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TAYLOR PROJECT SERVICES LLP
BUILDING SERVICES CONSULTANTS

November 2023

16-24 Whitfield Street & 55 Tottenham Court Road, Camden

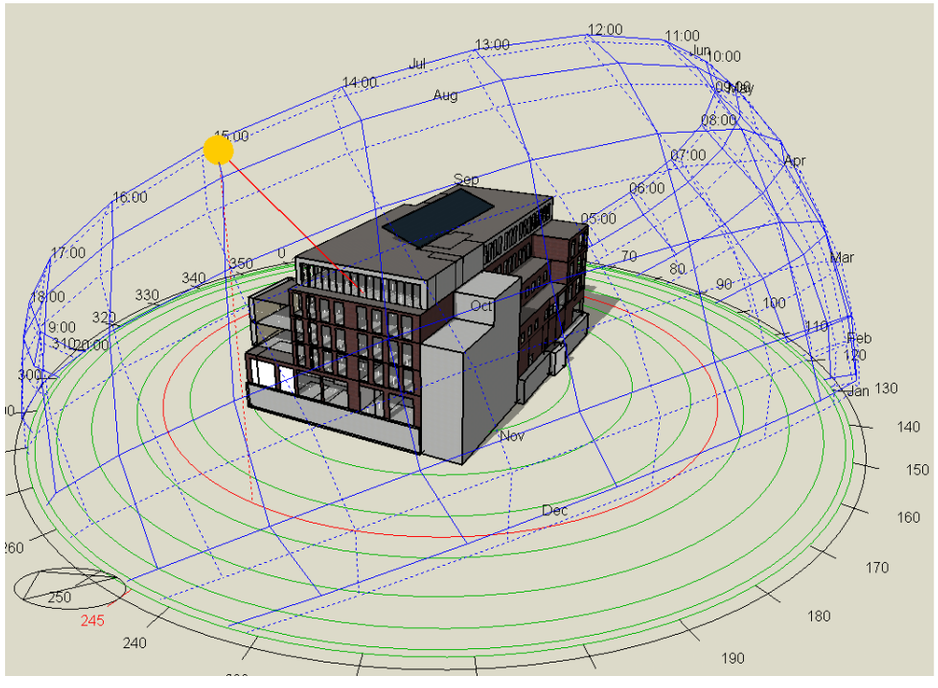
Energy & Sustainability Statement

Executive Summary

The following energy brief is for the proposed development at 16-24 Whitfield Street & 55 Tottenham Court Road, Camden, London. The development sees upgrading the majority of existing building fabric, remove the basement level car parking, retain the ground floor retail unit, replace the existing louvres with windows at the Tottenham Court Road frontage and finally an additional fourth floor block on the top of third floor.

The proposed passive design features resulted in the whole building achieving a 17.9% improvement in energy saving against the existing condition, when compared against the Building Regulations Part L2B 2021 notional figures and other local and national technical guidance has been reviewed to ensure the project has energy efficiency, future proofing and biodiversity at its heart.

To further enhance the sustainable elements of the project, a 24.8 kWp photovoltaic array and air source heat pump to provide heating and cooling is proposed, to achieve an additional 31.45% carbon reduction, equating to an overall CO_2 reduction of 49.35% against the existing condition. This therefore complies with policy CC1.



The Energy and Sustainability Statement outlines the sustainability and energy strategies for meeting the sustainability targets set out by Camden London Borough Council and the GLA.

Excellent sustainability measures have been incorporated within the design, including:

1. Excellent building fabric values, as per Building Regulation Part L 2021 standards, therefore substantially reducing the buildings heat losses, compared to the existing fabric
2. The development will have new mechanical ventilation with heat recovery throughout, thereby substantially reducing the building's heat losses compared to the existing fabric
3. Natural day lighting will improve occupancy comfort and reduce the requirement for lighting
4. Lighting will be low energy and highly efficient
5. The air tightness of the building will be improved to reduce air permeability below $10m^2/hr/m^3$. This will be met through improved fabric detailing and draught proofing.

Sustainable Measures

A number of sustainable measures have been proposed for the development, including:

1. Sustainably and locally sourced materials will be used where possible, to reduce transport pollution and support the local economy
2. Materials will be reused where possible, reducing the embodied carbon footprint
3. Recycling facilities will be provided on site for construction and operational waste;
4. Water use will be minimised by the specification of water efficient taps, shower heads, dual flush toilets and low water use appliances.
5. Water metering will be installed to monitor and minimise wastage.
6. A Site Waste Management Plan (SWMP) will be produced for the works;
7. A green roof is proposed, increasing the biodiversity of the site.
8. To comply with the City of London Air Quality Plan Action Plan, an all-electric scheme is to be implemented.
9. Photovoltaic array of 24.8 kWp, connected on the roof space.

Local and National Policies

Policy CC1 Climate Change Mitigation

In line with policies CC1 and CC2, the Council will require development to incorporate sustainable design and construction measures.

The uplift in floorspace is above 500 sqm GIA therefore as required by pages 22 and 28 of Camden's Local Area Requirements for Planning Applications (2020), an Energy and Sustainability Statement is required as part of this submission.

Renewable technologies should be incorporated where feasible.

This has been met on site through excellent fabric, energy efficient services and renewable technology and exceeds the requirements by 49.35%

The be green stage where photovoltaics and air source heat pumps have been utilised (for heating and cooling) contributes a 31.45% carbon reduction.

Policy CC2 Adapting to Climate Change

All development should adopt appropriate climate change adaptation measures such as:

The protection of existing green spaces and promoting new appropriate green infrastructure;

1. Not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems.

2. Incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and

3. Measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

A green roof is proposed, increasing the biodiversity of the site and mitigating flood risk. There is no increase in impermeable area.

Be Lean: Use Less Energy

For all developments a balance will need to be reached between the need to retain heat, the heat generated within a development and the need to remove excess heat. As the building fabric will form a major part in the overall energy assessment and performance of the building, an upgraded thermal strategy is recommended, with the improvement of the Part L2 limiting fabric parameters where feasibly possible. The following table shows the limiting fabric parameters contained within ADL.

Thermal Element	Baseline Figures (2002 Part L)	Existing Refurbished	New Element(2021 Part L)
External Walls	0.35 W/m^2K	0.55W/m^2K	0.26W/m^2K
Ground Floor	0.25 W/m^2K	0.25W/m^2K	0.18W/m^2K
Roof	0.25 W/m^2K	0.18W/m^2K	0.18W/m^2K
Windows	2.2 W/m^2K	NA	1.4 W/m^2K
Doors	2.2 W/m^2K	NA	1.6W/m^2K
Air Tightness	10.00 m^3/hr.m^2 @ 50Pa	NA	8 m^3/hr.m^2 @ 50Pa
Energy Efficient Lighting	100%	100%	100%

Energy Efficient Design Measures

- Optimally sized windows that achieve good daylight levels but avoid excessive solar gain in summer and heat loss in winter.
- Excellent building fabric.
- A design air leakage rate of 8-9 m3/m2hr to all floors.
- Careful design to reduce the effect of non-repeating thermal bridges including the use of high-performance thermal breaks where feasible.
- All lighting, in most of the area will use lamps with a luminous efficacy of at least 45 lamp-lumens/watt (equivalent to an “A” rating).
- Most of the areas will have lighting which will have automatic controls with occupancy and daylight sensors.
- Mechanical ventilation systems with heat recovery will be installed in every floor.

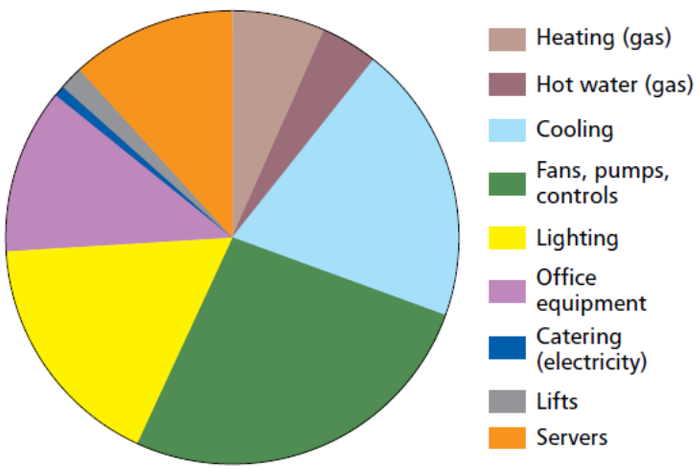
Energy Comparison

Data	Existing Unit	Be Lean	Be Clean	Be Green
Target Emission Rate(TER)	0.2 kg.CO2/m2.yr	1.7 kg.CO2/m2.yr	1.7 kg.CO2/m2.yr	2.6 kg.CO2/m2.yr
Reference Building	11 kg.CO2/m2.yr	15.4 kg.CO2/m2.yr	15.4 kg.CO2/m2.yr	15.4 kg.CO2/m2.yr
Building Emission Rate (BER)	15.36 kg.CO2/m2.yr	12.61 kg.CO2/m2.yr	12.61 kg.CO2/m2.yr	7.78 kg.CO2/m2.yr
Building Energy Consumption	99.50 kWh/m2.yr	86.98 kWh/m2.yr	86.98 kWh/m2.yr	60.33 kWh/m2.yr
Rating	C 70	B 41	B 41	A 25
Area (m2)	5061.75	6274.65	6274.65	6274.65
% Energy Saving	-	12.58%	0.00%	39.37%
%Carbon Saving	-	17.90%	0.00%	49.35%

Be Clean: Use Energy Efficiently

The Be Clean section looks into using energy efficiently, by adopting energy saving methods when supplying the services to the building (heating, hot water, ventilation). For the development, the following strategy is proposed:

Heating and Hot Water	Ventilation
Highly efficient heat pump technology, which will provide heating and cooling to the new units. This technology will ensure future proofing and mitigation of fossil fuel generation and residual emission risks in the area.	To minimise unnecessary heat loss through ventilation, it is proposed that a Mechanical Ventilation Heat Recovery (MVHR) system is utilised, achieving high thermal efficiency of minimum 80% while maintaining a low energy consumption with Specific Fan Power (SFP) not exceeding 1.9W/l/s (SAP 2012). All ductwork shall be insulated where necessary to prevent unwanted heat gain / loss.
Hot Water Supplied with Electric point of use.	
Time and Temperature Zone Control; Delayed Start Thermostat.	



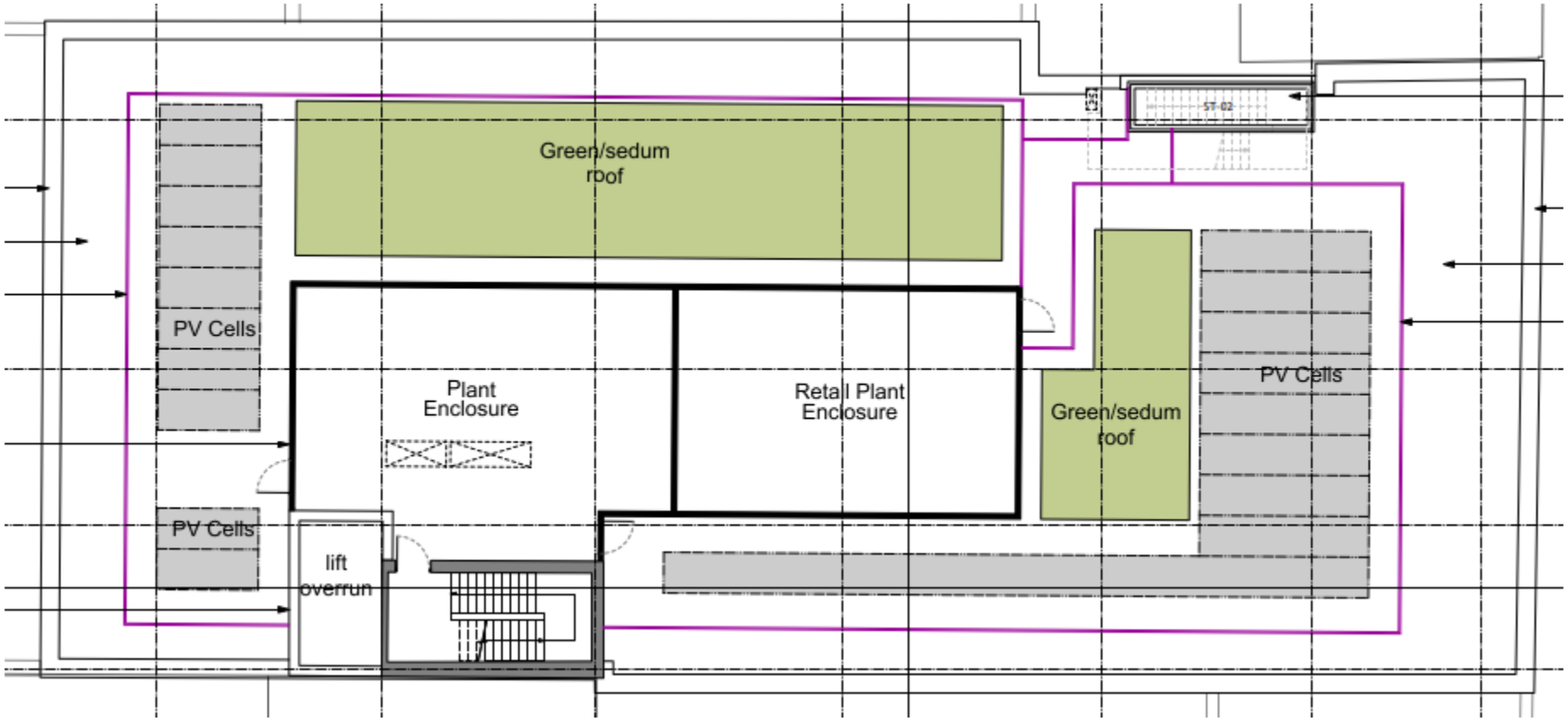
Average Energy Use Breakdown On An Office Building (CIBSE TM 54)

Be Green: Use Renewable Energy

The Be Green section reviews each of the technologies that are to be considered on a new development in line with The London Renewable Toolkit, with the most feasible method being selected. The following renewable technologies have been considered to assess their potential to meet the renewable targets for the development.

Technology	Viable	Reasoning
Solar (Photovoltaic)		There is space to add a photovoltaic array on the top floor. The system will provide renewable energy to all the floors.
Solar Thermal (Hot Water)		As with the PV panels, there is potential to install a small solar thermal array to the roof, to provide renewable hot water to the new apartments.
Wind Turbine		Due to the location the uneven and turbulent wind patterns that can be expected to occur near buildings, the effective operational time is likely to be limited. Additionally due to noise, vibration, reflected light and shadow flicker it is not best practice to locate in close proximity to residential areas.
Biomass		Biomass technology could potentially offer a solution to satisfying heating and hot water loads to the project. However, it has been discounted as there is no space allocation for the pellets on site. There is also an increased fire risk where combustible materials are going to be stored
Combined Heat and Power		A small, centralised CHP could provide a good level of CO2 reduction. However, initial studies found an inadequate heating and electrical demand within scheme, to justify a CHP system.
Air Source Heat Pump (Heating & Cooling)		Air Source Heat Pumps could be installed to future proof the units and provide efficient heating and cooling cooling. The system will need to be A rated and should have a COP of no less than 3.5. Rooftop plantroom is available for condenser units
Ground Source Heat Pump		The use of horizontal ground source heat pumps is inhibited because of the areas required for the horizontal ground loop system. The site would also be difficult to accommodate both a vertical borehole system or plateau setup, in regards to safe working area and lack of open available space. Ground Source Heat Pumps have therefore been discounted based on these potential constraints.

Be Green: Use Renewable Energy



Data	Results
Number of Panels	62
Approximate Area per Panel	1.45 m^2
Per Panel Output (kWp)	0.400
Total Output (kWp)	24.8
Total Output (kWh/year)	17,443.52
SAP 10 Carbon Factor (kg.CO2 /kWh)	0.136
CO2 Offset (kg.CO2 /year)	2,386.27

Sustainable Measures

All timber used for basic or finishing building elements in the scheme will be sourced from responsibly managed and sustainable forests or plantations. Such timber products are the only truly renewable construction material in common use and growing trees also absorb and fix CO2. Forests can also provide the habitat for a wide variety of plant and animal life, preserving important ecology and promoting biodiversity.

Local Sourcing

A building that is truly sustainable must be constructed using locally sourced, sustainable materials i.e. materials that can be supplied without any adverse effect on the environment. Therefore, where practical, materials should be sourced from local suppliers, reducing the environmental impacts and CO2 emissions associated with transportation to the site.

Reuse and Recycling

Scope for increased recycling will be incorporated by specifying recycled materials where possible and ensuring that even where new materials are used, as much as possible can be recycled at the end of the buildings' life.

Any material not required from the original building can be recycled and used as aggregate.

Specifying materials with a high-recycled content is also another method of saving processing or manufacturing energy. The recycled content of a material can be described as either post-consumer or post-industrial to indicate at what point in the life cycle a material is reclaimed.

Lifecycle Assessment

A Life Cycle Assessment (LCA) - is a tool that can be used to assess the environmental impacts of a product, process or service from design to disposal i.e. across its entire lifecycle. This process will be carried out during technical design stage.

Adaptation to Climate Change

The new building will be assessed under the CIBSE TM52; Design Methodology for the Assessment of Overheating Risk in European Building and will enable the design team to assess the risk of overheating and allows a future adaptation to climate change strategy

Mitigation of Climate Change

The development will be an all-electric scheme and will ensure future proofing and mitigation of climate change through the use of low carbon technologies. Technologies such as heat pumps/MVHR/renewable technologies will be utilised.

Enhancement of Bio-Diversity

It is intended that a bio-diverse green roof will be installed and will enhance the urban green ratio of the site. The roof will not only provide green spaces, it will also enhance the thermal mass and therefore protect the units from overheating (natural heatsink). The roof will allow for a natural sustainable drainage treatment, diverting the first amount of rainfall from flowing immediately into the main drainage system. This will also reduce the flood risk.

Planters along the façade will improve the appearance and provide a space for users to potentially grow food.

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