



Bonded Warehouse, St John's, Manchester Planning Submission Sustainability Strategy Statement

This commentary pertains to the mixed use development of The Bonded Warehouse, St John's, Manchester and demonstrates how Manchester Quays Limited will address the sustainability aspirations of Manchester's Guide to Development.

Specifically, this Statement is in support of one planning application on the St John's site (Previously ITV Granada), which forms part of the overall development proposals. The Bonded Warehouse, to incorporate workspace on the upper three floors and mixed use / office spaces on the lower three floors.

The Bonded Warehouse has heritage value which brings with it a unique set of challenges and constraints which must be overcome or accommodated to make the building as sustainable as reasonably practicable. This commentary demonstrates the proposed approach in this regard.

The building will be modelled with accredited software packages to determine the optimum energy efficiency strategy including layout and solar performance of the building given the constraints that its current orientation and massing provides. This exercise will then review the above against varying servicing strategies to establish the optimum strategy to minimise on-site energy demand and carbon emissions of the development and promote sustainability and a high quality local environment. Holistic thinking and consideration of the following areas are key to achieving the optimum solutions for the development.

Glazing, Daylighting and Solar Gain

There are three key criteria when considering the glazing strategy for the development. These are energy efficiency, natural daylighting factors and summertime internal temperatures. They are intrinsically linked and should be considered holistically to determine the optimum strategy to achieve a comfortable, productive and healthy environment in all weather conditions, whilst making best use of the sun as a natural heating source.

The main factors in optimising the above are the size, orientation and specification of the glazing in relation to the occupancy and usage patterns of the buildings.

Through the modelling exercise the effect of high external temperatures will be assessed and measures taken to minimise the heat gain and temperature rise within the building. Ventilation, free cooling and thermal massing strategies (e.g. leaving existing thermal mass exposed to exploit its properties) shall be considered to minimise the need for cooling, particularly within the upper floor.



A number of options have been dismissed on the grounds of the existing form and heritage significance of the building including external shading and replacement of the existing windows with new.

A significant source of solar gain is the existing roof structure which incorporates dark roofing tiles with minimal insulation between this structure and the occupied space below. During the summertime, this roof is likely to be irradiated by the sun and then pass this heat through to the space below. Therefore, a mechanical cooling strategy will be considered.

Energy Efficiency and Water Conservation

Due to the heritage significance of The Bonded Warehouse, it is proposed to retain, reuse and keep on show as much of the existing fabric of the building as possible so that the history of the building can be remembered and celebrated. This brings with it energy efficiency challenges.

In addition, the building uses deep plan spaces to drive the need for forced ventilation for the occupants. The building is heated throughout using a modern gas fired boiler with a highly efficient heat recovery system.



To facilitate the development, the following elements have been considered through the design process from both an energy efficiency and thermal comfort perspective:

- Fabric insulation levels - balancing thermal performance and internal temperatures
- Building air permeability - this is a constraint due to the nature of the building
- Thermal mass - exploiting the properties of the constructions to benefit the internal environment
- Glazing strategy - optimising the use of the sun as a natural resource
- Ventilation strategy - optimising the use of heat recovery
- Heating strategy - using low energy and carbon emission sources of heating
- Cooling strategy - eradicated as far as possible and provided as efficiently as feasible
- Water consumption strategy

These considerations have enabled the design team to arrive at the following energy efficiency measures for the building:

- Supplemental heat recovery ventilation to Level 2, 3 or 6.
- Supplemental air source heat pumps for heating and cooling to Level 6.
- Energy efficient LED lighting.
- Occupancy and daylight linked lighting controls.
- Water conserving sanitary ware.

Water is a naturally occurring resource that is critical to supporting life and must be managed and conserved effectively. Minimising the water consumption of the site is of utmost importance and this will be addressed through the use of flow restricted fittings and dual flush WCs.

Whilst water consumption shall be minimised, the water that is used and that which falls on the hard surfaces will need to be drained from site in an efficient, effective and sustainable manner. Sustainable drainage methods shall be considered including water recycling systems where appropriate and viable.

Where the systems lend themselves to integration into a community energy scheme at a later date, the provision for this connectivity shall be considered through the design detailing.

Low and Zero Carbon Technologies

Following the optimisation of the respective energy efficiencies of the buildings the development will aspire to obtain a proportion of its predicted usage through decentralised low and zero carbon technologies where feasible and viable.



The following table demonstrates the merits of different technologies considered in relation to this development: -

Low or Zero Carbon Technology	Likelihood of Being Feasible	Main Reason for Dismissal	Feasible to Export Energy?	Cost for Carbon Emission Reduction
HYDRO-POWER	Unlikely	Whilst there is a running watercourse nearby the scale and technical considerations limit its applicability.	Yes (if technology was feasible for development)	High
COMBIN ED HEAT & POWER	Unlikely	St John Development will not be available until 2023.	N/A - this building could be linked to a site wide energy strategy in the future.	Low - due to the efficiencies afforded by the site wide approach.
GROUND/ WATER SOURCE HEAT PUMPS	Unlikely	Water from the district heating and heat rejection system will make a water-cooled condenser system viable.	No - however multiple tenants within the building will benefit from energy sharing between demises.	Low
AIR SOURCE HEAT PUMPS	Likely	This technology is likely to be applicable to the levels 2 & 6.	No - there is no existing network	Medium
WIND POWER	Unlikely	The strobing effect and noise issues from this technology are not acceptable in this location.	Yes (if technology was feasible for development)	High
BIOMASS	Unlikely	Site location and logistics preclude this from viability.	N/A - this building will connect to a district energy scheme.	High
SOLAR PHOTOVOLTAICS	Unlikely	The area of roof available for the use of solar panels which doesn't impact on the heritage significance of the building is likely to be shaded by the roof mounted plant.	Yes - can be easily linked to the grid supplied electricity	Medium
SOLAR THERMAL	Unlikely	The area of roof available for the use of solar panels which doesn't impact on the heritage significance of the building is likely to be shaded by the roof mounted plant.	Yes - this system could like with the condenser water system.	Medium