3 WADHAM GARDENS, CAMDEN
MECHANICAL AND ELECTRICAL
SERVICES PROPOSAL SUMMARY

REVISION A

25TH FEBRUARY 2010

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Date: 25th February 2010

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1. INTRODUCTION

The purpose of this report is to outline the initial Mechanical and Electrical services proposal. The report also describes the various sustainability options which are being explored for inclusion into the project. It will form part of the planning submission.

2. SUSTAINABILITY OPTIONS

2.1 RAINWATER HARVESTING

We propose to implement rainwater harvesting in the project by diverting all rainwater collected from the roof to a new rainwater tank that will be buried in a convenient location within the garden. The harvested rainwater is to be used primarily for watering the garden.

The benefits for implementing rainwater harvesting are expected to be:

- It eliminates the need for energy and chemicals used to produce and treat mains water if it's to be used for watering gardens.
- It reduces the demand for mains water together with the associated pumping cost, pollution and CO2 emission associated within.
- It reduces demand on rivers and ground water.
- It reduces run off and the associated risk of flooding.
- Rainwater is soft and is beneficial for plants.

The proposal is subject to a feasibility study which will be undertaken during the detailed design phase of the project.

2.2 SOLAR

The use of solar energy to heat domestic water via solar panels installed on the roof is an option that we have considered but will not be pursued due to the property being located within the Elsworthy Conservation Area. Siting solar panels on the roof would make them visible from the roads around the property which would have an impact on the character and appearance of the Conservation Area.

All South facing roof slopes are exposed to the Wadham Gardens and Harley Road approaches.

2.3 GROUND SOURCE HEAT PUMP

We propose to have the heating to the house primarily provided through the use of a ground source heat pump system supplemented by gas boilers. This will involve drilling 6 no. boreholes below the new basement each 50m deep spaced 5m apart. It is also our intention to investigate whether the same boreholes could be used for heat rejection from the proposed air conditioning system in summer which would work efficiently towards achieving co-efficient of performance (COP's) of around 4.5 compared to 3 for air cooled condensers.

The following are the expected benefits of using a ground source heat pump system:

- Reduce CO2 emission through high efficiencies attainable through these systems. For heating COP's of between 3-4 are achievable.
- Reduced energy bills.
- Operate quietly and require little maintenance.
- Reduce the number of boiler flues required and the associated visual impact on the character and appearance of the Conservation Area.
- A 50% improvement in efficiency when used as a heat sink for the air conditioning system in summer.

A feasibility study will need to be undertaken to make a detailed assessment of whether this system will be suitable or not. The feasibility study will look at the following items among other issues:

- Accurate assessment of building heat loss and gain loads.
- A detailed and thorough survey of the site to identify all buried services.
- Obtain geotechnical survey report which gives descriptions of rock types, estimates of mean annual ground temperatures and thermal conductivities.
- Type of soils on the site and ground water levels.

From the feasibility study we will be able to determine the following:

- Cost Estimates.
- Payback period which will dictate whether this is worth pursuing.
- Predicted CO^2 emission reduction.
- Site suitability.

3. MECHANICAL AND ELECTRICAL SERVICES PROPOSALS

3.1 MECHANICAL

Heating

Heating to the house will be through the use of a ground source heat pump supplemented by gas boilers. A mixture of radiators and under floor heating will be used to deliver heating to the various rooms. Gas boiler flues will be run to the roof through the existing chimneys. The heating system will be designed to achieve high efficiencies through optimising equipment selection and inclusion of both time and temperature zone controls.

Ventilation

Mechanical extract ventilation will be provided to all bathrooms, wc's and plant rooms. All habitable rooms will have natural ventilation achieved through trickle vents incorporated in the windows by the Architect or through infiltration rom single glazed window frames which are to be retained in most existing areas. Extract fans that achieve low specific fan power (SFP) of less than 1 will be selected in line with part L regulations.

The kitchen will have a dedicated kitchen extract ventilation system which will be run to discharge to atmosphere in such a location that it doesn't cause a smell nuisance to the neighbours.

Cooling

It is proposed that comfort cooling will be provided to various rooms within the house through a very efficient VRF system. The proposed VRF system will achieve a COP of around 3.5 and will incorporate a heat recovery facility. The external condenser for the VRF system will housed in an acoustic enclosure in-order to reduce the noise breakout and keep it within the existing background noise levels. The acoustic enclosure will be a purpose made one and detailed such that it blends in with the local surroundings.

Subject to a feasibility study proving the suitability of using ground source heat pump, we will investigate the option of using the boreholes as a heat sink for the cooling systems which will give a 50% improvement in the COP (efficiency) to around 4.5.

3.2 PUBLIC HEALTH

Foul Drainage

We propose to continue to direct all foul water from No. 3 Wadham Gardens into the existing mains sewer system utilising the existing connections.

Foul drainage from the new basement level will be directed into a new sump from where it will be pumped to discharge into the existing town sewer system.

Rainwater Drainage

Rainwater from the roof will be directed into a new tank buried in a convenient location within the garden. The rainwater will be pumped from the tank and used for watering gardens.

Domestic Water

A new domestic water tank and associated boosted cold water pump set will be provided. Domestic cold water will be piped from the booster to various appliances with the house.

A fast recovery hot water cylinder will be provided served from the proposed gas boiler/ground source heat pump system. Hot water pipework will be run from the cylinder to all appliances. The hot water cylinder will include a cylinder thermostat and insulated such that a nominal cylinder heat loss of 3021KWh/day is not exceeded in accordance with part L regulations.

3.3 ELECTRICAL

A new electrical supply is proposed which will be metered subject to site investigations.

Energy efficient lighting will be proposed in accordance with part L regulations.