MCS 007 issue 4.0 Planning Standard for Air Source Heat Pumps
(Pages 16, 17, 18, 19)

Description of assessment position tested:

Fraser Regnart Court is arranged around a quad with ASHP locations on the rear ground floor of each of the three ranges – North, West and South.

All the ASHP units are ground mounted against the rear wall of the dwellings (Q4 reflected sound situations).

One ASHP has been specified to provide heat/hot water for three dwellings, minimising the number of units required. Each unit operating at full power creates 61.6 dB(A), with a low noise operation at 36dB(A). There is a minimum of 8.8 metres between the centreline of each ASHP unit along each of the three ranges. Buildings along the North, West and South ranges are parallel to those ranges, so each Unit along the range has the same value.

On the South range the distance between the six ASHP locations to the habitable room windows of adjoining dwellings is 14.5 metres.

On the West range the distance between the three ASHP locations to the habitable room windows of adjoining dwellings is 35 metres.

On the North range the distance between the five ASHP locations to the habitable room windows of adjoining dwellings is 7 metres. These houses have ground floor rear extensions but are below the boundary wall.

The ground level to the South and West ranges is substantially lower (approx. 3.2 metres), than the adjoining sites (housing), with solid boundary walls in place.

A dimensioned plan is attached, together with some contextual photographs (Figs 1-4).

Step	Instructions	MCS contractor results / notes
1.	From manufacturer's data, obtain the A-weighted sound power level of the heat pump. See 'Note 1: Sound power level'. The highest sound power level specified should be used (the power in "low noise mode" should not be used). *Example: Manufacturer's data states the sound power level of the heat pump is 55 dB(A).*	STEP 1 RESULT = 61.6 dB(A)
2.	Use 'Note 2: Sound pressure level' and 'Note 3: Determination of directivity' below to establish the directivity 'Q' of the heat pump noise. *Example: The heat pump is to be installed on the ground and against a single wall hence the directivity (Q) of the heat pump noise is Q4.*	STEP 2 RESULT = Q4 (ground mounted against a wall).
3.	Measure the distance from the heat pump to the assessment position in metres. *Example: Distance between heat pump and assessment position is 4 metres.*	STEP 3 RESULT = North range: 7 metres West range: 35 metres South range: 14.5 metres
4.	Use table in 'Note 4: dB distance reduction' below to obtain a dB reduction. *Example: 4 metres @ Q4 = -17 db.*	STEP 4 RESULT = North range: -20 West range: -34 South range: -27

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. *Example: There is a brick wall between the heat pump and the assessment position. Moving less than 25cm enables the assessment position to be seen. dB reduction = -5 dB.*	STEP 5 RESULT = Brick boundary walls to all ranges, visibility of upper storey windows to North range, no visibility to West or South.
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) *Example (55) + (-17) + (-5)=55 – 17 – 5 =33 dB(A) Lp*	STEP 6 RESULT = North 61.6-20+0 = 41.6dB(A) West: 61.6-34-10 = 17.6dB(A) South: 61.6-27-10 = 24.6dB(A)
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 information see 'Note 6: MCS Planning Standard for air source heat pumps background noise level'. *Example: Background noise level is 40 dB(A).*	STEP 7 RESULT = 40 dB(A)
8.	Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	STEP 8 RESULT = North 40-41.6 = -1.6dB(A) West: 40-17.6 = 21.4dB(A) South: 40-24.6 = 15.4dB(A)

	Example: 40 dB(A) (background) – 33 dB(A) (heat pump) = 7dB(A).		
9.	Using the table in 'Note 7: Decibel correction' obtain an adjustment figure and then add this to whichever is the higher dB figure from STEP 6 and STEP 7. Round this number up to the nearest whole number.		FINAL RESULT= North: 41.6+2.5 = 44.1dB(A) West: 40+0.1 = 41dB(A) South: 40+0.1 = 41dB(A)
	Example: Adjustment figure is 0.8 dB and the higher figure is 40 dB(A). *40 + 0.8 = 40.8 dB(A).* *Rounded up to 41 dB(A)* *Final result at this assessment position is 41 dB(A).*		
10.	Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42.0 dB(A)? If YES – the air source heat pump will comply with the permitted development noise limit for this assessment position and may be permitted development (subject to compliance with other permitted development limitations/conditions and parts of this standard). NOTE – Other assessment positions may also need to be tested. If NO – the air source heat pump will not be permitted development. This installation may still go ahead if planning permission is granted by the local planning authority. *Example: 41 dB(A) is equal to or lower than 42.0 dB(A).*		Final result is equal to or lower than 42.0 dB(A) YES / NO (delete as appropriate) North: no West: yes South: yes