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10 PARK VILLAGE WEST

LOW CARBON STRATEGY REPORT

12048

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Prepared by:

CBG CONSULTANTS LTD

OXFORD: South House, 3 Farmoor Court, Cumnor Road, OXFORD, OX2 9LU

Tel: 01865 864500

LONDON: 38 Warren Street, London, W1T 6AE

Tel: 02073 874 175

CAMBRIDGE: 50-60 Station Road, Cambridge, CB1 2JH

Tel: 01223 637746

MANCHESTER: 1 St Peters Square, Manchester, M2 3AE

Tel: 0161 5272805

E: info@cbgc.com

www.cbgc.com

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CONTENTS

1. EXECUTIVE SUMMARY

This report provides an initial assessment of the installation and location of an Air Source Heat Pump (ASHP), solar panels and associated improvements to the building.

It is feasible to install 2no Air Source Heat pumps connected in series to operate efficiently as a single unit to provide heating and domestic hot water generation. As well as being efficient, the proposed units have low noise characteristics in operation. The heat pumps would contribute to approximately 50% of the heating capacity with a new, more efficient, gas boiler making up the remainder. The ASHPs would effectively provide over 60% of the building energy for heating and be a low carbon contributor.

It is feasible to install 2no solar arrays (PV's) in a discreet location on the roof to provide the generation of clean electricity to serve the dwelling and for export to the grid.

The proposed systems provide a significant carbon reduction. The existing building fabric shall be improved thermally and protected during both the construction works and in-use through fabric and frost protection controls.

2. INTRODUCTION

CBG Consultants have been employed by Simon Morray-Jones Architects to conduct a survey of the existing M&E systems and produce a report on the feasibility of installing low carbon heating, domestic hot water and power systems to satisfy the needs or partial needs of the heating, domestic hot water, lighting and small power systems. A survey was conducted on Tuesday 19th March 2024 and involved a review of the type of M&E systems used currently and evaluating likely options for new systems to be installed as part of a major refurbishment.

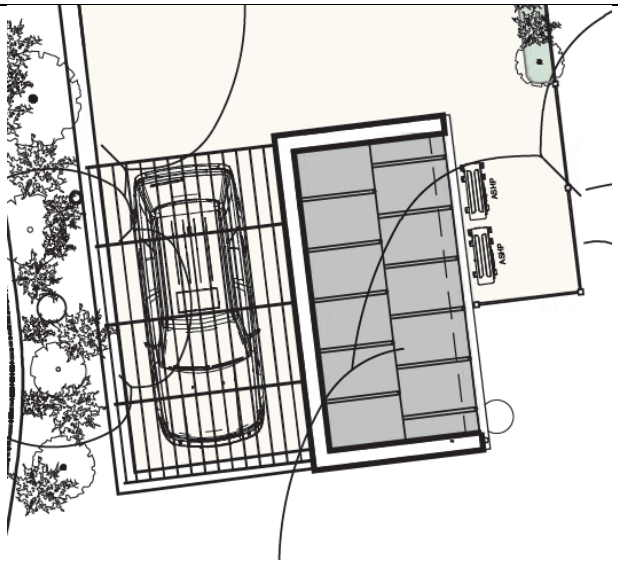
The project aims to improve existing areas whilst protecting and maintaining the existing historic fabric.

- The three-phase supply to the property has sufficient capacity available for a heat pump solution.
- There is a suitable location for solar PV's.

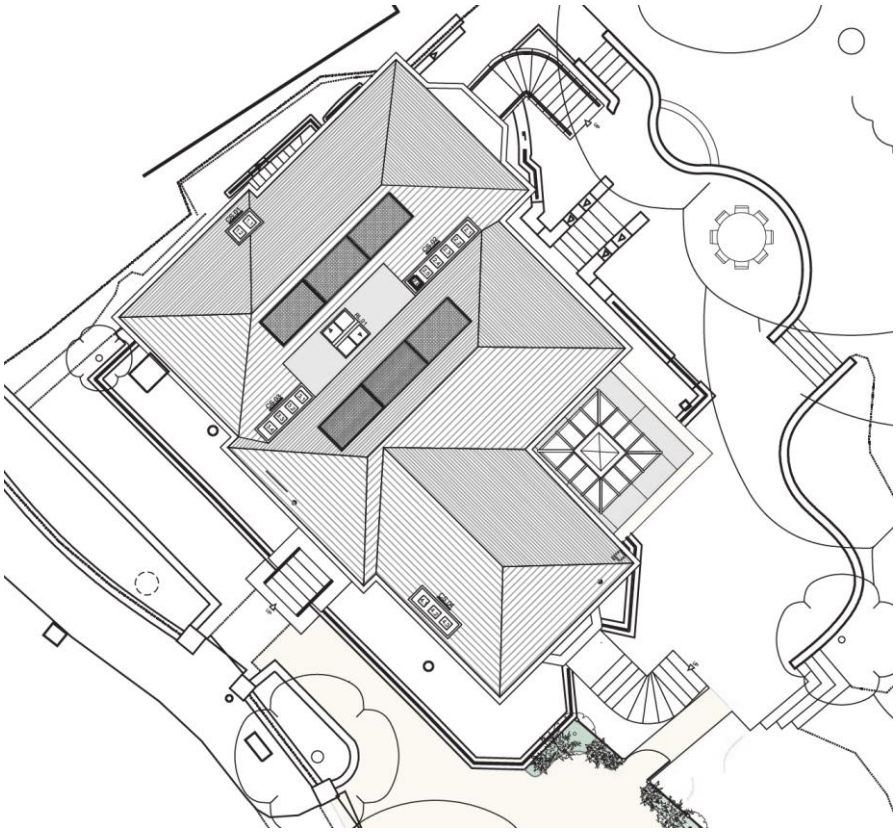
2.1. Initial ASHP Plant sizing

Selected plant equipment and estimated dimensions.

Equipment	Dimensions (mm)
Heat Pump	2 no. 1020W X 417D X 1350H – Weight 132 kg
Buffer Vessel	650D X 2100H
Hot Water Cylinder	630D X 2030H

The ASHP(s) would be located on the garden side of the proposed plantroom, serving the dwelling via a short run of external trenching of pipework.	

2.2. Solar PV

Equipment	Dimensions (mm)
Solar Panel location	6 no. SunPower 425 mono/black frame for K2 Tile (slate) mounting 

3. ESTIMATED SAVINGS

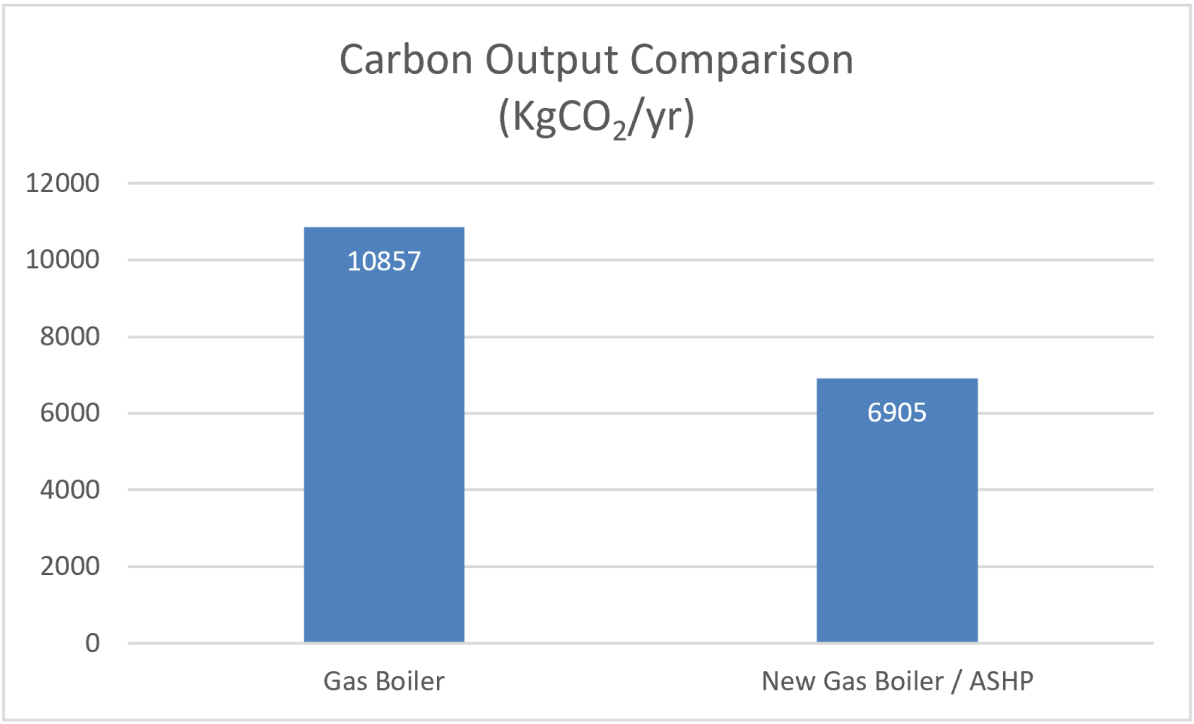
3.1. ASHP Energy and Carbon Dioxide Savings

An ASHP(s) would cover 60% space heating and domestic hot water load of the building. For comparison we have used a rule of thumb figure of 55,000 kWh/year heating and hot water demand. For a heat pump, the efficiency is defined by coefficient of performance (COP). For example a COP of 3.0 means for every 1kW of electrical input energy, you will receive 3kW of heating output.

A (COP) of 3.0 would mean the energy required to meet the estimated 55,000 kWh/year heating and hot water demand is 18,333 kWh/year.

100% Gas boiler:	55,000 kWh/yr x 94% efficient boiler x 0.210 kgCO2/kWhgas	= 10,857 kgCO2/yr
Mixture gas boiler / ASHP		
40% Gas boiler:	55,000 kWh/yr x 40% x 94% efficient boiler x 0.210 kgCO2/kWhgas	= 4,342 kgCO2/yr
60% ASHP:	55,000 kWh/yr x 60% / 300% heat pump x 0.233 kgCO2/kWhelec	= 2,563 kgCO2/yr

The heat pump will save 3,952 kgCO2 per year compared to a gas baseline.



3.2. ASHP Energy and Carbon Dioxide Savings

The solar PV will produce a further 1,957 kWh/yr total electricity at zero carbon.

The panels are worthwhile and signing up to the Smart Export Guarantee will provide 15p/kw/hr for exporting electricity.

4. M&E APPROACH STATEMENT

4.1. Power Supply

The property is provided with a 3-phase incoming supply. The heat pump will be 3 Phase and add approximately 10kW load and appears feasible. We will carry out a detailed load assessment and establish if an increased capacity is required.

5. SUMMARY

In summary, the proposals outlined within this report have been carefully considered to significantly reduce the property's reliance on fossil fuels and will save almost 4000 KgCO2 of carbon per year. The installation of ASHPs will allow the building to be constantly heated, even when unoccupied, to protect the heritage asset against decay at a much-reduced carbon cost. Positioning of the green technology has been thoroughly appraised to be as discrete as possible whilst not causing a nuisance to neighbours or the host property, demonstrated within the accompanying Acoustic Assessment by AJA Consultants.

CBG
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MANCHESTER 1 St Peters Square, Manchester, M2 3AE Tel: 0161 5272805

Email: info@cbgc.com