Manchester Stack
Mechanical, Electrical and Public Health Services
Energy Strategy Report

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Issue 01	First Issue	29/02/24
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Executive Summary

Link MEP Consulting Engineers. have been instructed by their client Stack Manchester. to provide this Energy Report to support the planning application for the redevelopment of the Hatch 2 site in Oxford Road Manchester.

The strategy adopted where practical is a BE LEAN, BE CLEAN, BE GREEN approach to building design and site servicing.

The site is essentially a part refurbishment and part new build of a current outside retail and leisure development, and works will consist of retaining and modifying the existing spaces.

No major works are anticipated to be undertaken to the building elevations with all works restricted to the existing street food units and outdoor entertainment venue.

Due to the building form and location, the works provided to reduce carbon emission and energy consumption on the site are restricted to the following:

- Where replacement equipment is to be provided the specified equipment will be of a higher efficiency than the current equipment to improve the current energy and carbon emission performance
- Provide metering to enable site energy usage to be monitored
- Use occupancy based control systems to prevent energy use whilst unoccupied or when not in use

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Introduction

Link MEP Consulting Engineers. have been instructed by their client Stack Manchester. to provide this Energy Report to support the planning application for the redevelopment of the Hatch site in Oxford Road Manchester.

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The site is essentially a part refurbishment and part new build of a current outside retail and leisure development, and works will consist of retaining and modifying the existing spaces.

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Energy Policy Statement

The development will be a part refurbishment and part new build of an existing site of similar usage and where practicable will follow the requirements of *Manchester City Council Policy EN4 -Reducing CO2 Emissions by Enabling Low and Zero Carbon Development.*

In order to achieve compliance with the Policy and the energy strategy adopted for the building to energy reduction and carbon emission from the building, where practical, is a BE LEAN, BE CLEAN, BE GREEN approach to building design and site servicing.

Building Description

The building is located on a fully serviced existing site at 103 Oxford Road, Manchester M1 7ED, beneath the Mancunian Way A57(M) motorway

The site is serviced with common site services for the following:

- Mains Water
- Natural Gas
- Incoming Electrical Supply

The site is a predominantly outdoor leisure venue housing a performance space, food and beverage spaces housed within container style units which are heated through portable calor gas or infra red electric heaters located strategically to meet the needs of the flexible spaces.

Natural ventilation is provided through the open nature of the development, with mechanical extraction through food and toilet areas in accordance with current legislation.

General lighting is predominantly temporary festoon type lighting.

Existing Buildings

The site is a predominantly outdoor leisure venue housing a performance space, food and beverage spaces housed within container and demountable partitions.

The food and beverage vendors are accommodated within the various spaces with fitout arranged to suit the needs of the vendors.

The central area and circulation consists of outdoor space with tables and bench type seating.

The roof is predominantly open with partly covered by the M57(M) motorway.

Refurbishment Proposals

Due to the nature of the development there are no current proposals for the refurbishment of the building fabric. As the development is open to the external ambient environment there is no benefit to be obtained from improving the building fabric thermal performance.

Heating the spaces is through temporary gas fired heaters and the proposed solution would retain this method to heat the areas.

Where necessary the following measures will be adopted to improve energy efficiency:

- Provision for energy metering and monitoring throughout the development
- Improved efficiency for any mechanical extraction fans ad equipment where necessary.
- Improved efficacy for any fixed or festoon lighting that may be included as part of the new development.

Energy Strategy

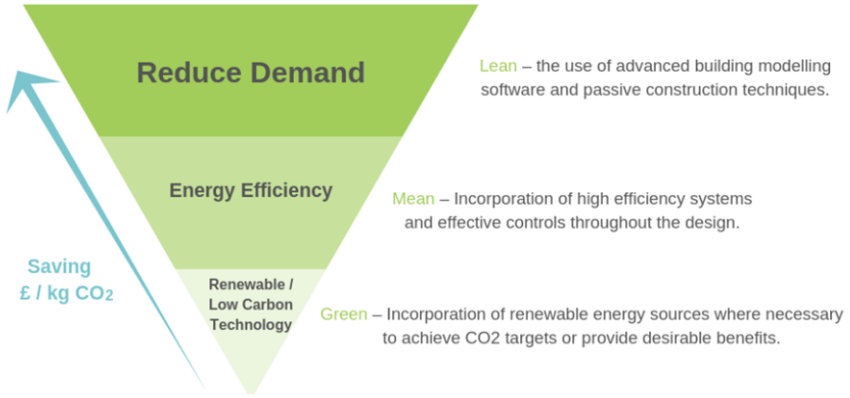
The overall energy strategy will adopt an approach that limits energy usage from the site. The approach will engage a strategy that keeps energy usage to a minimum such that the demand on the energy networks is as efficient as possible.

The strategy proposed to ensure energy efficiency is maximised is a BE LEAN, BE CLEAN, BE GREEN approach to building design and site servicing. This three-step approach is summarised as follows:

Step 1 BE LEAN Design: the use of advanced building modelling and passive construction techniques.

Step 2 BE CLEAN Design: specification of high efficiency systems and controls to reduce energy consumption in use.

Step 3 BE GREEN Design: supplement the site services design where necessary with the inclusion of LZC technologies to further reduce carbon emission.



The proposed building is a part refurbishment and part new build facility to upgrade the existing development to the meet the needs of Stack Manchester with the majority of the works based on internal space planning modifications and redecoration. External fabric modifications are restricted to the external nature of the development.

BE LEAN

At this stage of the design process we have an understanding of the existing site and that the building form and orientation will have a significant impact on the energy consumption of the development.

The proposal is to maintain the building shape and form, so the building will remain covered above from the a57(M) motorway as indicated in Fig 1



Fig 1: Building Location – Beneath A57(M)

This will limit the intrusion of excessive solar gain whilst allowing natural north light and natural ventilation to the development.

Further BE LEAN measures would include the provision of high efficiency fixed building services and the use of occupancy based control systems that will be centrally controlled to specified values to ensure fixed parameters are not exceeded during occupancy.

BE CLEAN

The correct selection and energy efficiency of services systems, plant and distribution will be of great importance to the energy efficiency strategy of the development. As well as some standard measures to optimise the efficiency of the services. The following list of energy efficient plant and equipment will be provided where new equipment is required:

- Occupancy Based Environmental Systems
- Variable Speed Fans and Pumps
- Effective Commissioning of Building Services Systems
- Natural Daylighting
- High Efficiency Lighting
- Lighting Controls
- Effective Metering Strategies

The measures undertaken to make the building both BE LEAN and BE CLEAN, i.e., careful selection of building fabric and form (BE LEAN) and energy efficient services and equipment (BE CLEAN) will result in a building which creates annual savings in CO_2 emissions in comparison to current Building Regulation standards.

BE GREEN

The next stage has been consider making the building BE GREEN, which requires an appraisal of the possible LZC technologies which may be applicable for the building. The following technologies have been appraised and the feasibility of including the technology briefly described below:

- Solar Hot Water – shaded site so no benefit
- Photovoltaics (PV) - shaded site so no benefit
- Small Scale Hydro Power – no coastal water source
- Tidal Power– no coastal water source
- Wave Power– no coastal water source
- Wind Turbines – planning restrictions
- Fuel Cells – not a proven technology, capital cost constraints

- Biomass Single Heater – no space heating requirements
- Independent Biomass Boiler– del no space heating requirements
- Biomass Boiler with District Heating– no space heating requirements
- Biomass CHP– delivery and storage of biomass fuel
- Combined Heat and Power – no space heating requirements
- Combined Cooling Heat and Power– no space heating requirements
- Air Source Heat Pumps – no space heating requirements
- Ground Source Heat Pumps – no space heating requirements
- Water Source Heat Pumps – no space heating requirements
- Anaerobic Digestion with District Heating – no space heating requirements

A simple initial analysis of the most suitable LZC technologies has been carried out to determine the viability of each technology for the development. The site is a restricted site in under the A57(M), so limitations associated with planning restrictions and building location have limited the options available for integration of the majority of the technologies.

From the initial analysis a preliminary outcome has failed to identify any viable low zero carbon technologies for use at the site.

Summary

In summary there are limitations to the proposed energy strategy based on site orientation and building form.

However the following measures can be confirmed following the introduction of the BE LEAN, BE CLEAN, BE GREEN Energy Strategy proposed for the building to assist in reducing carbon emission and energy consumption:

- Where replacement equipment is to be provided the specified equipment will be of a higher efficiency than the current equipment to improve the current energy and carbon emission performance
- Provide metering to enable site energy usage to be monitored
- Use occupancy based control systems to prevent energy use whilst unoccupied or when not in use