



Part of the **Contollo** Group

Sustainability Report
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Wythenshawe Town Centre
PA1775

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1.0 Executive Summary

This report has been prepared to inform Manchester City Council of the sustainable approach that has been taken to help reduce the building's carbon footprint and the possible energy saving that could be established when the full refurbishment project is completed. The report highlights the different sustainable measures that have been implemented in the design as well as the improvements that could be implemented in the future.

Refurbishment of an existing vacant two storey department store into a new culture hub and associated public realm works within Wythenshawe civic centre. The new culture hub consists of a new entrance and food outlet to the ground floor with open workshops, communal areas, exhibition spaces to the first floor and a new theatre and associated rehearsal spaces, recording studio and green room to the second floor.

Reducing the building's carbon footprint will be done by incorporating the following;

- Upgrading the building fabric
- Removing the use of gas and implementing air source heat pump to provide simultaneous heating and cooling along with direct electric heating to circulation spaces and workshop areas.
- Introducing new mechanical ventilation with heat recovery
- Replacing the existing lighting with new LED lighting and introducing lighting controls.
- Optimising the potential for renewable energy(Photovoltaic Panels)
- Improving the buildings air permeability.
- Use of recycled, low carbon and low VOC materials

As part of the design the systems have been future proofed as it is able to be adapted to connect to a district heating and cooling network.

1.1 Low or Zero Carbon (LZC)

To achieve a reduction in CO₂ emissions we have adopted the fabric first approach and the provision of renewable energy. This will be done by upgrading the windows, walls and roof beyond those stated in table 4.2 of Part L Volume 2 of the building regulations.

Table 4.2 Limiting U-values for existing elements in existing buildings

Element	U-value ⁽¹⁾ W/(m ² ·K)	
	(a) Threshold	(b) Improved
Pitched roof – insulation at ceiling level ⁽²⁾	0.35	0.16
Pitched roof – insulation at rafter level ⁽²⁾⁽³⁾	0.35	0.18
Flat roof or roof with integral insulation ⁽²⁾⁽⁴⁾	0.35	0.18
Wall – cavity insulation ⁽²⁾⁽⁵⁾	0.70	0.55
Wall – external or internal insulation ⁽²⁾⁽⁶⁾	0.70	0.30
Floors ⁽⁷⁾⁽⁸⁾	0.70	0.25

2.0 Energy & Sustainability Strategy

2.1 Introduction

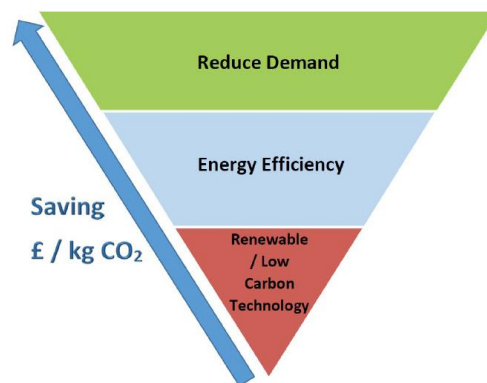
Sustainable building will be delivered through the utilisation of a holistic approach, which

considers, plans, and monitors the use of natural resources. The strategy for achieving this is outlined as follows:

The Low Carbon Design Hierarchy

The strategy for reducing carbon dioxide (CO₂) emissions and energy consumption within the Culture Hub development will be to embrace a lean, mean and green approach as defined below.

- Lean – the use of advanced building modelling software and passive construction techniques.
- Mean – Incorporation of high-efficiency systems and effective controls throughout the design.
- Green – Incorporation of renewable energy sources where possible



2.1.1 Lean – Building Passive Measures

The passive measures are to be included within the design of the refurbishment to Culture Hub, to reduce energy use and the associated CO₂ emissions are:

- Improved building fabric parameters over those required by Building Regulations Part L 2021
- Windows with high thermal insulation
- Improved air permeability
- Maximisation of daylight
- Optimise glazing solar energy transmittance.

Enhanced Insulation to the Building Envelope

Limiting heat losses across the entire building envelope will future proof the energy efficiency of the development over its whole life.

This will be done by upgrading the windows, walls and roof beyond those stated in table 4.2 of Part L Volume 2 of the building regulations and in conjunction with finalisation of the energy efficiency measures included to meet the CO₂ emission rates required by Building Regulations.

Engineered Façade Design

The glazed proportion of the building façades and the glazing location will be designed to maximise the use of natural daylight to offset demand for artificial lighting. The G-value will also be improved that within the building regulations to help reduce the amount of solar gains helping with future climate changes.

Reduced Air Permeability

As we are refurbishing the existing building and upgrading the building fabric, the air permeability of the building will naturally be improved better than its current air permeability.

2.1.2 Mean – High-Efficiency Systems, Plant and Controls

High-efficiency systems, plant, controls, and equipment will be incorporated as follows:

Optimised Plant Controls

Control of heating and cooling plant will be optimised, and weather compensated to ensure plant operates as close to demand as possible and not at full capacity.

Variable Speed Drives

Variable speed drives shall be installed on circulation pumps and ventilation fans to allow the speed of the respective motors to be amended by the automatic controls to suit changing load of the building. This will ensure energy usage matches demand requirements.

Energy Efficient LED Lighting

Internal lighting within the Culture Hub will incorporate energy-efficient LED lighting where practicable.

Lighting controls will be provided to limit energy use. Automatic presence/absence detection will be included in appropriate areas. This form of control will ensure lights are automatically switched off during periods of non-occupancy. Where appropriate lighting controls will incorporate daylight control.

External lighting will be designed to incorporate energy efficient luminaires and an automatic lighting control system utilising daylight sensors and time clock control to ensure energy-efficient operation of the lighting.

High Efficiency air source heat pump

The building heating/cooling system shall utilise a high efficiency air source heat pump. The mechanical building services designed for the project will utilise various means to heating the building, depending upon the function of the Zones. The use of high efficiency systems minimise the emission of greenhouse gases compared with traditional systems.

By utilizing air source heat pumps to provide simultaneous heating and cooling allows the building to be future proofed and easily adapted to meet the demands of future climate changes.

Heat Recovery on Ventilation Systems

The ventilation systems installed within the development will also incorporate heat recovery within the mechanical ventilation plant to recover waste heat from the exhaust air. This is then used to heat the incoming fresh air and therefore reduce energy usage. The air handling plant will have low specific fan power to minimise the energy used by the fans.

2.1.3 Green – Renewable Technologies

The design of the building as detailed above will place particular emphasis on the first fabric by careful design of the building and the building services. To enhance the building's

performance, PV will be installed on the upper room. This will be designed in further detail by a specialist at the next stage.

It should also be noted that this forms part of the holistic PV strategy being developed for the Civic Centre.

3.0 Water Efficiency

The sanitaryware within the building has been specified to reduce water usage within the building. Water saving devices such as aerated taps, sensor controlled taps, low or dual flush toilets, low flow shower heads, etc will be used. Pipes and taps supplying the building will be maintained on a regular basis to avoid water being lost through leakages.

4.0 Recycling and waste

The design development will encourage maximising the use of recycled, low carbon and low VOC materials within new specifications. The BRE Green Guide Specification will be used to support the selection of sustainable materials.

Where possible, existing materials are being re-used. The nature of the refurbishment means that the scheme is maximising the amount of re-use in the new design for example the existing frame, stair cores and the majority of the external facade, reducing waste whilst balancing this with upgrades required for the change of use.

The construction waste will be forecast and monitored in line with industry best practice and the project specific site waste management plan. The scheme will also be registered with the Considerate Construction Scheme.

5.0 Opportunities, Limitations and spatial constraints

Whilst the scope of the scheme provides opportunities through the remodeling of the building allowing improvements to the building fabric and full replacement of the MEPH services, there are also limitations. The spatial constraints of working with the existing building limit the feasibility of additional sustainability measures such as greywater recycling. The extent of photovoltaic (PV) installation will be restricted by the available roof area and the need to coordinate with other plant requirements. Given the project's scope, pursuing BREEAM certification was not considered the most effective sustainability approach, though its principles will be applied where possible. Additionally, offsite manufacturing is limited due to access and logistical challenges associated with the existing building and project scope.

Whilst outside the boundary of this planning application, it is proposed that the wider masterplan will include proposals to improve the biodiversity of the civic centre including the planting of trees and additional green spaces.

5.0 Conclusion

From this report, with the design parameters used within building analysis are in line with the building regulations Part L approved document.

The passive measures adopted to comply with the regulations are:

- Upgrading the building fabric
- Removing the use of gas and implementing air source heat pump to provide simultaneous heating and cooling along with direct electric heating to circulation spaces and workshop areas.
- Introducing new mechanical ventilation with heat recovery
- Replacing the existing lighting with new LED lighting and introducing lighting controls.
- Providing renewable energy (Photovoltaic Panels)
- Improving the buildings air permeability.
- Use of recycled, low carbon and low VOC materials