Energy Statement

Home Bargains, 217 High Street, Yiewsley, West Drayton
Prepared for TJ Morris Ltd
June 2023

envision

Revision	Date
A	2nd June 2023
B	15th June 2023

Author	Signature
Monisha Selvaraju BArch MSc	
Checked & Authorised	**Signature**
Simon Rainsford BSc MSc	

London Office 0207 486 0680 **Oxford Office 01865 598698**

contact@envisioneco.com

CONTENTS

EXECUTIVE SUMMARY

1. This Energy Statement has been prepared by Envision on behalf of TJ Morris (the applicant) and is submitted in support of a full planning application made for the refurbishment of the existing building to accommodate a Home Bargains store at Yiewsley, West Drayton, London.

2. The planning application is seeking consent for the refurbishment of 1 no. retail unit within Class E with access and servicing arrangements, car parking, landscaping and associated works.

3. The primary purpose of this document is to explain how the scheme can meet with Hillingdon Council'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 Energy Strategy

4. 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.

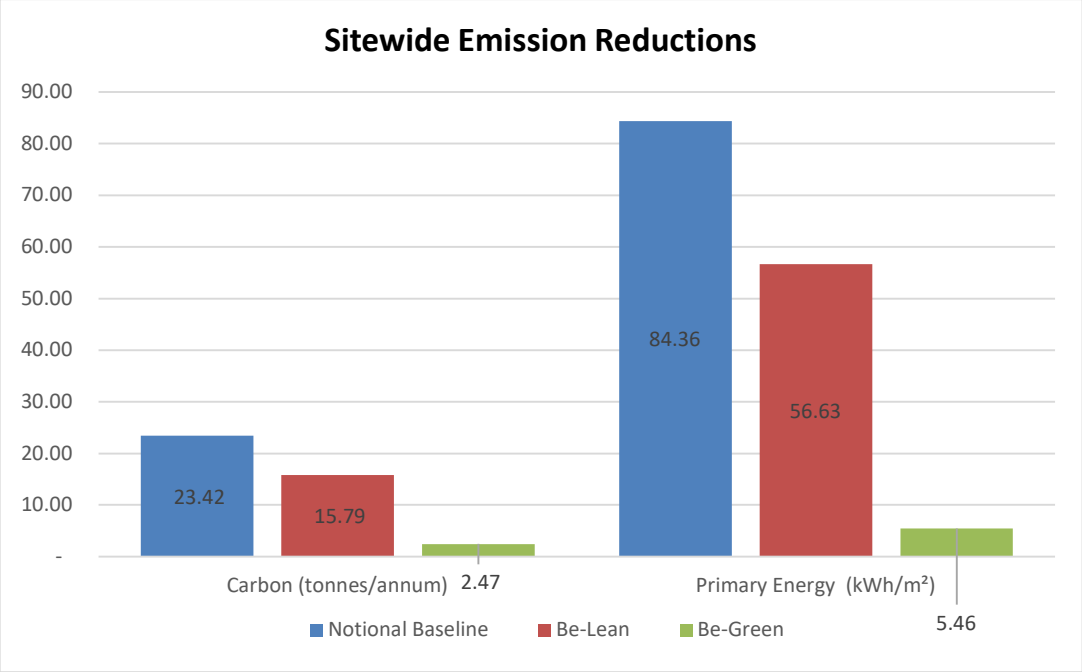
5. Envision has followed guidance as laid out in the GLA Guidance on Preparing Energy Assessments (2022) for major refurbishments and Part L of Building Regulations by using DesignBuilder SBEM to demonstrate that the calculated CO_2 emissions from the refurbished building with minor extension is no greater than for the building with notional inputs for thermal performance and building services. Carbon emissions have been calculated and reported via the GLA reporting tool.

6. To reduce the energy consumption of the development and to assist in achieving a Building Regulation Part L 2021 compliant development, the following design measures are recommended and will need to be incorporated into the detailed design:

   - Replacement of all windows with high performance double-glazed units;
   - Re-insulation of existing external walls and roof to significantly improve thermal performance and high-performance new-build thermal elements in the extension;
   - Installation of high-efficiency LED lighting throughout development, including occupancy sensing where required;
   - Decarbonisation of heating on-site through installation of high-efficiency heat pump systems providing heating and cooling, and;
   - Provision of a 122.4 kWp PV array across the main roof.

7. By following the method as prescribed above and explained in Section 3 of this report, the proposed refurbishment of the building to accommodate a Home Bargains would result in the development achieving a **89.44%** reduction in CO_2 emissions & **93.53%** reduction in primary energy when compared to a notional existing building baseline, with a **56.87%** reduction through the use of renewable technology.

8. The Part L BRUKLs verifying these emissions have been provided in Appendix I.



9. Furthermore, by retrofitting the building to an efficient all electric system, the scheme would benefit from progressive grid decarbonisation, assisting to meet future climate targets.

10. 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 Local Plan (2020).

11. A sustainability review is provided in Section 4.

1 INTRODUCTION

1.1 Envision has been appointed by TJ Morris (the Applicant) to produce an Energy Statement in support of a full planning application refurbishment of the existing B&M store at Yiewsley, West Drayton, London.

Scope

1.2 The primary purpose of this statement is to explain how best practice sustainable design and construction measures would be incorporated in the proposed development to ensure alignment with local planning policy set out in the Adopted Hillington Local Plan 2020.

1.3 This statement is structured as follows:

- Section 2 provides a description of the main energy policies relevant to the application;
- Section 3 includes the Energy Statement, including measures proposed to reduce energy demand and carbon dioxide in operation;
- Section 4 includes a Sustainability Policy review;
- Section 5 provides a concluding summary.

Site Location and Existing Situation

1.4 The site measures 0.98 hectares in size and is comprised of a single retail warehouse of approximately 2,980 sqm of floor space with associated car parking and delivery access, an MOT testing centre and repair shop (B2 / sui generis) to the rear of 1908sqm and highway land to the front. The general location of the site in relation to the surrounding area is shown in Figure 1.1.

Figure 1.1 – Site Location

1.5 The site is located in Yiewsley, London Borough of Hillingdon. The site is located immediately to the west of the A408 High Road as illustrated in Figure 1.1. The proposed Home Bargains site is situated just north of the West Drayton railway station which is a future Crossrail station. The site is bound by the Grand Union Canal along the western boundary, the River Pinn to the north and petrol filling station to the south.

The Proposed Development

1.6 A new Home Bargains store at West Drayton, London is being developed which consists of a retail unit of 2,980 sqm with shared car parking area (circa 120 spaces).

1.7 The proposed development for a new Home Bargains is shown in plan form in figure 1.2 and consists of the following elements:

- Refurbishment of existing retail unit (Class E), including installation of new shopfront, reconfiguration of car park, landscaping, external plant, and associated works;
- The removal of 9 car parking spaces which are being replaced by landscaping adjacent to River Pinn. Proposal of 120 no. of car parking areas.

1.8 The works will be delivered to a high standard of sustainable design and construction, respecting the requirements of Local Plan Policy DMEI 2 in particular – Development Standards.

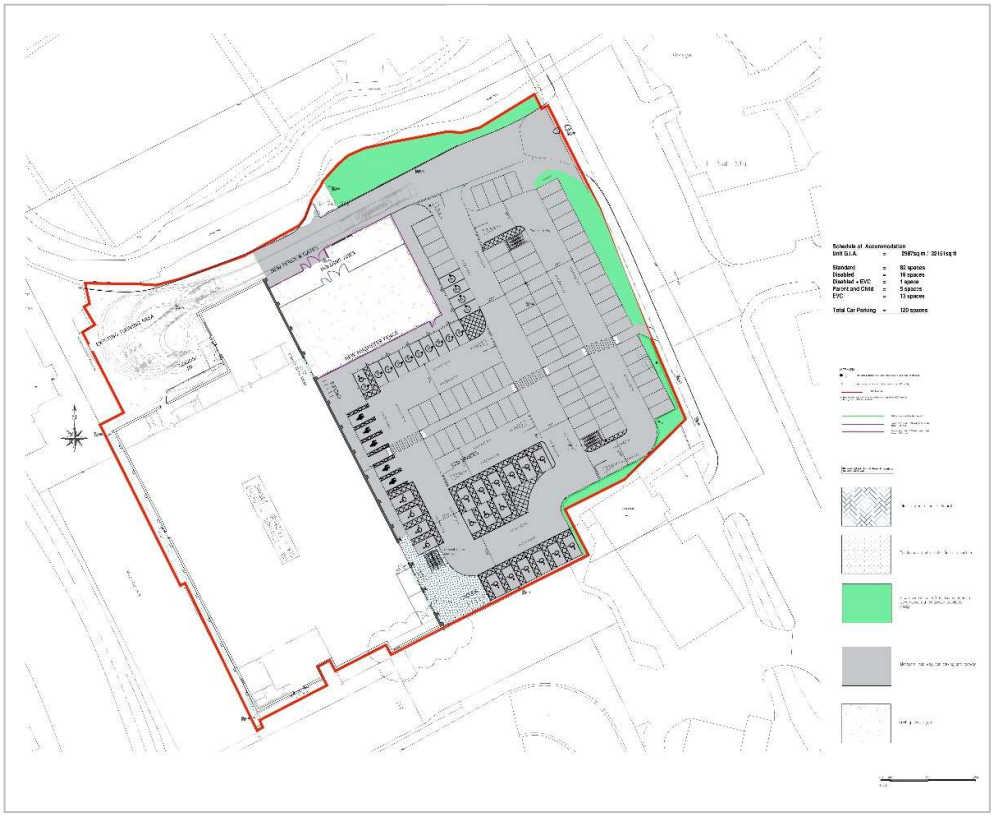


Figure 1.2 – Proposed Site Layout

2 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 revised National Planning Policy Framework (NPPF) was released on 20th July 2021. It sets out the framework for all planning policy in England and how these policies are expected to be applied. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs. At a similarly high level, members of the United Nations – including the United Kingdom – have agreed to pursue the 17 Global Goals for Sustainable Development in the period to 2030. These address social progress, economic well-being and environmental protection.

2.3 The NPPF sets out a presumption in favour of sustainable development, and the need to support economic growth through the planning system. Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

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

2.4 Planning plays a key role in helping shape places to 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.

London Plan Policy

2.5 The London Plan (2021) sets out the Mayor's vision for London. In accordance with the NPPF, it promotes economic development, and endorses the principles of sustainable development. It is the main vehicle for strategic decision-making on London's development, including development decisions. The Plan contains a number of policies directly related to a development's sustainable design and energy reduction, including:

- Policy G1 Green Infrastructure;
- Policy G5 Urban Greening;
- Policy G 6 Biodiversity and Access to Nature;
- Policy SI 1 Improving Air Quality;
- Policy SI 2 Minimising greenhouse gas emissions;
- Policy SI 3 Energy Infrastructure;
- Policy SI 4 Managing heat risk;
- Policy SI 7 Reducing Waste and supporting the circular economy;
- Policy SI 12 Flood Risk Management;
- Policy SI 13 Sustainable Drainage; and
- Policy T 5 Cycling.

2.6 Of particular importance to the CO_2 and Energy reductions required for a development is *Policy SI-2: Minimising carbon dioxide emissions.* This requires that development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

- Be lean: use less energy;
- Be clean: supply energy efficiently;
- Be green: use renewable energy.

2.7 The Mayor will work with boroughs and developers to ensure that major developments meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations.

Hillington Council Policy

2.8 The most relevant policies which need to be considered when assessing the sustainable design features of a scheme are held within local policy documents. The Hillington Local Plan Strategic Policies 2020 was adopted in January 2020. The principal policies of relevance when considering the wider sustainability & energy and carbon emissions of the application are as follows:

2.9 Policy DMEI 1 (Living walls and Roofs on site Vegetation) includes requirements on the following:

a. All major development should incorporate living roofs and/or walls into the development. Suitable justification should be provided where living walls and roofs cannot be provided; and

b. Major development in Air Quality Management Areas must provide onsite provision of living roofs and/or walls. A suitable offsite contribution may be required where onsite provision is not appropriate.

2.10 Policy DMEI 2 (Reducing Carbon Emissions) includes requirements on the following:

a. All developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with London Plan targets.

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

c. 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.

2.11 Policy DMEI 3 (Decentralised Energy) outlines the following :

a. All major developments are required to be designed to be able to connect to a Decentralised Energy Network (DEN).

b. Major developments located within 500 metres of an existing DEN, and minor new-build developments located within 100 metres, will be required to connect to that network, including provision of the means to connect to that network and a reasonable financial contribution to the connection charge, unless a feasibility assessment demonstrates that connection is not reasonably possible.

c. Major developments located within 500 metres of a planned future DEN, which is considered by the Council likely to be operational within 3 years of a grant of planning permission, will be required to provide a means to connect to that network and developers shall provide a reasonable financial contribution for the future cost of connection and a commitment to connect via a legal agreement or contract, unless a feasibility assessment demonstrates that connection is not reasonably possible.

d. The Council will support the development of DENs and energy centres in principle, subject to meeting the wider policy requirements of this plan and in particular on design and air quality.

2.12 Policy DMEI 10 (Water Management, Efficiency, and Quality) includes requirements on the following:

a. All new development proposals (including refurbishments and conversions) will be required to include water efficiency measures, including the collection and reuse of rain water and grey water.

It is expected that major development proposals will provide an integrated approach to surface water run-off attenuation, water collection, recycling and reuse.

2.13 Policy DMEI 14 (Air Quality) includes requirements on the following:

a. Development proposals should demonstrate appropriate reductions in emissions to sustain compliance with and contribute towards meeting EU limit values and national air quality objectives for pollutants.

b. Development proposals should, as a minimum:

- be at least "air quality neutral";
- include sufficient mitigation to ensure there is no unacceptable risk from air pollution to sensitive receptors, both existing and new; and
- actively contribute towards the improvement of air quality, especially within the Air Quality Management Area.

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 through refurbishment.

2.15 Where an existing building or group of buildings is refurbished and the development qualifies as a major refurbishment, applicants are required to provide an energy assessment demonstrating how the individual elements of the energy hierarchy have been implemented and how reductions in regulated CO_2 emissions have been achieved.

2.16 To provide this, applicants are required to estimate the CO_2 emission baseline performance of the existing building using Building Regulations approved compliance software, assuming the notional specification for existing buildings, shown in Appendix 4, and which is based on Approved Documents L1 and L2.

2.17 Once the baseline has been established, applicants will be expected to demonstrate that they have incorporated improvement measures that maximise performance at each stage of the energy hierarchy. The BER/DER of the refurbished building should be determined following improvements at each stage of the energy hierarchy using Building Regulations compliance software. These figures should then be used to report the CO_2 savings at each stage of the energy hierarchy in the carbon emissions reporting spreadsheet and included in the energy assessment.

3 ENERGY STATEMENT

3.1 Policy DMEI 2 Reducing Carbon emissions of Hillington Local Plan (2020) requires all minor and major development, including major refurbishment, to demonstrate how it is making the fullest contribution to minimising carbon dioxide emissions in accordance with the London Plan energy hierarchy.

3.2 To demonstrate how the refurbishment of the building to Home Bargains will achieve the maximum feasible reduction in carbon emissions, the applicant has followed the method as laid out in the GLA Guidance on Preparing Energy Assessments and Part L of Building Regulations as follows:

1. Calculate a **'Notional Building Baseline'** by modelling the building and proposed extension with all building service efficiencies and thermal elements in the existing building matching the minimum parameters as outlined in Table 11 (Appendix 3) of the GLA Guidance on Preparing Energy Assessments.
2. Calculate the **'Actual Building'** emissions by following the Energy Hierarchy and modelling the building with all building service efficiencies, new thermal elements and upgraded thermal elements performance input to match the proposed strategy put forward (by this Energy Statement);
3. Demonstrate that the calculated CO_2 emissions from the actual building have been reduced as far as feasibly possible.

Methodology

3.3 New non-domestic buildings are subject to the provisions of *Approved Document L: Conservation of Fuel and Power Volume 2, Buildings Other than Dwellings* (ADLV2), which applies to the proposed Home Bargains at Yiewsley, West Drayton.

3.4 The appropriate methodology for calculating Units energy performance and compliance with Part L of the Building Regulations is through a Simplified Building Energy Model (SBEM). The SBEM was produced using Design Builder software version 7.1.4.005, which is a Department of Communities and Local Governments (DCLG) approved software and methodology for undertaking SBEM.

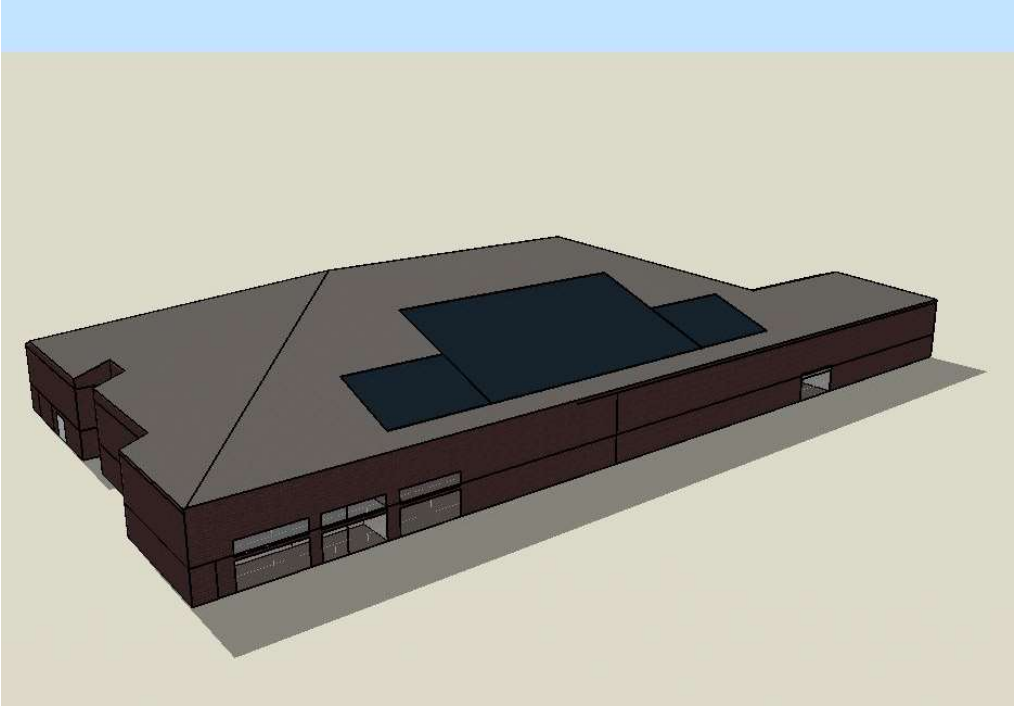


Fig 3.1 Design Builder Model of Proposed Development (not aesthetic representation)

Step 1 - Establishing the Target Emissions (Notional Building Baseline)

3.5 The total emissions savings calculated in this report are expressed against a Notional Building Target Emission Rate. This is the baseline against which the measures implemented must show an improvement. The Target Emission Rate for the refurbishment has been established using DCLG approved methodology and software.

3.6 The inputs for the Notional Building have been derived from guidance as laid out in Appendix 3 of the GLA Guidance on Preparing Energy Assessments, which details the minimum performance levels for thermal elements and building services to be used in a Notional Building as follows:

Table 3.1 – Notional Building Inputs

Element	Unit	Existing Building Notional Inputs
External Wall	W/m²K	0.30
Roof	W/m²K	0.18
Floor	W/m²K	0.25
Glazing	W/m²K	1.4
Vision Element	g-value	0.4
Air Permeability	(m³ /h.m² @ 50 Pa)	25
Thermal Bridging	W/m²K	Default
HVAC System	Type	System type as proposed ASHP with COP of 2.5 BOH – Direct electric
Heating & Hot Water	%	100% direct electric
Cooling	SEER	As per final building specifications . Notional building SEER of 5 for split/multi-split air conditioners & variable refrigerant flow as per Table 6.6 of Part L 2021
Lighting	Lm/watt	60
Ventilation SFP	W/l/s	
Ventilation SFP	W/l/s	As per table 6.9 in Approved Document L2
Heat recovery	Per Cent	70

3.7 Using the inputs as detailed above the following notional building baseline has been calculated as seen below;

Table 3.2 – Target CO_2 and Target Primary Energy emissions for Development

Unit	Total Floor Area (m²)	TER	Total Target CO_2 (tn.CO2.yr)	TPER	Total Target Primary Energy (kWh.yr)
Baseline Retail Unit	2980	7.86	23.42	84.36	251,392.80
		Total	**23.42**		**251,392.80**

3.8 The figure of **23.42 tonnes.CO_2.per year** and **251,392.80kWh per year** are the targets that must be reached and improved upon in order to comply with Policy DMEI 2 Reduce Carbon Emissions. This will be achieved through the implementation of fabric efficiency, energy-reduction and carbon-saving measures as outlined in the next section.

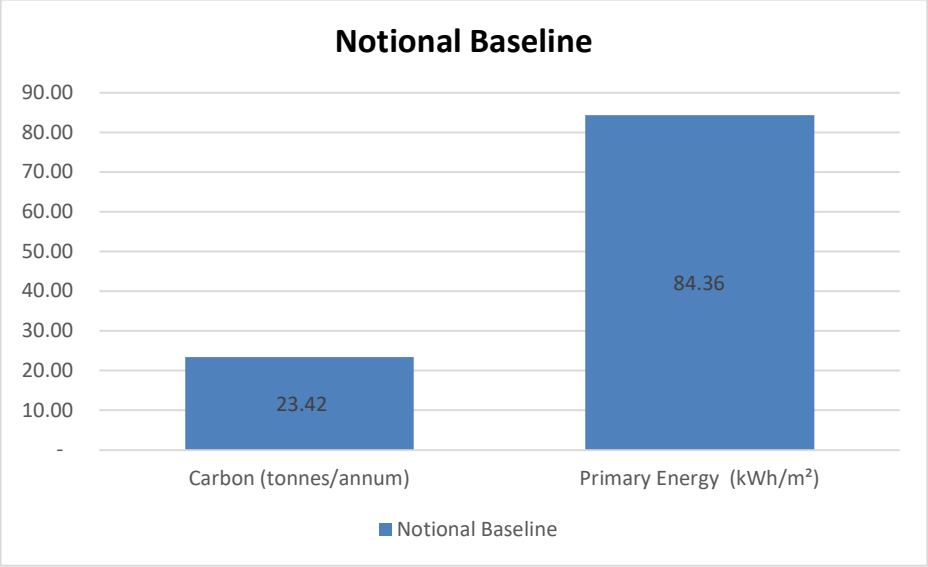


Fig 3.3 – Target CO_2 & Target Primary Energy (kWh.yr) emissions for the proposed development

Applying the Energy Hierarchy: Stage 2 – Be Lean Measures

3.9 The Greater London Authority seeks a 'fabric first' approach to reducing the carbon footprint of new development. This is achieved through buildings using less energy by improving u-values, airtightness and lighting efficiency, amongst others.

Fabric Efficiency

3.10 U-Values are used to measure how effective elements of a building's fabric are as insulators. That is, how effective they are at preventing heat from transmitting between the inside and the outside of a building. The lower the U-value of an element of a building's fabric, the more slowly heat is able to transmit through it, and so the better it performs as an insulator. Very broadly, the better (i.e., lower) the U-value of a building's fabric, the less energy is required to maintain comfortable conditions inside the building.

3.11 The applicant is aiming to reduce heat losses from the development by implementing high level of thermal performance in the development as follows:

Table 3.3 Proposed U-Values

Elements	Proposed U-Values – W/m^2 K	GLA Appendix 3 Specification	Comment
New External Wall	0.15	0.30	n/a
Ground/Exposed Floor	0.18	0.18	Assumed as Part L minimum
External Roof (flat & sloped)	0.18	0.15	n/a
Standard Window Units	1.4	1.4	Assumed as Double-glazed, argon-filled with a g-value of 0.45
External Solid Doors	2.2	1.6	Assumed

Air Tightness

3.12 The designed Air Permeability Rate (APR) has been set at 3 m^3/h.m^2 @ 50Pa for each unit.

Lighting

3.13 This energy demand will be limited by the installation of efficient LED lighting with the use of photocell daylight control where relevant. The following lighting design requirements are therefore stipulated:

Table 3.4 –Lighting Datasheet

Lighting zone	Luminaire Lumens / Circuit Watt	Light Output Ratio	Photocell Dimming (Parasitic Power – W/m²)	Occupancy Sensing – On/Off (Parasitic Power – w/m²)
Shop Floor	110	1	No	No
BOH	110	1	No	Yes (0.3 W/m²)

Ventilation Strategy

3.14 The ventilation strategy has been detailed to improve the energy efficiency needed to lower carbon emissions. The following strategy is proposed:

Table 3.5 – Summary of Ventilation Strategy

Ventilation Zone	System	Specific Fan Power	Heat Recovery (Efficiency)
Shop Floor	n/a	n/a	n/a
Back of House Staff Room	AHU	1.5	n/a
WC	Basic Extract	0.3	n/a

Space Heating &Cooling

3.15 In accordance with the 'GLA Guidance on preparing energy assessments', the 'Be-Lean' heating system in the front of house portion has been assumed as a split system with a heat pump providing space heating with a COP of 2.64.

3.16 The back-of-house heating to amenity areas has been assumed as electric with 100% efficiency as per Be-Green stage.

Hot Water

3.17 All retail areas are assumed to be served by the same hot water system, an instantaneous electric water heater.

Be-Lean Development CO_2 Reductions

3.18 The following tables and graphs represent the Be-Lean improvements for the development over the notional building baseline emissions, calculated using SAP 10 emission factors:

Table 3.6 –Lean Stage CO_2 Reductions over National Baseline

Unit	Total Floor Area (m^2)	BER	Total CO_2 ($tn.CO_2.yr$)	BPER	Target Regulated Energy (kWh.yr)
HB Be-Lean	2987.5	5.30	15.79	56.63	168,757.40
		Total =	**15.79**		**168,757.40**
		Difference over Baseline	7.63		82635.40
		% Difference	**32.57%**		**32.87%**

3.19 As detailed above, the Be-Lean measures at Home Bargains would result in the development achieving a **32.57%** reduction in CO_2 emissions & **32.87%** of Primary energy reductions when compared to a notional building baseline.

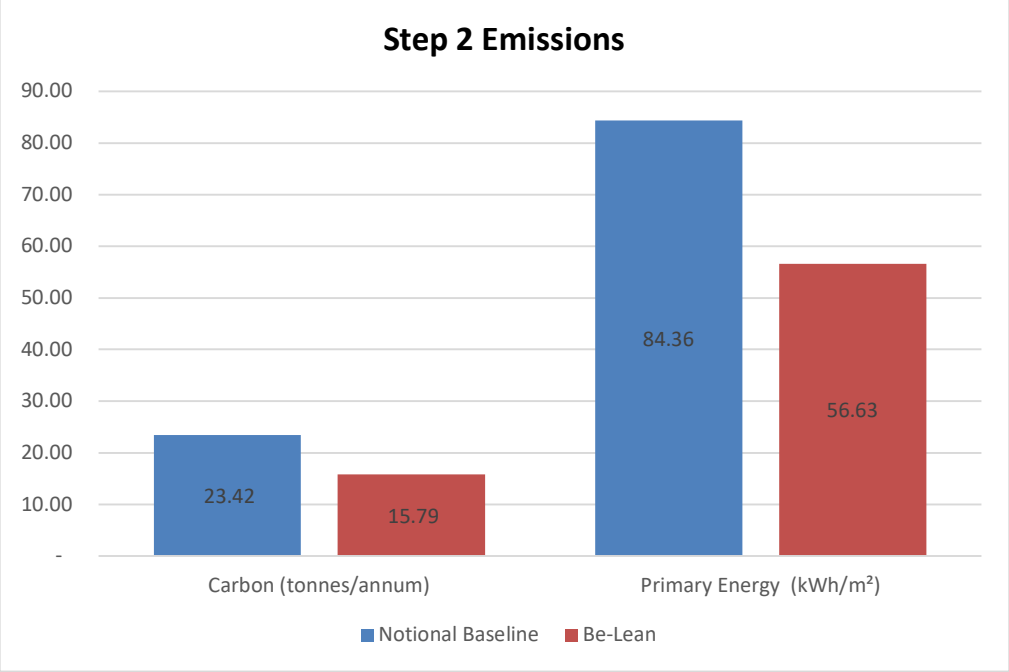


Figure 3.2 Graph of Be-Lean CO_2 reduction over Baseline

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

3.20 The 'Be-Clean' stage requires that any energy supplied to major developments should be as efficient as possible by selecting energy systems in accordance with the following hierarchy:

1. connect to local existing or planned heat networks;
2. use zero-emission or local secondary heat sources (in conjunction with heat pump, if required);
3. use low-emission combined heat and power; and
4. use ultra-low NOx gas boilers.

Connection to local existing or planned networks

3.21 By reviewing the London Heat Map below, there is no 'proposed heat network' located within 500m. However the Council is focusing on the three areas for potential decentralised energy supply identified within the London Heat Map.

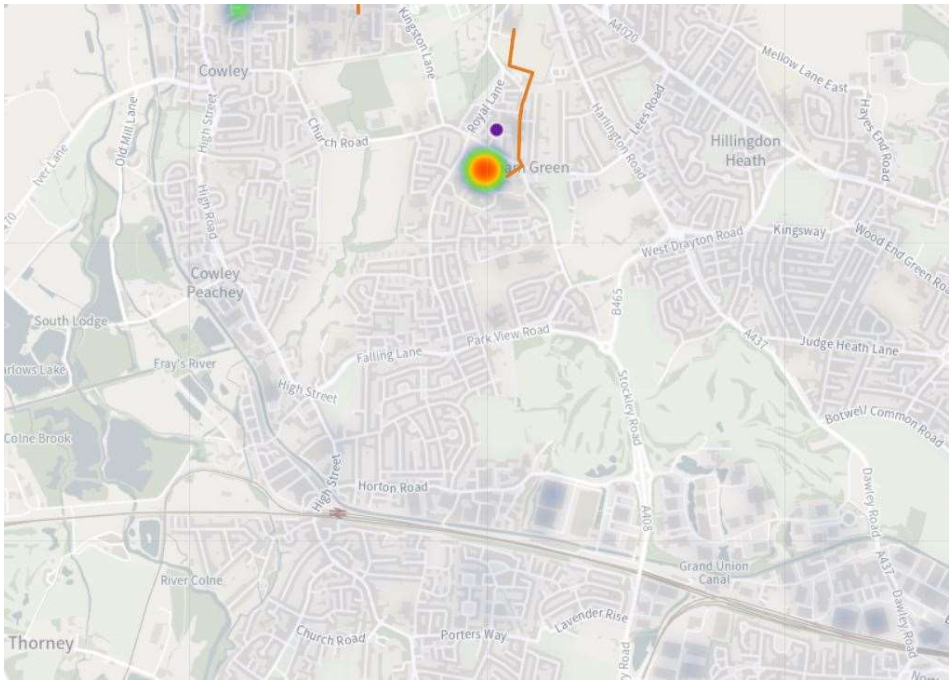


Fig 3.3 – London Heat Map

On-Site Provision

3.22 Given the nature of the development, there will not be a significant demand for concurrent heating and hot water throughout the year (a precursor for on-site communal heating and hot water), meaning an on-site network or DE future connection point would not be practical. The existing nature of the site also adds significant connection for future connection. Therefore , Policy DMEI 3 Decentralised Energy is not suitable for a proposal of this nature.

3.23 In this instance, the unit will be heated via air source heat pumps – which are most appropriate for a scheme of this nature with small ancillary areas and limited hot water demand and align with Criterion 2 of the Be-Clean guidance and also satisfies the Local Plan Policy DMEI 14 Air Quality . The proposed development will be better that 'air quality neutral' in terms of building emission.

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

3.24 During the design-development period for this scheme, multiple low carbon/renewable systems were examined for both their feasibility and ability to lower carbon emissions insofar as possible. Given the retail nature of the development, the renewable systems deemed to be the most viable for the development are Air-Source Heat Pumps providing efficient heating and cooling to the refurbished restaurant unit and Photovoltaic panels (PV) providing renewable energy generation.

Air-Source Heat Pumps for Space Heating & Cooling[1]

3.25 The heating and cooling for the retail unit will be an air-source heat pump (ASHP). ASHPs with the following specifications have been assumed to serve the unit:

- The proposed ASHP is a conventional VRF air source heat pump system. The ASHP will be selected to operate on R32 which is an F-Gas compliant refrigerant;
- Cooling plant will have a minimum Energy Efficiency Ratio (EER) of 4 and SEER of 6;
- The ASHP will have a minimum COP of 4.5 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.

3.26 In line with GLA guidance the following details on the Air-Source Heat Pump system have been provided:

1. The proposed system will deliver **70,621 kWh/annum** of renewable heating energy and **55,849 kWh/annum** of cooling energy[2];
2. The system will require **8,298.61 kWh/annum** of electricity per annum;
3. The location of the external condensers has been provided on an updated architectural site plan;
4. The performance of the system will be monitored post-occupancy in line with the agreed 'Be-Seen' legal wording,

Photovoltaics (PV)[3]

3.27 The second low-carbon/renewable energy proposed for the development is a Photovoltaic (PV) array. The proposed PV array will be mounted at the uppermost roof level of the unit, facing

[1] To ensure the safety and security of the Electricity Networks, depending on the size, type and location of the installation, during detail design the applicant may need to apply for a connection with the DNO **prior to installation** of the device.

[2] An extract of system performance from the BRUKL has been provided in Appendix III

[3] To ensure the safety and security of the Electricity Networks, depending on the size, type and location of the installation, during detail design the applicant may need to apply for a connection with the DNO **prior to installation** of the device.

south-east. The building design will provide service riser accommodation to allow the roof mounted inverter to be wired back to a distribution board and G59 intake meter arrangement.

3.28 Roof mounted PV are specified for the development on the south eastern and western side of the roof.

3.29 The carbon offset from the installation will contribute towards an overall developments CO_2 reduction. Included in the table below is a break-down of the PV requirements:

Table 3.7 – PV Array Details

Unit	PV Area per unit	PV Peak Power (kWp) per unit	PV Energy Generation (kWh.annum) per unit
Total Across Development	**648m²**	**122.4 kWp**	**93,228 kWh[4]**

3.30 An architectural roof layout drawing showing the location of the PV has been submitted alongside the application.

Be-Green Development CO_2 Reductions

3.31 The following tables and graphs represent the Be-Green improvements for the development over the notional building baseline emissions:

Table 3.8 – Target CO_2 and Target Primary Energy emissions for Development

Unit	Total Floor Area (m²)	BER	Total CO2 (tn.CO2.yr)	BPER	Target Regulated Energy (kWh.yr)
Home Bargains, West Drayton	2987.5	0.83	2.47	5.46	16,270.80
		Total =	**2.47**		**16,270.80**
		Be green savings	13.35	51.17	152870.38
		% Difference	**56.87%**		**60.66%**
		Difference over Baseline	20.95		235122.00
		% Difference	**89.44%**		**93.53%**

[4] This is the electrical generation requirement to be passed through to PV supplier.

3.32 The figure of **2.47 tonnes.CO_2.per year** and **16,270.80 kWh per year** are the proposed Be- Green measures for the development achieving a overall **89.44%** reduction in CO_2 emissions & **93.53%** reduction in primary energy reductions when compared to a notional building baseline.

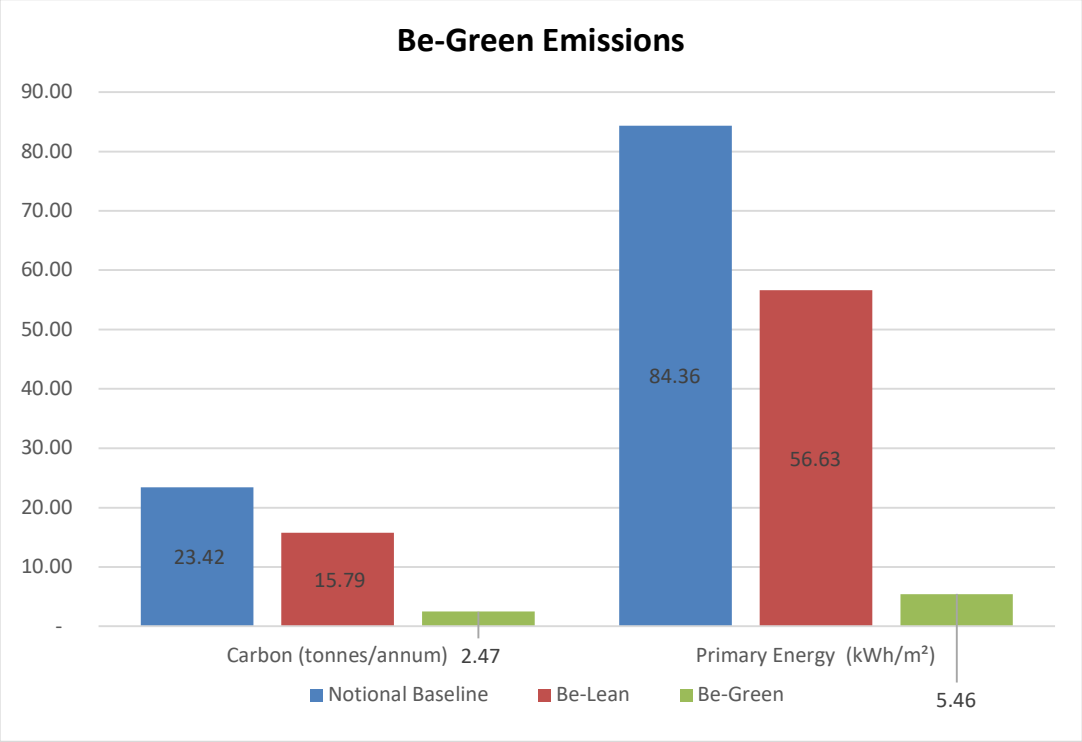


Figure 3.4 Graph of Be-Green CO_2 & Primary Energy (kWh.yr) reduction over Baseline

3.33 Feasibility and detailed design will be progressed post-planning with the appointed building services design team.

Final CO_2 Reduction Chart

3.34 In with the GLA Guidance on Preparing Energy Assessments, the final CO_2 reduction chart demonstrating savings at each stage of the energy hierarchy has been presented below:

Table 3.9 – Final Carbon Emission Reduction Chart

	Carbon Dioxide Emissions for domestic buildings (Tonnes CO2 per annum)	
	Regulated	Unregulated
Baseline: Part L 2013 of the Building Regulations Compliant Development	23.42	28.60
After energy demand reduction	15.79	28.60
After heat network / CHP	n/a	n/a
After renewable energy	2.47	28.60
	Regulated domestic carbon dioxide savings	
	(Tonnes CO2 per annum)	**(%)**
Savings from energy demand reduction	7.65	32.57%
Savings from heat network / CHP	n/a	n/a
Savings from renewable energy	13.32	56.87%
Cumulative on-site savings	20.95	89.44%

3.35 The predicted carbon emissions have been calculated. The BRUKLs are attached in the Appendix. This development would achieve an overall **89.44%** reduction in CO_2 emissions when compared to a notional existing building baseline.

Be-Seen Stage

3.36 All major schemes are required to monitor and report on energy performance to the Mayor for at least five years in line with the Mayor's 'Be Seen' Guidance.

3.37 The applicant has made a commitment that the development will be designed to enable post construction monitoring and that the information set out in the 'be seen' guidance will be submitted to the GLA's portal at the appropriate reporting stages (including planning stage, as-built stage and in-use stages). This will be secured via S106.

4 SUSTAINABILITY REVIEW

4.1 The Home Bargains retail scheme complies with the Adopted Local Plan: Part 1 Strategic Policies (2012) and the Hillingdon Local Plan Part 2 Development Management Policies (2020). Specific policy requirements and how the development complies is set out below:

1. ***Policy DMEI 1 Living Walls and Roofs and on-site vegetation*** **:** A garden centre and landscaped areas are proposed in the retail unit as a part of the refurbishment. A living wall or roof is not feasible as there is limited scope for any alternations. Installing a living roof is technically not feasible as the roof is proposed with PV panels.

2. ***Policy DMEI 3: Decentralised Energy*** **:** As mentioned in Section 3 there are no available decentralised energy networks within 500m of the site, the council, however, has future proposals for decentralized energy network installations in the area which will be operational in 3 years. Regardless of the unavailability, the decentralised energy option is unsuitable as the proposed retail unit has no major hot water demand. Hence an all-electric instantaneous water heater is proposed.

3. ***Policy DMEI 7 Biodiversity Protection and Enhancement*** **:** The policy expects all major development proposals to contribute additional biodiversity improvements if they benefit from a frontage on to the Grand unit canal. The proposed site is bounded by the Grand Union canal to the rear of the site. The scheme retains the existing biodiversity with an addition of a garden centre & landscape areas.

4. ***Policy DMEI 10 Water Management, Efficiency and Quality :*** The policy requires all Major developments including refurbishments to show water efficient measures. The scheme is hence proposed to comply with BREEAM Wat 01 Credit Excellent criteria which requires the project to achieve minimum of 12.5% improvement above the baseline . The proposal will hence limit the Water consumption (L/person/day) to a min of 105L/person/day . The garden centre and landscaped areas will have efficient irrigation system with an installation of outdoor Bib tap. Water submetering for both potable and non-potable water is proposed. Energy efficient components will be specified in the toilets & bakery areas complying to BREEAM Wat 01 credits. No greywater or rainwater systems are proposed at this time. Appendix II provides BREEAM Wat 01 calculations satisfying the excellent criteria by achieving 25.84 % above the baseline .

5. ***Policy DMEI 14 Air Quality :*** The proposed scheme is all electric and therefore there will be no NOx emissions associated with the operation of the building.

5 CONCLUSION

5.1 Envision has been appointed by TJ Morris (the Applicant) to produce an Energy Statement in support of a full planning application made for the development of a Home Bargains, Yiewsley, West Drayton, London. The proposed development involves alterations to the existing elevations and external modifications and minor alternation including relocation of the entrance.

5.2 The most relevant policy when considering the sustainability of the application is Policy DMEI 2 Reducing Carbon emissions of the Adopted Hillington Local Plan (2020). This requires a demonstration of the following:

a . How development proposals are making the fullest contribution to minimising carbon dioxide emissions in accordance with the London plan following energy hierarchy:

(i) Be lean: use less energy.

(ii) Be clean: supply energy efficiently.

(iii) Be green: use renewable energy.

b. How the reductions will be achieved through an Energy assessment.

5.3 The Energy Statement presented in Section 3 of this report explains the approach which has been taken to address carbon emissions through the energy efficient refurbishment of the store. It is material to note that the scheme involves the reuse of the former B&M unit existing superstructure and sub structure - two elements which are associated with the highest embodied carbon of a construction project. In addition, the scheme will incorporate a range of energy saving measures and is to achieve a **89.44%** reduction in carbon emissions and **93.53%** reduction in primary energy compared to a notional existing building baseline.

5.4 As described within this statement, the scheme complies with the wider sustainability policies set in the Hillington Local Plan (2020). This is presented in section 4 of this report . Furthermore, the carbon savings presented are in line with the methodology presented by London Plan Guidance. Savings have been maximised on the site by following the energy hierarchy.

APPENDIX I – BRUKL FOR THE DEVELOPMENT

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Home Bargains Yiewsley - Notional

As designed

Date: Fri Jun 02 10:34:36 2023

Administrative information

Building Details

Address: 217 High Street, Yiewsley,, West Drayton, London, UB7 7GN

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, 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: v7.1.4

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 3063.39

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

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2$.annum	4.79	
Building CO_2 emission rate (BER), $kgCO_2/m^2$.annum	7.86	
Target primary energy rate (TPER), kWh_{PE}/m^2.annum	51.33	
Building primary energy rate (BPER), kWh_{PE}/m^2.annum	84.36	
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	0.3	0.35	GROUND FLOOR - WAREHOUSE_P_29
Floors	0.18	0.25	0.25	GROUND FLOOR - OFFICE CORRIDOR_S_3
Pitched roofs	0.16	0.18	0.18	GROUND FLOOR - WAREHOUSE_R_50
Flat roofs	0.18	0.18	0.18	GROUND FLOOR - WAREHOUSE_R_38
Windows** and roof windows	1.6	1.4	1.4	GROUND FLOOR - OFFICE/MEETING_G_7
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.43	1.6	GROUND FLOOR - MALE WC_D_6
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	15

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- BOH

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

2- SPLIT

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	5	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
GROUND FLOOR - OFFICE	-	-	-	-	2	-	-	-	-	0.7	N/A
GROUND FLOOR - FEMALE WC	-	-	0.5	-	-	-	-	-	-	-	N/A
GROUND FLOOR - MALE WC 1	-	-	0.5	-	-	-	-	-	-	-	N/A
GROUND FLOOR - MALE WC	-	-	0.5	-	-	-	-	-	-	-	N/A
GROUND FLOOR - OFFICE/MEETING	-	-	-	-	2	-	-	-	-	0.7	N/A
GROUND FLOOR - OFFICE MAIN	-	-	-	-	2	-	-	-	-	0.7	N/A
GROUND FLOOR - ROOM 1	-	-	-	-	2	-	-	-	-	0.7	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
GROUND FLOOR - ELECTRICAL	60	-	-
GROUND FLOOR - OFFICE CORRIDOR	60	-	-
GROUND FLOOR - OFFICE	60	-	-
GROUND FLOOR - CORRIDOR	60	-	-
GROUND FLOOR - FEMALE WC	60	-	-
GROUND FLOOR - MALE WC 1	60	-	-
GROUND FLOOR - MALE WC	60	-	-
GROUND FLOOR - WC	60	-	-
GROUND FLOOR - WC1	60	-	-
GROUND FLOOR - OFFICE/MEETING	60	-	-
GROUND FLOOR - OFFICE MAIN	60	-	-
GROUND FLOOR - WAREHOUSE	60	60	2.5
GROUND FLOOR - ENTRANCE	60	60	2.5
GROUND FLOOR - ROOM 1	60	-	-

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?
GROUND FLOOR - OFFICE	N/A	N/A
GROUND FLOOR - OFFICE/MEETING	NO (-74.5%)	NO
GROUND FLOOR - OFFICE MAIN	NO (-93.3%)	NO
GROUND FLOOR - WAREHOUSE	NO (-96.9%)	NO
GROUND FLOOR - ENTRANCE	YES (+95.5%)	NO
GROUND FLOOR - ROOM 1	N/A	N/A

Regulation 25A: Consideration of high efficiency alternative energy systems

Were alternative energy systems considered and analysed as part of the design process?	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]	3071.1	3071.1
External area [m^2]	8034.4	8034.4
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	15	5
Average conductance [W/K]	2017.31	2669.44
Average U-value [W/m^2K]	0.25	0.33
Alpha value* [%]	7.67	19.48

* 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	15.33	12.43
Cooling	5.67	6.79
Auxiliary	0.36	0.22
Lighting	32.18	13.97
Hot water	1.77	1.77
Equipment*	21.75	21.75
TOTAL**	**55.31**	**35.18**

* 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	0.68
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*0.68*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	208.82	228.36
Primary energy [kWh_{PE}/m^2]	84.36	51.33
Total emissions [kg/m^2]	7.86	4.79

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	0	1016.3	0	0	0	0	0	0	0
	Notional	0	994.8	0	0	0	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	84.8	55.9	29.4	0	6.4	0.8	0	1	0
	Notional	74.8	78	15.5	0	6.5	1.34	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	134	73.9	15.1	5.8	0.3	2.46	3.55	2.64	5
	Notional	118	109.7	12.4	6.9	0.1	2.64	4.4	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Home Bargains West Drayton - Be Lean

As designed

Date: Fri Jun 02 10:45:11 2023

Administrative information

Building Details

Address: 217 High Street, Yiewsley,, West Drayton, London, UB7 7GN

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

Address: 8-9 Stephen Mews, 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: v7.1.4

BRUKL compliance module version: v6.1.e.0

Foundation area [m²]: 2954.11

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

The building does not comply with England Building Regulations Part L 2021

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	4.01	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	5.3	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	42.27	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	56.63	
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	0.18	0.18	GROUND FLOOR - WC LOBBY_W_5
Floors	0.18	0.18	0.25	GROUND FLOOR - RETAIL WAREHOUSE_F_24
Pitched roofs	0.16	0.15	0.15	GROUND FLOOR - RETAIL WAREHOUSE_R_29
Flat roofs	0.18	0.15	0.15	GROUND FLOOR - RETAIL WAREHOUSE_R_19
Windows** and roof windows	1.6	1.4	1.4	GROUND FLOOR - RETAIL WAREHOUSE_G_11
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.3	1.3	GROUND FLOOR - SEASONAL STORE_D_11
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	3

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- BOH

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

2- SPLIT

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	2.64	6	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	System type in the Approved Documents
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	SFP [W/(l/s)]									HR efficiency	
ID of system type	A	B	C	D	E	F	G	H	I		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	Zone	Standard
GROUND FLOOR - BAKERY	-	-	-	-	-	-	-	-	0.3	-	N/A
GROUND FLOOR - WC LOBBY	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - MALE WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - UNISEX WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - UNISEX WC	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - OFFICE AREA	-	-	-	-	1.5	-	-	-	-	0.85	N/A
GROUND FLOOR - BREAK OR CAFE-ROOM	-	-	-	-	1.5	-	-	-	-	0.85	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
GROUND FLOOR - STAFF ROOM	-	-	-	-	1.5	-	-	-	-	0.85	N/A
GROUND FLOOR - CASH OFFICE	-	-	-	-	1.5	-	-	-	-	0.85	N/A
GROUND FLOOR - MEETING ROOM	-	-	-	-	1.5	-	-	-	-	0.85	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
GROUND FLOOR - BAKERY	110	-	-
GROUND FLOOR - WC LOBBY	110	-	-
GROUND FLOOR - SEASONAL STORE	110	-	-
GROUND FLOOR - MALE WC 2	110	-	-
GROUND FLOOR - CORRIDOR	110	-	-
GROUND FLOOR - STORE	110	-	-
GROUND FLOOR - UNISEX WC 1	110	-	-
GROUND FLOOR - UNISEX WC	110	-	-
GROUND FLOOR - WC	110	-	-
GROUND FLOOR - RETAIL WAREHOUSE	110	100	1.5
GROUND FLOOR - OFFICE AREA	110	-	-
GROUND FLOOR - BREAK OR CAFE ROOM	110	100	1.5
GROUND FLOOR - STAFF ROOM	110	-	-
GROUND FLOOR - CASH OFFICE	110	-	-
GROUND FLOOR - MEETING ROOM	110	-	-
GROUND FLOOR - ENTRANCE/EXIT	110	100	1.5

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?
GROUND FLOOR - RETAIL WAREHOUSE	NO (-94.1%)	NO
GROUND FLOOR - OFFICE AREA	N/A	N/A
GROUND FLOOR - BREAK OR CAFE ROOM	N/A	N/A
GROUND FLOOR - STAFF ROOM	N/A	N/A
GROUND FLOOR - CASH OFFICE	N/A	N/A
GROUND FLOOR - MEETING ROOM	N/A	N/A
GROUND FLOOR - ENTRANCE/EXIT	YES (+57.6%)	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]	2983.3	2983.3
External area [m^2]	7865.5	7865.5
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	1413.63	2591.8
Average U-value [W/m^2K]	0.18	0.33
Alpha value* [%]	8.78	16.57

* 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	12.61	13.32
Cooling	3.87	6.65
Auxiliary	0.68	0.59
Lighting	16.83	12.91
Hot water	3.04	3.12
Equipment*	21.69	21.69
TOTAL**	**37.02**	**36.59**

* 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	8.28
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*0*	*8.28*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	150.02	227.2
Primary energy [kWh_{PE}/m^2]	56.63	42.27
Total emissions [kg/m^2]	5.3	4.01

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	17.5	257.6	0	0	4.9	0	0	0	0
	Notional	19	267.2	0	0	9.9	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	109.9	9.9	38.2	0	1	0.8	0	1	0
	Notional	104.1	32.1	21.6	0	1.9	1.34	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	85.1	67.3	9.6	4.4	0.6	2.46	4.26	2.64	6
	Notional	118.3	119.4	12.4	7.5	0.3	2.64	4.4	----	----

Key to terms

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

BRUKL Output Document

HM Government

Compliance with England Building Regulations Part L 2021

Project name

Home Bargains West Drayton - Be Green As designed

Date: Fri Jun 02 15:04:51 2023

Administrative information

Building Details

Address: 217 High Street, Yiewsley,, West Drayton, London, UB7 7GN

Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: DesignBuilder SBEM

Interface to calculation engine version: v7.1.4

BRUKL compliance module version: v6.1.e.0

Certifier details

Name: Ciaran Dorrity

Telephone number: 02074860680

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

Foundation area [m^2]: 2954.11

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

Target CO_2 emission rate (TER), $kgCO_2/m^2.annum$	4.01	
Building CO_2 emission rate (BER), $kgCO_2/m^2.annum$	0.83	
Target primary energy rate (TPER), $kWh_{PE}/m^2.annum$	42.27	
Building primary energy rate (BPER), $kWh_{PE}/m^2.annum$	5.46	
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	0.18	0.18	GROUND FLOOR - WC LOBBY_W_5
Floors	0.18	0.18	0.25	GROUND FLOOR - RETAIL WAREHOUSE_F_24
Pitched roofs	0.16	0.15	0.15	GROUND FLOOR - RETAIL WAREHOUSE_R_29
Flat roofs	0.18	0.15	0.15	GROUND FLOOR - RETAIL WAREHOUSE_R_19
Windows** and roof windows	1.6	1.4	1.4	GROUND FLOOR - RETAIL WAREHOUSE_G_11
Rooflights***	2.2	-	-	No external rooflights
Personnel doors^	1.6	1.3	1.3	GROUND FLOOR - SEASONAL STORE_D_11
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 [$W/(m^2K)$] $U_{i\text{-}Calc}$ = Calculated maximum individual element U-values [$W/(m^2K)$]

$U_{a\text{-}Calc}$ = 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

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	3

Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	NO
Whole building electric power factor achieved by power factor correction	<0.9

1- BOH

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

2- SPLIT

	Heating efficiency	**Cooling efficiency**	**Radiant efficiency**	**SFP [W/(l/s)]**	**HR efficiency**
This system	4.5	6	-	-	-
Standard value	2.5*	5	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.					

1- DHW

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

Zone-level mechanical ventilation, exhaust, and terminal units

ID	**System type in the Approved Documents**
A	Local supply or extract ventilation units
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal balanced supply and extract ventilation system
E	Local balanced supply and extract ventilation units
F	Other local ventilation units
G	Fan assisted terminal variable air volume units
H	Fan coil units
I	Kitchen extract with the fan remote from the zone and a grease filter
NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.	

Zone name	**SFP [W/(l/s)]**									**HR efficiency**	
ID of system type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**		
Standard value	0.3	1.1	0.5	2.3	2	0.5	0.5	0.4	1	**Zone**	**Standard**
GROUND FLOOR - BAKERY	-	-	-	-	-	-	-	-	0.3	-	N/A
GROUND FLOOR - WC LOBBY	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - MALE WC 2	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - UNISEX WC 1	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - UNISEX WC	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - WC	-	-	0.3	-	-	-	-	-	-	-	N/A
GROUND FLOOR - OFFICE AREA	-	-	-	-	1.5	-	-	-	-	0.85	N/A
GROUND FLOOR - BREAK OR CAFE-ROOM	-	-	-	-	1.5	-	-	-	-	0.85	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
GROUND FLOOR - STAFF ROOM	-	-	-	-	1.5	-	-	-	-	0.85	N/A
GROUND FLOOR - CASH OFFICE	-	-	-	-	1.5	-	-	-	-	0.85	N/A
GROUND FLOOR - MEETING ROOM	-	-	-	-	1.5	-	-	-	-	0.85	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
GROUND FLOOR - BAKERY	110	-	-
GROUND FLOOR - WC LOBBY	110	-	-
GROUND FLOOR - SEASONAL STORE	110	-	-
GROUND FLOOR - MALE WC 2	110	-	-
GROUND FLOOR - CORRIDOR	110	-	-
GROUND FLOOR - STORE	110	-	-
GROUND FLOOR - UNISEX WC 1	110	-	-
GROUND FLOOR - UNISEX WC	110	-	-
GROUND FLOOR - WC	110	-	-
GROUND FLOOR - RETAIL WAREHOUSE	110	100	1.5
GROUND FLOOR - OFFICE AREA	110	-	-
GROUND FLOOR - BREAK OR CAFE ROOM	110	100	1.5
GROUND FLOOR - STAFF ROOM	110	-	-
GROUND FLOOR - CASH OFFICE	110	-	-
GROUND FLOOR - MEETING ROOM	110	-	-
GROUND FLOOR - ENTRANCE/EXIT	110	100	1.5

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?
GROUND FLOOR - RETAIL WAREHOUSE	NO (-94.1%)	NO
GROUND FLOOR - OFFICE AREA	N/A	N/A
GROUND FLOOR - BREAK OR CAFE ROOM	N/A	N/A
GROUND FLOOR - STAFF ROOM	N/A	N/A
GROUND FLOOR - CASH OFFICE	N/A	N/A
GROUND FLOOR - MEETING ROOM	N/A	N/A
GROUND FLOOR - ENTRANCE/EXIT	YES (+57.6%)	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]	2983.3	2983.3
External area [m^2]	7865.5	7865.5
Weather	LON	LON
Infiltration [m^3/hm^2@ 50Pa]	3	5
Average conductance [W/K]	1413.63	2591.8
Average U-value [W/m^2K]	0.18	0.33
Alpha value* [%]	8.78	16.57

* 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	9.11	13.32
Cooling	3.87	6.65
Auxiliary	0.68	0.59
Lighting	16.83	12.91
Hot water	3.04	3.12
Equipment*	21.69	21.69
TOTAL**	**33.52**	**36.59**

* 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	31.25	8.28
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0
Displaced electricity	*31.25*	*8.28*

Energy & CO_2 Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m^2]	150.02	227.2
Primary energy [kWh_{PE}/m^2]	5.46	42.27
Total emissions [kg/m^2]	0.83	4.01

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	17.5	257.6	0	0	4.9	0	0	0	0
	Notional	19	267.2	0	0	9.9	0	0	----	----
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Natural Gas										
	Actual	109.9	9.9	38.2	0	1	0.8	0	1	0
	Notional	104.1	32.1	21.6	0	1.9	1.34	0	----	----
[ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity										
	Actual	85.1	67.3	5.6	4.4	0.6	4.19	4.26	4.5	6
	Notional	118.3	119.4	12.4	7.5	0.3	2.64	4.4	----	----

Key to terms

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

APPENDIX II – BREEAM WAT 01 CALS

BREEAM UK Refurbishment and Fit-out 2014 Wat 01 Water consumption: Water efficiency calculator

BREEAM UK

Building details

Building name	Home Bargains Yiewsley
BRE assessment reference no.	TBC

Building type	Description of building type	Default annual days/ooeration	Default daily hours of ooeration
Retail - Shop / retail unit(s) / retail warehouse	TCP Classification A1 Shops: shop/retail unit(s)/retail warehouse(s).	362	8.5
	Does the retail development contain sanitary facilities for use by visiting customers?		No
		Default daily occupancy visiting customers	Not applicable
		Default daily occupancy staff	190

Main building activity areas	Description of activity area	Activity area present in building?	Net Floor Area (m²)
Retail - sales areas for display of bulky items	A retail sales/display area trading predominantly in bulky items, e.g. furniture, floor coverings, cycles, prams, large domestic appliances or other bulky goods, or trading on a wholesale self-selection basis.	No	
Retail - sales areas for display of non bulky items and/or customer service area.	A general sales/display areas in department stores, supermarkets, shops and/or customer service waiting and/or collection areas e.g. in banks, post office, bookmakers etc.	Yes	2987.5
Retail - concourse/shopping mall	The central (shared) area within a shopping centre used for access by shoppers (typically a covered area containing one or more of benches, cafes, escalators etc.)	No	
Retail - Staff office area and staffroom	Staff office space and staffroom, often located in 'back of house' areas.	Yes	110.4
Retail - Staff canteen dining area	Seated areas in a staff canteen that accompany a food preparation areas where food and drink is consumed by staff on the premises.	No	
Retail - Goods-in and storage area	Internal areas for receiving and storing goods.	Yes	250
Retail - Workshop	A workshop / vehicle servicing area within a car showroom or general workshop in other type of retail development.	No	

Water consumption - building microcomponent

WC component - all activity areas	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
WC - male (no urinals installed)	Effective flush volume (Litres)	6.00	4.00	1.00	12.00
WC - female	Effective flush volume (Litres)	6.00	4.00	1.00	12.00

Urinal component - all activity areas	units	Specification	No. of cisterns	Flushing frequency (flushes/hour)	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)

	units		Usage/person/day	Usage factor	Consumption (L/person/day)

	units	Specification	Usage/person/day	Usage factor	Consumption (L/person/day)
Taps components (personal hygiene) - all activity areas					
Wash hand basin taps	Flow rate (litres/min)	5.00	4.00	0.25	3.39
Shower use	Flow rate (litres/min)	0.00	0.030	5.60	0.00
Fixed use - vessel filling	Litres/person/day	-	-	-	1.58
Tap components (cleaning) - staff kitchenette					
Kitchen taps - kitchenette	Flow rate (litres/min)	6.00	1.00	0.67	2.72
Dishwasher	Litres/cycle	0.00	0.0400	1.00	0.00
Tap components (cleaning and food preparation) - staff canteen food preparation area					

	Microcomponent Consumption (L/person/day)
Total	31.69

Non potable water yield - greywater system

Has, or will, the greywater system be specified and installed in compliance with BS8525-1:2010 Greywater Systems - Part 1 Code of Practice	System not specified

Greywater source (building components)	Greywater collected	Proportion of components collected from (%)	Greywater yield (L/person/day)

Greywater source (other components)	Typical greywater yield (litres)	Frequency of yield (days)	Greywater yield (litres/day)	Greywater yield (L/person/day)

	Greywater yield (L/person/day)
Total	

Non potable water yield - rainwater system

Has, or will, the rainwater system be specified and installed in compliance with BS8515:2009 Rainwater Harvesting Systems - Code of practice	System not specified
How has the storage capacity for the proposed system been calculated?	

Rainwater yield if intermediate:

Collection area (m2)	Rainfall (average mm/yr)	Hydraulic filter efficiency (%)	Yield co-efficient (%)	Annual rainwater yield (Litres)	Rainwater yield (L/person/day)

Rainwater yield if detailed:

Daily rainfall collection (litres)	Rainwater yield (L/person/day)

Non potable water demand - building components

	Greywater and/or rainwater yield (L/person/day)
Total	

Component	Greywater and/or rainwater utilised for component	Proportion of components using greywater and/or rainwater yield (%)	Maximum permissible demand (L/person/day)

	Demand met by yield (L/person/day)
Total	

Other permissible components

	Maximum permissible demand (L/day)

	Demand met by yield (L/person/day)
Total	

	Greywater and/or rainwater demand met by yield (L/person/day)
Total	

Water consumption calculation results

	Litres/person/day	m³/person/yr
Water consumption - modelled baseline performance benchmark (excludes fixed uses)	**40.60**	**14.70**
Microcomponent water consumption - modelled performance (excludes fixed uses)	**30.11**	**10.90**
Modelled water demand met via greywater and rainwater sources	**0.00**	**0.00**
If greywater/rainwater systems specified has the minimum % efficiency improvement for component specifications been met	**System not specified**	
Net modelled water consumption (excludes fixed uses)	**30.11**	**10.90**
Percentage improvement	**25.84%**	
Total Wat 01 BREEAM credits achieved	**2 credits**	
Total Wat 01 BREEAM innovation credits achieved	**Exemplary level not achieved**	
Key performance indicator - use of freshwater resource (includes fixed uses)	**31.69**	**11.47**