WEBB YATES ENGINEERS

Sustainability Statement

J5016 14 John Street

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Webb Yates Engineers Ltd
48-50 Scrutton Street
London. EC2A 4HH
020 3696 1550
london@webbyates.com
www.webbyates.com

Registered in England & Wales No.: 5393930

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REVISION HISTORY

Revision	Status	Date	Author	Reviewer	Approver
00	S2	27.07.2022	ES	AL	AL

1. EXECUTIVE SUMMARY

This report describes the sustainability strategy for the proposed redevelopment of 14 John Street, London WC1N 2EB.The project consists of the refurbishment of an existing office building of approximately 469m^2 GIA into a residential property. The proposed development will have a basement, ground floor and four storeys above. The building is Grade II listed.

The guidance and policies used in formulating this report are listed below and the resulting findings are compliant with the content of each;

- Camden Local Planning Documents
- Building Regulations Part L2B

The building is listed and so is exempt from Building Regulations part L requirements. The energy strategy proposed aims to achieve the best outcome in terms of sustainability and energy efficiency.

As demonstrated for the proposed energy hierarchy of the development, energy consumption and associated carbon emissions will be reduced through passive and active design measures. Natural passive design measures are prioritised over the active measures to reduce energy.

In addition to measures reducing operational energy and associated carbon emissions, the embodied carbon content of materials used will be minimised as far as possible. It is the philosophy of Marek Wojciechowski Architects and Webb Yates Engineers to design efficient, low carbon buildings.

2. INTRODUCTION

This report describes the sustainability strategy for the proposed redevelopment of 14 John Street, London WC1N 2EB. The project consists of the refurbishment of an existing office building of approximately 469m^2 GIA into a residential property. The proposed development will have a basement, ground floor and four storeys above. The building is Grade II listed.

This report sets out the sustainability strategy for the proposed development. In developing this strategy local and regional planning policies have been addressed.

Due to its listed status a part L energy assessment is not required and is not included as part of this Sustainability Statement.

The proposed Sustainability Principles and Engineering Concepts incorporate the requirements and guidelines of the relevant British Standards and CIBSE Guides.

3. PLANNING POLICY BACKGROUND

The main planning documents which constitute the statutory development plan for Camden and form the basis on which decisions will be made for the proposed development are:

- Building Regulations Part L2B
- Camden Planning Guidance – Energy Efficiency and Adaptation 2021
- CIBSE Technical Manuals and Guides

The main planning documents which constitute the statutory development plan and form the basis on which decisions will be made for the proposed development are outlined below.

3.1. Building Regulation Compliance

Building Regulations apply to all developments, although the energy requirements set-out in Approved Document: Part L1B: Conservation of Fuel and Power in Existing Dwellings, do not apply to listed buildings.

3.2. Camden Planning Guidance 2021

Camden Council strongly encourages refurbishment projects to be energy and resource efficient. Improving environmental sustainability of existing building stock is an important challenge to the borough. All proposed developments are required to minimise use of energy and other non-renewable resources, as well as to facilitate an increase in the use of low and zero carbon technologies to help reduce carbon dioxide (CO2) emissions and air pollutants harmful to health.

The development is classified as a minor development and will therefore not need to meet the carbon reduction targets set out in the London Plan or the on-site renewable generation targets required for larger developments under the Camden planning guidance.

All developments in Camden are expected to reduce carbon emissions through the application of the London Plan Energy Hierarchy:

- Use less energy (Be Lean);
- Supply energy efficiently (Be Clean)
- Use renewable energy (Be Green); and
- Monitor, verify and report on energy performance (Be Seen)

The Camden plan notes the importance of improving the existing building stock, and of reusing and repurposing existing buildings, but also the limitations on the improvements that can be made with heritage buildings. Guidelines on what improvements may be possible are included in the planning guidance and these are used as the basis of the measures set out in the 'be lean' improvements.

There is some emphasis in the planning guidance on dealing with future climate change while minimising the risk of overheating and providing comfortable environmental conditions. Measures to achieve this are set out under the cooling hierarchy.

4. ENVIRONMENTAL DESIGN STRATEGY

It is proposed to use a number of energy efficiency measures to reduce the energy demand of the development in line with the energy hierarchy of Be Lean, Be Clean, Be Green and Be Seen.

4.1. Be Lean

4.1.1. Reduce the need for energy

Passive design measures have been considered and any viable measures will be utilised to reduce energy demand. Options assessed:

- Thermal envelope: a fabric first approach with U-value improvement for fabric and glazing to minimise heat losses has been evaluated, but assessed as not viable, given the aim of keeping the heritage asset as much intact as possible, internally and externally.
- Enhanced airtightness could reduce cold bridges and heat losses through fabric, but an upgrade to the existing detailing has been assessed as not viable given the nature of the building and its Grade II listing.
- Limit overheating: The façades are East and West facing, the internal layout will be designed to maximise solar gains in winter while minimising them in summer, including the use of internal blinds where required. Openable windows provide natural ventilation reducing reliance on mechanical cooling. Exposed thermal mass will be utilised wherever possible to create a more comfortable internal environment.
- Daylight: the internal layout is designed to maximise daylight while minimising summer solar gains
- Ventilation: Openable windows to provide natural ventilation

4.1.2. Using energy more efficiently

Energy demand will be further reduced through active design measures. These include:

- Limit overheating: Systems to be designed to minimise internal heat gains by creating as short as possible service runs and the use of low energy lighting.
- Ventilation: The development will utilise mechanical extract fans in the wet rooms.
- Efficient systems: Use of efficient systems and equipment with suitable time and temperature controls which have been appropriately commissioned such that the systems can be operated efficiently. Minimization of lengths and diameters of 'dead legs.' Efficient components i.e. fans, pumps, and other equipment will be appropriately sized to have no more capacity for demand and standby than is required for the task, to allow them to operate at their optimum levels. Insulation of pipework, ductwork and hot water systems will be in line with the future highest standards.

- Energy efficient lighting and appliances: Provision of the required lighting levels whilst minimizing energy consumption by appropriate specification of light fittings and effective control of lighting systems by:
    - Specifying 100% of the fixed internal light fittings as dedicated energy efficient fixtures.
    - Having suitable energy consumption metering.
    - Ensuring systems have been appropriately commissioned.
    - Using lighting systems which are efficient and make use of daylight where possible/practical.
    - Provision of low output or energy efficient external lighting.

  A lighting efficacy average of 90 lumens per circuit watt will be used as the design standard. This will be achieved including LED lighting sources throughout.

4.2. Be Clean

Due to the development location, it is not proposed to connect to an existing low carbon heat network.

4.3. Be Green

The viability of renewable systems such as Photovoltaic Panels, Solar Thermal, and Heat pumps has been assessed and all these systems have been considered not viable for this project due to the nature of the building, lack of space and its Grade II listing.

4.4. Be Seen

Sufficient information about the building, the fixed building services and their maintenance requirements will be provided to the users so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances. The systems provided within the development will allow for monitoring to ensure they are run at optimum performance.

5. LOW AND ZERO CARBON TECHNOLOGIES

The following section provides a feasibility analysis of Low or Zero Carbon (LZC) technologies for use at 14 John Street. There are various options when it comes to LZC technology, but a combination of project constraints rules these out. The constraints are:

- Grade II Listed status
- Capital expenditure
- Return on Investment
- Carbon savings potential
- Clean energy output potential
- Spatial requirements
- Operation and maintenance requirements
- Planning requirements

Out of the technologies considered the following were discounted immediately for this site:

- Ground-source heat pumps; no space for ground-loop or boreholes
- Hydroelectric: there are no suitable water courses or hydroelectric plants near the site.
- Hydrogen: generation and storage are still in the experimental stage at this scale and no systems are currently commercially available.
- Biomass: planning energy and carbon targets rule out the use of a gas boilers or alternatives (including CHP or biomass CHP). It is also considered not a viable solution due to issues with emissions and transport.
- CHP: as above.
- Biomass CHP: as above.
- Wind Turbines: wind turbine technology is not suitable for high density areas and those within close proximity to residential properties.

The feasibility study therefore reviewed the use of the following technologies to offset CO2 emissions:

- Air Source Heat Pumps
- Photovoltaics
- Solar Thermal Panels

5.1. Feasibility of LZC Technologies

5.1.1. Air Source Heat Pump

An air to water heat pump uses the air as a heat sink and transfers the heat in the external space into the heating system. The temperature of the Low Temperature Hot Water (LTHW) providing the heating also affects the efficiency (coefficient of performance – COP) of the units, with the ideal flow and return temperatures being 45°C/35°C.

This limits the heating output that is possible using traditional radiator systems or underfloor heating systems. To ensure comfort levels in peak winter conditions would require significant fabric upgrades to match the heat pump output to the building heat loss. The listed nature of the building means that this will not possible.

Air-source heat pumps (ASHP) need to be located externally, away from noise sensitive receptors. There is no suitable location within the project site.

On the basis of space and technical limitations ASHP are not considered appropriate for the project.

5.1.2. Solar Photovoltaic (PV) Panels and Detailed information

Photovoltaic (PV) Panels are a renewable technology which will decrease the amount of electricity from the grid used in the building, particularly during the summer months when the solar irradiance is at its peak. Panels can be integrated within the building roof or stand alone; most efficient when south facing and angled at 30° from the horizontal. Such panels would reduce carbon emissions from the electrical uses within the building.

With limited roof space available, and the listing of the building, this technology is considered not appropriate for the project.

5.1.3. Solar Thermal Systems

Solar thermal panels would need to be roof-mounted or integrated into a new roof structure. Flat plate or evacuated tube type panels could be used. The solar thermal panels would be used to heat water which can be used for the domestic hot water supply to the dwelling.

With limited roof space available, and the listing of the building, this technology is considered not appropriate for the project.

6. COOLING HIERARCHY

The building will be designed in line with the cooling hierarchy outlined in Policy SI4 Managing heat risk in the New London Plan and referenced in the Camden planning guidance. The following measures will be followed at each stage of the hierarchy in order to reduce the demand for cooling.

6.1. Minimising Internal Heat Gains

Stage one of the Cooling Hierarchy is to minimise internal heat generation through energy efficient design.

Heat distribution infrastructure will be designed to minimise pipe lengths. This will be achieved at coordination stage, ensuring pipework is well insulated and that pipe configurations minimise heat loss. Good daylighting and high efficiency light fittings with simple controls will also help to reduce excess heat gains from artificial lighting. Low energy lighting will be specified throughout.

6.2. Reducing Heat Entering the Building

Incorporation of internal blinds will help to limit solar gains in the summer.

6.3. Passive Ventilation

Openable windows in all perimeter rooms will allow sufficient natural cross ventilation to prevent overheating.

6.4. Mechanical Ventilation

Wet rooms will have mechanical extract ventilation to enhance the airflow through natural ventilation to help maintain a comfortable internal environment.

6.5. Active Cooling

It is not proposed to have any active cooling.

7. OVERHEATING RISK ANALYSIS

The measures described in the Cooling Hierarchy set out how overheating risk will be mitigated through passive design measures.

8. WATER CONSUMPTION

The design shall incorporate water saving strategies, such as low flush toilets, and non-concussive spray taps to keep the water use as low as possible. Water consumption will be monitored. Other features shall include mains leak detection and sanitary shut-off.

9. MATERIALS

The development will maximise the use of recycled, responsibly sourced and low impact materials. As a refurbishment, the development will reuse the existing structure and constructions as much as possible. This will greatly reduce the embodied carbon of the development.

To promote resource efficiency via the effective management and reduction of construction waste. The proposed development will implement a Site Waste Management Plan (SWMP).

Demolition waste will be minimised, reused and recycled, where practicable.

These measures will aid in minimising waste to landfill, with the aim of diverting at least 85% of demolition and construction waste from landfill.

10. OPERATIONAL SUSTAINABILITY

As stated in Section 4.4 Be Seen, sufficient information about the building, the fixed building services and their maintenance requirements will be provided to the users so that the building can be operated in such a manner as to use no more fuel and power than is reasonable in the circumstances. The systems provided within the development will allow for monitoring to ensure they are run at optimum performance via user-friendly controls, and metering.

High efficiency equipment and appliances will be installed throughout. Where white goods are to be provided fridges and freezers will be A+ rated under the EU Energy Efficiency Rating Scheme, washing machines and dishwashers will be A rated.