Design and Access Statement

for Air Source Heat Pumps

at Station House, Lowdham NG14 7DU

Version 2 issued 1st Feb 2024

There is a clear need in the modern world to use less energy to heat our homes. The Station House at Lowdham already has as much loft insulation as is practicable, and there is a need to further save CO2 emissions to the environment. Air Source Heat Pumps (ASHPs) are the next viable step.

Station House was built by the Midland Railway for the line from Nottingham to Lincoln which was opened in August 1846 (and has recently celebrated its 175th birthday). It was bought off British Rail in derelict state by the current owner, David Moore, in 1991 and sympathetically restored with effort used to keep all salvageable original features. David is thus the first and only person to have ever bought this property since new!

David would like to add ASHP heating and remove the need for gas to be used at the property, but with minimal impact on the building, both from the point of view of the fabric of the building, and from the public view of the building.

Fabric of the Building

The pipe route from the existing boiler room to the ASHPs goes through an existing hole in the masonry from the boiler room to the kitchen loft space, and out of the wall end of the kitchen. As the kitchen was extended as part of the renovations in the 1990s, this aperture will be through modern masonry, not the historic fabric of the building.

The pipe will come down the outside of the wall in one or two square-section black plastic conduits, horizontally along the wall just above ground level, and into the former coal store at ground level. This aperture will be made through modern breezeblocks. The conduit will go up the inside wall, and through the parapet of the modern flat-roof extension.

The parapet of the extension will be raised by two courses to be more similar to its original height (as historic photos have recently come to light) and will further shield the ASHPs from public view.

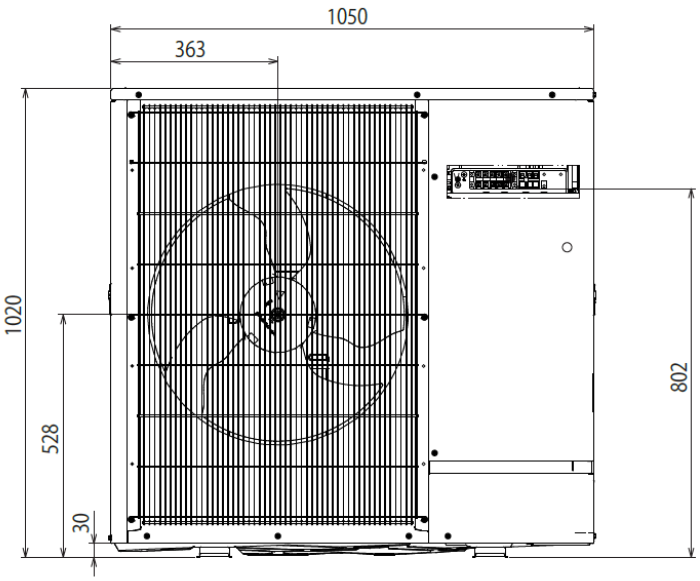
Public View

The view of the extension will be improved by the raising of the parapet by two courses, as it will be more similar to the historic structure it replaced.

The external section of pipe run in the plastic conduit will be wholly obscured from view from anywhere outside the private garden of the property. It will not be visible from the street at all.

As the AHSPs will be 1.1m tall, they will protrude over the parapet and will (just) be visible from Station Road (see photos taken with a cardboard box simulating the profile of the ASHP). They will however be substantially visible by visitors to the signal box on its monthly open days. This is not felt to be a serious problem as nowadays, the general public are much more accepting of 'green' infrastructure.

In the following photos, the cardboard box is in fact substantially taller than the actual ASHP. I have marked the position of the actual top of the AHSP with a red line.



View from the garden – even with the parapet at it's current height, the ASHP will be completely hidden. The ASHP is 1020 tall, 1050 wide and 520 deep.

The view from the ramp to the signal box. From this view, the ASHP will be substantially visible.

The view from street level in The Sidings. The red line is only just visible. With two more courses of brick, it will be completely hidden.

The view from street level in Station Road. The red line is visible about 200mm above the parapet. With two more courses of brick, it will be almost hidden.

ASHP Method of Fixing

With regards the fixing of the heat pumps, each pump is only ‘tethered’ to the building, meaning they are connected by flexible (anti-vibration) hoses. There is no fixed screw point to either floor or wall. The heat pumps sit on rubberised anti-vibration feet measuring 600mm in length running front to back. These securely stabilise them and prevent them from falling over in high winds.

ASHP Noise Levels

The contractors doing the work have written:

"When installing to MCS standards we are required to carry out a sound power level survey (see attached).

An 11.2kw Mitsubishi Ecodan unit has a sound power level of 58dB on the manufacturer datasheet (this falls within their 'Ultra Quiet' range of heat pump models). The attached survey includes the assessment position at 5m away from heat pump, uses two reflective services (the rear wall and the floor), and from the public footpath there will be little to no view of the heat pump due to the parapet wall. To err on the side of caution I have selected 'partial view'.

A background noise level of 40dB has been factored in. Once the sound level calculation is carried out to MCS guidelines, a final figure of 41dB is given."

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Air Source Heat Pump Noise Level Calculation Form

Step	Instructions	MCS Contractor's result
1	From manufacturers data, obtain the A-weighted sound power-level of the heat pump. See "Note 1: Sound Power Level" below. The highest sound power level specified should be used (the power in "low noise mode" should not be used).	58
2	Use "Note 2: Sound Pressure level" and "Note 3: Determination of directivity" below to establish the directivity "Q" of the heat pump noise.	Q4 - "Two Reflective Surfaces"
3	Measure the distance from the heat pump to the assessment position in metres.	5
4	Use table in "Note 4: dB distance reduction" below to obtain a dB reduction.	-19
5	Establish whether there is a solid barrier between the heat pump and the assessment position using "Note 5: Barriers between the heat pump and the assessment position" and note any dB reduction.	Barrier (partial view)
6	Calculate the sound pressure level (see Note 2: Sound pressure level") from the heat pump at the assessment position using the following calculation: (STEP 1) + (STEP 4) + (STEP 5)	34
7	Background noise level. For the purposes of the MCS Planning Standard for air source heat pumps the background noise level is assumed to be 40 dB (A)Lp. For informa_on see "Note 6: MCS Planning Standard for air source heat pumps background noise level"	40

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