1.1.3 12-13 Jockey's Fields

12-13 Jockey's Fields is a 4-story tall building with the 4th floor being stepped back, it is a concrete frame structure infilled with blockwork and large glazing units, built in 1969. The building is currently a low ceiling, completely open plan office with few private offices.

The Ground floor garages behind the metal shutter and beneath the 1st floor slab as shown in Figure 5, do not belong to the development being private residential parking for the owners at 12-13 Bedford Row and as such are not included within the plans of work.

Figure 5: 12-13 Jockey's Fields elevation

1.1.4 14 Jockey's Fields

14 Jockey's Fields is the newest edition of the 3 buildings being built in 1986 it is 3 stories tall, with an additional large single-storey extension to the rear and basement throughout, it is assumed to be a concrete frame building with cavity walls construction. Currently, the building is being used as individual low-ceiling offices with a large function room located at the rear with supporting conference rooms. Please see Figure 6 for the front elevation.

Figure 6: 14 Jockey's Fields

1.2 The Proposal

The proposed development is for the refurbishment of all 3 buildings into a single high-quality apart-hotel comprising 65 rooms, with supporting amenity space, a rooftop terrace, and a cycle store.

As part of the development there will be some minor external work carried out to the rear of the 14 Jockey's fields, please see Figure 7 for the plan highlighting key areas and Table 1 for an area schedule of all provisions.

Figure 7: Fourth Floor plan - Courtyard infill (red), Courtyard creation (green), Rooftop plant (orange) - (Source: White Red

Infilling Courtyard - This will be in the form of infiling the existing courtyard to provide additional internal floor space and allow for the removal of a significant proportion of outdated poorly performing and utilised glazing.

Creation of a new courtyard - There will also be the creation of a new external courtyard that would run along the boundary of 15 Jockey's Fields providing a considerable increase in green space and allowing for greater natural day light in the ground floor and lower ground floor rooms.

Table 2: Area Schedule

Space	Number of rooms	Gross Internal Area (sqm)
Rooms	65	1184
Amenity space	N/a	148
Courtyard garden	N/a	45
Ancillary	N/a	74
Internal Plant	N/a	58
Circulation	N/a	501
Total		**2010**

Creation of rooftop plant: there will be the creation of three rooftop plant enclosures - one sitting on the link structure terrace, and the other two on the roofs of 12-13 and 14 Jockey's Fields - to meet the MEP demands for servicing the development.

For further details please see the Design and Access statement submitted alongside this document produced by White Red Architects.

1.3 Compliance

This assessment demonstrates how the proposed Major refurb from office (Class E) to apart-hotel (Class C1) development has the potential to achieve a minimum of 70% reduction in regulated Carbon Dioxide (CO2) emissions over the estimated existing building baseline, and that the proposed climate change mitigation measures would comply with London Plan 2021 energy policies, including the energy hierarchy. This assessment would also ensure that energy remains an integral part of the development's design and evolution.

The energy and carbon reduction strategy under the climate change mitigation measures proposed for the proposed development are in line and in compliance with the relevant and applicable targets and requirements listed within the following:

1. Camden Council Design Guidance 2017
2. The London Plan 2021 relevant planning policies within Chapter 9
3. The GLA Draft Energy Assessment Guidance June 2022

The project team is committed to achieving the reduced carbon target by following the London Plan Energy Hierarchy principles.

1.4 Carbon Emission Factors

Fuel carbon emission factors are displayed below in Table 3. The proposed development energy performance has been assessed using the Standard Assessment Procedure 10 (SAP10).

Table 3: Carbon (CO_2) Emission Factors

Fuel Type	Fuel Carbon Factor ($kgCO_2/kWh$)
Natural Gas	0.222 (not used - The proposed scheme is a gas free development)
Grid Electricity	0.381

2. Establishing CO_2 Emissions

The energy and the associated CO_2 emission calculations for the proposed development were calculated using Integrated Environmental Solution Virtual Environment (IES VE).

The target emission rate (TER) was produced utilising the limited information available to calculate the thermal performances of the existing building fabric along with specifying a gas boiler and service strategy in line with the notional specification for existing building set out Appendix 3 of the Mayor of London Energy Assessment Guidance 2022.

The appropriate building energy demand benchmarks were applied, similarly to the new build methodology to ensure accurate analysis of each space.

The savings and reductions in CO2 emissions in both assessments, due to incorporating the climate change mitigation measures into the proposed design, have been calculated, compared and demonstrated against the estimated CO2 emissions of the notional/existing building.

The results tables were completed and presented to demonstrate savings in CO2 emissions (expressed in tonnes of CO2 per annum) following the London Plan Energy Hierarchy.

Please see Figure 8 for an image of the model created within IES VE.

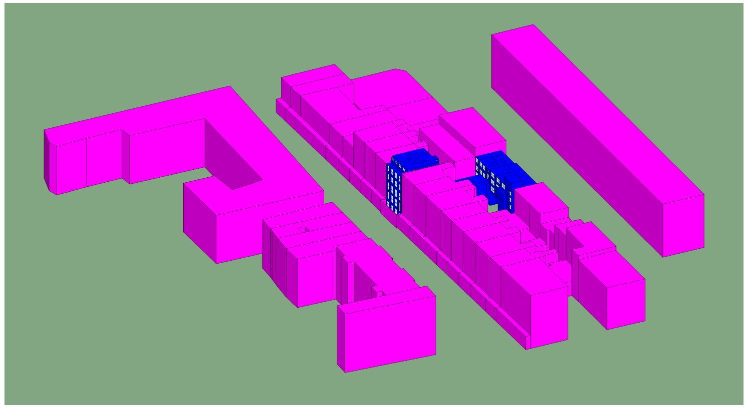


Figure 8: IES model

IES INTEGRATED ENVIRONMENTAL SOLUTIONS

3. Building Regulation Targets

New and refurbished buildings must be shown, by calculation, to meet the following building regulation targets.

- Co2 Emission reduction - New and refurbished buildings
- Fabric energy efficiency rate - New buildings only (not required)
- Primary energy requirement - New buildings only (not required)

3.1 Emission Rate

A key component of building regulation Part L 2021 is the target CO2 emission rate (TER). This sets a minimum allowable standard for the energy performance of a building and is defined by the annual CO2 emissions of a notional building of the same type, size and shape as the proposed building. The maximum CO2 emission rate for the buildings is expressed as kgCO2/(m2 ·year) and determined using the Standard Assessment Procedure.

As the development is a major refurbishment, being greater than 1,000 sqm; the proposed development will be assessed in line with the relevant paragraphs of section 6 of the GLA Energy Assessment Guidance (June 2022). *Where major refurbishments are being carried out, an estimate of the CO2 savings from the refurbishment of the building will be expected. To provide this, applicants are required to estimate the CO2 emission baseline performance of the existing building using Building Regulations approved compliance software*.

The TER in this instance is calculated based on an estimated carbon performance of the existing building.

Table 4 displays the overall results for TER against the DER for the proposed development.

Table 4: Major refurb from office (Class E) to apart-hotel (Class C1) Refurb CO_2 Emission Rates

	TER/BER (kWh/m^2)	DER (kWh/m^2)	Improvement (%)
Total	68.84	22.01	**68**

3.2 Fabric Energy Efficiency Rate

Compliance with this element is not required for the proposed development as this element is only applicable to new build developments.

3.3 Primary Energy Requirement

Compliance with this element is not required for the proposed development as this element is only applicable to new build developments.

4. Major Refurbishment

The following section provides the proposed carbon emission reduction strategy for the Major Refurbishment development, in line with the London Plan Energy Hierarchy.

4.1 Demand Reduction (Be Lean)

Potential reduction due to 'Be Lean' measures, in CO2 emission compared to Part L2 2021, is 11.56%.

4.1.1 Passive Measures

As the building is existing, there is limitation to the extent of passive measures that can be adopted. That being said, improvements have been made where possible.

The existing building facade and glazing are proposed to be improved to minimise heat loss in winter and mitigate potential overheating risk in summer.

Furthermore, thermal bridging will be considered in the proposed construction to further improve the building's thermal performance.

The aim is to use less energy and manage demand during operation through fabric and servicing improvements, and the incorporation of flexibility measures. Before any mechanical systems are considered, the development will be made as energy efficient as possible by having low U-values and using daylight.

Passive design measures would include optimising orientation and site layout (where applicable), thermal mass and site microclimate to provide natural lighting, heating and cooling of buildings. Green roofs, green walls, high ceilings and window heights (for natural light and ventilation) are preferred (where possible), as well as high thermal mass and the incorporation of solar shading.

4.1.1.1 Building Facade and Air Permeability

The building facade has a great impact on a building's energy efficiency. Specifying materials with low U-values and ensuring low air permeability* minimise energy demand through reduced heat loss.

The thermal performances of the existing facade, where technically feasible, has been improved in line with the relevant thermal performances recommended performances listed within table 4.2 of Approved Document Part L2 for refurbished developments.

**Air permeability describes the amount of air that passes, perpendicularly through a facade. This can be reduced through material selection and best practice construction methods.*

4.1.1.2 Thermal Bridging

Thermal bridges occur when an area of a building has significantly higher heat transfer than the surrounding parts. Breaks in insulation, reduced insulation or more conductive materials can contribute to thermal bridge effects. The building fabric should be constructed so that thermal bridging, including at the party wall, is reasonably limited.

Building Regulation Part L 2021 places increased importance on addressing thermal bridging, that could be minimised by careful detailing, or the use of standard details (such as Accredited Construction Details i.e. ACDs) where appropriate.

The role of thermal bridges in building heat loss can be significant for well insulated buildings.

We recommend that as the refurbishments design progresses, building junctions are considered carefully to minimise thermal bridging. Standard 'accredited construction details' are available, for which the impact of thermal bridging is known. In many cases, the impact of thermal bridging can be ignored if good thermal continuity is achieved through the junction. For more complex or less intuitive scenarios, thermal bridging calculations can be carried out to calculate the additional heat loss.

4.1.1.3 Passive Ventilation

Passive ventilation utilises natural forces, such as wind or thermal buoyancy to extract stale air and supply fresh air to a space.

Natural ventilation has been proposed as a secondary method of ventilation to help mitigate the risk of overheating in the summer months and provide ventilation when outdoor air temperature is adequate to cool guests and would not disrupt the occupant's thermal comfort. These steps are seen as adequate to mitigate the risk of overheating alongside the proposed active mechanical ventilation.

4.1.1.4 Passive Measures Summary

The design team has made considerable effort to consolidate the building's exterior facade's thermal performance and decreased the external area by infilling the poorly performing existing courtyard that contained a large amount of glazing.

Table 7 displays the average weighted thermal performances for each key component of the refurbishment due the number of different constructions and their respective thermal performance. Furthermore key considerations have been discussed below.

Table 7: Whole building weighted Thermal Performances for l refurbishment

	Existing	Proposed Design	Notional Specification for Existing Buildings
Walls U-Value Target	1.06	0.25	0.55
Floors U-Value Target	0.56	0.56	0.25
Roofs U-Value Target	2.47	0.12	0.18
Doors U-Value Target	2.2	1.56	-
Windows U-Value Target	2.21	1.49	1.4
Windows G Value Target	0.8 - 0.58	0.65 - 0.40	0.4
Air permeability	25	8	25
Heating system pipework	Insulated pipework and fittings within the plant room to reduce heat loss		
Thermal Mass	Medium		-

Walls - All existing walls are targeted to be improved to the Building Regulation Part L2 2021 table 4.2 threshold of 0.3 W/m2k, this has been accounted for within the design by allowing for an additional 100mm insulation zone internally. It is anticipated that in specific areas such as corridors where strict widths must be maintained to allow for accessibility (Building regulation Part M) improvement may not be feasible.

The new facade to the rear of 14 Jockey's Fields will have a U-value of 1.5 W/m2k.

Roof - It is proposed that the external roof finish will be removed and additional insulation fitted along all roofs in order achieve average U-value of 0.12 W/m2k.

Floors - The floors/foundations construction falls below the Building Regulation Part L2 2021 table 4.2 threshold of 0.7 W/m2k and as such no upgrade has been suggested. It should be noted that there is a significant limitation due to the low ceiling height restricting the level of intervention.

Windows - It is the design team's intention to keep in place the existing windows as they were upgraded across the building in 2013, this will also result in minimal change to the existing facades.

All new glazing within the courtyard extension to the rear of 14 Jockey's Fields will have high performing triple glazing with a U-value of 1.0 W/m2k and a G-value of 0.4. In addition, in order to improve the single glazing along the front facade of 14 Bedford Row secondary glazing will be installed internally to improve its fabric performance.

4.1.2 Active Measures

Active design measures would include mechanical heating, cooling and ventilation required in the building, as well as any mechanical systems that are considered, for example, efficient mechanical ventilation with heat recovery (MVHR) or waste water heat recovery (WWHR) (where appropriate).

4.1.2.1 Lighting

Traditional fluorescent lighting dissipates a large amount of energy to heat. Alternatively, specifying high-efficiency LED lighting can significantly reduce the energy demand for a building, and therefore the carbon emissions.

100% LED lighting is proposed throughout the development.

4.1.2.2 Active Ventilation

A block by block centralised AHU with built in heat recovery (MVHR) with a minimum MVHR efficiency of 85% is proposed for all guest rooms and communal spaces. These systems supply fresh air and extract stale air from occupied spaces, whilst minimising heat loss. A summer bypass function is available in this system to ensure that the heat from outgoing air is not used to heat the incoming air.

The units will be sized depending on ventilation requirement calculations for the development, conducted by a specialist MEP Engineer to ensure the units can provide adequate indoor air quality.

The MVHR reduces overheating risk during the summer months.

4.1.2.3 Waste water heat recovery

Waste water heat recovery can reduce the energy consumption of a building significantly by reducing the energy required to heat cold mains water to the required hot water temperature. This is achieved by utilising a water-to-water heat exchanger located at the end drain pipe for all shower and/or bath downpipes, in which waste heat is transferred to incoming mains water at the same speed as hot water is consumed.

4.1.2.4 Controls

Smart control systems can massively reduce energy consumption within the development through targeted heating, ventilation and lighting.

Temperature/CO_2 sensors have been proposed for all ventilation systems. Once temperatures/CO_2 levels rise above a certain threshold, a ‘boost’ function will be activated to ensure adequate indoor air quality is restored.

Additionally, occupant controlled heating by zones within each guest room is proposed to further minimise wasted energy.

4.1.2.5 Active Measures Summary

Table 8 displays a summary of the active design measures proposed for the proposed development.

Table 8: Active Measures (Energy Saving)

Lighting	100% LED
Mechanical Ventilation with Heat Recovery	A centralised thermal wheel of least 85% efficiency to be specified
Space Heating and Cooling system controls	Zoned temperature control to minimise waste in line with
Smart Controls	Time and temperature zone control by suitable arrangement of plumbing and electrical services including delayed start thermostat. (ErP Class VI)

4.1.3 Carbon Emission Reduction after ‘Be Lean’

Potential reduction, due to Lean measures, in CO2 emission compared to Part L 2021 11.56% for the proposed development. Please see Tables 9a and 9b, summarising findings for ‘Be Lean’ measures.

Table 9a: Carbon (CO$_2$) Emissions

	Regulated (Tonnes CO$_2$ per annum)
Baseline Part L 2021 Target Emission	147.64
After ‘Be Lean’ Measures	130.58

Table 9b: Regulated CO$_2$ Savings

	Tonnes CO$_2$ per annum	(%)
Savings from ‘Be Lean’ Measures	17.06	11.56

4.2 Demand Reduction (Be Clean)

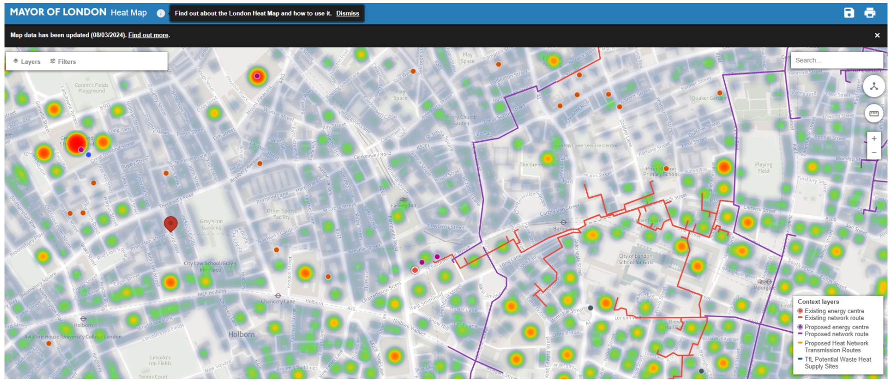
Potential reduction due to 'Be Lean' measures, in CO2 emission compared to Part L2 2021, is 32.23%.

4.2.1 Connection to Heating Distribution Network

Developments should initially aim to connect to a decentralised energy network (DEN). Please see Figure 9, which displays the site location, existing networks (red) and future proposed networks (purple).

The London Heat Map tool was used to determine if there are any existing district heating schemes in close proximity for the development to connect to.

As displayed in Figure 9, the existing and proposed heat networks are at a significant distance from the proposed site. Connection to these areas is not feasible due to associated technical and economic challenges given the small scale of the development.



Find out about the London Heat Map and how to use it. Dismiss

Map data has been updated (08/03/2024). Find out more.

Figure 9: London heat map displaying local heat sources to development

4.2.2 Connection to Shared Heating Network

Following this, connection to a shared heat network or local secondary heat sources should be pursued. Please see Figure 10 for the nearest Combined Heat and Power (CHP) plant to the site.

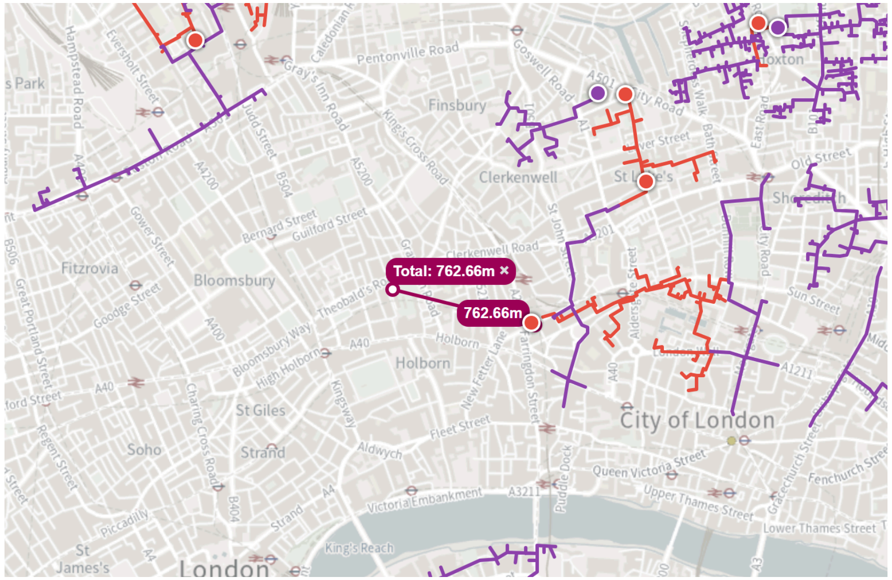


Figure 10: Nearest CHP Plant to Proposed Site

As displayed in Figure 10, the nearest CHP plant to the proposed site is located over 0.76km from the development. The energy loss associated with the transfer of heat to the site, as well as the technical challenges and costs make connection unfeasible.

4.2.3 Local Site CHP

If connection to a shared heating network is not feasible, local on-site CHP should be considered. Local on-site CHP only becomes economically viable for larger schemes with constant and steady demand for heat and electricity throughout the year such as heated indoor swimming pools. This is not suited for the proposed development, which has insufficient steady thermal and electrical loads throughout the year. Therefore, this has been ruled out for the site.

4.2.4 Space Heating

Electrical panel heating in corridors space and electric underfloor heating in all guest rooms has been specified as part of the energy modelling as it will utilise clean electrical power provided by the grid reducing on-site carbon emission and preventing the building from contributing to local air pollution. Furthermore, there is the possibility of air heating utilising green technologies, which will be explored as part of further detailed design, however, this is subject to further detailed design given the internal height restrictions of spaces, particularly in regard to room within 12-14 Jockey's Fields.

4.2.5 Carbon Emission Reduction after 'Be Clean'

Potential reduction, due to Clean measures for the proposed development, is displayed below in Tables 12a and 12b.

Since a district heating connection or on-site CHP is unviable, carbon emissions reductions are achieved via electric UFH. This is displayed in Tables 10a and 10b.

Table 10a: Carbon (CO_2) Emissions

	Regulated (Tonnes CO_2 per annum)
Baseline Part L 2021 Target Emission	147.64
After 'Be Lean' Measures	130.58
After 'Be Clean' Measures	82.99

Table 10b: Regulated CO_2 Savings

	Tonnes CO_2 per annum	(%)
Savings from 'Be Lean' Measures	17.06	11.56
Savings from 'Be Clean' Measures	47.59	32.23

4.3 Renewable Energy (Be Green)

Potential reduction, due to Green measures (Be Green) in CO2 emission compared to Part L 2021 is 25.90% for the proposed development.

4.3.1 Technology Options

There are several renewable options that could be utilised for the generation of electricity required for lighting, machinery, controls etc on site. Financial and technical feasibility of the following renewable systems was assessed to determine the most suitable technologies for the proposed development:

- Photo-voltaic (PV) panels
- Air-source heat pumps (ASHPs)
- Ground-source heat pumps (GSHPs)
- Variable refrigerant flow (VRF) systems
- Wind turbines

Selection is made based on a variety of factors, including efficiency, constraints of the development, location or cost.

4.3.2 ASHP Technology

Energy efficiency improvements are proposed through the use of an Air Source Heat Pump (ASHP) system for meeting hot water demand. ASHPs are widely considered a renewable energy source as they extract thermal energy from the air which can be used to provide hot water efficiently.

The planning and modelling of the system is based on using ASHP units, the space for these units has been allowed for on the rooftop of 14 Jockey's Fields within a suitable acoustic enclosure. Please see Figure 11 for an image of these units.

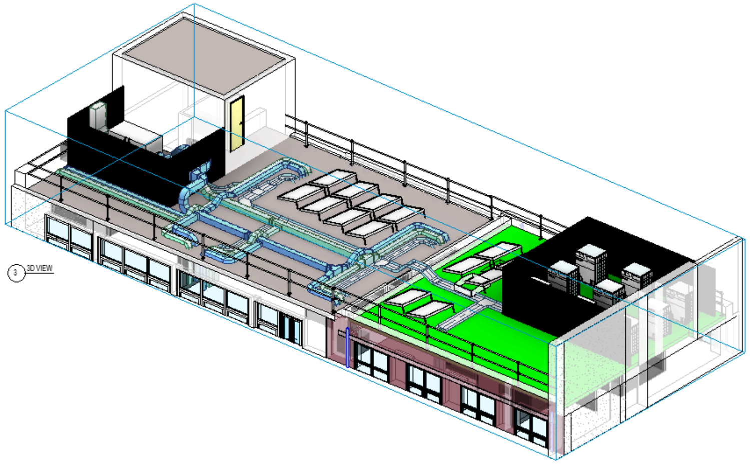


Figure 11: 12-14 Jockey's Fields roof plant space

The heat pumps are estimated to contribute 100% of the site's DHW.

The ASHPs can achieve a flow temperature of up to 65°C when the outside temperature is -6°C and the return temperature is 29°C. The pipes are insulated to allow for direct flow to the network or storage in a buffer tank. The design also allows for low return temperatures. Sufficient buffer tanks shall be provided on block by block basis to ensure optimised pipework runs to rescue any unnecessary heat losses.

4.3.2 PV

A PV panels system installed over 12-14 Jockey's Fields roof is proposed. As there are no moving parts in the PV cell, the units tend to be low maintenance but they must be kept clean as efficiency can drop as a result of fouling. This is reduced if the panels are installed at a 30° - 45° angle, therefore allowing for potential cleaning through rainfall. Additionally, locating the panels away from trees can mitigate fouling caused by leaves and debris. Furthermore, an inclination of 30° allows the panels to maximise the potential for electrical output.

Maximum energy yield will occur when the panels are orientated between south-east and south-west. Once installed, the panels have no running costs apart from occasional maintenance.

PV panels are proposed to be installed at between 30° - 45° angle, south facing across the roof areas. A total of 14 PV panels is proposed to serve the proposed development, based on a 20% efficient PV panel, providing approximately 4.7 kWp. The initial PV electricity production assessment was based on the parameters defined in Table 11. Please see Appendix 9 for the PV panels calculation. (Source: Applied Energy)

Table 11: PV Requirements

Roof Space	As per drawings
Panel Efficiency	At least 20%
Orientation	South
Inclination of Panel	30 degree closest to the flat
Number of Panels	14
Panel Area	1.62 m^2
Total Panel Area	22.83 m^2
Electrical Output	4.7 kWp

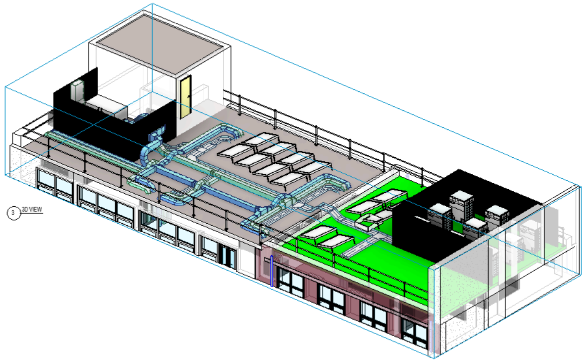


Figure 12 displays the roof plan of the development. PV panels are proposed.

4.3.3 Carbon Emission Reduction after Be Green

Potential reduction, due to Green measures for the proposed development, is displayed below in Tables 11a and 11b.

Table 11a: Carbon (CO_2) Emissions	
	(Tonnes CO_2 per annum)
Baseline Part L 2021 Target Emission	147.64
After 'Be Lean' Measures	130.58
After 'Be Clean' Measures	82.99
After 'Be Green' Measures	44.76

Table 11b: Regulated CO_2 Savings		
	Tonnes CO_2 per annum	(%)
Savings from 'Be Lean' Measures	17.06	**11.56**
Savings from 'Be Clean' Measures	47.59	**32.23**
Savings from 'Be Green' Measures	38.23	**25.90**

5. Overheating Analysis

The CIBSE TM52 Overheating Assessment was carried out by Energylab Consulting Ltd.

The assessment confirms that the proposed development is compliant with CIBSE TM52 guidelines in reducing the risk of overheating, particularly in summer months. The climate change mitigation measures proposed for the proposed development are in line and compliance with the relevant and applicable targets and requirements listed within the following planning policies of Camden's Council and the London Plan:

1. Camden Council
2. The London Plan relevant planning policies within section 9, i.e. Policy SI 4 - Managing Overheating Risk
3. The Approved Document: Part O 2021

The CIBSE TM52 Assessment provides a robust methodology to analyse and understand the risk of overheating in non-domestic developments as a result of these rising temperatures. This assessment is conducted at the design stage to identify any potential high risk areas, and implement mitigation measures where necessary.

The Overheating Assessment for the proposed development has been developed in line with the London Plan Cooling Hierarchy principles to mitigate overheating risk utilising a passive first approach.

See Appendices 6, 7 & 8 for more information and results.

Three models were assessed in IES VE analysing the key occupied spaces (65 guest rooms and 3 amenity spaces) to assess overheating risk in line with the GLA cooling hierarchy utilising CIBSE weather file DSY1 :

1. Model A - utilising solely passive cooling measures
2. Model B - utilising mechanical ventilation with boost
3. Model C - active cooling measures

The summarised pass rate for the assessed spaces across each model is displayed below:

1. Model A: **Fail** (20 rooms/amenities pass - 48 rooms/amenities Fail)
2. Model B: **Fail** (54 rooms/amenities pass - 14 rooms/amenities Fail)
3. Model C: **Pass** (68 rooms/amenities Pass - 0 rooms/amenities Fail)

Out of the total of 68 rooms/amenities spaces, only 14 would necessitate a restricted level of comfort cooling. This will be facilitated by a renewable and low carbon ASHP technology, boasting an efficiency of approximately 300%. Not only will this technology offer a sustainable energy source, but it will also ensure energy is provided at a reduced running cost. The system will be powered entirely by a renewable source of grid electricity.

Overheating risk should be mitigated utilising the cooling hierarchy as stated within Policy SI 4 of the London Plan. This strategy is stated as follows:

1. Reduce the amount of heat entering the building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure.
2. Minimise internal heat generation through energy efficient design.
3. Manage the heat within the building through exposed internal thermal mass and high ceilings.
4. Provide passive ventilation.
5. Provide mechanical ventilation.
6. Provide active cooling systems.

This strategy has been utilised to ensure adequate thermal comfort within the proposed development. An overheating assessment has been performed to assess the level of risk for the proposed development, along with any mitigation methods required.

The proposed overheating risk mitigations were determined to be as below:

1. Natural ventilation operable areas were based on the existing window types and following opening profiles outlined within Building regulation Part O. All windows are specified to be openable during day and night with the exception of windows on the lower ground floor where night time access is of a concern and as such are fully closed.
2. Mechanical Ventilation with Heat Recovery units with summer bypass, purge ventilation and 30l/s boosted option in particular to the lower ground, ground level and rooms with no openable window compensate for the restricted windows opening at these levels during the night.
3. Where the risk of overheating has not been overcome by either passive or active ventilation in certain rooms and amenity spaces , a renewable and low carbon ASHP technology has been utilised to provide comfort cooling.

Table 12: Overheating Mitigation Measures (Examples)

Reduce Internal Heat	● Introduce 100% LED lighting ● Insulate all heating system primary and secondary pipework ● Use smart controls to control operation of any appliances
Balance daylight and overheating	Windows areas & G values
Improve ventilation	● Openable windows ● Trickle vents ● Cross ventilation ● Thermal mass and night purge ● MVHR with summer bypass
Potential ceiling mount fans (future retrofit)	Potential for future retrofit with ceiling heights greater than 2.8m

6. BREEAM

A Sustainable Design and Construction Statement has been provided separately to demonstrate the project team approach to sustainability and how this approach has been developed in line with the guidance listed within the London Plan (2021) relevant section (Chapter 9) has been utilised as an additional standard to strive for in ensuring sustainability is thoroughly considered throughout the design and construction of the development. Furthermore, the scheme design approach has been aligned with the standards and design recommendations to potentially achieve at least a BREEAM Excellent Rating. A separate BREEAM-Pre assessment has been provided to demonstrate the team commitment to achieving the targeted score.

7. ‘Be Seen’

Monitoring renewable and low-carbon energy systems in new development

The proposal is to undertake post-construction monitoring of renewable/low-carbon energy systems for a period of five years.

It Is proposed to use a web-based solution in the form of an Automated Energy Monitoring Platform (AEMP). This AEMP is provided by Energence Ltd.

The monitoring involves installing “smart” metres that record kWh readings from PV, heat pumps, etc. These kWh readings are transmitted to the AEMP and displayed on a web-dashboard. The platform provides a remote monitoring solution for the Council (as well as developers) that enables them to track the performance of renewable/low-carbon equipment.

Is it installed? Is it switched on? Is it performing properly? Is it delivering the CO2 cuts anticipated? The new London Plan 2021 introduces a fourth stage to the (Lean, Clean, Green) Energy Hierarchy of “be Seen” which requires the manual inputting of energy data annually. A daily monitoring will also be explored and provided where required in order to immediately identify and rectify any performance problem.

Physical monitoring requirements

Most developments use PV and/or Air/Water Source Heat Pumps to meet energy planning policies, and in large development schemes heat pumps will drive a communal distribution loop.

1. PV monitoring requires a (SIM card) smart metre. This will be the MCS metre.

2. Heat pump systems need a heat metre (such as a Sontex or Kamstrup) to record the kWh generation, and an electric metre to record the parasitic kWh load. These are connected to a (SIM card) datalogger.

Please see appendices 11 & 12 for more information.

8. Conclusion

The report confirms that the energy and carbon reduction strategy proposed for the proposed development aligns with and complies with the applicable targets and requirements outlined in the planning policies of both the Camden Council and the London Plan.

These planning policies include:

- Camden Council’s Design Guidance B Report 2022
- Camden Local Plan 2017
- The relevant planning policies within chapter 9 of the London Plan 2021, specifically the Energy Hierarchy and carbon reduction targets
- GLA Energy Assessment Guidance June 2022

The Energy Statement for the proposed development has been formulated in accordance with the principles of the London Plan Energy Hierarchy (as depicted in Figure 1) to minimise energy consumption and associated CO2 emissions. This approach includes the following strategies:

- "Be Lean": Enhancements to the building's structure and energy-efficient services to reduce energy demand, such as the implementation of efficient building services and 100% low-energy LED lighting.
- "Be Clean": It has been concluded that connecting to any DHN or on-site CHP is not practical. Nevertheless, the delivery of energy in an efficient manner has resulted in a reduction of CO2 emissions. Savings have been attained by implementing an efficient space heating system, which includes smart panel radiators for communal areas and UFH for the rooms.
- "Be Green": The proposal includes the incorporation of low-carbon technologies, specifically Air Source Heat Pumps (ASHP) with a high coefficient of performance (COP) of at least 2.5, as well as a PV system.
- "Be Seen": All major development proposals are required to monitor and report on their actual operational energy performance for a minimum of five years.

The design team is dedicated and actively implementing circular economy principles to repurpose, refurbish, and reuse any available materials, whenever technically feasible. This approach significantly reduces the carbon footprint of the development in comparison to completely new approaches. Additionally, the proposed development will incorporate various sustainable design and construction measures to further enhance the promotion of reduced carbon emissions and sustainability.

Moreover, the new development has the potential to meet the GLA requirements, the Building Regulations Part L 2021 performance targets for refurbished developments, and the targets outlined in Camden Council's Design Guidance.

Appendices

Appendix 1: Preliminary Appraisal of Renewable Energy Options

This appendix summarises the preliminary analysis of renewable energy options, and identifies which should be assessed in further detail, and which should be discounted because of clear technical reasons or other obstacles.

LZC Technology	Basic Technical Information	Technical, Environmental & Economic implications / Considerations	Suited Application	Site Specific Comment	Included ?
Solar thermal	Solar collectors (flat plate or tube) transfer energy into transfer liquid to a closed loop twin coil hot water cylinder	+ Government grants available (RHIs) +/- Can meet a significant proportion of the DHW demand - Efficiency affected by site factors – shading, orientation and roof/ground space -Requires considerable hot water demand all year round to be financially beneficial	Domestic and commercial applications with high annual hot water load; leisure centres, canteens, washrooms	This technology has not been specified as the PV panels proved to be the most viable and sufficient technology to achieve the targeted reduction in CO2 emissions. Hence this has not been specified for the proposed development.	NO
Wind turbine	Turbine/generator converts wind energy to electrical power.	+ Government grants available (FITs) + Allows on site generation of renewable electricity - Can create structural, vibrations and noise implications - Not suited for urban environments - Costs can be high in relation to the actual amount of electricity generated - Potential for additional planning issues	Large sized turbines in non-urban or offshore locations will be more effective	The site is located in a dense urban area and further planning approvals would be required.	NO
Solar Photo-voltaic	Converts sunlight to DC electrical power which then uses an inverter to convert to AC.	+ Government grants available (FITs) + Allows on site generation of renewable electricity + Generally payback between 7-12 years + Low maintenance requirements - Efficiency affected by site factors – shading, orientation and roof/ground space	Wide range of building types particularly buildings with limited solar shading and south facing roof	The roof shape provides limited space for the optimum positioning of solar collectors along with minimal space	YES

LZC Technology	Basic Technical Information	Technical, Environmental & Economic implications / Considerations	Suited Application	Site Specific Comment	Included ?
Air heat pump	Air Source Heat Pumps (ASHP) capture heat from the outside air and transfer the heat directly to the air inside the building or transferring the heat to a liquid medium that can be pumped around the building	+Lower installation cost that ground source heat pump + Can provide heating and cooling + Government grants available (RHIs) -COP is not as good during the heating season when the outside air temperature is often less than the ground temperature -Can restrict distribution strategies -Carbon saving are less clear cut -Noise and visual impact	Wide range of building types particularly buildings designed to have low temperature heat emitters.	ASHP technology has been used to serve the domestic hot water demand for all guests.	YES
Ground Source Heat Pump	Ground Source Heat Pumps (GSHP) capture heat from the ground and transfer the heat to a liquid medium that can be pumped around the building	+ COP is much better than air source heat pumps + Government grants available (RHIs) -Requires area for ground collector or borehole -High initial capital cost - Can restrict distribution strategies -Carbon saving are less clear cut	Suits building designed to have low temperature heat emitters with sufficient space for necessary ground works	Limited external ground space to allow for the installation. The high capital cost relevant to the size of the development has also been considered when discounting this technology.	NO
Biomass	Uses biomass as a fuel source for space heating and hot water	+ Government grants available (RHIs) + Renewable source of heating - Requires large fuel storage capacity - Generally a large capital cost	Building/site with sufficient access and storage facilities and a capable maintenance team	There is insufficient storage space and very limited access for regular deliveries to warrant further investigation.	NO