**THE CAVENDISH SCHOOL**

**CAMDEN,**

**NEW HALL AND CLASSROOM BLOCK**

# OUTLINE MECHANCIAL SERVICES SCHEME

# AND SUSTAINABILITY STATEMENT

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## 1.0 Introduction

This sustainability statement has been prepared in conjunction with Barnsley Hewett and Mallinson, to outline the mechanical services strategy for the proposed Hall and Classroom Block at The Cavendish School, Camden.

The new block shall be constructed over 3 floors and consists of:-

Ground floor entrance
Meeting Room/Music classroom
Main Hall
4No classrooms
Toilets
Ancillary Spaces.

Camden Borough Council development Policies DP22 Promoting sustainable design and construction along with DP23 Water provides various guidance on new developments.

Stated within these documents and of particular note is reference to the Borough's highly built up, inner environment therefore providing fewer options on integrating sustainable construction and renewable/low carbon energy measures.

The new construction is categorised as 'Medium Development' and therefore there is no planning requirement to incorporate sustainable/low carbon energy generation into the scheme.

Therefore with these constraints, it is particularly important to ensure the building is constructed with energy efficiency in mind and incorporating the following:-

1) Good building fabric efficiency
2) Improved air tightness
3) Limitation of thermal bridging
4) Energy efficient heating system
5) Heat recovery ventilation
6) Natural ventilation
7) Building Automatic control system
8) Energy efficient lighting system
9) Water efficient fittings

Incorporation of the above into the development will reduce the overall energy consumption of the building, therefore producing a reduction in the carbon emissions of the building.

## 2.0 Building Design

### 2.1 Good Building Fabric Efficiency

The development shall be constructed as detailed within the BH&M design and access statement, utilising materials providing improved thermal properties and reducing building heat gains to reduce the requirement for comfort cooling.

### 2.2 Air Tightness

The building shall be constructed with air tightness in mind and therefore improved levels shall be achieved.

### 2.3 Thermal Bridging

The building shall be designed and constructed to limit thermal bridging and shall be detailed by the architect.

### 2.4 Heating System

Low temperature hot water heating via underfloor heating. Heat source high efficiency low NOx gas fired condensing boilers.

Individual zone controls served via variable speed pump sets.

### 2.5 Ventilation

Mechanical supply and extract ventilation to main hall and 2No first floor classrooms. System to incorporate heat recovery and inverter driven fans and controlled via temperature/CO2 sensors to minimise energy consumption.

Toilets to be ventilated via an extract only system incorporating PIR control. The systems shall operate at low speed and boost ventilation, activated via the PIR sensor.

### 2.6 Natural Ventilation

Natural ventilation to 2No Second floor classrooms utilising active roof mounted terminals. Each terminal shall be controlled via temperature/CO2 sensors.

### 2.7 Automatic Controls System

A fully automatic BMS controls system shall be installed to provide efficient control of the installed mechanical services.
Heat meters and gas check meter shall be provided to monitor major energy uses within the building.

## 2.8 Energy Efficient Lighting

An Energy efficient lighting system shall be installed incorporating LED light fittings complete with PIR control.

## 2.9 Water Efficient Fitting

All water fittings shall be provided with low water usage taps and provided with flow restrictors to minimise water consumption.

Domestic hot water circulation to be fitted with thermostatic control valves and variable speed pump. Circulation pump shall be timeclock controlled via the BMS.

## 2.10 Procurement of Low Impact Materials

Where possible recycled materials would be utilised.

## 2.11 Waste Management Process

F.G. Alden and Darke and Taylor have obtained certification for the British Standard for Environmental waste management system (BS EN14001).

F.G. Alden and Darke and Taylor are committed to reduction of waste to landfill and the control of Hazardous waste.
Materials would be recycled i.e. Packaging, Plastics, Metals etc…

F.G. Alden and Darke and Taylor would work with the main contractors waste management plan.

## 3.0 On Site Renewable Energy

Throughout the design process, the potential for onsite energy generation shall be reviewed and considered. The following have been considered:-

### 3.1 Biomass Boilers

Biomass boilers could be incorporated into the mechanical services system to provide a low temperature hot water energy source either utilising wood chip or wood pellets. This boiler would be sized to provide the buildings base load and hot water demand. However due to environmental issues and spatial restrictions on the site and issues with fuel deliveries this option will not be considered any further.

### 3.2 Wind Turbines

Wind turbines are available in various sizes and styles. To provide an element of onsite energy generation via wind energy would result in numerous turbines being located on the site and we would not consider this to be a viable option.

### 3.3 Solar Hot Water Panels

Due to the building usage and limited hot water demand, solar panels would provide a limited reduction in building CO2 emission. Therefore solar thermal panels will no longer be considered.

### 3.4 Photovoltaic Panels

Photovoltaic panels would provide an useful reduction in building CO2 emissions, however the incorporation of these panels would be subject to planning, final spatial arrangements and financial considerations. PV panels would be the preferred onsite energy generation method.

### 3.5 Ground Source Heat Pump

The GSHP would be ideally suited to the proposed heating method of underfloor heating and the low flow temperatures required. The GSHP system can also be reversed and therefore provide cooling to various areas thorough the summer months.

This option would also provide the minimal impact on the building appearance however, due to the restricted site for the ground array, GSHP will not be considered.

## 3.6 Air Source Heat Pumps

As with the ground source heat pumps above, the air source heat pump would be a favorable inclusion into the scheme due to the renewable element and reduction of building CO2 emissions. Additional benefits include minimal ground works, easier location of plant within the roof top plant area and lower capital costs. This option would be one of the preferred renewable energy options and shall be discussed further with the professional team. However environmental and acoustic issues along with financial aspects would require further consideration.

## 3.7 Combined Heat and Power

CHP systems provide maximum efficiency when there is a constant demand and due to the operation of the school, this demand is varied and only in constant for the occupied periods. Due to these factors, the higher capital cost and limited reduction, therefore this is not considered to be a viable option.

## 4.0 Conclusion

The building will be constructed with reduction in building energy demand utilising methods detailed above and inline with the planning guidelines.

Onsite energy generation methods shall be discussed further with the client and professional team to review the potential for inclusion into the scheme.