TAYLOR PROJECT SERVICES LLP
BUILDING SERVICES CONSULTANTS

Energy & Sustainability Statement

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Contents Page

1.0 INTRODUCTION

1.1 Energy Strategy

This Energy Statement has been prepared by TPS LLP on behalf of Hale Brown Architects in support of the planning application for the proposed works at 32 Percy Street, London, W1T 2DE.

This document sets out the Energy and Sustainability strategy for the development, it supports the planning application for the scheme showing how it will meet its obligations as set out in national, regional and local planning policies and Building Regulations including commitments under Consequential Improvements.

The following energy efficiency hierarchy has been used through the design process:

- Be Lean: Reduce energy demand through good design and construction measures.
- Be Clean: Providing efficient energy supply.
- Be Green: Providing energy from efficient renewable energy sources on site.
- Be Seen: Monitor, verify and report on energy performance.

This approach to the design accords with the Mayor's Energy Hierarchy. The development approach proposed is also inherently sustainable, and sees the majority of the existing building structure and fabric retained. This reduces the amount of embodied carbon expended in developing the site, unlike a redevelopment proposal where the existing building is demolished and replaced.

1.2 Basic Description of the Development

This application mainly covers internal refurbishments and reconfigurations to return some of the floors to more original layouts. It includes renewal of MEP services and the replacement of the Gas heating system with a low carbon alternative which includes Air Source Heat Pumps (ASHP).

The application also includes proposed reinstatement of existing roof lights to the rear ground floor flat roof and the installation of the new high efficiency lo carbon ASHP condensers on the roof.

2.0 POLICY FRAMEWORK

2.1 Building Regulations Part L – Conservation of Fuel and Power 2013

The UK has committed to cut emissions of greenhouse gases, the most significant of which being carbon dioxide. To achieve such a cut requires us to use energy much more efficiently, and to increase substantial uptake of the utilisation of renewable energy sources.

The current version of the Approved Document Part L1A 2013 (for new dwellings) and L2A 2013 (for non-dwellings) and L1B and L2B for existing buildings, of the Building Regulations continued the trend for legislation to drive increasingly tougher energy and carbon standards for buildings. This development will need to meet the requirements of Part L 2013 and therefore will need to incorporate high levels of energy efficiency.

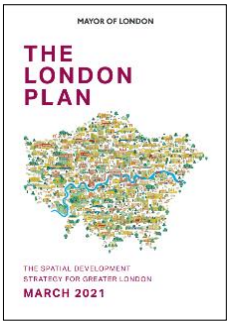
2.2 National Planning Policy

The Government sets out planning policy guidance in the National Planning Policy Framework (NPPF), the latest version was issued in July 2021, replacing the previous NPPF. This sets out the government's strategy on the delivery of sustainable development through the planning system. It places responsibility for policy making with the Local Authority, who shall communicate their policies through core strategy and supplementary planning guidance documents.

The NPPF covers a wide range of planning issues from promoting sustainable transport to facilitating the sustainable use of minerals. Climate change is covered in Section 14 'Meeting the challenge of climate change, flooding and coastal change' which encourages developments to contribute to sustainability and tackle climate change by reducing energy demand and incorporating sustainability measures.

2.3 Planning Requirements – The London Plan

The New London Plan, The Spatial Development Strategy for Greater London was published March 2021 and acknowledges that to become an exemplary, sustainable world city, London must use natural resources more effectively, increase its re-use of resources and reduce levels of waste and environmental degradation.



Policy SI 2 Minimising greenhouse gas emissions requires the reduction in greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

1. Be Lean: Use less energy and manage demand during operation.

2. Be Clean: Exploit local energy resources and supply energy efficiently and cleanly.
3. Be Green: Maximise opportunities for renewable energy by producing, storing and using renewable energy on-site.
4. Be Seen: Monitor, verify and report on energy performance.

2.4 Camden Energy Policy – Check Sheet / Proforma

In accordance with Camden Planning Guidance the following measures have been considered and major project Proforma for energy and sustainability completed to support the application – however it should be noted that for this particular application is a minor application and it is a listed building and so many of the passive and building fabric measures identified cannot be implemented without major works which is not appropriate nor proportionate to the works proposed.

2. Regulated and whole life carbon emissions (CPG Energy Efficiency and Adaptation Chts 6 & 9)

Regulated and whole life carbon	Yes / No
a. Worksheets provided (BRUKL for each stage)	Yes
b. Sample method stated	SBEM
c. Whole Life Carbon Assessment provided	No

3. Be Lean (CPG Energy Efficiency and Adaptation cht 3)

a. Passive measures	Yes / No	
i. Orientation and site layout optimised	No - Existing (Listed)	
ii. All areas at least dual aspect and designed to allow natural ventilation	No - Existing (Listed)	
iii. Solar shading incorporated into the design	No - Existing (Listed)	
iv. Exposed internal thermal mass and night time purge ventilation	No - Existing (Listed)	
v. Glazing percentage	N/A - Existing (Listed)	%
vi. Other please state – EXISTING LISTED BUILDING		

b. Building Fabric	Yes / No	
i. Meets all Building Regulation part L2A Limiting Fabric Parameters	No – Existing (listed)	
ii. Meets all Part L2A Concurrent Notional Dwelling Specification	No – Existing (listed)	
iii. Meets LETI design guide standards	No – Existing (listed)	
iv. Meets Passivhaus Standard	No – Existing (listed)	
v. Air permeability	25 – Limited improvement possible	(m3/h.m2 at 50 Pa)

c. Active design measures	Yes / No
i. High efficiency lighting	Yes - LED
ii. Efficient MVHR	No – Existing (Listed)
iii. Waste water heat recovery incorporated?	No – Not Possible

4. Be Clean (Camden Local Plan Policy CC1, CPG Energy Efficiency and Adaptation Cht 4)

Potential decentralised energy network	Yes / No
a. Is the site within 500m of existing network?	No – Minor App
b. If no to a) Within 1km of existing or potential network?	No – Minor App
c. If yes to b) Future proofing checklist completed?	No – Minor App
d. Is a site wide heat network proposed?	No – Minor App
e. Is Combined Heat and Power (CHP) proposed?	No – Minor App
f. CHP and District Heating Feasibility Checklist completed?	No – Minor App

5.Be Green (Camden Local Plan Policy CC1 and section 8.11)

Minimum 20% reduction in CO2 from on-site renewable energy technologies	Viable (Yes /No)	Proposed (kW)	Expected tCO_2 saved per annum
a. Solar Thermal	No		
b. Solar PV	No		
c. Waste heat source heat pump	No		
d. Water source heat pump	No		
e. Ground source heat pump	No		
f. Air source heat pump (air to water)	No		
g. Air source heat pump (air to air)	**YES**	48kW	3.0 / 9.5
h. Biomass	No		
i. Wind	No		
j. Other please state_____	N/A		

6. Be Seen (Camden Local Plan section 8.28, CPG Energy Efficiency and Adaptation Cht 5)

a. Building management, metering and monitoring (Camden Local Plan section 8.28, CPG Energy Efficiency and Adaptation section 5.19 to 5.22)	Yes / No
i. Will there be a whole-building energy management system (BEMS)?	No
ii. Will all units be individually metered?	Yes
iii. Will key plant be monitored post construction?	Yes

b. Be Seen reporting requirements to GLA	Yes / No
i. Required data will be upload to GLA 'Be Seen' portal	No
ii. Required target dates have been set out for subsequent stages	No
iii. Metering plans in place to enable in-use reporting	No

Sustainability Statement

7. Overheating

Overheating / cooling (Camden Local Plan Policy CC2 and section 8.41.8.42 and CPG Energy Efficiency and Adaptation Cht 10)	Yes / No
a. Overheating - dynamic thermal modelling completed using TM52 and TM49?	Yes
b. Cooling hierarchy followed and passive design measures incorporated?	Yes
c. Is active cooling proposed?	Yes (as secondary function)

3.0 BE LEAN – USE LESS ENERGY

In applying the recognised energy hierarchy as part of a holistic design approach, the first stage is to be lean, i.e. use less energy, and in particular adopting sustainable design and construction techniques. However a light touch approach is required respecting the heritage fabric and as such significant measures such as wall insulation which will affect skirting boards, architraves and cornices or adding insulation to fabric that will require destructive access is not deemed possible.

Table 1 shows the u-values including threshold u-values that should be met for the existing thermal elements in the retained elements, and where the existing fabric elements do not meet the **Threshold** requirements **(a)** fabric upgrades shall be carried out to the targets figures in **(b) Improved** in order to meet the Part L2B of the building regulations.

Table 1: Upgrading Retained Thermal Elements (Approved Document L1B)

Source: Approved Documents L1B Table 5 Upgrading retained thermal elements)		
Element	**U-Value (W/m²K)**	
	(a) Threshold	**(b) Improved**
Wall – external or internal insulation	0.70	0.30
Floors	0.70	0.25
Pitched roof – insulation at ceiling level	0.35	0.16
Pitched roof – insulation at rafter level	0.35	0.18
Flat roof or roof with integral insulation	0.35	0.18

Due to the Grade II listing of the building, no additional insulation will be able to be applied to the existing walls, floors or at ceiling level. Within the rear extension areas the roof and roof glazing thermal performance shall be up graded and improved to the above standards. New insulation shall be installed in accessible voids at roof level to improve thermal performance.

The application of secondary glazing will be pursued which along with rafter level roof insulation, upgrading the roof insulation to the extension flat roof, sealing and draft proofing throughout, will generally improve the thermal performance of the building.

4.0 BE CLEAN – SUPPLY ENERGY EFFICIENTLY

Using energy efficiently and cleanly will result in a reduced energy demand and savings in CO_2 emissions. Energy efficient active design measures that will be incorporated into the development include:

Heating Strategy:	The site is not local to any existing or planned heat networks and given the limited size of the building it is not feasible to connect. It is therefore proposed that air-source heat pumps shall be installed to provided energy efficient heating throughout the building and to eliminate the need for gas / fossil fuel usage for heating in the building.
Local Controls:	The office heating and cooling controls will include time and temperature zone control to ensure that heating is not in operation when not required. Radiators within the dwellings will also be provided with thermostatic radiator valves for individual room control.
Heat Recovery and air tightness:	Existing Chimneys will be reversibly sealed, existing windows draft proofed, and gaps in structure sealed where observed without detriment to the heritage fabric. It is anticipated that a combination of these measures will reduce the building air tightness to below $15m^3/(h.m^2)$@50Pa.
Efficient Lighting:	All new light fittings will be low energy to maximise energy efficiency and reduce the energy required for lighting. The building will be provided with a low energy lighting system, typically LED, with photo-electric control to provide a maximum 8 W/m² @ 350 lux.
Monitoring:	Smart meters will be installed to monitor the heat and electricity consumption and enable the users/occupiers to identify energy usage by system.

5.0 BE GREEN – USE RENEWABLE ENERGY

Renewable ASHP's: High efficiency Air Source Heat Pumps shall be installed using variable refrigerant flow (VRF) technology will be utilised for heating and cooling of the office spaces. These systems are a very efficient as they allow different areas to be simultaneously heated and cooled to take advantage of heat recovery within the system. These will offer a considerable improvement in carbon emissions over the existing gas boiler installations and DX Split cooling systems currently installed at the property. When heating is required, the system is operated as an air-source heat pump, utilising renewable heat within the air.

The feasibility of various other renewable energy technologies have been reviewed for use in this development. It has however been concluded that the use of wind turbines is impractical, and because of the issues of fuel deliveries, air quality concerns and other environmental worries, that the use of CHP or biofuels in this location is also inappropriate.

There is limited roof area available for the siting of solar technologies due to the existing butterfly roof arrangement and it is not considered feasible that a small number of solar panels could be located such that they are able to offer significantly beneficial performance.

For similar reasons solar hot water systems have been discounted and because of the limited number of sanitary fittings they would be able to serve, the vertical distance between the panels and the furthest outlet and their visual impact at roof level.

Figure HP1 : Details of Proposed Air Source Heat Pumps and Performance (Daikin RXYSQ4T)

					RXYSQ4T8VB9
Recommended combination					3 x FXSQ25A2VEB + 1 x FXSQ32A2VEB
Cooling capacity	Prated,c			kW	12.1 (1)
Heating capacity	Prated,h			kW	12.1 (2)
	Nom.		6°CWB	kW	12.1 (2)
Power input - 50Hz	Heating	Nom.	6°CWB	kW	2.68 (2)
COP at nom. capacity	6°CWB			kW/kW	4.52
SCOP					4.4
SEER					7.0
ηs,c	%				278.9
ηs,h	%				171.6

6.0 CALCULATION OF CO_2 EMMISSION REDUCTIONS

SBEM modelling has been completed for the building, this being based upon the existing condition of the spaces in terms of fabric and services provision, this includes the heating and DX split system comfort cooling being provided from the existing boiler / heating system and cooling only split DX comfort cooling system. This has then been remodelled incorporating the proposed design and fabric improvements, with the resulting performance summarised in the Table below, with the SBEM output documents both pre and post refurbishment are summarised and available should they be required..

When referring to the SBEM documents reference should only be made to the Building CO_2 Emission Rate (BER), and not the Target Emission Rate (TER) generated by the software, the latter only providing the baseline performance against which a new building is measured. Similar reference to a failure of Building Regulations should also be ignored since it is also not applicable.

Table 2: Results from iSBEM for the building.

	Existing (2012)	As Proposed (2012)	Existing SAP10	As Proposed SAP10
Heating Energy Consumption (kWh/m²)	189.21	62.96	189.21	62.96
Cooling Energy Consumption (kWh/m²)	1.01	3.21	1.01	3.21
Auxiliary Energy Consumption (kWh/m²)	3.9	1.92	3.9	1.92
Lighting Energy Consumption (kWh/m²)	33.12	33.47	33.12	33.47
Hot Water Energy Consumption (kWh/m²)	8.33	2.24	8.33	2.24
Total Building Energy Consumption (kWh/m^2)	235.56	103.8	235.56	103.8
Building CO_2 Emission Rate (kgCO_2/m²)	62.40	**53.87**	50.34	**24.19**
Percentage Improvement Over Existing		**14%**		**52%**

Table 3. Carbon Reduction (Camden Local Plan Policy CC1)

	SAP2012		
a. Energy Statement	Total tCO2	Stage reduction, tCO2	Stage reduction, %
Baseline	22901.17	N/A	N/A
Be Lean	20740.77	2160.40	9.4%
Be Clean	20740.77	0.00	0.0%
Be Green	19771.10	969.67	4.7%
TOTAL	**19771.10**	**3130.07**	**13.7%**
Target	*N/A*	*N/A*	*N/A*
Shortfall	*N/A*	*N/A*	*N/A*

Offset payment	see notes

	SAP10		
b. Energy Statement	Total tCO2	Stage reduction, tCO2	Stage reduction, %
Baseline	18475.54	N/A	N/A
Be Lean	16341.25	2134.29	11.6%
Be Clean	16341.25	0.00	0.0%
Be Green	8876.04	7465.21	45.7%
TOTAL	**8876.04**	**9599.50**	**52.0%**
Target	*N/A*	*N/A*	*N/A*
Shortfall	*N/A*	*N/A*	*N/A*
Offset payment	see notes		

7.0 SUSTAINABILITY STRATEGY

A combination of the measures described within this report will be implemented as part of the project works to provide a lean, clean and green development. The works will include the following as appropriate and allowable within the confines of a listed building:

- Upgrades to building fabric U-values (windows, roofs and non-sensitive elements)
- Improvements to building air tightness
- The installation of low carbon and/or high efficiency heating systems
- Provision of ASHP's with heat recovery in the office spaces
- Installation of energy efficient controls and metering measures
- Installation of low water use fittings

8.0 CONCLUSION

The proposed design approach for the development is inherently sustainable. The proposal retains the majority of the existing building fabric, which is far less carbon intensive than a demolition-and-redevelopment approach. The proposal decarbonises the building heating system by omitting the existing gas boiler and replacing with Air Source Heat Pumps in line with Local and National Energy policies.

The proposal follows the Mayor's and Camden's energy hierarchy reducing energy demand where possible (be Lean) and by utilising Clean, Green energy such that a 14% / 52% improvement in regulated emissions of CO_2 can be demonstrated over the baseline (based on 2012 / Current carbon conversion factors).

It should be noted that the baseline for this performance is the current building, determined from energy modelling of the current building and its building services.

The feasibility of a range of renewable energy technologies has been reviewed for use in the development, and many are not viable because of the buildings heritage status and limited available roof space.

In addition to the sustainability benefits of utilising existing building stock over building new, the proposed refurbishment of 32 Percy Street, London significantly reduces the CO_2 emissions associated with it use over the current existing building's utilisation and future proofs .