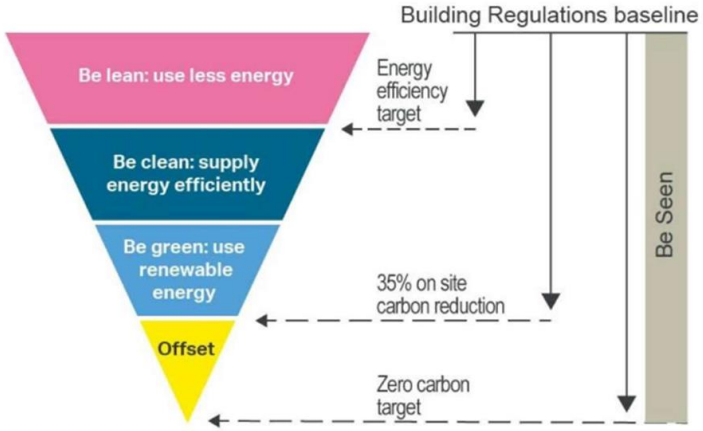


Figure 1.2 Energy Hierarchy

2.0 Approach to carbon reduction

2.1 Energy Strategy

This energy strategy summarises the relevant planning policies and requirements applicable to the Development in relation to energy and carbon emissions. Of these, the main target is to achieve a reduction in regulated CO2 emissions of 35% or greater beyond the requirements of the Building Regulations Part L on site and 'Zero Carbon' (100% reduction in regulated CO2 emissions with carbon offsetting) as set out in the GLA guidance on preparing energy assessments and the GLA Sustainable Design and Construction SPG.

2.2 Appraisals

The Development has been assessed to determine the estimated regulated energy requirements and associated carbon emissions.

2.3 Baseline

Baseline carbon emissions set out by Part L 2021 of the Building Regulations are expressed as Target Emissions Rate (TER), calculated within the Tas software. This is the baseline figure to which the proposed buildings carbon emissions for Lean, Clean and Green are compared against using the Dwelling Emission Rate (DER) for each stage. The TER from the final proposed building is used as the baseline figure.

2.4 Be Lean

A range of passive design and energy efficiency measures have been incorporated into the Development to optimise the balance between beneficial winter solar gains and summer comfort, while maximising internal daylight levels. These include:

- Suitable glazing ratio and glass g-value to balance heat losses, heat gains and daylight ingress.
- Fabric insulation levels achieving improvements over Building Regulations Part L (2021) minimum standards.
- Fabric air permeability improvement upon Building Regulations Part L (2021) minimum standards.
- Insulated pipework and ductwork (and air sealing to ductwork) to minimise losses and gains.
- Variable speed pumps and fans to minimise energy consumption of services distribution.

It is anticipated that these measures will achieve a 24% reduction in site-wide regulated CO2 emissions beyond the requirements of the Building Regulations Part L (2021) 'baseline'.

Therefore, the Development is anticipated to achieve carbon emissions below the Building Regulations Part L (2021) baseline, through passive design and energy efficiency measures, i.e. before the inclusion of any Low or Zero Carbon (LZC) technologies.

2.5 Be Clean

No existing heat network is available for consideration. Therefore, the reduction remains the same as seen in "Be Lean". Communication has been initiated with the London Borough of Camden to confirm the lack of existing networks as can be seen in Appendix D.

2.6 Be Green

An all-electric heat pump solution is being implemented in line with the decarbonisation of the grid and provides a 2% reduction in carbon emissions.

The use of all electric heat pump plant will mean there is no onsite combustion of fossil fuels meaning there will be no air quality impact from the heating systems and as a result the site will not produce any NOx.

The potential for incorporating further renewable energy systems has been reviewed and photovoltaic (PV) panels are expected to be able to achieve significant additional CO2 savings. PV achieves a further 9% in CO2 emissions reductions due to the significant amount of roof area available.

When combining the PV savings with those from the use of air source heat pump plant a total green saving of 11% is achieved.

In order to follow the mayor's energy hierarchy, priority will be given to systems that would not displace loads from heat pump systems.

Beyond Part L compliance and regulated emissions, opportunities will be sought to encourage a reduction of non-regulated emissions in practice through measures such as metering, displays and controls.

Combining the lean and green savings gives rise to an overall reduction in regulated carbon emissions of 35% for the site. This impressive reduction is thanks to the significant amount of roof area available for PV in addition to provisions of heat pump systems. The scheme is also low rise and as such performs much better than high-rise, high-density schemes with much larger energy requirements

2.7 Be Seen

Metering provisions are confirmed in this report. Data will be gathered at practical completion and annually in operation for at least 5 years. The operator will either seek permission to gather aggregated metered data on a yearly basis or; The operator will gather data from an upstream meter, with the permission and assistance of the distribution network operator. The operator will provide data as required and upload to the GLA's portal at appropriate stages.

Full GLA Be Seen spreadsheet can be seen in Appendix C and is also submitted alongside this report.

2.8 Cost reduction

As described throughout this report, a range of energy efficiency measures have been implemented which keep energy demand and therefore operational costs down (high performance fabric and services for example)

The developer will ensure the prices are fair and transparent, with tariff options considered and provided, including the option of pre-payment meters as applicable.

3.0 Policies, Guides and Regulations

3.1 Current Policy Framework

The policies considered when preparing this strategy are contained in the London Plan (Greater London Authorities (GLA)) and the Local Plan documents of the London Borough of Camden.

3.2 Building Regulations Part L 2021

The assessment of the Development against policy targets has been carried out using Part L 2021 benchmarks.
The Building Regulations Part L (2021) requires that the building as designed is not anticipated to generate CO2 emissions in excess of that set by a Target Emission Rate (TER) calculated in accordance with the approved National Calculation Methodology (NCM).
Upper limits are placed on the efficiency of controlled fittings and services for example, an upper limit to an external wall U-value of 0.26W/m2.K (new non-domestic buildings).
The Building Regulations Part L (2021) also requires that spaces are not subject to excessive solar gains. This is demonstrated using the procedure given in the NCM.

3.3 The London Plan

The below is a summary of London Plan policies for energy and CO2 emissions:
– Major development to be Net Zero Carbon (taken to mean a 100% reduction in regulated CO2 emissions from the relevant Building Regulations baseline).
– Minimum 35% on-site emissions reduction.
– Minimum 15% commercial / 10% residential reduction in regulated CO2 through energy efficiency measures (Be Lean stage).
– Demonstrate a pathway to Zero Carbon by 2050

Figure 3.1 Policy Documents

3.4 London Borough of Camden

In its Local Plan, the London borough of Camden has set required carbon dioxide emission reduction standards, outlined in the below figure 3.2 in line with the GLA plan.

Policy CC1 Climate change mitigation

The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.

We will:

a. promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
b. require all major development to demonstrate how London Plan targets for carbon dioxide emissions have been met;
c. ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks;
d. support and encourage sensitive energy efficiency improvements to existing buildings;
e. require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
f. expect all developments to optimise resource efficiency.

For decentralised energy networks, we will promote decentralised energy by:

g. working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them;
h. protecting existing decentralised energy networks (e.g. at Gower Street, Bloomsbury, King's Cross, Gospel Oak and Somers Town) and safeguarding potential network routes; and

Figure 3.2 -Camden Climate change Mitigation

The London Borough of Camden have also set out requirements to ensure that climate change adaptation is addressed at every stage of the design process.

Figure 3.3 -Camden Climate change Adaptation

3.5 Further documents considered.

The GLA Guidance on Preparing Energy Assessments
GLA Sustainable Design and Construction SPG (2014)

3.6 Approach and Methodology

The appraisals within this strategy are based on the Building Regulations Part L (2021) calculation methodology and should not be understood as a predictive assessment of likely future energy requirements.
Occupants may operate systems differently or the climate may be different from the assumptions made by Part L calculation methods, leading to differing energy requirements.

3.7 Energy Hierarchy

This strategy outlines how the Development will have a reduced impact on climate change by reducing CO2 emissions associated with energy use in buildings.
The Energy and CO2 appraisal is based on the approach in line with GLA policy.
The strategic approach to the design of the Development has been to reduce demand for energy prior to the consideration of integrating Low or Zero Carbon (LZC) technologies, since controlling demand is the most effective way of reducing energy requirements and CO2 emissions. Further reductions are ensured through the specification of high efficiency building services to limit losses in energy supply, storage and distribution.
After the inclusion of passive design and energy efficiency measures, various options have been investigated to reduce CO2 emissions associated with energy supply.
The feasibility of LZC technologies has been investigated in line with the policy aspirations and as part of the Energy Strategy submitted in support of the application.

3.8 Carbon Factors

The Part L (2021) and current GLA CO2 emission factors (Standard Assessment Procedure 10.2) have been used to calculate the CO2 emissions for the Development.

Fuel	SAP 10.2 - Emission Factor (kgCO2 /kWh)
Gas	0.21
Electricity	0.136

Figure 3.4: CO2 Emission Factors

3.9 Regulated and Unregulated Sources

Regulated energy sources are those controlled by the Building Regulations Part L, as follows:
• Space Heating
• Hot Water
• Space Cooling
• Lighting
• Auxiliary Loads (pumps, fans, and controls).

Unregulated energy includes small power electricity use (computers, plug in devices) and catering energy consumption. Currently, unregulated energy is not included within the Part L assessments but can form a significant part of overall energy consumption and CO2 emissions from developments.

Building users will be encouraged to reduce their equipment energy use, which could be provided in the form of building user guides and tenant's fit-out guides. In general, the Development will aspire to include the use of energy efficient appliances, for example:
•Highly rated white goods (EU Energy Efficiency Labelling Scheme);
• Energy efficient transportation systems
• Voltage optimisation and power factor correction.

3.10 Water Services Infrastructure

The water services infrastructure to the London Borough of Camden area is managed by Thames Water. The main contractor will apply for a new mains water connection for potable use if required. Potable water supply shall have a water meter accessible on the building perimeter for Affinity Water personnel meter reading with the fire main (if provided) will be an unmetered supply.

3.11 Fire Services Infrastructure

The fire infrastructure and strategy will be advised by the project fire consultants, including confirmation if there are any existing fire hydrants within 100metres of the site. Fire hydrant(s) will be required for fire brigade and dry/wet riser inlets.

4.0 Energy Calculations & Inputs

4.1 "Be Lean"

Estimated predicted energy demand and regulated carbon emissions for the Development were calculated using EDSL Tas software.

Baseline carbon emissions set out by Part L 2021 of the Building Regulations are expressed as Target Emissions Rate (TER), calculated within the Tas software. This is the baseline figure to which the proposed building's carbon emissions for Lean, Clean and Green are compared against using the Dwelling Emission Rate (DER) for each stage. The TER from the final proposed building is used as the baseline figure.

4.2 Passive Design Measures

Passive design and energy efficiency measures are prioritised to be designed into the Development to optimise the balance between beneficial winter solar gains and summer comfort, while maximising internal daylight levels. The U-values and air permeability rate have been designed to exceed the minimum requirements of the Building Regulations seen in figure 4.1.

4.3 "Be Clean"

The Development is providing an all-electric heat pump solution which achieves the best carbon emission reductions and is future proofed for zero carbon as the grid continues to decarbonise. No existing heat networks are in the immediate vicinity and as such has not been considered for connection. The proposed plant is centralised however and enables the Development to connect to any future heat networks as required e.g., by adding a heat exchanger in the plantrooms.

4.4 "Be Green"

The potential for incorporating further renewable energy systems have been reviewed details of which can be found in section 5, however this expected to lead to limited CO2 savings. In order to follow the mayors energy hierarchy, priority will be given to systems that would not displace loads from the selected heat pump systems.

Beyond Part L compliance and regulated emissions, opportunities will be sought to encourage a reduction of non-regulated emissions in practice through measures such as metering, displays and controls.

Element	Part L (2021) limiting factors	Proposed U-values assumptions(W/m_2K) (Subject to viability and buildability)
Roof	0.18	0.1
External Wall	0.26	0.13
Windows	1.6	1.2
Ground Floor	0.18	0.1

Figure 4.1 Part L and proposed U-values assumptions

Parameter	Non- Residential
Space Heating	High Eff Heat Pumps 350%
Hot water	High Eff Heat Pumps 350%
Lighting	Efficacy 150 lm/W
Ventilation	MVHR with HR efficiency 85%
Pipework & Ductwork Insulation	Yes
Variable Speed Pumping	Yes
Fabric Air Permeability (m3/(m2.h) at 50Pa)	3

Figure 4.2 Assumed service inputs.

5.0 LZC Selection

	Annual Regulated CO2 Emission Reduction	Notes	Suitable?
	% Beyond Part L "Baseline"		
CHP	-	The decarbonisation of the grid has made heat pumps a more suitable option over CHP	✗
CCHP	-	As above, CHP is no longer suitable for carbon savings	✗
District Energy Network	-	There is no nearby district energy network	✗
Photovoltaic (PV) Panels	9%	PV panels be included in the design. The area will be maximised with consideration of shading, plant etc. currently approx. 23 kWp / 125 sqm of PV is shown in the design pending information on export availability and final peak demand. PV array is expected to produce 3.47kWh/sqm of GIA	✓
Solar Thermal Heating	-	not considered appropriate as DHW demand is not significant, solar thermal would displace loads from the heat pumps and would generate excessive unused energy at the weekends etc.	✗
Wood Pellets Boiler	-	Due to local air quality issues as well as fuel delivery and storage, biomass is not considered appropriate.	✗
Ground Source Heat Pump	-	GSHPs are not considered appropriate as an imbalance could occur in the ground when this is not carefully managed. The loads for the building would require expensive, numerous energy piles.	✗
Air Source Heat Pump	2%	ASHPs are the recommended solution and align with industry best practice design standards.	✓
Horizontal axis wind turbine	-	Not suitable for the urban location.	✗

Figure 5.1 Suitable green technologies

6.0 Results

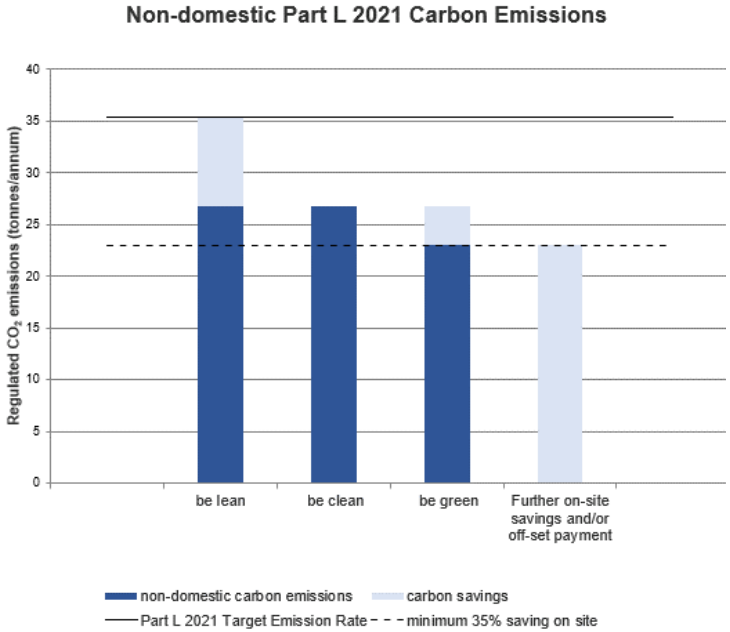
6.1 Overall CO2 Emissions Reduction

A summary of the anticipated CO2 emissions reduction at each step of the energy hierarchy is shown below.

An overall reduction in regulated CO2 emissions of 35% is expected to be achieved when accounting for the benefits of passive design and energy efficiency and clean heat generation from heat pumps this satisfies the criteria of the London plan 2021.

The energy demand table identifies the different regulated energy uses for the development and demonstrates that passive measures have been successful in limiting demand.

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Be lean: savings from energy demand reduction	8.6	24%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	3.8	11%
Total Cumulative Savings	**12.3**	**35%**



Energy Demand following energy efficiency measures (MWh/year)						
	Space Heating	Hot Water	Lighting	Auxiliary	Cooling	PV generated
Non-Domestic	1.6	7.7	35.2	96.8	51.8	26.7

7.0 Overheating

Overheating assessment has been carried for office and warehouse areas using TM52 criteria in line with the GLAs energy guidance. Warehouse spaces are not intended to be occupied for extended periods

7.1 Summary

The analysis concluded that the Blackburn Road development could achieve compliance with TM52 when cooling is applied with a set point of 24 degrees. Ultimately cooling is provided to all spaces due to market expectations and intended use / density and as such comfortable conditions will always be achieved.

7.2 Passive Design Measure to reduce Energy Demand, Overheating Risk and Cooling Demand.

Passive design measures are those which reduce the energy demand within buildings without consuming energy. These are the most effective and long-lasting measures for reducing CO2 emissions as the performance of the solutions (e.g. insulation), is unlikely to deteriorate or be subject to change.

7.2.1 Glazing Ratio

The Development has taken a 'fabric first' approach to reducing energy demand and CO2 emissions. Glazing ratio has been optimised to achieve a balance between providing natural daylighting to reduce the use of artificial lighting, the provision of passive solar heating to limit the need for space heating in winter and limiting summertime solar gains to reduce space cooling demands and limit the likelihood of high internal temperatures. Glazing on the south, east and west facing facades can lead to beneficial solar gains in winter months, whilst glazing on northerly orientations will typically loose heat.

7.2.2 Glazing Energy and Light Transmittance

In designing the elevations with an appropriate approach to fenestration, the design team has also been mindful to balance the solar energy transmittance and light transmittance values of the glass, to control solar gains and to maximise daylight respectively. Solar gains can be beneficial in winter months as a means of avoiding the need for active heating to maintain comfortable internal temperatures. However, in summer months excessive solar gains can lead to the potential for uncomfortably high internal temperatures. In tandem with the glazing ratio targets, the solar energy transmittance (g-value) of the glass has been targeted to allow solar gains in winter but control solar gains in summer. An initial value of 0.45 is targeted i.e. transmitting 45% of the incident solar heating gains into internal spaces respectively. As such, the g-value and the glazing ratio currently being considered are not anticipated to have a significant detrimental effect on daylight ingress, allowing natural light to penetrate the building to limit the demand for lighting.

7.2.3 Lighting

Energy efficient lighting will be provided throughout where possible.

External lighting will also be energy efficient and will be linked to daylight sensors and presence detectors to prevent unnecessary use (where appropriate).

As well as reduced energy requirement that would be achieved by implementing these lighting measures, the contribution to the ventilation requirements may also be reduced by limiting heat gains. This would further reduce the total energy requirements and CO2 emissions of the building.

7.2.4 Ventilation

Ventilation will be provided by mechanical ventilation with heat recovery. Purge ventilation is also achieved by openable windows.

Ventilation is important to maintain good indoor air quality by providing fresh air and extracting stale air. Ductwork will be rigid type, circular wherever possible, with minimal flexible ductwork (for connections only).

7.2.5 Metering and Controls

It is the intention that meters will be provided so that occupants can monitor and manage their energy use for heating, cooling and hot water as applicable. Metering provisions will enable whole building data to be logged and reviewed (this would enable monitored data to be provided to the Local Authority as required by Be Seen guidance). Logging provisions should be able to store at least 5 years' worth of data.

7.3 Modelling Inputs

Software	EDSL Tas	Occupancy	Monday to Friday
Weather Data	Design Summer Year (DSY1)	Max Occupancy Density	From NCM data
Assessment Criteria	CIBSE TM52	Occupancy Heat Gains	7 W/m^2 (Sensible) 5 W/m^2 (Latent)
Assessment Season	Non-heating season (1st May-30th September	Window opening type (where applicable)	50% opening.
Wall U-Value	As per assumptions within this report	Lighting Gains	8 W/m^2
Window Averaged U-value	-	-	-
Window g-value	0.45	-	-
Roof U-value	As per assumptions within this report	Heat Interface Unit and primary pipework	HIUs designed out
Floor U-value	As per assumptions within this report	-	-
Window Covering (SF=Shading Factor)	N/A	Internal door undercut	-
Infiltration	0.15 ACH	Thermal Bridging Coefficient (W/m^{2}K)	Included in U-values
Wall thickness and window positioning	500mm and positioned 150mm from the inner wall i.e windowsill depth of 350mm	Window frame dimensions	50mm to each window pane

Figure 7.1 Modelling inputs

7.4 Results

Below results show that with cooling provided to occupied areas, TM52 criteria is satisfied. Cooling plant has been sized in order to have sufficient capacity in order to deal with future weather scenarios. Figure 7.2 shows results for DSY1 2020s, high emissions, 50% percentile scenario, results for DSY2 and DSY3 can be found in Appendix G.

Adaptive Overheating Report (CIBSE TM52)

Building Designer File (.tbd): Blackburn.tbd
Simulation Results File (.tsd): Blackburn.tsd
Date: 21 March 2023
Building Category: Category II
Report Criteria: TM52

Results

Zone Name	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Criterion 2: Peak Daily Weighted Exceedance	Criterion 3: #Hours Exceeding Absolute Limit	Result
LG WH 1	1377	41	0	0.0	0	Pass
1st showroom 1	1377	41	0	0.0	0	Pass
02 Office 1	1530	45	0	0.0	0	Pass
02 Office 2	1530	45	0	0.0	0	Pass
02 Office 3	1530	45	0	0.0	0	Pass
02 Office 4	1530	45	0	0.0	0	Pass
02 Office 5	1530	45	0	0.0	0	Pass
02 Office 6	1530	45	0	0.0	0	Pass
02 Office 7	1530	45	0	0.0	0	Pass
02 Office 8	1530	45	0	0.0	0	Pass
03 Office 1	1530	45	0	0.0	0	Pass
03 Office 2	1530	45	0	0.0	0	Pass
03 Office 3	1530	45	0	0.0	0	Pass
03 Office 4	1530	45	0	0.0	0	Pass
4 office 1	1530	45	0	0.0	0	Pass
4 office 2	1530	45	0	0.0	0	Pass
4 office 3	1530	45	0	0.0	0	Pass
4 office 4	1530	45	0	0.0	0	Pass
5 office 1	1530	45	0	0.0	0	Pass
5 office 2	1530	45	0	0.0	0	Pass
5 office 3	1530	45	0	0.0	0	Pass

Figure 7.2 TM52 Results

8.0 Flexibility and peak energy demand

	Electrical	Heat	Enabled through…
Estimated peak demand (MW)	1.5MW	N/A	Realistic estimates of demand profiles and peak demand
Available capacity (MW)	1.5MW	N/A	Early engagement with DNO or IDNO to establish available capacity. Additional capacity to be added.
Flexibility potential (MW)	N/A	N/A	Modelling of flexibility using demand profiles
Revised peak demand (MW)	N/A	N/A	Revision to peak demand considering available capacity, engagement with third parties and flexibility potential
Percentage flexibility predicted (%)	0	N/A	Calculations from flexibility potential as a proportion of peak demand

Figure 8.1 Summary of site-wide peak demand, capacity, and flexibility potential

Flexibility achieved through:	Yes/No	Details
Electrical energy storage (kWh) capacity	No	N/A however will be further reviewed at stage 3
Heat energy storage (kWh) capacity	No	N/A
Renewable energy generation (load matching)	Yes	ASHP and PV as detailed in this energy strategy.
Gateway to enable automated demand response	No	N/A
Smart systems integration (e.g. smart charge points for EV, gateway etc)	Yes	Expected for EV charging facilities
Other initiative	No	N/A

Figure 8.2 Summary of interventions for achieving flexibility

The tables above confirm that there will be sufficient electrical capacity on site to support the development as well as confirming that EV charging will be utilised. Further review of the potential of utilising electrical storage will be completed at the next design stage.

9.0 Conclusion

In conclusion through a range of passive design measure and the inclusion of renewable technologies the Development at Blackburn Road has achieved a 35% reduction on Part L 2021 baseline figures. Overheating has also be modelled for occupied zones and demonstrates that all areas pass TM52 criteria.

	Regulated non-domestic carbon dioxide savings	
	(Tonnes CO_2 per annum)	(%)
Be lean: savings from energy demand reduction	8.6	24%
Be clean: savings from heat network	0.0	0%
Be green: savings from renewable energy	3.8	11%
Total Cumulative Savings	**12.3**	**35%**

Appendix A-BRUKLs

Lean BRUKL

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

As designed

Date: Mon Mar 20 17:18:27 2023

Administrative information

Building Details

Address:

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.4"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.4

BRUKL compliance check version: v6.1.b.0

Foundation area [m²]: 1285.71

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

Target CO_2 emission rate (TER), kgCO_2/m².annum	4.59	
Building CO_2 emission rate (BER), kgCO_2/m².annum	3.48	
Target primary energy rate (TPER), kWh/m².annum	50.45	
Building primary energy rate (BPER), kWh/m².annum	38.3	
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	$U_{b\text{-}Limit}$	$U_{b\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.13	0.13	External Wall
Floors	0.18	0.12	0.12	Ground Floor
Pitched roofs	0.16	0.1	0.1	Roof
Flat roofs	0.18	-	-	No flat roofs in project
Windows** and roof windows	1.6	1.32	1.37	750*1800 (open)
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	-	-	No personnel doors in project
Vehicle access & similar large doors	1.3	-	-	No vehicle access or similar large doors in project
High usage entrance doors	3	-	-	No high usage entrance doors in project

$U_{b\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m²K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m²K)]
$U_{b\text{-}Calc}$ = 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
N.B.: 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
m³/(h.m²) at 50 Pa	8	3

Page 1 of 6

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m²]	7714	7714
External area [m²]	10703	10703
Weather	LON	LON
Infiltration [m³/hm²@ 50Pa]	3	4
Average conductance [W/K]	2316	2959
Average U-value [W/m²K]	0.22	0.28
Alpha value* [%]	21.75	6.75

* 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	0.34	0.53
Cooling	6.72	6.57
Auxiliary	12.55	13.76
Lighting	4.57	12.24
Hot water	1.24	1.24
Equipment*	38.59	38.59
TOTAL**	**25.42**	**34.35**

* 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	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*0*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m²]	105.19	114.95
Primary energy [kWh/m²]	38.3	50.45
Total emissions [kg/m²]	3.48	4.59

Page 5 of 6

Green BRUKL

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

As designed

Date: Mon Mar 20 17:10:16 2023

Administrative information

Building Details

Address:

Certifier details

Name:

Telephone number:

Address: , ,

Certification tool

Calculation engine: TAS

Calculation engine version: "v9.5.4"

Interface to calculation engine: TAS

Interface to calculation engine version: v9.5.4

BRUKL compliance check version: v6.1.b.0

Foundation area [m²]: 1285.71

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

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	4.59	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	2.99	
Target primary energy rate (TPER), kWh/m^2.annum	50.45	
Building primary energy rate (BPER), kWh/m^2.annum	32.69	
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	$U_{b\text{-}Limit}$	$U_{b\text{-}Calc}$	$U_{i\text{-}Calc}$	First surface with maximum value
Walls*	0.26	0.13	0.13	External Wall
Floors	0.18	0.12	0.12	Ground Floor
Pitched roofs	0.16	0.1	0.1	Roof
Flat roofs	0.18	-	-	No flat roofs in project
Windows** and roof windows	1.6	1.32	1.37	750*1800 (open)
Rooflights***	2.2	-	-	No rooflights in project
Personnel doors^	1.6	-	-	No personnel doors in project
Vehicle access & similar large doors	1.3	-	-	No vehicle access or similar large doors in project
High usage entrance doors	3	-	-	No high usage entrance doors in project

$U_{b\text{-}Limit}$ = Limiting area-weighted average U-values [W/(m^2K)] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [W/(m^2K)]
$U_{b\text{-}Calc}$ = Calculated area-weighted average U-values [W/(m^2K)]
* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.
** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.
^ For fire doors, limiting U-value is 1.8 W/m^2K
N.B.: 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	3

Page 1 of 6

Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters

	Actual	Notional
Floor area [m^2]	7714	7714
External area [m^2]	10703	10703
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	4
Average conductance [W/K]	2316	2959
Average U-value [W/m^2K]	0.22	0.28
Alpha value* [%]	21.75	6.75

* 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/m^2]

	Actual	Notional
Heating	0.25	0.53
Cooling	6.72	6.57
Auxiliary	12.55	13.76
Lighting	4.57	12.24
Hot water	1.01	1.24
Equipment*	38.59	38.59
TOTAL**	**25.11**	**34.35**

* 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	3.47	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*3.47*	*0*

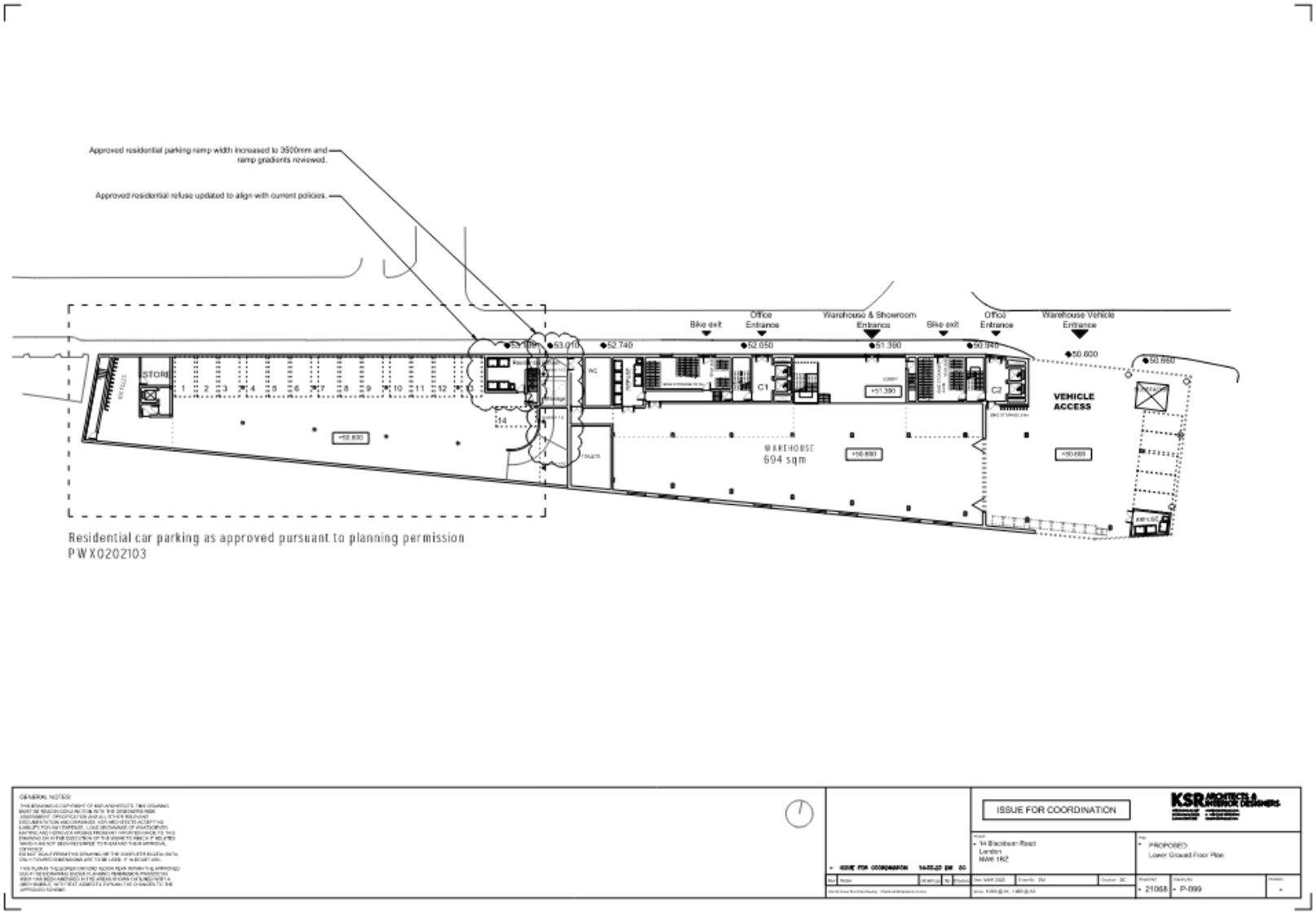
Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	105.19	114.95
Primary energy [kWh/m^2]	32.69	50.45
Total emissions [kg/m^2]	2.99	4.59

Page 5 of 6

Appendix B- Site Plans

Site Plans



Appendix C- Be Seen

CONTEXTUAL DATA — *Progress: 100%*

ORGANISATION & CONTACT DETAILS

ORGANISATION DETAILS

Organisation Name	Bellaview Properties
Organisation Address	Devonshire House London W1W 5DR

CONTACT DETAILS

Contact Name	Edward Aaronson
Email	edwardaaaronson@hotmail.co.uk
Additional Email(s)	
Telephone No.	2074265781
Mobile No.	

DEVELOPMENT INFORMATION

OVERALL DEVELOPMENT DETAILS

Planning Reference Number	Unknown
Name of Whole Development	14 Blackburn Road

DEVELOPMENT LOCATION

Development Address	
Address Line 1	14 BLACKBURN ROAD
Address Line 2	
Address Line 3	
Address Line 4	
London Borough	Camden
Postcode	NW6 1RZ
Ordnance Survey Reference	
Development UPRN (if available) *Please add if available ->*	
Geo-Location Coordinates	
Latitude (to 6 decimal places)	51.547
Longitude (to 6 decimal places, +ve or -ve)	-0.190

DEVELOPMENT TOTAL AREA BREAKDOWN

Residential		
Total Residential Floor Area	GIA m2	0
Dwelling Counts		
Flats	number	
House	number	
Non-Residential		
Non-Residential Floor Area Breakdown		*Please include complete non-resi details below*
Landlord Circulation (in Residential Blocks)	GIA m2	
General office (A2, B1, B8, D1 planning classes	GIA m2	3,126
High street agency (A2 planning classes)	GIA m2	
General retail (A1, SG planning classes)	GIA m2	
Large non-food shop (A1 planning classes)	GIA m2	
Small food store	GIA m2	
Large food store	GIA m2	
Restaurant (A3, A5 planning classes)	GIA m2	
Bar, pub or licensed club (A4 planning classes)	GIA m2	
Hotel (C1 planning classes)	GIA m2	
Cultural Activities	GIA m2	
Entertainment halls (D2 planning classes)	GIA m2	
Swimming pool centre	GIA m2	
Fitness and health centre	GIA m2	
Dry sports and leisure facility (D2 planning clas	GIA m2	
Covered car park	GIA m2	
Public buildings with light usage (D1, SG planni	GIA m2	
Schools and seasonal public buildings (D1, D2	GIA m2	
University campus	GIA m2	
Clinic (D1 planning classes)	GIA m2	
Hospital (clinical and research)	GIA m2	
Long term residential (C1, C2, C2A planning cl	GIA m2	
General accommodation (C1, C2, C3 planning c	GIA m2	
Emergency services (SG planning classes)	GIA m2	
Laboratory or operating theatre	GIA m2	
Public waiting or circulation (SG planning class	GIA m2	
Terminal (B8 planning classes)	GIA m2	
Workshop (B1, B2 planning classes)	GIA m2	
Storage Facility (B8 planning classes)	GIA m2	
Cold Storage (B8 planning classes)	GIA m2	
Overall Development Summary		
Total Development Floor Area		
Residential	GIA m2	0
Non-Residential	GIA m2	3,126
Total	GIA m2	3,126
Total Non-Residential Uses		General office

SUPPLEMENTARY FILES AND UPCOMING REPORTING STAGES

SUPPLEMENTARY FILES

Site Plan	
Does the development have a site plan?	Yes
What is the site plan filename?	Included witin energy strategy
Best Practice Documents	
Does the development have a predicted DEC?	No
Is there a base building energy rating (in line with DFP)?	No

ANTICIPATED DATES FOR UPCOMING REPORTING STAGES

As-Built Stage	1 Jan 2024
Operational Year 1 End	1 Jan 2025

DEVELOPMENT PERFORMANCE AND EMISS

Progress: 100%

DEVELOPMENT PERFORMANCE

DEVELOPMENT OVERALL PREDICTED PERFORMANCE

Predicted Performance Calculation Details		
Fuel Carbon Intensity Source (aligned with planning energy		SAP 10.2
Residential Elements of the development		
Predicted Annual Energy Use		*Fill in all applicable fuels below*
Annual Electricity Use	kWh/yr	0
Annual Gas Use	kWh/yr	0
Annual Oil Use (if applicable)	kWh/yr	
Annual Biomass Use (if applicable)	kWh/yr	
Annual District Htg Use (if applicable)	kWh/yr	
Annual District Clg Use (if applicable)	kWh/yr	
Elec Generation, Gross (if applicable)	kWh/yr	
Solar Thermal Generation (if applicable)	kWh/yr	
Predicted Annual Carbon Emissions	tCO2/yr	0
Non-Residential Elements of the development (Part L Calculation)		
Predicted Annual Energy Use		*Fill in all applicable fuels below*
Annual Electricity Use	kWh/yr	193,621
Annual Gas Use	kWh/yr	0
Annual Oil Use (if applicable)	kWh/yr	
Annual Biomass Use (if applicable)	kWh/yr	
Annual District Htg Use (if applicable)	kWh/yr	
Annual District Clg Use (if applicable)	kWh/yr	
Elec Generation, Gross (if applicable)	kWh/yr	
Solar Thermal Generation (if applicable)	kWh/yr	
Predicted Annual Carbon Emissions	tCO2/yr	26
Non-Residential Elements of the development (TM54 Calculation)		
Predicted Annual Energy Use		*Fill in all applicable fuels below*
Annual Electricity Use	kWh/yr	237,683
Annual Gas Use	kWh/yr	0
Annual Oil Use (if applicable)	kWh/yr	
Annual Biomass Use (if applicable)	kWh/yr	
Annual District Htg Use (if applicable)	kWh/yr	
Annual District Clg Use (if applicable)	kWh/yr	
Elec Generation, Gross (if applicable)	kWh/yr	
Solar Thermal Generation (if applicable)	kWh/yr	
Predicted Annual Carbon Emissions	tCO2/yr	41

CARBON OFFSETTING

Predicted Carbon Shortfall (aligned with planning	tCO2	692
Total Committed Carbon Offset	£	65,735

Appendix D – Contact with Camden Council

Correspondence has been initiated with Camden council in relation to existing and proposed heat networks in the immediate vicinity of the site, however, to date no response has been received.

Blackburn Road

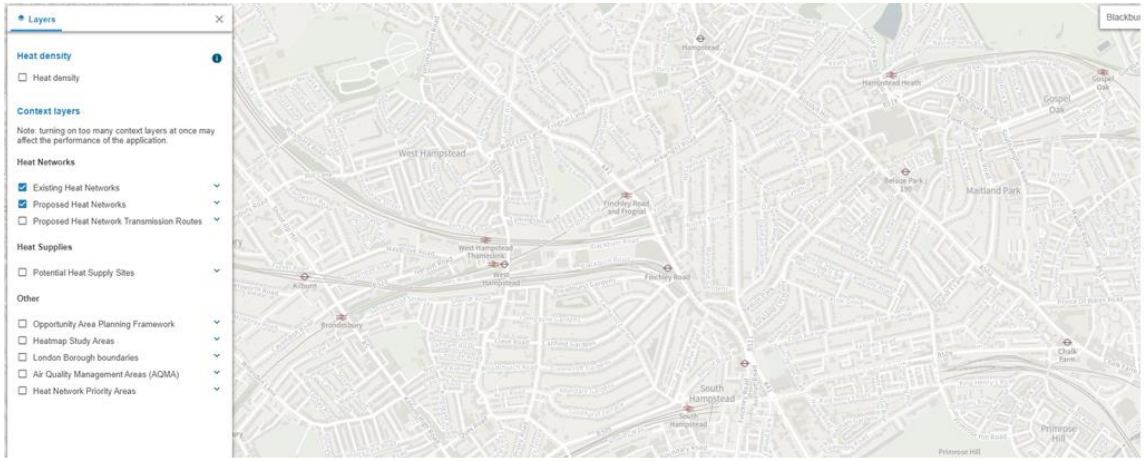
TN

Tom Nugent
To 'planning@camden.gov.uk'
Cc Eddie Beer

Reply | Reply All | Forward

Good morning,

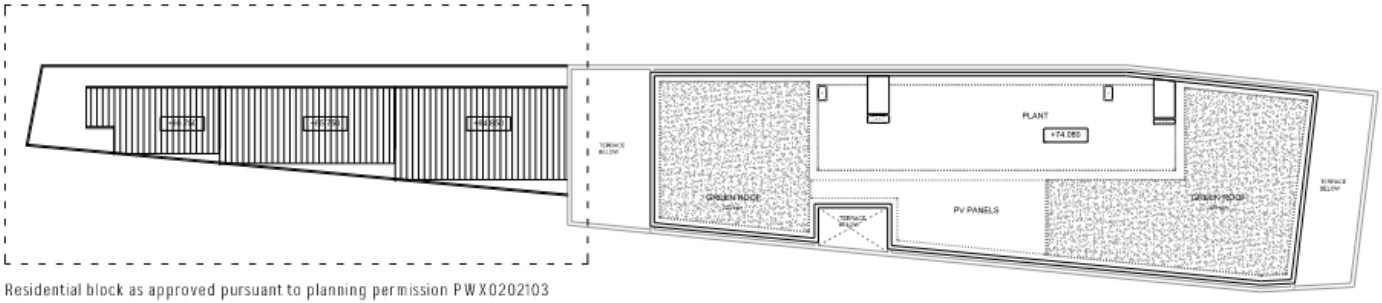
We are currently working on a private project in the Blackburn road area and are investigating the potential to connect to a district heating network. The London heat map does not indicate any existing or proposed networks in the immediate vicinity. Could you confirm if you know of any potential networks?



Thanks

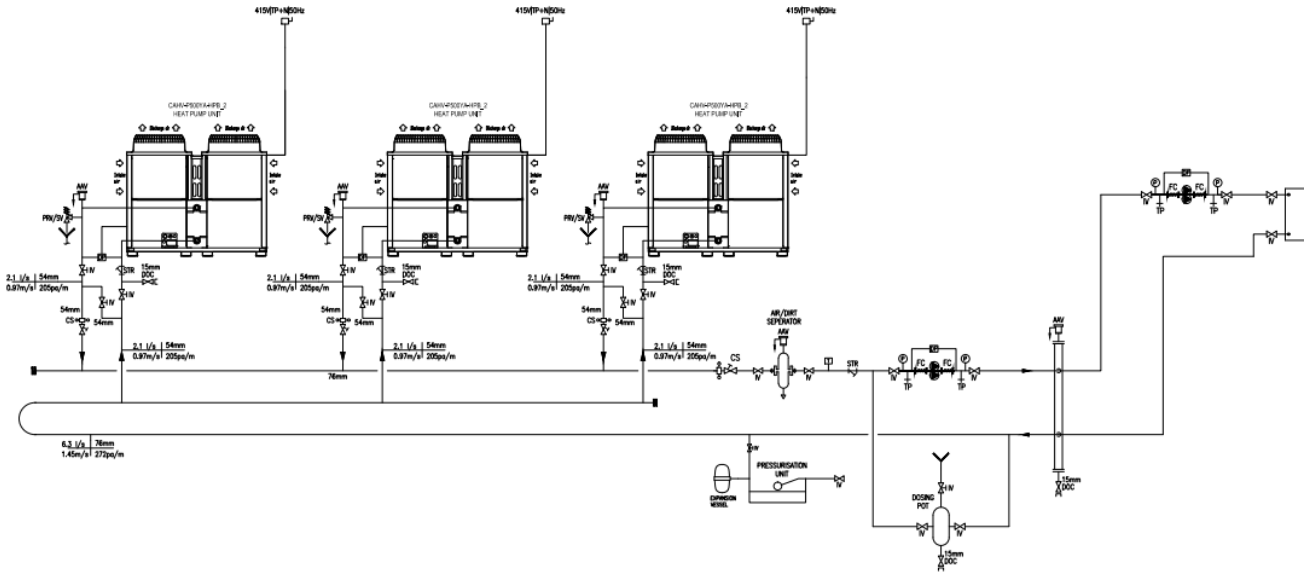
Appendix E-Roof Layouts

The possibility of further provision of PV within the green roof areas is to be investigated as the design develops.



Residential block as approved pursuant to planning permission PWX0202103

Appendix F Typical ASHP Arrangement



Heating

Product Information

CAHV-P500YB-HPB
Ecodan Air Source Heat Pump

Making a World of Difference

CAHV Monobloc Heat Pump System

The Ecodan CAHV air source heat pump monobloc system can operate singularly, or form part of a multiple unit system. The CAHV also comes equipped with a wide range of controller features as standard.

A multiple unit system has the ability to cascade available units on and off to meet the load from a building. As an example of this modulation, a 16 unit system allows 0.5kW increments of capacity, from 18kW all the way up to 688kW. This level of modulation is unprecedented within the heating industry and with cascade and rotation built in as standard, the Ecodan CAHV system is perfectly suited to a wide range of commercial applications.

ErP A++

Key Features

- Multiple unit cascade control of up to 688kW capacity
- Split refrigerant circuits within each CAHV provide 50% back up
- Ability to rotate units based on accumulated run hours
- Provides from 25°C up to 70°C water flow temperatures without boost heaters
- Low maintenance, hermetically-sealed monobloc design
- Low on-site refrigerant volume
- HIC (Zubadan) technology delivers 43kW at -3°C with minimal drop off down to -20°C

MITSUBISHI ELECTRIC
Air Conditioning | Heating
Ventilation | Controls

ecodan
Renewable Heating Technology

Heating

Product Information

CAHV-P500YB-HPB
Ecodan Air Source Heat Pump

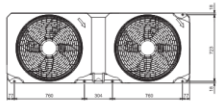
Making a World of Difference

MODEL		CAHV-P500YB-HPB
HEAT PUMP SPACE HEATER - 55°C	ErP Rating	A++
	η_s	125%
	SCOP	3.19
HEAT PUMP SPACE HEATER - 35°C	ErP Rating	A+
	η_s	139%
	SCOP	3.54
HEATING*1 (A-3/W35)	Capacity (kW)	42.6
	Power Input (kW)	15.2
	COP	2.80
OPERATING AMBIENT TEMPERATURE (°C DB)		-20~+40°C
SOUND PRESSURE LEVEL AT 1M (dBA)*2*3		59
LOW NOISE MODE (dBA)*2		Variable
FLOW RATE(l/min)		126
WATER PRESSURE DROP (kPa)		18
DIMENSIONS (mm)	Width	1978
	Depth	759
	Height	1710 (1650 without legs)
WEIGHT (kg)		526
ELECTRICAL SUPPLY		380-415v, 50Hz
PHASE		3
NOMINAL RUNNING CURRENT [MAX] (A)		17.6 [52.9]
FUSE RATING - MCB SIZES (A)*4		63

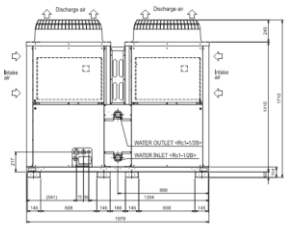
*1 Under normal heating conditions at outdoor temp: -3°CDB / -4°CWB, outlet water temp 35°C, inlet water temp 30°C
*2 Under normal heating conditions at outdoor temp: 7°CDB / 6°CWB, outlet water temp 35°C, inlet water temp 30°C as tested to BS EN14511
*3 Sound power level of the CAHV-P500YB-HPB is 70.7dBA. Tested to BS EN12102
*4 MCB Sizes BS EN60898-2 & BS EN60947-2
η_s is the seasonal space heating energy efficiency (SSHEE) η_{wh} is the water heating energy efficiency

DIMENSIONS

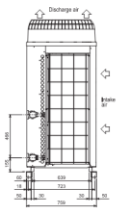
Upper View



Front View



Side View



Appendix G- Overheating results

DSY 2

Adaptive Overheating Report (CIBSE TM52)

Building Designer File (.tbd): Blackburn.tbd
Simulation Results File (.tsd): Blackburn.tsd
Date: 21 March 2023
Building Category: Category II
Report Criteria: TM52

Results

Zone Name	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Criterion 2: Peak Daily Weighted Exceedance	Criterion 3: #Hours Exceeding Absolute Limit	Result
LG WH 1	1377	41	0	0.0	0	Pass
1st showroom 1	1377	41	0	0.0	0	Pass
02 Office 1	1530	45	0	0.0	0	Pass
02 Office 2	1530	45	0	0.0	0	Pass
02 Office 3	1530	45	0	0.0	0	Pass
02 Office 4	1530	45	0	0.0	0	Pass
02 Office 5	1530	45	0	0.0	0	Pass
02 Office 6	1530	45	0	0.0	0	Pass
02 Office 7	1530	45	0	0.0	0	Pass
02 Office 8	1530	45	0	0.0	0	Pass
03 Office 1	1530	45	0	0.0	0	Pass
03 Office 2	1530	45	0	0.0	0	Pass
03 Office 3	1530	45	0	0.0	0	Pass
03 Office 4	1530	45	0	0.0	0	Pass
4 office 1	1530	45	0	0.0	0	Pass
4 office 2	1530	45	0	0.0	0	Pass
4 office 3	1530	45	0	0.0	0	Pass
4 office 4	1530	45	0	0.0	0	Pass
5 office 1	1530	45	0	0.0	0	Pass
5 office 2	1530	45	0	0.0	0	Pass
5 office 3	1530	45	0	0.0	0	Pass

DSY 3

Adaptive Overheating Report (CIBSE TM52)

Building Designer File (.tbd): Blackburn.tbd
Simulation Results File (.tsd): Blackburn.tsd
Date: 21 March 2023
Building Category: Category II
Report Criteria: TM52

Results

Zone Name	Occupied Summer Hours	Max. Exceedable Hours	Criterion 1: #Hours Exceeding Comfort Range	Criterion 2: Peak Daily Weighted Exceedance	Criterion 3: #Hours Exceeding Absolute Limit	Result
LG WH 1	1377	41	0	0.0	0	Pass
1st showroom 1	1377	41	0	0.0	0	Pass
02 Office 1	1530	45	0	0.0	0	Pass
02 Office 2	1530	45	0	0.0	0	Pass
02 Office 3	1530	45	0	0.0	0	Pass
02 Office 4	1530	45	0	0.0	0	Pass
02 Office 5	1530	45	0	0.0	0	Pass
02 Office 6	1530	45	0	0.0	0	Pass
02 Office 7	1530	45	0	0.0	0	Pass
02 Office 8	1530	45	0	0.0	0	Pass
03 Office 1	1530	45	0	0.0	0	Pass
03 Office 2	1530	45	0	0.0	0	Pass
03 Office 3	1530	45	0	0.0	0	Pass
03 Office 4	1530	45	0	0.0	0	Pass
4 office 1	1530	45	0	0.0	0	Pass
4 office 2	1530	45	0	0.0	0	Pass
4 office 3	1530	45	0	0.0	0	Pass
4 office 4	1530	45	0	0.0	0	Pass
5 office 1	1530	45	0	0.0	0	Pass
5 office 2	1530	45	0	0.0	0	Pass
5 office 3	1530	45	0	0.0	0	Pass

Appendix I- Development Information

TABLE 2. DEVELOPMENT DETAILS		Further notes	Response
Application details	Date of Application	Please provide the date the application was submitted to the Local Planning Authority.	
	Local Planning Authority	Please indicate the Local Planning Authority determining the application.	*Camden*
	Confirmed carbon offset price (£/tonne of carbon dioxide)	Please confirm the agreed carbon offset price for the Local Planning Authority. If no value is entered then the GLA's recommend price of £95 per tonne of carbon dioxide will be used.	*95.00*
	Evidence of communication on the carbon offset price included in the energy assessment (Y/N).		*N*
	Residential units number (Part L1)		*N/A*
	Non-residential floor area in m^2 (Part L2)		*9126*
Heat risk	CIBSE TM59 undertaken for residential development (Y/N)		*N*
	CIBSE TM52 undertaken for non-residential development (Y/N)		*Y*
	All sample units meet CIBSE criteria with DSY1 weather file (Y/N)		*Y*
	DSY2 and DSY3 included in overheating assessments (Y/N)		*Y*
	Residential g-value		*N/A*

	% Glazing Ratio over façade		*N/A*
	External shading proposed (Y/N)		*N*
Energy efficiency measures	Target Fabric Energy Efficiency met (Y/N)		*Y*
	Mechanical Ventilation with Heat Recovery included (Y/N)		*Y*
	Waste Water Heat Recovery (Y/N)		*N*
	Low energy lighting (Y/N)		*Y*
District heating connection	Development in a Heat Network Priority Area (HNPA) (Y/N)		*N*
	District Heating Network connection (Y/N)		*N*
	Name of District Heating Network		*N/A*
	Carbon factor ($kgCO_2$/ kWh)		*N/A*
	Borough energy officer and Heat Network Operator contacted and evidence of correspondence included in the energy strategy (Y/N)	Applicable to all applications.	*Y*
Site heating distribution configuration	Development future proofed for DHN connection (Y/N)	Note that individual heating systems would not be appropriate for developments in HNPAs.	*Y*
	Drawings of communal system provided (Y/N)	Applicants should provide a drawings of the energy centre, on-site communal network with all building uses connected and future proofing arrangements detailed, including single point of connection.	*Y*

	Distribution type		*communal system (building level)*
	Flow temperature (°C)		*42.00 (tbc)*
	Return temperature (°C)		*35.00 (tbc)*
	Distribution losses modelled (%)	See table 4 below for details.	*10*
Heating system performance	Heat Pump (Y/N)		*Y*
	Heat Pump source		Air Source
	Centralised Heat Pump capacity (kWth)		*130*
	Heat Pump Seasonal Heating Efficiency (SCoP)		*3.50*
	Heat Pump SCoP calculation includes heat source and heat distribution temperature and seasonal performance factor (Y/N)	See table 5 below for details.	*Y*
	Fraction of heat supplied by heat pump (only for hybrid systems with boilers) (%)		*N/A*
	Low-emission on-site CHP enabling an area-wide heat network (Y/N)	Only low-emission CHP is suitable and only where it is facilitating an area-wide heat network. Therefore, new gas engine CHP is not suitable for any other purpose for new developments.	*N*
	CHP (kWe)		*N/A*
	Estimated end user cost (pence/kWh)		*4.75*

	Energy assessment includes consideration of occupant running costs (Y/N)	Applicants should consider the estimated costs to occupants of the energy assessment and outline how they are committed to protecting the consumer from high prices.	*Y*
Solar technologies	Solar PV included (Y/N)		*Y*
	Roof layout demonstrating solar PV technologies have been maximised included in energy strategy (Y/N)		*Y*
	kWh generated		*26,800 approx*
	kWp		*23*
	Total PV panel area (m^2) installed		*125*
	Solar Thermal included (Y/N)		*N*
	Solar Thermal panel area (m^2) installed		*N/A*
Flexibility and peak energy demand	Site-wide peak demand, capacity and flexibility potential included in energy assessment (Y/N)	Table 9 in the energy assessment guidance to be completed.	*Y*
	Interventions for achieving flexibility included in energy assessment (Y/N)	Table 10 in the energy assessment guidance to be completed.	*Y*
	Estimated peak demand (MW)		*1.5*
	Electrical energy storage (kWh) capacity		*N/A*
	Heat energy storage (kWh) capacity		*N/A*
Other technologies	System type (e.g. wind turbine)		*N/A*
	Capacity (kW)		*N/A*

Cooling	Cooling proposed - Residential (Y/N)	It is not expected that 'active cooling' will be proposed for any residential developments. It will be expected that applicants can fully demonstrate that all passive design measures have been thoroughly investigated before considering 'active cooling'.	*N*
	Cooling proposed - Non-residential (Y/N)		*Y*
	Residential Cooling consumption (kWh p.a.)	See note in cell C60.	*N/A*
	Commercial Cooling consumption (MJ p.a.)		*197,168*

TABLE 4. DISTRIBUTION LOSSES			
Primary network (buried pipe)	Total pipe length (m)		N/A
	Average heat loss rate (W/m)		N/A
Secondary network (buried pipe)	Total pipe length (m)		200
	Average heat loss rate (W/m)		2
Total losses (MWh/year)			3.5
Total heat supplied (MWh/year)			35
Distribution Loss Factor (DLF)			0.10
Calculation included in energy statement (yes/no)			Yes

IN2 London
IN2 Engineering Design
2nd Floor,
5-23 Hill St,
Belfast,
BT1 2LA
info@in2.ie