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Scheme: Highgate Newtown Community Centre
Title: Noise from the Air Source Heat Pump on Block B

Introduction

An air source heat pump will be provided on the roof of Block B at the new HNCC scheme as part of the heating strategy for the development. This note assesses the external noise levels at nearby residential locations to demonstrate that the unit can meet the planning noise limits imposed on the scheme.

Air Source Heat Pump

The air source heat pump is specified with a noise level of 65 dB(A) at 1m with spectral values given below in Table 1.

Table 1 – Air Source Heat Pump Noise Levels

Acoustic information								
Sound pressure level at 1 m from the unit (rif. 2 x 10 ⁻⁵ Pa)								
63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	db(A)
65.0	68.0	62.0	63.0	60.0	59.0	53.0	45.0	65.0

Values referred to Evap. IN/OUT 12/7°C and 35°C Amb., full load operation, standard unit configuration without options. Sound pressure level calculated from sound power level. Sound pressure in octave band is for information only and not considered binding.

Planning Conditions

Planning condition 26 requires plant noise levels to be 10dB below the background noise levels at sensitive receptors (eg residences).

Based on a noise survey carried in the communal garden of the nearby Pentad housing, plant limits can be determined in line with BS4142:2014 and the planning condition. Table 2 below shows the limits; these would apply at 1m outside the windows of noise sensitive rooms.

Table 2 – Proposed Plant Noise Limits (for Pentad Housing)

Period	Typical Background Noise L _{A90} , dB	Noise Limit dB(A)
Day 07:00 to 19:00	37	27
Evening 19:00 to 23:00	32	22
Night-time 23:00 to 07:00	30	20

At Croftdown Road, a separate measurement was done of the background noise after midnight. The result was 32 dB L_{A90}. Therefore a limit for Croftdown Road would be 22 dB(A).

The proposed noise limits are very low and will provide a good standard of amenity. In practice, it is not necessary to control noise levels to as low as 20dBA as that is a very low absolute noise level at the threshold of audibility. BS 4142 states that a plant noise level equal to the background is already a low impact, but the planning condition requires noise levels 10dB below this. Controlling the plant noise down to 25dB(A) would still provide a very good level of amenity. However, given the clear stipulation of the condition, the plant is assessed against the lower limits determined from the background noise levels.

The nearest houses are the Pentad houses and the rear of two-storey houses on Croftdown Road. These are shown in plan in Figure 1 below together with the distances (in plan) to the housing. The actual noise source to receiver distances are greater as there is a difference in height and the noise source is also obscured from the dwellings, so will provide some acoustic shielding.

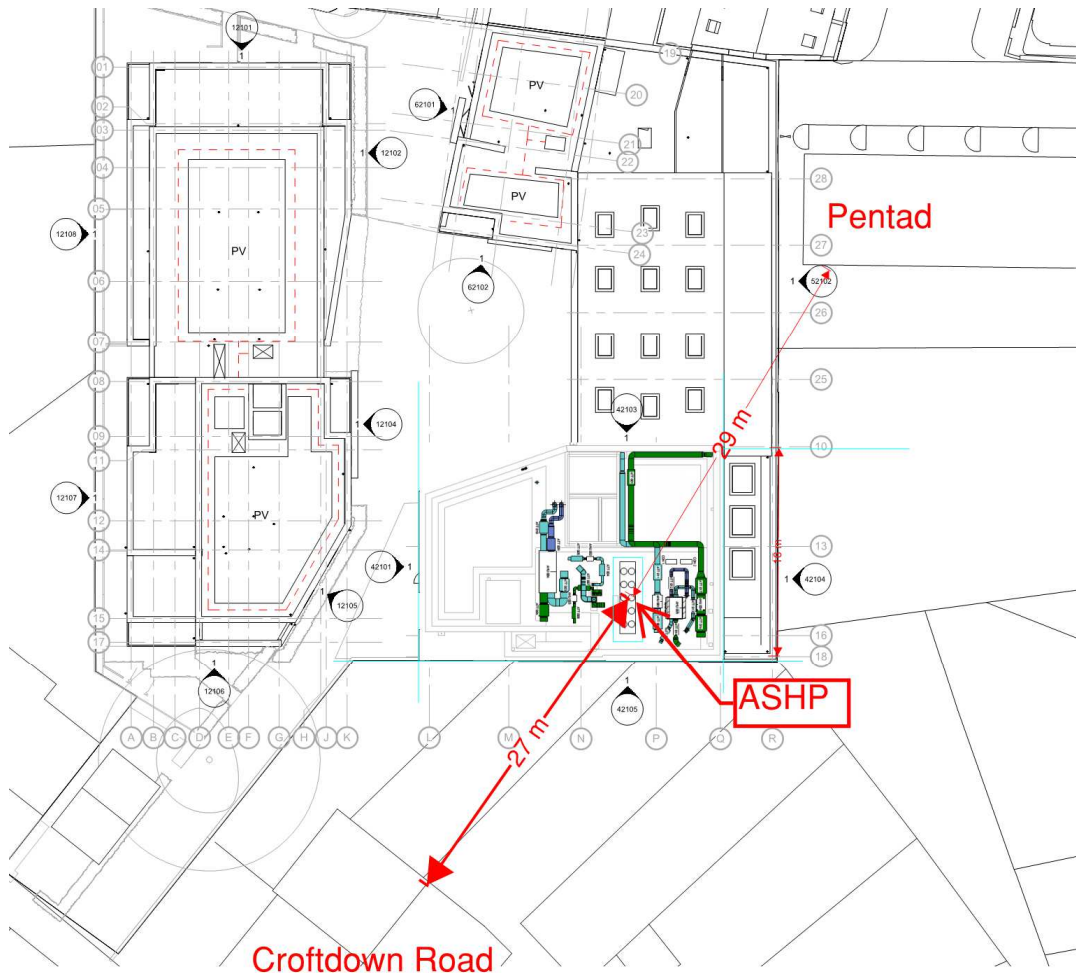


Figure 1 Plan Shown ASHP Location and Nearest Housing

Noise levels have been calculated to these two locations the calculations are attached. The air source heat pump will be shielded by a noise control barrier this will be designed to be 100mm greater than the height of the ASHP, therefore around 2.2 metres above roof level. The barrier loss has been included in the calculations.

The air source heat pump could operate at any time and therefore the night-time period is the most sensitive. In practice it is less likely to be required during the quieter parts of the night. There are other items of plant on the roof serving the community centre, but these would not typically operate during the night and therefore have not been included in the calculations.

The results are set out in Table 3 below.

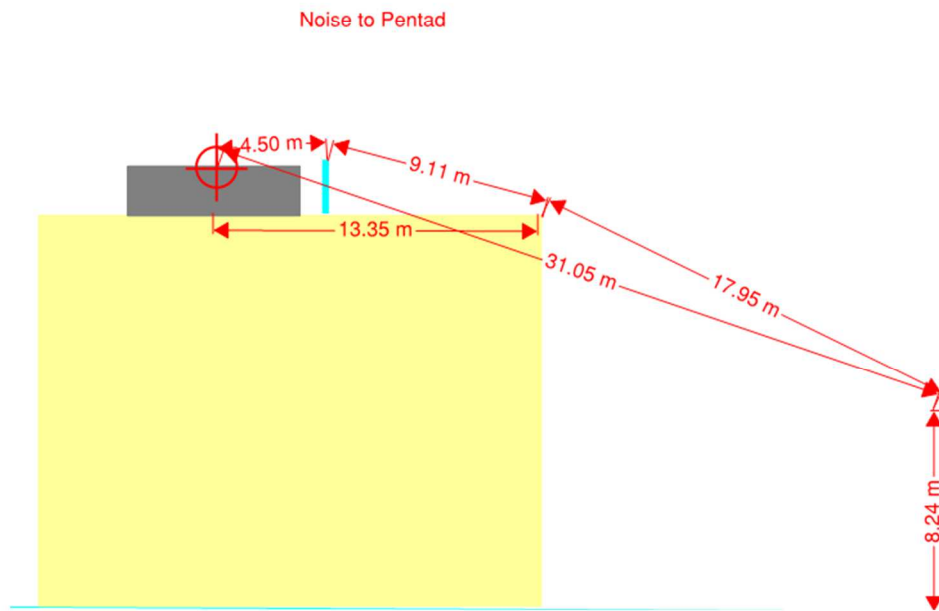
Table 3 – Night-time Noise Assessment

Location	Predicted Noise Level	Limit	Complies
Pentad Housing	20 dB(A)	20 dB(A)	Yes
Croftdown Road	19 dB(A)	22 dB(A)	Yes

It can be seen that night-time noise levels meet the noise limits derived from the planning condition.

Calculations

		Octave Band Centre Frequency, Hz											
		63	125	250	500	1000	2000	4000					
1	ASHP to Pentad	65.0	68.0	62.0	63.0	60.0	59.0	53.0	65.6 dB(A)				
	Distance Loss	31.1	29.9	29.9	29.9	29.9	29.9	29.9					
	Barrier Loss	4.5	9.11	17.95	31.05	0.51	7.7	9.5	11.9	14.7	17.7	20.7	23.7
	Predicted Noise Level dB	27.4	28.6	20.2	18.4	12.4	8.4	-0.6	19.8 dB(A)				



2	ASHP to Croftdown Road	65.0	68.0	62.0	63.0	60.0	59.0	53.0	65.6 dB(A)			
	Distance Loss	30.4	29.7	29.7	29.7	29.7	29.7	29.7				
	Barrier Loss	2.98	28	30.4	0.58	8.0	9.9	12.4	15.3	18.3	21.3	24.3
	Predicted Noise Level dB	27.3	28.4	19.9	18.0	12.0	8.0	-1.0	19.4 dB(A)			

