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TECHNICAL NOTE

Proposed Air Source Heat Pumps

Crow Trees Farm, Crow Trees Brow, Chatburn BB7 4AA

Date	4th March 2025
Site Visited	N/A
Ref.	20250304 9215 Chatburn ASHP
Planning Ref.	3/2025/0001
Prepared by:	M A Kenyon MSc BSc MIOA

[redacted]

1.0 Introduction

Planning consent has been previously granted for residential development of a site at the above location; there would be 37 plots and the developers recently submitted a non-material application so that Air Source Heat Pumps [ASHP] can be provided to heat the properties, i.e. a total of 37 ASHPs.

It is understood that the Environmental Health Department [EHD] has requested *"…a noise assessment of the cumulative effects of noise…"*; however, the EHD also stated that the most commonly used method of determining the impact of ASHP noise, which is MCS020, should **not** be used on the grounds that the installation of multiple units, means that *"…this will be out of the scope of the MCS020 standard which is for individual units."*

And further:

"*The applicant needs to demonstrate and model the impact of all the units, the noise assessment shall be carried out in accordance with BS 4142:2014+A1:2019 the assessment must be undertaken by a suitably qualified person…"*

This Technical Note considers the most appropriate standard for the cumulative assessment of ASHPs proposed for new properties on the residents of the existing properties, conducts the assessment and then presents the results. Acoustic terminology is at Appendix 1 and the author's qualifications and experience appear at Appendix 2.

2.0 Noise Criteria

2.1 MCS020

This document is entitled *"MCS Planning Standards For permitted development installations of wind turbines and air source heat pumps on domestic premises"*.

Having re-read the document, we were unable to find any indication that the standard should only apply to the assessment of single heat pumps.

The standard sets out a prediction and assessment methodology for ASHP noise and logically there would be no reason why the standard should not apply to an installation which comprised of multiple heat pumps as much as it applied to an installation with just one heat pump.

In addition, all the units could be individually installed under permitted development rights, in which case the MCS020 would be used, but only for each

heat pump individually and there would be no assessment of the cumulative impact.

2.2 BS 4142:2014+A1:2019

In the Scope Section [1.3 h] of the British standard it is stated that:
"*The standard is not intended to be applied to the rating and assessment of sound from… other sources falling within the scopes of other standards or guidance."*

Given that MCS020 is a standard specifically covering ASHP noise, and that it does not rule out its use for multiple such units, BS4142 would appear to exclude itself from use under these circumstances.

3.0 MCS 020 Predictions

The standard sets out a specific calculation procedure to determine the noise level produced by ASHPs, depending on a variety of factors including the manufacturer's sound power level for the unit and the distance to assessment positions 1m outside the centre of nearby habitable windows/doors. If the predicted ASHP level, combined with a notional background noise, is 42dB(A) or less, then the ASHP noise impact is deemed acceptable.

There is no provision within MCS020 for separation distances greater than 30m; presumably on the basis that if an ASHP is more than 30m away then it would not have a significant noise impact; however, in this case none of the ASHPs are within 30m of any of the existing properties, so beyond 30m a 6dB reduction per doubling of distance has been used, which effectively assumes a point source

radiating over a reflective surface [worst case assumption].

It is understood that the ASHPs would be Daikin EDLA04-08EV3 units; it can be seen from the Specification Data below; that the sound power level depends on whether the unit is an EDLA06EV3, EDLA06EV3 or EDLA08EV3; unfortunately, the exact designation of the units isn't clear; therefore, it has been assumed that they are all EDLA08EV3 units, which are the loudest [worst case assumption].

Given that there would be 37 ASHPs on the site, it is unlikely that all units would ever operate simultaneously; however, the predictions assume that all units operate continuously and simultaneously [worst case assumption].

For this analysis, fences and walls have been assumed to have a zero barrier effect [worst case assumption].

In the Tables at the rear of this Technical Note is the set of MCS020 calculations for the four closest existing properties to the development site. The location of the receivers and the ASHPs are as shown in Figure 2 below.

4.0 Conclusion

For the reasons stated above, it is considered that MCS020 is the most appropriate standard to assess the cumulative impact of Air Source Heat Pump noise on the existing properties.

From the Tables of this Technical Note, it can be seen that the **cumulative** noise from the Air Source Heat Pumps on the existing properties complies with the limits in MCS 020, i.e. the impact is deemed acceptable.

APPENDIX 1

EXPLANATION OF ACOUSTIC TERMS

The dB or the decibel, is the unit of noise. The number of decibels or the level, is measured using a sound level meter. It is common for the sound level meter to filter or 'weight' the incoming sound so as to mimic the frequency response of the human ear. Such measurements are designated **dB(A)**.

A doubling of the sound is perceived, by most people, when the level has increased by 10 dB(A). The least discernible difference is 2 dB(A). Thus most people cannot distinguish between, say 30 and 31 dB(A).

The Background level of noise is most commonly represented by the level which is exceeded for 90% of the time i.e. the LA90.

If a noise varies over time then the **equivalent continuous level, or LAeq**, is the notional constant level of noise which would contain the same amount of acoustic energy as the time varying noise.

The following table gives an approximate indication of the comparative loudness of various noises expressed in terms of the A weighted scale:

Source of noise	dB(A)	Nature of Noise
Inside Quiet bedroom at night	25-30	Very Quiet
Quiet office	40-45	
Rural background noise	35-45	
Normal conversational level	55-65	
Busy restaurant	65-75	
Inside suburban electric train	70-80	
Hand clap @ 1m	75-85	
HGV accelerating @ 5m away	85-90	Very Loud

APPENDIX 2

QUALIFICATIONS AND EXPERIENCE OF M. A. KENYON

My full name is Melville Alexander Kenyon. I am the principal of the firm of Martec Environmental Consultants Ltd, a consultancy company that specialises in environmental noise assessment and control. I graduated in 1982 with a Bachelor's degree in Engineering and subsequently a Master's degree in Environmental Acoustics. I have been a corporate member of the professional body for noise and vibration specialists, the Institute of Acoustics, since 1988, and have sat on the British Standards Committee dealing with noise in buildings [BS.8233:1999].

I have lectured at Liverpool John Moores University on the Diploma of Acoustics course and at Manchester Metropolitan University on their Environmental Health degree course.

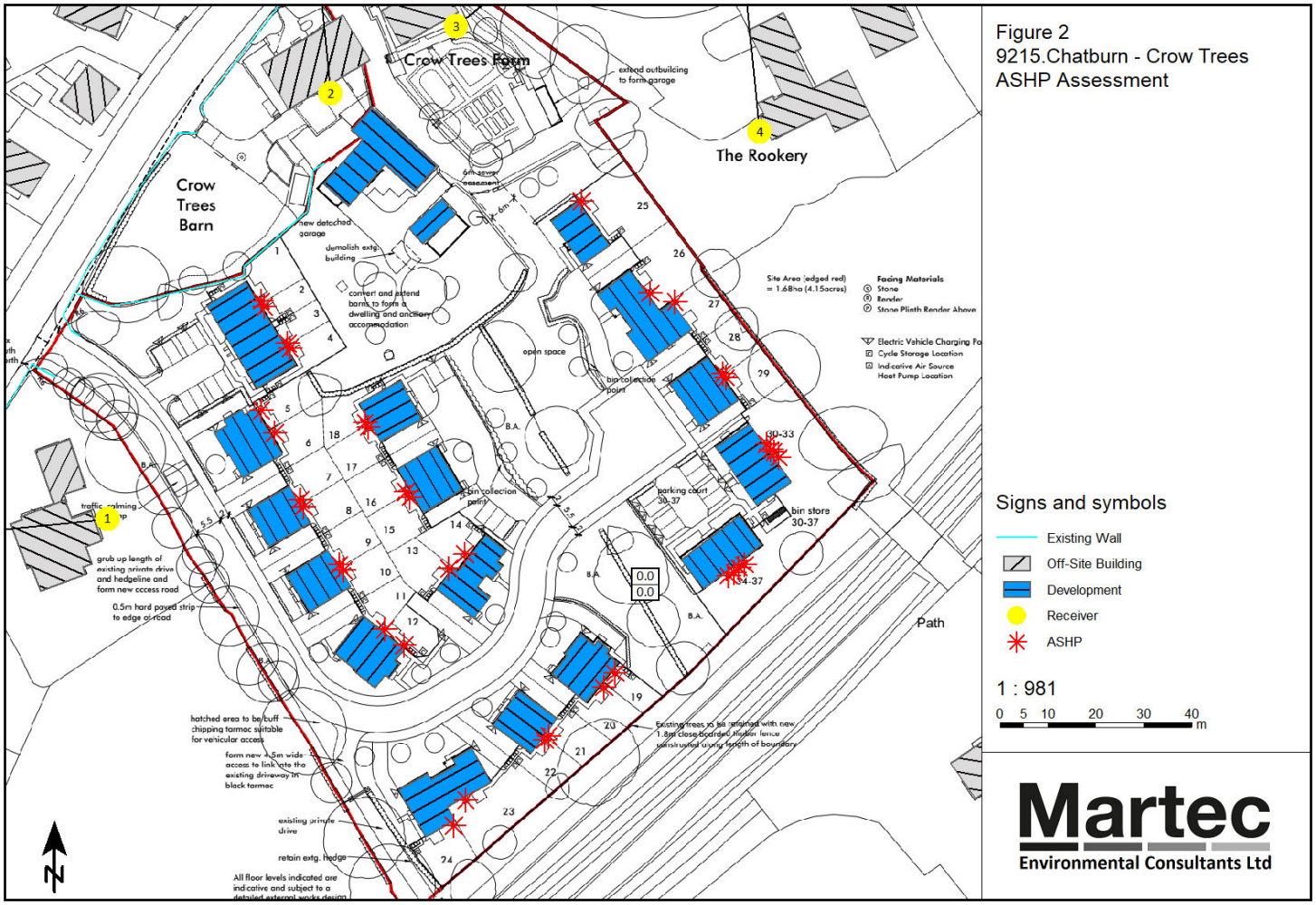
The firm of Martec Environmental Engineering was formed in the 1970's and joined The Association of Noise Consultants in 1996. It is now known as Martec Environmental Consultants Ltd.

Since its formation, Martec has advised many groups of both residents and developers about the problems of noise and vibration in the environment.

Specifications Table for EDLA04-08EV3

					EDLA04E2V3	EDLA06E2V3	EDLA08E2V3
Heating capacity	Nom.			kW	4.30 (1), 4.60 (2)	6.00 (1), 5.90 (2)	7.50 (1), 7.80 (2)
Power input	Heating		Nom.	kW	0.840 (1), 1.26 (2)	1.24 (1), 1.69 (2)	1.63 (1), 2.23 (2)
COP					5.10 (1), 3.65 (2)	4.85 (1), 3.50 (2)	4.60 (1), 3.50 (2)
Dimensions	Unit		Height	mm	770	770	770
			Width	mm	1250	1250	1250
			Depth	mm	362	362	362
Weight	Unit			kg	88	88	88
Operation range	Heating	Water side	Min.	°C	9 (3)	9 (3)	9 (3)
			Max.	°C	65 (3)	65 (3)	65 (3)
	Domestic hot water	Ambient	Min.	°CDB	-27	-27	-27
			Max.	°CDB	35	35	35
		Water side	Min.	°C	25	25	25
			Max.	°C	55 (3)	55 (3)	55 (3)
Sound power level	Heating		Nom.	dBA	58	60	62
Sound							

Figure 1: Specification Provided as part of the Application


Crow Trees Farm
The Rookery
Crow Trees Barn
Path
Figure 2
9215.Chatburn - Crow Trees
ASHP Assessment
Signs and symbols
Existing Wall
Off-Site Building
Development
Receiver
ASHP
1 : 981
0 5 10 20 30 40 m
Martec
Environmental Consultants Ltd

MCS 020 Planning Standard - Air Source Heat Pump calculation procedure																																							
Receiver	1																																							
X CoOrdinates	376709																																							
Y CoOrdinates	443915																																							
Heat Pump Plot Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
X CoOrdinates	376741	376742	376747	376747	376741	376744	376750	376750	376758	376759	376767	376771	376780	376784	376772	376772	376764	376763	376815	376813	376801	376800	376784	376781	376808	376822	376828	376837	376838	376847	376847	376848	376849	376842	376841	376840	376839		
Y CoOrdinates	443960	443959	443951	443950	443937	443933	443919	443917	443905	443904	443892	443889	443905	443908	443919	443920	443934	443935	443883	443880	443870	443869	443856	443851	443981	443962	443960	443945	443944	443931	443929	443929	443928	443905	443905	443904	443903		
Separation Distance	55	55	52	52	39	39	40	41	49	50	62	67	72	75	63	62	58	57	110	109	102	102	95	96	119	122	126	132	132	138	139	139	140	133	132	131	130		
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).	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62		
2. Directivity	8	8	8	8	4	8	8	8	8	8	8	4	8	4	8	8	8	8	4	8	8	8	4	8	4	4	8	4	8	8	4	4	4	4	4	4	4		
4. Use table in 'Note 4: dB distance reduction' below to obtain a dB reduction.	-37	-36	-36	-36	-37	-34	-34	-34	-36	-36	-38	-41	-39	-42	-38	-38	-37	-37	-46	-42	-42	-42	-44	-41	-46	-46	-44	-47	-44	-44	-48	-48	-48	-47	-47	-47	-47		
5. Barrier Effect	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	0	0	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10		
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)	15	16	16	16	15	18	18	18	16	16	14	11	13	10	14	14	25	25	6	10	10	10	8	11	6	6	8	5	8	8	4	4	4	5	5	5	5		
7. Background noise level.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	25	24	24	24	25	22	22	22	24	24	26	29	27	30	26	26	15	15	34	30	30	30	32	29	34	34	32	35	32	32	36	36	36	35	35	35	35		
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.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES		
Alog Individual ASHP Levels	31.62278	39.81072	39.81072	39.81072	31.62278	63.09573	63.09573	63.09573	39.81072	39.81072	25.11886	12.58925	19.95262	10	25.11886	25.11886	316.2278	316.2278	3.981072	10	10	10	6.309573	12.58925	3.981072	3.981072	6.309573	3.162278	6.309573	6.309573	2.511886	2.511886	2.511886	3.162278	3.162278	3.162278	3.162278		

6. Total ASHP Level	31
7. Background noise level.	40
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	9
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.	41
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES

MCS 020 Planning Standard - Air Source Heat Pump calculation procedure																																							
Receiver	2																																							
X CoOrdinates	376755.9																																							
Y CoOrdinates	444003.4																																							
Heat Pump Plot Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37		
X CoOrdinates	376741	376742	376747	376747	376741	376744	376750	376750	376758	376759	376767	376771	376780	376784	376772	376772	376764	376763	376815	376813	376801	376800	376784	376781	376808	376822	376828	376837	376838	376847	376847	376848	376849	376842	376841	376840	376839		
Y CoOrdinates	443960	443959	443951	443950	443937	443933	443919	443917	443905	443904	443892	443889	443905	443908	443919	443920	443934	443935	443883	443880	443870	443869	443856	443851	443981	443962	443960	443945	443944	443931	443929	443929	443928	443905	443905	443904	443903		
Separation Distance	46	46	53	54	68	72	85	86	98	99	112	116	102	100	86	84	70	69	134	136	141	142	150	155	57	78	84	100	101	116	118	119	120	130	130	130	130		
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).	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62		
2. Directivity	8	8	8	8	4	8	8	8	8	8	8	4	8	4	8	8	8	8	4	8	8	8	4	8	4	4	8	4	8	8	4	4	4	4	4	4	4		
4. Use table in 'Note 4: dB distance reduction' below to obtain a dB reduction.	-35	-35	-36	-36	-41	-39	-40	-40	-42	-42	-43	-46	-42	-45	-40	-40	-39	-38	-47	-44	-45	-45	-48	-45	-40	-43	-40	-45	-42	-43	-46	-46	-46	-47	-47	-47	-47		
5. Barrier Effect	0	0	0	0	-10	-10	0	0	0	0	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10		
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)	27	27	26	26	11	13	22	22	20	20	9	6	10	7	12	12	13	14	5	8	7	7	4	7	12	9	12	7	10	9	6	6	6	5	5	5	5		
7. Background noise level.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	13	13	14	14	29	27	18	18	20	20	31	34	30	33	28	28	27	26	35	32	33	33	36	33	28	31	28	33	30	31	34	34	34	35	35	35	35		
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.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40		
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES		

6. Total ASHP Level	34
7. Background noise level.	40
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	6
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.	41
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES

Receiver	3	Crow Trees Barn											
X CoOrdinates	376782												
Y CoOrdinates	444017.3												

Heat Pump Plot Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
X CoOrdinates	376741	376742	376747	376747	376741	376744	376750	376750	376758	376759	376767	376771	376780	376784	376772	376772	376764	376763	376815	376813	376801	376800	376784	376781	376808	376822	376828	376837	376838	376847	376847	376848	376849	376842	376841	376840	376839
Y CoOrdinates	443960	443959	443951	443950	443937	443933	443919	443917	443905	443904	443892	443889	443905	443908	443919	443920	443934	443935	443883	443880	443870	443869	443856	443851	443981	443962	443960	443945	443944	443931	443929	443929	443928	443905	443905	443904	443903
Separation Distance	70	71	75	75	90	93	104	105	115	115	126	129	113	110	98	97	85	85	139	141	149	150	161	166	45	69	73	91	92	108	110	111	112	127	127	127	128
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).	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
2. Directivity	8	8	8	8	4	8	8	8	8	8	8	4	8	4	8	8	8	8	4	8	8	8	4	8	4	4	8	4	8	8	4	4	4	4	4	4	4
4. Use table in 'Note 4: dB distance reduction' below to obtain a dB reduction.	-39	-39	-39	-39	-44	-41	-42	-42	-43	-43	-44	-47	-43	-45	-42	-41	-40	-40	-48	-45	-45	-45	-49	-46	-38	-41	-39	-44	-41	-42	-45	-46	-46	-47	-47	-47	-47
5. Barrier Effect	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	0	0	0	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10
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)	13	13	13	13	8	11	10	10	9	9	8	5	9	7	10	11	12	12	4	7	7	7	3	6	24	21	23	8	11	10	7	6	6	5	5	5	5
7. Background noise level.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	27	27	27	27	32	29	30	30	31	31	32	35	31	33	30	29	28	28	36	33	33	33	37	34	16	19	17	32	29	30	33	34	34	35	35	35	35
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.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

6. Total ASHP Level	29
7. Background noise level.	40
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	11
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.	40
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES

MCS 020 Planning Standard - Air Source Heat Pump calculation procedure

Receiver	4	The Rookery											
X CoOrdinates	376845.2												
Y CoOrdinates	443995.4												

Heat Pump Plot Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
X CoOrdinates	376741	376742	376747	376747	376741	376744	376750	376750	376758	376759	376767	376771	376780	376784	376772	376772	376764	376763	376815	376813	376801	376800	376784	376781	376808	376822	376828	376837	376838	376847	376847	376848	376849	376842	376841	376840	376839
Y CoOrdinates	443960	443959	443951	443950	443937	443933	443919	443917	443905	443904	443892	443889	443905	443908	443919	443920	443934	443935	443883	443880	443870	443869	443856	443851	443981	443962	443960	443945	443944	443931	443929	443929	443928	443905	443905	443904	443903
Separation Distance	110	109	108	108	119	119	123	123	126	126	130	130	112	107	105	105	102	102	117	120	133	134	152	158	40	41	40	51	52	65	66	67	68	90	91	92	93
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).	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
2. Directivity	8	8	8	8	4	8	8	8	8	8	8	4	8	4	8	8	8	8	4	8	8	8	4	8	4	4	8	4	8	8	4	4	4	4	4	4	4
4. Use table in 'Note 4: dB distance reduction' below to obtain a dB reduction.	-42	-42	-42	-42	-46	-43	-43	-43	-44	-44	-44	-47	-43	-45	-42	-42	-42	-42	-46	-43	-44	-44	-48	-46	-37	-37	-34	-39	-36	-38	-41	-41	-41	-44	-44	-44	-44
5. Barrier Effect	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	-10	0	0	0	0	0	0	0	0	0	-10	-10	-10	-10
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)	10	10	10	10	6	9	9	9	8	8	8	5	9	7	10	10	10	10	6	9	8	8	4	6	25	25	28	23	26	24	21	21	21	8	8	8	8
7. Background noise level.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	30	30	30	30	34	31	31	31	32	32	32	35	31	33	30	30	30	30	34	31	32	32	36	34	15	15	12	17	14	16	19	19	19	32	32	32	32
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.	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Alog Individual ASHP Levels	10	10	10	10	3.981072	7.943282	7.943282	7.943282	6.309573	6.309573	6.309573	3.162278	7.943282	5.011872	10	10	10	10	3.981072	7.943282	6.309573	6.309573	2.511886	3.981072	316.2278	316.2278	630.9573	199.5262	398.1072	251.1886	125.8925	125.8925	125.8925	6.309573	6.309573	6.309573	6.309573

6. Total ASHP Level	34
7. Background noise level.	40
8. Determine the difference between STEP 7 background noise level and the heat pump noise level using the following calculation: (STEP 7) – (STEP 6)	6
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.	41
10. Is the FINAL RESULT in STEP 9 equal to or lower than the permitted development noise limit of 42 dB(A)?	YES