Greenwood Place, 96-98 Shoot Up Hill

Energy Statement

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tga CONSULTING ENGINEERS

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SHOOT UP HILL

ENERGY STATEMENT

REVISION B

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1.0 INTRODUCTION

1.1 PREAMBLE

A team of construction professional are developing proposals for the refurbishment of 96-98 Shoot Up Hill.

TGA consulting Engineers LLP has been engaged, as part of the Tibbalds multi-disciplinary team, to provide professional design services. TGA's role includes development of the energy and building engineering services strategies for the redevelopment.

Development proposals are currently at RIBA stage D

1.2 CAMDEN COUNCIL PLANNING POLICIES

All new and refurbished building developments in the London Borough of Camden are required to meet minimum standards relating to sustainability, energy efficiency and carbon reduction. This is in line with London wide and national aspirations set by the London Mayor and the UK Government.

In the London Borough of Camden area, sustainability, energy efficiency and carbon reduction all feature in the planning process. Planning guidance on these matters is set out in the Local Development Framework and, in particular, in the following inter-related policy documents:

- CPG3 - Sustainability
- CS13 - Tackling Climate Change Through Promoting Higher Environmental Standards
- DP22 - Promoting Sustainable Design and Construction
- DP23 - Water
- CS16 - Improving Camden's Health and Wellbeing
- DP32 - Air Quality & Camden's Clear Zone

The formulation of a viable servicing strategy and energy plan for this project, as defined in this Energy Statement, takes into account guidance contained in the above listed documentation.

1.3 THE ENERGY HIERARCHY

It is now customary to consider energy supply and energy efficiency in buildings in a three tier process known as an 'Energy Hierarchy'.

The Energy Hierarchy:

1. Be Lean – *Design and construct a new building to consume less energy*
2. Be Clean – *Deliver and consume energy efficiently*
3. Be Green – *Deliver some or all of the required energy from renewable sources.*

The importance of the 'Energy Hierarchy' is in its drive to ensure that new buildings are designed and constructed to consume only the minimum amount of energy in the first instance.

After this first objective in the hierarchy has been defined, the design of the energy generation and delivery systems can be considered.

The final step in the energy planning process is to identify how much of the buildings energy needs can be met from renewable energy sources.

1.4 CAVEAT

The energy consumption analysis and results, which underpin the recommendations included in this Energy Statement, have been derived by applying the National Calculation Methodology (NCM). This methodology is embedded in the SAP calculation procedures.

The energy consumption for the completed buildings may differ from the predictions given by SAP.

1.5 THIS REPORT

The purpose of this report is to set out design strategies and performance targets relating to energy conservation, energy efficiency and energy supply, which have been embodied into the development proposals and will be carried forward into the detail design and construction phases of the project.

In the first instance, the information contained in this report is will enable the local authority Planning Team to consider and understand the adopted measures and features, relating to energy, that have been incorporated into the development proposals thus far.

The emphasis in this report is on energy consumption and carbon reduction. Other issues, which come under the general heading of 'sustainability' will be covered in a separate document.

2.0 DEVELOPMENT PROPOSALS

2.1 PROJECT DESCRIPTION

96-98 Shoot-up Hill is a Camden Council owned buildings located in the Kentish Town area of London. Community facilities provided in this building will become redundant following completion of the Greenwood Estate development.

Proposals have been developed to convert the Shoot-up Hill property into residential apartments and the building is required to achieve a BREEAM 'Very Good' rating.

The following section of this report describes the key strategies that have been adopted, firstly to reduce the energy demand imposed by the new buildings and secondly to identify the principal mode of energy delivery.

2.2 REDUCE ENERGY DEMANDS

The building is to be remodelled to incorporate effective use of passive, internal climate moderating, features. This will result in less reliance of building engineering systems and hence reduced energy consumption.

Passive features that have been included.

- Natural ventilation to maintain comfortable internal temperature conditions in summer and to maintain an acceptable internal environment
- Good day lighting in interior spaces
- Effective use of winter sunshine on southern elevations

The building envelope is to be upgraded to improve existing u-values. The building envelope air permeability will be improved also, to reduce uncontrolled and wasteful air infiltration.

U value and air permeability standards, adopted for the building, are those values identified elsewhere in this report. (Table 3.1)

Efficient Energy Generation and Delivery

Thermal energy will be produced by individual, high efficiency gas-fired condensing boilers, located in each dwelling.

Space heating will be delivered to the occupied spaces by LTHW radiators mounted on wall surfaces.

Opening windows in perimeter rooms will be provided for rapid ventilation purposes. Background ventilation will be by trickle ventilator.

Mechanical extract ventilation will be provided in bathrooms and the kitchen spaces.

Interior lighting will be designed to take full advantage of the natural daylight admitted into the occupied spaces.

Energy efficient light sources and switching will be selected.

Each dwelling will be provided with effective programmable central heating user controls.

2.3 RENEWABLE ENERGY

Renewable energy technologies have not been included in this refurbishment project at this stage. Refer to table 2.1, below.

2.4 TECHNOLOGIES NOT INCLUDED

Consideration has been given to a number of energy supply/energy generation technologies in the early design stages of this project.

Table 2.1, below provides a summary of those technologies that have been considered and excluded.

Table 2.1

Item	Description	Remark
Raglan & Shoot Up		
Ground Source Heat Pump (GSHP) Technology	Central GSHP unit in central plant room and vertical or horizontal ground loop pipework.	Insufficient unobstructed ground available to accommodate ground loop pipework.
Air Source Heat Pump Technology	Central ASHP unit mounted on roof plant area and connected pipe systems in the building.	Architecturally not appropriate on the south facing roof elevations.
Biomass	Automatic wood burning boiler incorporated in a central heating system.	Air quality issues on and around the site preclude the inclusion of wood burning appliances.
Wind Turbine	Building mounted wind turbine generators.	Poor availability of wind energy in at this site precludes inclusion of this technology.
Solar PV and Solar Thermal	Roof mounted panels.	Architecturally not appropriate on the south facing roof elevations.

2.5 UN-REGULATED ENERGY CONSUMPTION

Un-regulated energy use and consumption is concerned with the energy consumed by white goods, household appliances, portable electrical equipment and the like.

Energy labelling of electric appliances is regulated under EU Directive 2010/30 EU. All such appliances, which are to be supplied and installed under the building contract, will be specified A-Rated or better.

Replacement lamps in light fittings also comes under the above mentioned EU directive.

Handover documentation provided at the end of the construction project will include a 'User Guide' and this document will include user advice relating to energy efficient product replacements along with general advice about energy efficiency and energy conservation.

3.0 THE ENERGY PLAN

3.1 GENERAL

In order to formulate a viable energy strategy for this development, a 'baseline' energy model has been produced using IES virtual environment software and SAP calculation methodologies.

Iterations to the baseline energy model have been performed and a final energy strategy has been derived.

The servicing strategy for the building, described in section 2.0 of this report, is based upon the provision of individual high efficiency gas-fired condensing boiler units in each dwelling.

In order to achieve a BREEAM 'Very Good' rating the following energy credit is required to be achieved:

- Ene02 requires a minimum EER 65

This section of the report presents a summary of the results obtained during model processing.

3.2 BASELINE SOLUTION

The methodology adopted in the analysis process first generated a baseline solution.

Building envelope u-values adopted for the baseline model are 1972 building regulations values. Central heating is by re-use of the existing central boiler plant, adapted to suit the re-modelled internal spaces.

The final iteration includes enhanced u values and air permeability, as defined in table 3.1, below. Central heating is by individual high-efficiency gas fired-boiler units, located in each dwelling.

Enhancements to the building fabric will be carried out internally and will not affect the exterior appearance of either building.

Table 3.1 below, identifies the enhanced u-values and an air-permeability value adopted and used in the modelling process.

Table 3.1 Envelope Parameters

Item	value	units
External Wall	0.6	$W/m^2/K$
Roof	0.13	$W/m^2/K$
Floor	1.4	$W/m^2/K$
Window	2.2	$W/m^2/K$
Glazed Door	2.2	$W/m^2/K$
Solid Door	1.0	$W/m^2/K$
Air Permeability	7.0	$m^3/h.m^2$

From this baseline, further iterations have been produced whereby improvements in energy delivery systems and building envelope performance has been introduced.

3.3 CALCULATION RESULTS SUMMARY

Table 3.2 includes the SAP calculation results and identifies energy demand, carbon emissions and EER/SAP ratings for the principal iterations.

Table 3.2 – Raglan & Shoot UP Hill Energy Demand and Carbon Emissions

	Energy	Carbon Emissions	SAP/EER Rating
Baseline Case			
Shoot Up	515.85 kWh/m^2.yr	106.4 kg(CO2)/m^2.yr	39
Baseline Case with Up-graded Building Fabric and Local Boilers			
Shoot Up	183.47 kWh/m^2.yr	40.18kg(CO2)/m^2.yr	67

The adopted improvements to building fabric and heat generation/delivery systems results in a significant reduction in energy consumption and carbon emission compared to the baseline option. In particular:

- EER is improved by 28 points.
- EER value achieves 67 and
- The energy consumption value is 183.47kWh/m^2.yr

All of the above values are compatible with achieving the energy credits required by BREEAM 'Very Good'.

4.0 CONCLUDING REMARKS

As part of a planning submission for this development, an Energy Statement is required to be prepared and submitted. This document is intended to fulfil that requirement.

Development proposals are at RIBA stage D and the measures and features that have been described in this document, relating to energy conservation and energy supply, are a fundamental and integral part of the stage D design solution.

The output from the modelling processes described in this document and the calculation results arising, has been assessed under BREEAM.

Both buildings exceed the mandatory energy credits which are required to achieve the stated ratings of '**Very Good**'.

Renewable energy technologies have been considered and have been excluded from the project at this stage.

In conclusion, TGA Consulting Engineers believe that the energy conservation and energy supply proposals described in this Energy Statement represents a pragmatic and feasible energy plan for the development.