mechanical and electrical consulting engineers

ENERGY STATEMENT

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GREATER LONDON HOUSE – ASOS INFILL OFFICES EXTENSION

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1.0 Introduction

This ENERGY STATEMENT document is issued on behalf of Lazari Investments Ltd for the proposed development of new infill offices in the open air atrium of Greater London House covering floors upper Ground, 1st and 2nd in addition, ancillary facilities will be provided at Lower Ground. This report makes due reference to the energy requirements in regard to minimising carbon dioxide emissions from the following documents:-

- Building Regulations 2013 Approved Document Part L2A and Part L2B – Conservation of Fuel and Power.
- London Plan 2015, with application of the Be Lean, Be Clean and Be Green policy.
- Camden Development Policies 2010. Policy DP22 – promoting sustainable design and construction.
- Core Strategy 2010 CS13 – Tackling climate change through promoting higher environmental standards.

The purpose of the ENERGY STATEMENT is to demonstrate that the proposed development will achieve sustainability, energy and carbon emission targets where possible as dictated by the above guidelines and legislation.

The report will show how the development will achieve compliance with building regulations 2013 Part L2B (see section 4.0 for compliance) and reduce CO_2 emissions by the building fabric thermal performance and low energy technologies applied to the environmental services and efficient control of energy usage.

2.0 Executive Summary

The ENERGY STATEMENT has been prepared on behalf of Lazari Investments Ltd to cover the proposed development of new infill offices extension in the open air atrium of Greater London House, Hampstead Road in the Camden Borough of London. The application has been submitted to provide ASOS, as existing tenant with additional floor space.

The ENERGY STATEMENT makes reference to the energy and CO^2 emission standard requirements and compliance as defined by the Building Regulations Part L2B 2013, and the technical specification.

The ENERGY STATEMENT will show that the proposed development has targeted the requirements of the improvement in energy and CO^2 emissions performance by the use of sustainable and energy efficient measures, as defined by the London Plan 2015 – Be Lean, Be Clean and Be Green Policies.

The HM Government Simplified Building Energy Modelling software (iSBEM) has been utilised to show how the baseline development scheme* achieves AD L2B 2013 compliance with a target energy performance certificate with a 'B' rating.

*The proposed baseline development scheme utilises low thermal property 'U' values below AD L2A requirements, air source heat pumps with high COP and heat recovery for heating and cooling, mechanical ventilation systems with heat recovery, high efficiency gas-fired water heaters and LED lighting with PiR control throughout.

The London Plan 40% reduction in CO^2 emissions against BR Part L2A 2010 equates to 28% against BR Part L2A 2013. However, given the development is an extension as Part L2B complaint with restricted external wall space and further to discussions with the Camden Sustainability Officer, we have applied Camden Core Strategy 2010 CS13 clause 13.11, which advises "Once a building and its services have been designed to make sure energy consumption will be as low as possible and the use of energy efficient sources has been considered, the council will expect developments to achieve a reduction in carbon dioxide emissions of 20% from on-site renewable energy generation, unless it can be demonstrated that such provision is not feasible".

Table 1 below shows that the baseline scheme for the development which is L2B compliant but can be improved by application of PV cells* for on-site electricity generation.

Greater London House – Table 1 – Building CO^2 emissions kg $CO^2/m^2/yr$			
Infill Extension Development Scheme	**TER CO^2 Emissions**	**BER CO^2 Emissions**	**CO^2 Emissions Savings**
Part L2A 2013 Target CO^2 Emission Rate.	20.71		
Baseline development scheme.		20.0	-
Application of 300m^2 of PV	20.0	15.68	-22%

TER: Target emissions rate (set for a notional building).

BER = Building emissions rate for this property.

To achieve Part L 2013, the BER must be equal or less than the TER.

The EPC energy performance certificate for the scheme with PV would be a B26, just short of an A rating.

3.0 Site Description

The proposed new infill offices extension development will be constructed to the existing internal open atrium area of Greater London House on Hampstead Road. The development will be sited internally within the open atrium at upper ground, 1st and 2nd floor levels with ancillary facilities at lower ground.

Greater London House is located in the London Borough of Camden and is located just opposite Mornington Crescent Underground station. It is an island site comprising of an entire block that sits between Hampstead Road and Mornington Crescent. The following Outline Specification has been prepared with the view that the office element will be let to existing tenants, ASOS.

The building currently comprises of 333,077 sq ft of office space (NIA) and it is intended that this be increased to 370,145 sq ft (NIA) to allow for further expansion of the ASOS tenants space at Ground, First and Second floor levels. It is intended that the additional space is created through development of the existing courtyard area over three new floor levels to the North and South courtyards. The new courtyard infills will consist of contiguous open plan spaces at Ground floor level with galleried space at first and second floor levels to allow natural light penetration through each level via a new glazed roof light. The courtyard extensions will be a new and independent structure to the existing building. Aesthetically, the new building will be sympathetic to the style of the 1930's architecture of the existing courtyard but will be clad in a modern insulated, glazed facade system which will comply with current building regulations. The new roof will incorporate a custom designed, double glazed roof light, the glazing will incorporate an interstitial graphic supported on a painted, fabricated steel sub-frame this addition will enhance the interior spaces below. The roof light support steelwork will also function as a structure to facilitate lighting to the atrium voids and will provide some solar shading to the internal spaces.

The new areas will be interlinked to the existing by creating access openings through the façade. The new raised access floors will be transitioned with existing floor levels within these openings. Existing rendered courtyard facades will be cleaned and service risers will be modified, clad to improve their visual impact. Two new exposed ductwork service routes will provide fresh air and extract to the North and South extensions. these will be fed from plant to be located at 5th floor roof level.

Plant space and PV cells will be allocated on the existing 5th floor roof to the front of the property (see attached plan drawing).

4.0 Policy and Planning

This ENERGY STATEMENT is based on achieving compliance with the Building Regulations 2013 Part L2B.

AD Clause L2B - 4.1 states that..." Under regulation 28 of the Building Regulations, the construction of an extension triggers the requirement for consequential improvements* in buildings with a total useful floor area greater than 1000m2."

Where *consequential improvements, generally means each element of installation (glazing, roof, AC, ventilation and lighting) must be part L2A compliant.

AD Clause L2B 2013 - 4.2 - Large extensions, states.. "Where the proposed extension has a total useful floor area that is both : a) greater than 100m2 and b) greater than 25% of the total useful floor area of the existing building, the work should be regarded as a new building and the guidance in approved document L2A followed. In this instance the extension is 12% of the total useful floor area of the existing building, so Part L2B will apply.

AD Clause L2B 2013 - 4.4 Opening areas -table 2 -opening areas in the extension limits windows as 40% of exposed wall and rooflights as 20% of area of roof.

Consideration has been given to the use of various low energy and renewables technologies available, in addition to current AD Part L ‘U’ value properties of the building fabric on construction.

The ENERGY STATEMENT makes reference to the London Plan Policy clauses 5.1, 5.5 and 5.7 and Camden Policies CS13 and DP22 whilst achieving compliance with AD L2B – 2013 and Fabric U values and building services element compliance with AD L2A – 2013.

The London Plan 2015 – Policy 5.2 states that non-domestic developments should achieve an improvement on the '2010 Building Regulations' of 40% minimum improvement over the Target Emission Rate.(TER)

Note: Building Regulations Part L 2013 were amended and 'strengthened' to deliver a 12% carbon dioxide savings against "offices" under the new non-domestic buildings relative to Part L 2010. Therefore the London Plan target of a 40% carbon emissions reduction against Part L2A 2010, would equate to a 28% reduction over the minimum improvement over the L2A 2013 Target Emission Rate.

However, in reference to Camden DP22 – Sustainable design and construction measures as in clause 22.5, the proposed development has addressed the following sustainability measures (further detailed below) – Levels of insulation, efficient heating, cooling and lighting systems, effective building management system, the source of energy used (air to air heat pumps), sub-metering, counteracting the heat expelled from plant equipment (thermal wheel air to air heat recovery on supply and extract air mechanical ventilation plant) and efficient use to water, to achieve a target EPC 'B' rating utilising iSBEM software.

Discussions with the Camden Sustainability officer referenced a 20% CO^2 saving above the Part L2A BER (building energy rating).

In practical terms, PV cells could be installed on the front 5th floor north light roof which is inclined 30-40° and faces south. We have therefore proposed 300m^2 of PV cells applied to the available un-shaded space on the north light roofing (see attached roof plan drawing). This has been calculated to achieve a 22% reduction of CO^2 over the L2A 2013 TER and equates to an EPC B26 rating, which will likely achieve an A rating on final detail design.

5.0 Simplified Building Energy Modelling iSBEM

The proposed development has been thermally modelled using iSBEM version 5.2g simulation modelling software to determine the annual energy demand and resultant CO_2 emissions for the proposed development.

This software contains all the construction fabric u-values for each of the building elements and outputs from the simulation program include hourly kW demands for heating, cooling, domestic hot water and small power. The model was simulated using the CIBSE weather data for London and the outputs from the software allow gas and electrical consumption and related CO_2 emissions to be calculated and the target reduction in CO_2 emissions to be established by application of renewables data.

6.0 The proposed building model - iSBEM data input

This section reflects the Be Lean and Be Clean part of the strategy of the London Plan to both "reduce energy demand" and to supply energy efficiently.

The iSBEM building model contains the thermal performance of the proposed development and the application of the plant and services low energy technologies as defined under ADL2A through the Non-Domestic Building Services Compliance Guide-2013 Edition.

1. Building Thermal Transmittance U values-:
The proposed building will have U values which surpass the ADL2A compliance guidelines as listed in table 2 below.

2. Air Permeability
The air permeability of the building is subject to the extension being open to the existing property.

3. Heating and Cooling
The building will utilise Mitsubishi High efficiency COP heat recovery VRF (variable refrigerant flow) Air Source Heat Pumps which have Energy Efficiency Ratios EER's above 3.5.

4. Mechanical Ventilation
The mechanical ventilation requirements to the offices will incorporate thermal wheel air to air heat recovery.

5. Hot Water Supply
Hot water provision will be from high efficiency hot water heaters to the Lower Ground Floor spa and toilet facilities.

6. Lighting
It is proposed that LED lighting will be utilised throughout the offices to maximise the provision of low energy lighting with PIR dimming control on daylight levels.

7. BMS (Building Management System
A new BMS system will be installed to auto-control the main HVAC plant and equipment and individual fan-coil units for local environmental control on heating, cooling and ventilation.

8. Water Consumption
Whilst water consumption is not a program input in the iSBEM model, water saving technology will be utilised in the form of the following, to ensure compliance with BREEAM requirements and to achieve credits on this scheme:

- WC flush volumes at 4.5 litres.
- Taps with minimum low flow regulators.
- Showers with a nominal flow rate of 8 litres/minute.

9. PV Cells
We have utilised 300m² of available north light roof space with the solar panels either on the open aspect south sloping roof sections or on flat roofs housing storage space (see attached drawing).

Table 2: iSBEM Data Input		
Item. (design stage)	ADL2A 2013 – Minimum*	Proposed Development
Thermal Property 'U' valves	W/m²K	W/m²K
External wall	0.30	0.27
Roof	0.25	0.25
Ground Floor	0.25	0.25
Windows	2.2	2.2
Air Permeability	m³/hm² at 50 Pa	m³/hm² at 50 Pa
Air permeability	10	10
HVAC plant efficiency*		
Heating/Cooling EER	2.6 (260%)	3.6 (360%)
Hot Water efficiency	80%	90%
AHU fan power with heat recovery w l/s	1.6	1.6
Local fan SFP w l/s	0.5	n/a
Energy Efficiency WR	60 luminaire lumens per circuit watt.	100 luminaire lumens per circuit watt.
*ADL2A values taken from the HM Government "Non-Domestic Building Services Compliance Guide".		

Table 3: GLH – Baseline Scheme to achieve AD 2LA 2013 compliance			
Item	**TER KWh/m²/yr**	**BER KWh/m²/yr**	**% Improvement**
Heating	0.72	3.72	
Cooling	10.21	8.63	
Auxiliary	2.7	6.29	
Lighting	24.47	19.89	
Hot Water	3.34	4.07	
PV systems	0.00	(9.68)	improvement
Total	**41.47**	**32.98**	**+20.4%**

The above Table 3 results are taken from the iSBEM calculation BRUKL output as attached.

7.0 Application of Alternative energy technologies and Renewables to reduce CO^2 emissions

The iSBEM model for the property has utilised low thermal property 'U' values and low energy technologies for the building services to achieve an AD L2A 2013 element targets in line with an AD L2B 2013 compliance.

In practical terms, the alternative technologies considered in reference to current Part L guidelines have been aimed at building fabric, heating, cooling, ventilation and lighting as reflected in the values as table 2 in compliance with AD L2A 2013.

The energy technologies discounted from the scheme as not viable or cost effective given the energy targets achieved by practical technologies include biomass boilers, ground source heat pumps, solar thermal and wind turbines.

Reference was made to the Camden Environment web-site to address the future proposals for " Decentralised Energy in Camden", which includes a map displaying decentralised energy clusters. The Greater London House site on Hampstead Road in the Mornington Crescent area of Camden is covered under future new energy network cluster studies and as such no current decentralised district heating scheme is available. The proposed scheme is an extension to an existing building. The extension represents only 12% of the total floorspace. Accordingly it is not considered practical, feasible or viable to allow for a future connection to a decentralised energy network which may or may not come forward.

The HVAC system for the property will incorporate BMS monitoring and control for efficient time and temperature operation.

The only viable alternative energy technology for this scheme in both reference to the London Plan under the Be Green strategy element and Camden Core Strategy 2010 CS13 would be PV cells for electrical energy generation, wherein we can utilise the north-light roofing on the 5th floor front roof, which would give around 300m² of inclined south facing roof for the PV application (see attached roof plant drawing).