CPU Relocation

Energy Statement

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1 Introduction

Stantec UK Ltd have been appointed by the University of Manchester to provide MEP design services in relation to the design and construction of the proposed refurbishment works at the Hulme Hall site which is situated

This document forms part of the planning application for the site and will inform the Manchester City Council Planning Department of the proposed energy strategy for the site.

1.1 Site and Location

The proposed site is located within the Victoria Park campus in Rusholme, Manchester and forms part of the University of Manchester Estate.

1.2 Development Description

The works are contained within the existing Hulme Hall kitchen and dining hall block and associated external areas.

The project seeks to provide a new extended kitchen at first floor level to serve the Hulme Hall catered residences and a new commercial kitchen at ground floor level to reprovide the University's Central Processing Unit (relocated from the nearby Fallowfield Campus)

The MEP strategy involves the provision of dedicated systems to serve the new kitchens with plant located within existing plantrooms and above the existing plantroom roof.

The proposed development is a refurbishment scheme and is reviewed against policy and regulation against refurbishment requirements.

Planning permission is sought for external plant and equipment, decanting modular building and electrical substation building.

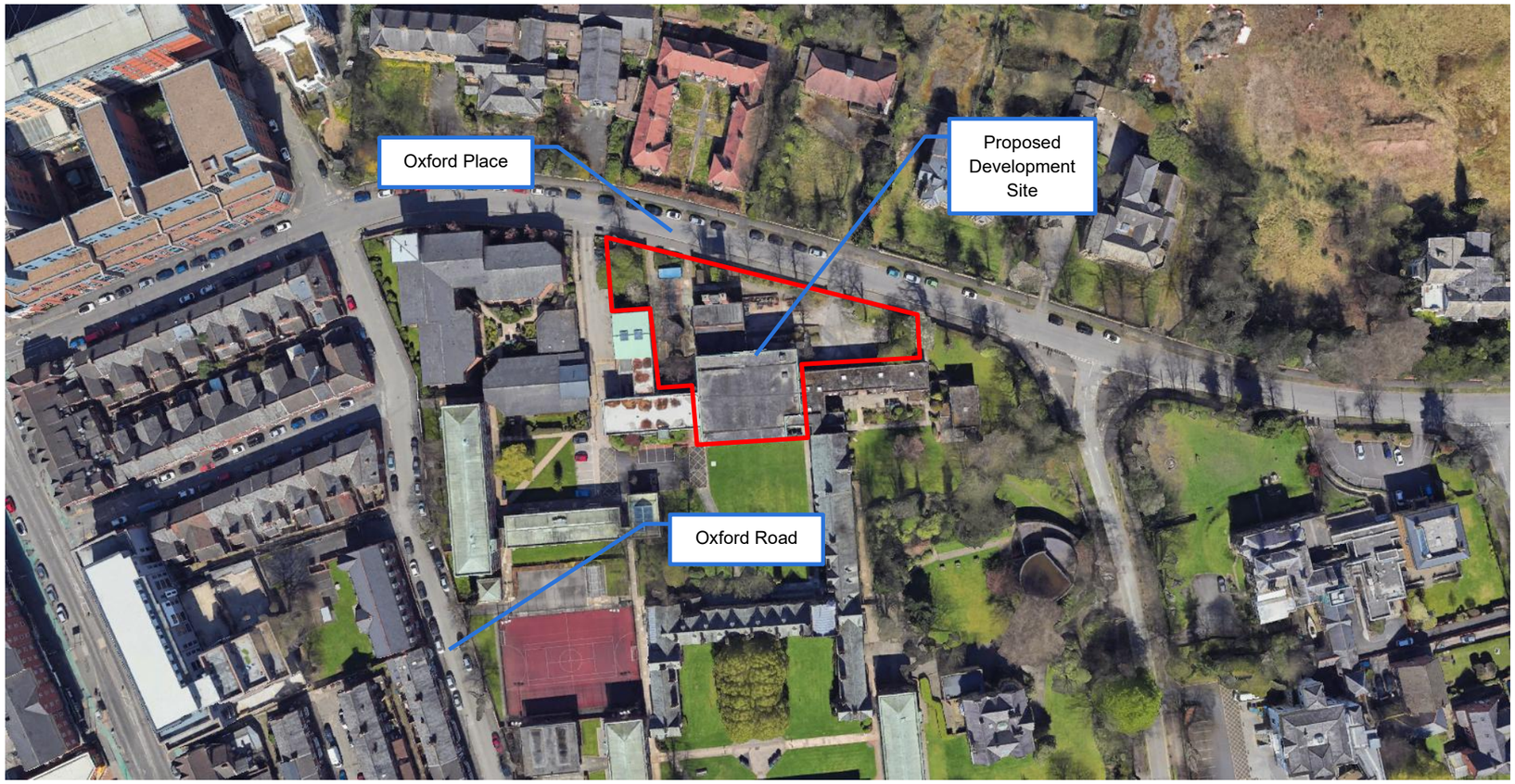


Figure 1: Site Location

2 Planning Policy Review

2.1 National Policy

2.1.1 National Planning Policy Framework

The National Planning Policy Framework (August 2026) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other developments can be produced. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so. It provides a framework within which local people and their accountable councils can produce their own local and neighbourhood plans and as a material consideration in the determination of planning applications.

Within this context National Guidance says that:

a) The purpose of the planning system is to contribute towards achieving sustainable development, set out in chapter 1.
b) Sustainable development comprises of economic, social and environmental dimensions. These are interdependent and need to be pursued in mutually supportive ways, set out in chapter 1:
    - Economic - contributing to building a strong, responsive and competitive economy.
    - Social - supporting strong, vibrant and healthy communities.
    - Environmental - contributing to protecting and enhancing the natural, built and historic environment.
c) These objectives are not criteria against which every decision can or should be judged. Plans and decisions must take into account local circumstances to ensure sustainable development is responded to appropriately in different areas.
d) At the heart of the National Planning Policy Framework is a presumption in favour of sustainable development (chapter 4), for both plan-making and decision-taking. For decision-making this means that:
    - Approving development proposals that accord with the development plan without delay; and
    - Where the development plan is absent, silent or relevant policies are out-of-date, granting permission unless:
        » specific policies in this Framework indicate development should be restricted; or
        » any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole.

Planning policies should follow the presumption in favour of sustainable development approach so development which is sustainable can be approved without delay. All plans should set clear policies that will guide how the presumption should be applied locally.

2.1.2 Building Regulations Part L

The development will need to meet the standards set by Building Regulations Approved Document Part L, Conservation of Fuel and Power Volume 2: Buildings other than dwellings (2021 edition incorporating 2023 amendments).

For refurbishment projects, a series of target standards for new elements are set out with a review of consequential improvements which are proposed to improve the performance of the existing building as much as possible.

Regulation 25A: Consideration of high efficiency alternative systems, requires that high efficiency building services systems are considered for new developments. Where buildings undergo major renovations, the technical, environmental and economic feasibility of these systems should be considered.

2.2 Local Sustainability Policy

This section discusses the relevant policies from Manchester City Council: Core Strategy (2012-2027) (Adopted July 2012).

2.2.1 CS Policy EN 4: Reducing CO_2 Emissions by Enabling Low and Zero Carbon Development

The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO2 emissions, and rising fossil fuel prices, through the following actions:

- Wherever possible new development and retrofit projects, including energy generation plant, must be located and designed in a manner that allows advantage to be taken of opportunities for low and zero carbon energy supplies.
- Where possible new development and retrofit projects will be used as a mechanism to help improve energy efficiency and provide low and zero carbon energy supplies to existing buildings.
- Where appropriate new development and retrofit projects will be required to connect to and/or make contributions to low or zero carbon energy schemes and/or to incorporate provision to enable future connection to any existing / potential decentralised energy schemes.
- The use of building materials with low embodied carbon in new development and refurbishment schemes.

2.2.2 Places for Everyone

This section discusses the relevant policies from Places for Everyone Joint Development Plan for Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Tameside, Trafford and Wigan (2022-2039) (Adopted March 2024).

The Places for Everyone policies align with overall intentions of the development and have been considered where applicable for the design approach.

The scheme is all electric, with no reliance on fossil fuels; EV charging has included in the external car park; and the possibility of connection points within plant areas for district heating networks will be explored.

2.2.2.1 Policy JP-S1 - Sustainable Development

To help tackle climate change, development should aim to maximise its economic, social and environmental benefits simultaneously, minimise its adverse impacts, utilise sustainable construction techniques and actively seek opportunities to secure net gains across each of the different objectives.

2.2.2.2 Policy JP-S2 – Carbon and Energy

The aim of delivering a carbon neutral Greater Manchester no later than 2038, with a dramatic reduction in greenhouse gas emissions,

For non-residential developments, achieve at least BREEAM excellent standard (or equivalent) for the 'Ene 01 – reduction of energy use and carbon emissions' category rising to 'BREEAM outstanding' equivalent for ENE 01 from 2028.

2.2.2.3 Policy JP-S3 – Heat and Energy Networks

The provision of decentralised energy infrastructure is critical to the delivery of our objectives for low carbon growth, carbon reductions and an increase in local energy generation.

3 MEP & Energy Strategy and Policy Compliance

This section of the report describes the following elements against the requirements of Building Regulations Part L and National and Local Planning Policy:

- the energy strategy for the proposed development
- the Part L2A consequential improvements applicable for the scheme
- heat and energy network consideration
- the carbon reduction measures considered (including their feasibility, viability and whether they are proposed for incorporation into the MEP design
- consideration of energy efficient alternative systems (Regulation 25A)

As this development is a refurbishment scheme, full thermal modelling has not been carried out for Part L compliance purposes. In lieu of this, the potential energy reduction options and feasible consequential improvements have been assessed and outlined in section 5 of this report.

All new systems will be designed in line with the efficiency requirements set out in Part L2 (Section 5: Minimum building services efficiencies and controls – general guidance and Section 6: System specific guidance).

3.1 MEP & Energy Strategy Overview

3.1.1 Above Ground Drainage Services

New above ground drainage systems will be provided to serve the proposed sanitary fittings within the ground and first floor kitchens.

3.1.2 Domestic Cold Water Services

Domestic cold water will be derived from the existing Hulme Hall cold water storage tank.

A new cold water booster set will be provided to independently serve the proposed kitchens.

New potable boosted cold water pipework will be routed throughout the proposed development as required.

Each kitchen will be provided with cold water sub meters connected to the University central metering system.

3.1.3 Domestic Hot Water Services

Domestic hot water will be fed from the new boosted cold water system outlined above. Hot water will be generated via high temperature hot water Air Source Heat Pumps located at lower roof level.

Each kitchen will be provided with hot water flow and return sub meters connected to the University central metering system.

3.1.4 Heating

A dedicated new Low Temperature Hot Water heating system will be provided to serve the new kitchen supply Air Handling Unit heater battery. The system will incorporate inverter driven variable volume pump sets, thermal store and valving as required to maintain supply air temperature.

The new heating system will be provided with energy meters connected to the University central metering system.

Space heating for the new kitchen areas will be provided via the existing boiler systems with local pipework and radiators reconfigured to suit the new layouts.

3.1.5 Cooling

Kitchen cold room condensers will be provided by the catering specialist. These are accommodated in terms of plant space, power and refrigerant pipework routes within the MEP design.

3.1.6 Ventilation

New kitchen supply and extract ventilation systems will be provided to serve the new Ground and First Floor kitchen areas in line with the requirements of B&ESA DW 172.

A combined supply air handling unit will be provided to serve both kitchen areas.

Separate extract fans will be provided to serve:

- Kitchen canopy extracts (fire rated)
- General extracts
- COSHH extract

Ventilation interlock systems will be provided to ensure that cooking equipment cannot be operated without the corresponding ventilation systems being active. The interlock systems will incorporate setback modes to allow ventilation plant air volumes to be reduced when the kitchens are not cooking.

Fire dampers will be provided within general supply and extract systems as required by the compartmentation and hazard wall lines.

Heat recovery has not been included in the ventilation scheme as it has been deemed Functionally unfeasible due to the complexity, remote location and space constraints associated with the proposed extract ventilation systems against the single supply AHU location.

3.1.7 Controls

A new Building Management System will be provided to allow full control of all new systems.

3.1.8 Electrical

The electrical systems to the proposed development will be upgraded to serve the proposed development and the wider site.

An upgraded substation will be provided to serve:

- Existing Victoria Park
- New Ground Floor CPU Kitchen
- New First Floor Hulme Hall Kitchen
- New Mechanical Plant
- External Services

Connections for a temporary generator will be provided.

3.2 Part L2A Consequential Improvements Review

A thorough review of the potential works has been conducted to determine the Technical, Functional and Economic Feasibility of the options. This assessment is outlined in section 5 below.

Following the feasibility review, the following work elements have been highlighted as Consequential Improvements:

- New ventilation systems with variable speed set back operation. These replace previous systems which were more than 15 years old.
- New Air Source Heat Pump heating systems to feed the kitchen supply air handling unit heater battery. There is currently no supply air provided to the existing kitchen and external air is heated via wall mounted radiators within the space. These replace previous systems which were more than 15 years old.
- New Carbon Dioxide based Air Source Heat Pump hot water generation system for the new kitchens in lieu of the original gas fired systems. These replace previous systems which were more than 15 years old.
- New LED lighting and lighting control systems. These replace previous systems which were more than 15 years old.
- New controls and sub metering

3.3 Heat and Energy Network Connection Review (Policy JP-S3)

The project involves the refurbishment and reconfiguration of existing kitchen areas to accommodate additional on-site and off-site catering functions. The proposed systems are designed to utilise Air Source Heat Pumps for all new heating and hot water generation.

There is an existing small district heat network serving parts of the existing Victoria Park site. However, due to the scale of the additional loads required, extension of the existing system has not been considered as part of these works.

As these systems are water based, they would be feasible for connection to a district heating network in the future subject to further investigation and system modification.

It is not believed that there are plans for any central systems in the vicinity of the development.

3.4 Carbon Reduction Measures Review (including Regulation 25A High Efficiency Alternative Systems)

The MEP services within the building have been designed with the aim to reduce CO_2 emissions and energy consumption wherever technically, functionally and economically feasible by following the principals of the energy hierarchy as outlined below:

- **Lean** – Use passive construction techniques as far as is cost effective to minimise the energy demand of the development.
- **Clean** - Incorporate high efficiency systems and effective controls within the design to reduce energy consumption.
- **Green** - Incorporate renewable energy sources where economically viable.

The assessment is outlined in the following section outlining the feasibility outcome and whether or not the options have been incorporated into the design.

3.4.1 Potential Passive Measures Assessment (Lean)

The following Building Fabric measures have been investigated for their applicability to reduce the overall energy demand of the proposed development:

Description	Technical Feasibility	Functional Feasibility	Economic Feasibility	Included in Design
Solar Shading	The provision of external solar shading to the south facing windows is technically feasible via the provision of Brise Soleil or applied films to existing windows.	Due to the listed nature of the existing buildings surrounding the proposed development site, the provision of external shading elements is not considered feasible, especially given that the main dining hall is largely outside the scope of works for the project.	The addition of external brise soleil to the existing South facing windows is not considered economically viable within the constraints of the project budget.	**No**
Thermal Element Upgrades (External Walls)	Thermal element upgrades are technically feasible. Additional insulation could be applied either internally or externally to reduce heat losses. Interventions would need to be carefully considered to ensure that the improved heat loss performance did not result in worse summertime overheating.	Due to the listed nature of the existing buildings surrounding the proposed development site, the provision of external insulation is not considered functionally feasible. The application of internal insulation would be complex due to the inevitable reduction in internal floor area.	The addition of external or internal insulation to the existing building is not considered economically viable within the constraints of the project budget.	**No**
Controlled Element Upgrades (Windows, Doors)	Controlled element upgrades (i.e. windows) are technical feasible. All existing windows could be replaced to reduce heat losses. However, interventions would need to be carefully considered to ensure that the improved heat loss performance did not result in worse summertime overheating.	Due to the listed nature of the existing buildings surrounding the proposed development site, the replacement of existing windows is not considered functionally feasible.	The upgrade of existing windows is not considered economically viable within the constraints of the project budget.	**No**

3.4.2 Potential Efficiency Measure Assessment (Clean)

The following Building System Efficiency measures have been investigated for their applicability to reduce the overall energy consumption of the proposed development:

Description	Technical Feasibility	Functional Feasibility	Economic Feasibility	Included in Design
Domestic Hot Water				
High temperature Air Source Heat Pumps	High Temperature Carbon Dioxide refrigerant Air Source Heat Pumps are technically feasible for the hot water generation of the proposed kitchens and offer a good efficiency (Coefficient of Performance – CoP)	Incorporating the plant requirements of a high temperature ASHP is functionally feasible.	There is a relatively high cost to high temperature heat pump systems but their applicability to this type of development offsets	Yes
Low flow sanitary fittings where applicable	The use of low flow sanitary fittings is technically feasible with the exception of process kitchen fittings.	The use of low flow sanitary fittings is functionally feasible with the exception of process kitchen fittings.	The use of low flow sanitary fittings is economically feasible with the exception of process kitchen fittings.	Yes / Where feasible for kitchen specialist requirements.
Variable volume cold water booster set	Technically Feasible	Functionally Feasible	Economically Feasible	Yes
Heating				
Low temperature Air Source Heat Pumps	Technically Feasible	Functionally Feasible	Economically Feasible	Yes
Variable speed pumps	Technically Feasible	Functionally Feasible	Economically Feasible	Yes
BMS control to match system operation to required load	Technically Feasible	Functionally Feasible	Economically Feasible	Yes
Ventilation				
Variable volume ventilation systems / setback function	It is technically feasible to incorporate variable volume ventilation and set back operation into the design.	A series of BMS sequences to operate shutoff dampers and adjust fan speeds can be built into the ventilation system via the ventilation interlock panel in each kitchen.	Energy savings will offset the cost of the variable speed systems.	Yes

Description	Technical Feasibility	Functional Feasibility	Economic Feasibility	Included in Design
Heat recovery	Heat recovery could technically be incorporated into the kitchen extract systems to link the canopy extract systems with the central supply system.	Due to the retrofit nature of the project and significant space constraints and listed building restrictions it has not been possible to provide heat recovery into the ventilation systems.	Heat recovery would be economically feasible if it were technically and functionally feasible.	No
Lighting				
LED Lighting	Technically Feasible	Functionally Feasible	Economically Feasible	Yes
Lighting Controls	Technically Feasible	Functionally Feasible	Economically Feasible	Included where applicable due to kitchen functions
High Efficacy Lighting	Technically Feasible	Functionally Feasible	Economically Feasible	Yes
General				
Sub Metering	Technically Feasible	Functionally Feasible	Economically Feasible	Yes
BMS Controls	Technically Feasible	Functionally Feasible	Economically Feasible	Yes

3.4.3 Potential Renewable Measures Assessment (Green)

The following Renewable measures have been investigated for their applicability for the scheme:

Description	Technical Feasibility	Functional Feasibility	Economic Feasibility	Included in Design
Photovoltaic panels	The provision of Photovoltaic panels to the dining hall top roof is technically feasible provided that appropriate electrical infrastructure was provided to allow the power to be incorporated into the building electrical network.	Photovoltaic panels could be provided on the flat dining hall roof. However, the roof would require structural upgrades, improved access and appropriate edge protection to facilitate this. The listed nature of the existing buildings surrounding the proposed development site would likely involve planning and heritage concerns.	There is typically economic viability for the retrofit of photovoltaic panel systems. However, given the associated structural, edge protection and access improvements required, financial viability is likely to be minimal in this instance.	No
Wind turbines	The provision of wind turbines is not considered technically feasible at this site due to the low rise, urban nature of the site.	The listed nature of the existing buildings surrounding the proposed development site, combined with the proximity to residential buildings make the provision of local wind turbines unviable. Issues of noise and flicker combined with planning and heritage concerns rule out the viability of this option.	Small scale wind turbines do not typically offer economic viability.	No
Solar thermal hot water	Solar thermal hot water systems could be provided on the dining hall upper roof.	Inherent challenges from summertime stagnation and legionella risk would typically rule this option out.	There is not typically economic viability for solar thermal hot water systems.	No

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