

PROJECT: 13A POND STREET

DATE

2 DEC 2019

REF:

429



## ENERGY STRATEGY UPDATE

### 1. INTRODUCTION

Following the design development process for 13A Pond Street, it is proposed that the scheme be amended by:

- Changing the heat source from a gas boiler to an air source heat pump
- Omitting the roof mounted photovoltaic panels due to poor performance from local shading

This change results in the scheme achieving **39.5%** below Part L compared to the previous scheme which achieved 32.7%.

As the design for 13A Pond Street has been developed it has been determined that the roof where the proposed photovoltaic panels were to be located is heavily shaded by existing trees. It is also recognised that domestic heat pump performance has improved significantly in recent years and would be applicable to the house due to the use of underfloor heating throughout which will maximise the efficiency of the heat pump.

Therefore the emphasis for carbon savings has shifted from photovoltaics to the use of a heat pump. Based on current and long-term electricity grid carbon intensities, it is emerging the heat pumps are the most efficient way to provide heat to homes as the UK's electricity continues to decarbonise from coal power stations closures and increased renewable energy penetration.

### 2. AIR SOURCE HEAT PUMP LOCATION

It is proposed that the heat pump will be located within an acoustic enclosure at the bottom of the garden at ground floor, connected to the house via buried pre-insulated pipework.

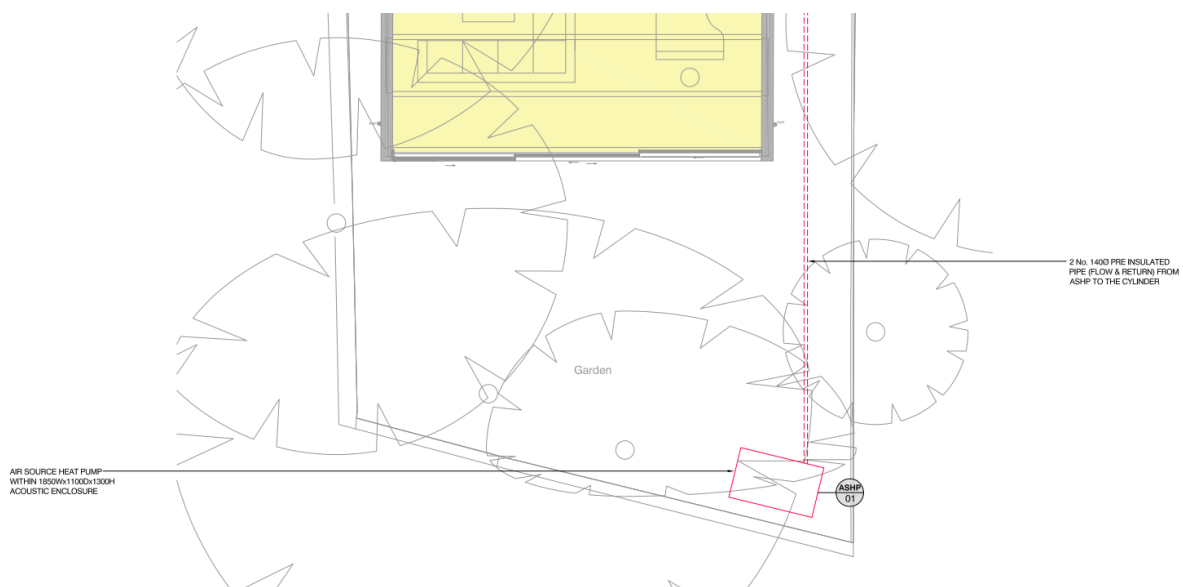


Figure 1: Location of air source heat pump

# INTEGRATION

The acoustic impact of the heat pump has been assessed by KP Acoustics as described in their report dated 21<sup>st</sup> November 2019.

### 3. FABRIC PROPERTIES

The CO<sub>2</sub> emissions for the revised strategy have been assessed assuming the fabric properties for the current design as scheduled below.

	U-value	Solar Gain Value
Exposed Floors	0.11 W/m <sup>2</sup> K	-
Exposed Walls (new build)	0.15 W/m <sup>2</sup> K	-
Exposed Roofs	0.11 W/m <sup>2</sup> K	-
Glazing	1.20 W/m <sup>2</sup> K	0.50
External Doors	1.20 W/m <sup>2</sup> K	0.50
Air Permeability	5m <sup>3</sup> /hr/m <sup>2</sup> @50Pa	

### 4. CO<sub>2</sub> EMISSIONS REDUCTIONS

Energy demand and CO<sub>2</sub> emissions calculations have been prepared for the amended scheme using SAP 2012 software. The results are summarised in the table below:

	Previous Scheme	Amended Scheme
<b>TER vs. DER % CO<sub>2</sub> Emissions Reduction</b>	<b>32.7%</b>	<b>39.5%</b>