Azymuth Acoustics UK

Professional Acoustic Services

Noise Impact Assessment
Ref: AA0532.2

28no. Air Source Heat Pumps
Riverdale
Higher Blackley

On behalf of

Manchester City Council

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1.0 Introduction

Azymuth Acoustics UK (henceforth Azymuth) has been contracted by Manchester City Council (MCC) to perform a Noise Impact Assessment (NIA) in relation to 28no. Air Source Heat Pumps (ASHPs) being proposed to 3no. maisonette blocks located on Riverdale Road, Higher Blackley.

Azymuth had previously undertaken a NIA in relation to the 28no. ASHPs in report ref: AA0532. In this previous report all ASHPs were being proposed to the roofs of each apartment block, the design has since progressed with the relocation of 14no. ASHPs from roof level to the ground floor. The purpose of this assessment is to assess the noise impact of the new ASHP layout.

Figure 1 – Maisonette blocks at Riverdale Road

This noise impact assessment is intended to provide information relating to the potential noise impact of the ASHPs on the surrounding environment in order to aid the discharge of any planning condition relating to fixed plant noise. In particular, the report sets out the following details:

- The results of a baseline noise survey undertaken in the vicinity of Riverdale Road
- Recommendations to meet the targets as set out by the assessment criteria.
- Suitable noise limits for externally mounted plant which could affect the wider environment.
- An assessment of the proposed plant items with calculated noise impact.
- Noise mitgiation measured recommended with the aim of compliance with noise limits.
- It is undertsood that the plant items will operate during both daytime and night-time periods. As such, night-time periods are assessed, being the worst-case scenario when background noise levels in the area would be the lowest.

2.0 Baseline Noise Survey

2.1 Measurement Procedures

The instrumentation used for the NIA consisted of a SvanTek 971 type 1 precision sound level meter. The equipment was calibrated before and after measurements. The sound level meter measured A-weighted (fast response) noise levels as well as octave bands noise levels for all measurement record.

Daytime noise level measurements were undertaken between 09:43hrs and 12:51hrs on Monday 8th July 2024. The night-time measurements were undertaken between 23:01hrs and 00:21hrs on Tuesday 16th / Wednesday 17th July 2024.

The noise measurements were undertaken using the sound level meter at the position(s) shown in Figure 2 below:

- Position 1: Inchape Drive (~1m from the roadside)
- Position 2: Car park
- Position 3: Riverdale Road (~2m from the roadside)

Figure 2 – Azymuth noise measurement positions

2.2 Summary of Measurements

The following table summarises the results of the noise measurements undertaken at the site in terms of the average daytime and night-time noise levels.

Location	Period	L_{AFmax}	L_{Aeq}	L_{A10}	L_{A50}	L_{A90}
1) Inchape Drive	Day	68.3	51.0	50.5	43.6	38.3
1) Inchape Drive	Night	56.8	40.6	42.4	38.2	36.6
2) Car Park	Day	71.4	55.0	52.1	43.6	37.7
2) Car Park	Night	46.0	36.4	38.1	34.8	33.1
3) Riverdale Road	Day	74.4	58.0	57.3	49.1	44.6
3) Riverdale Road	Night	54.6	48.9	42.8	37.5	35.9

Table 1 – Summary of Azymuth noise measurements

Full results of the noise levels recorded during the course of the survey are included in Appendix B of this report.

2.3 Description of Noise Climate

The site is generally quiet with any noise coming from traffic along Riverdale Road and general activity of local residents.

The weather during the measurement procedures was dry with winds speeds ranging from 5 to 10mph.

3.0 Assessment Criteria

In order to assess the extent of any measures required in order to comply with suitable conditions relating to potential noise sources, Azymuth Acoustics UK has reviewed various guidance documents and standards, these include:

- British Standard 8233:2014
- World Health Organisation Guidelines on Community Noise
- British Standard 4142:2014
- Microgeneration Certification Scheme (MCS 020a)
- Manchester City Council Planning and Noise: Technical Guidance

3.1 British Standard 8233: 2014

BS 8233 provides a code of practice for the sound insulation of a variety of building types affected by general environmental noise. It provides recommendations for control of noise in and around buildings and suggests appropriate internal ambient noise level criteria / limits for a variety of different situations including residential properties.

The following table summarises the noise limits suggested by BS 8233 applying to residential properties:

Activity	Room	Good Design Range $L_{Aeq,T}$ dB	
		07:00-23:00hrs	23:00-07:00hrs
Resting	Living Room	35	-
Dining	Dining Room / Area	40	-
Sleeping (daytime resting)	Bedroom (at night)	35	30

Table 2 – Noise Limits for Residential Properties Suggested in BS 8233

3.2 World Health Organisation Environmental Noise Guidelines (ENG) 2018

The main purpose of the 2018 WHO guidelines is to provide recommendations for protecting human health from exposure to environmental noise originating from the following sources: transportation (road traffic, railway and aircraft), wind turbines and leisure activities.

The guidelines set out to define recommended exposure levels for environmental noise in order to protect population health. Exposure limits are average levels defined over a period of one year, measured outdoors in free field at the most exposed façade. It should be noted that the document does not provide guideline limit values for multiple noise sources in combination.

The 2018 guidelines supersede the Community Noise Guidelines from 1999. Nevertheless, the document recommends that all CNG indoor guideline values and any values not covered by the current guidelines should remain valid. As such, the following guidance would remain appropriate:

For protection against sleep disturbance inside dwellings, night-time noise levels should not exceed 30dB L_{Aeq} for continuous noise and 45dB L_{Amax} for typical single sound events (which are exceeded 15 times or more per night – see ProPG Appendix A.12 for more details).

To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise (interpreted as noise from all sources combined) should not exceed 55dB L_{Aeq} on balconies, terraces and in outdoor living areas.

It should be noted that exposure levels defined in ENG and CNG are for guidance purposes as relates potential adverse health impacts and should not be interpreted as absolute limits or regulations.

3.3 British Standard 4142:2014

British Standard 4142: 2014 “Methods for assessing and rating industrial sound” describes methods for rating and assessing sound of an industrial and/or commercial nature. The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

- Typically, the greater the difference between background sound and industrial/commercial noise, the greater the magnitude of the impact.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.

BS 4142 notes that: "Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

3.4 Microgeneration Certification Scheme (MCS 020a)

The Microgeneration Certification Scheme allows for ASHPs to be installed on residential properties under permitted development.

Permission is granted if noise from the ASHP is equal to or lower than the noise limit of 37.0dB $L_{Aeq,5min}$ at 1 metre from a window or door opening to a habitable room ("a room other than a bathroom, shower room, water closet or kitchen") on the façade of a neighbouring residential property (including flats within the same block of flats). Compliance is determined via a series of steps set out in MCS 020a. The 37.0dBA noise limit approximately equates to an internal noise level ≤25dBA in rooms with half-opened windows. This is in line with target night-time limits for bedrooms described in BS 8233 and ENG.

3.5 Manchester City Council Planning and Noise: Technical Guidance

The guidance aims to provide help and advice in relation to noise in a planning context to encourage good acoustic design. It outlines what is expected in relation to current guidance and policy with the aspiration that new developments achieve the highest possible standards without compromising the health and wellbeing of people that live and work within the City of Manchester.

3.6 Recommended Noise Assessment Criteria

Through discussions with the MCC planning department the following noise limit criteria has been agreed:

- For on-site receptors: MCS 020a noise limit of ≤37dB from neighbouring ASHP on individial receptor location i.e. not inclusive of receptors own ASHP
- For off-site receptors: MCS 020a noise limit of ≤37dB from all ASHP units accumulatively

4.0 Assessment of Noise Levels

4.1 Heat Pump Layout and Receptor Locations

ASHPs are now being proposed to the roofs of each block as well as the ground floor.

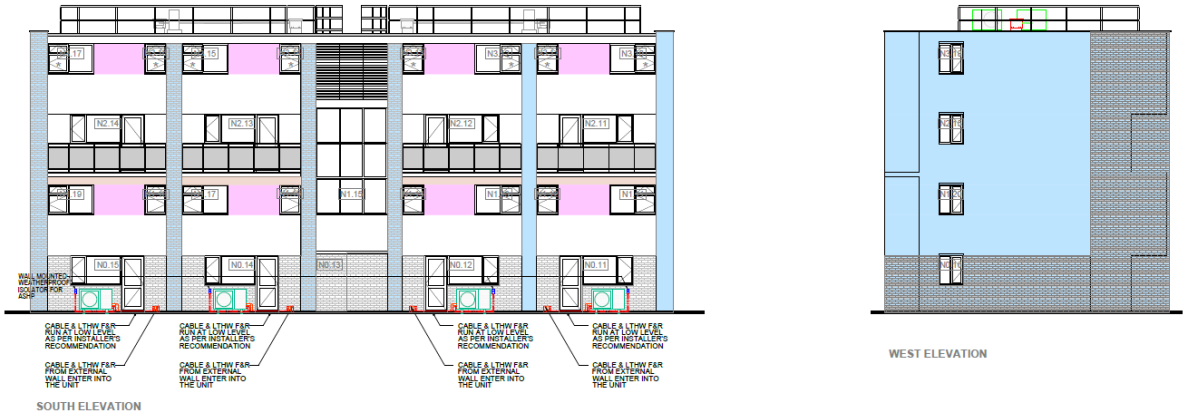

Figure 3 – North block ASHP locations

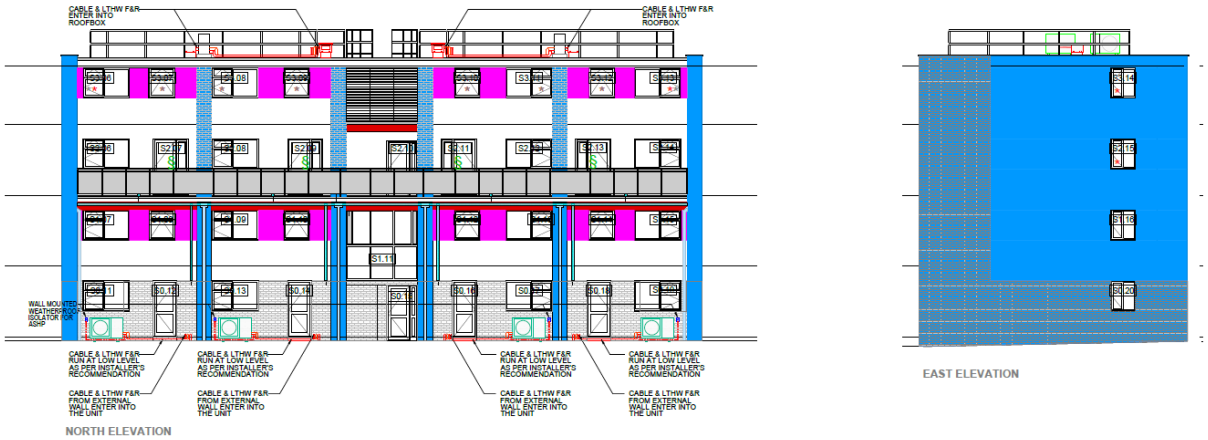

Figure 4 – South block ASHP locations

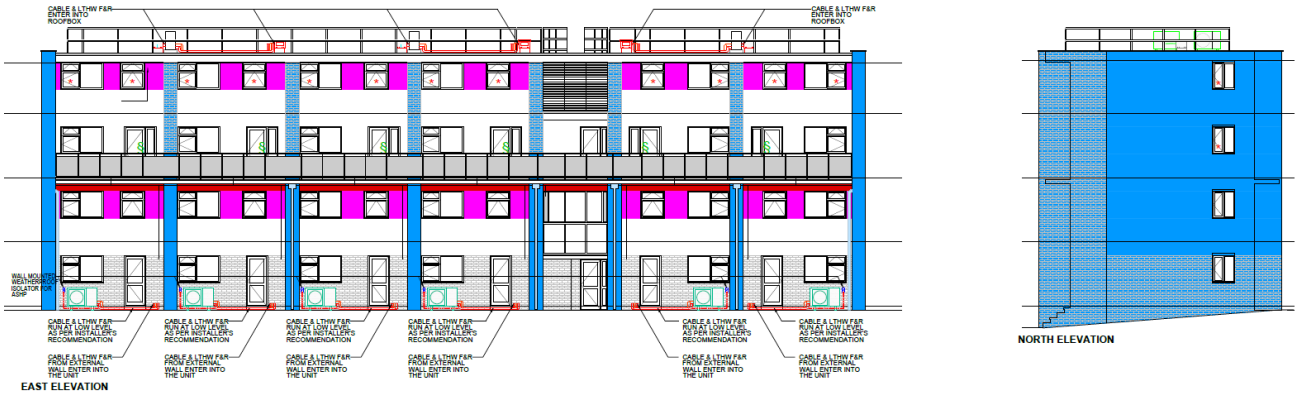

Figure 5 – West block ASHP locations

4.2 Proposed Air Source Heat Pump Assessment

The proposed outdoor unit(s) are understood to be as follows:

- Daikin Monobloc R32 EDLA06EV3 (6kW)

Noise emissions from the above heat pumps can be characterised as broadband air movement over fan blades with low level compressor noise, with no obvious narrow band tonality.

Azymuth have calculated the sound power level of each octave band to be as follows:

Power Output (kW)	Sound Power Level (~dB), Octave Band Frequency (Hz)								Total L_{WA} (dB)
	63	125	250	500	1k	2k	4k	8k	
6	60	50	55	60	55	51	46	28	60

Table 3 – Daikin Monobloc R32 (6kW) octave band sound power levels

4.3 Noise Impact

Azymuth have created a noise prediction model in SoundPLAN 9.1 to predict and visualise the effect of the externally mounted plant on the surrounding environment, including the noise levels at nearest worst-case residential receptors.

4.3.1 Grid Noise Map (GNM)

Azymuth have produced the following GNMs of the proposed site (with all ASHP units operating simultaneously and at 100%). Different GNM heights have been computed in order to assess the varying noise levels potentially affecting upper floor receptor locations.

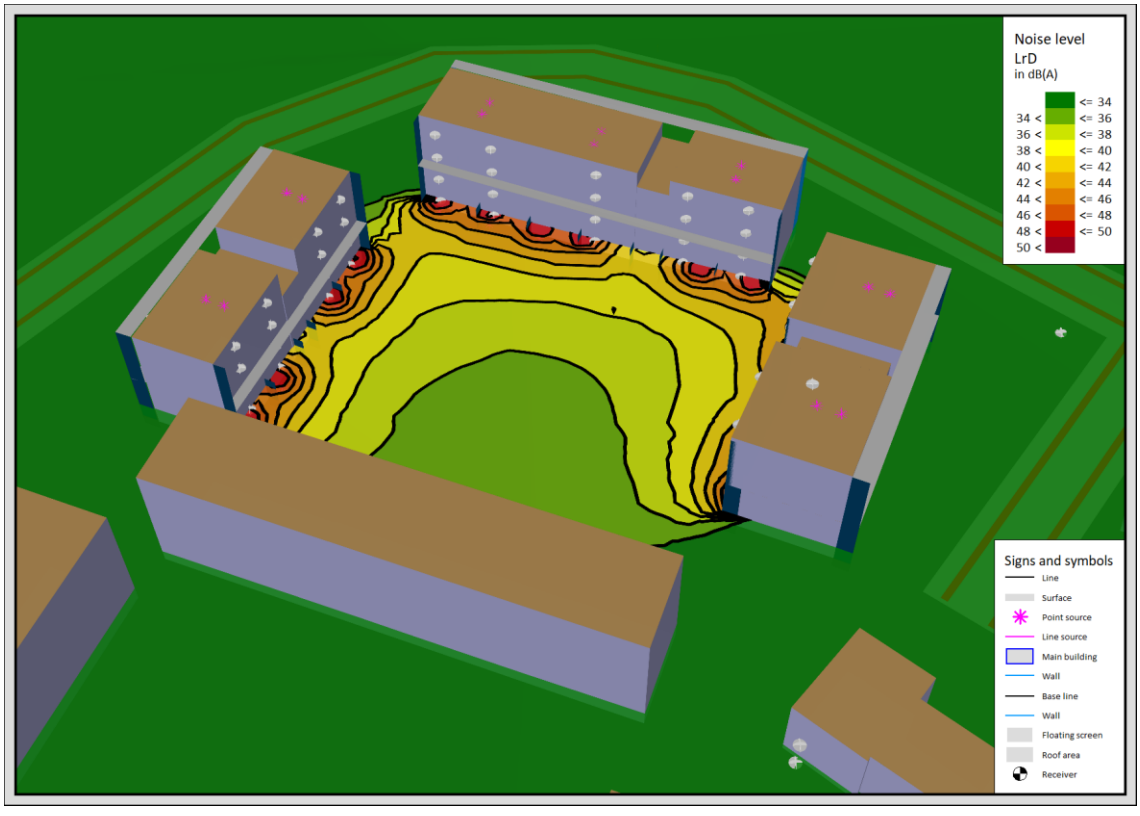

Figure 6 – GNM (1.5m height)

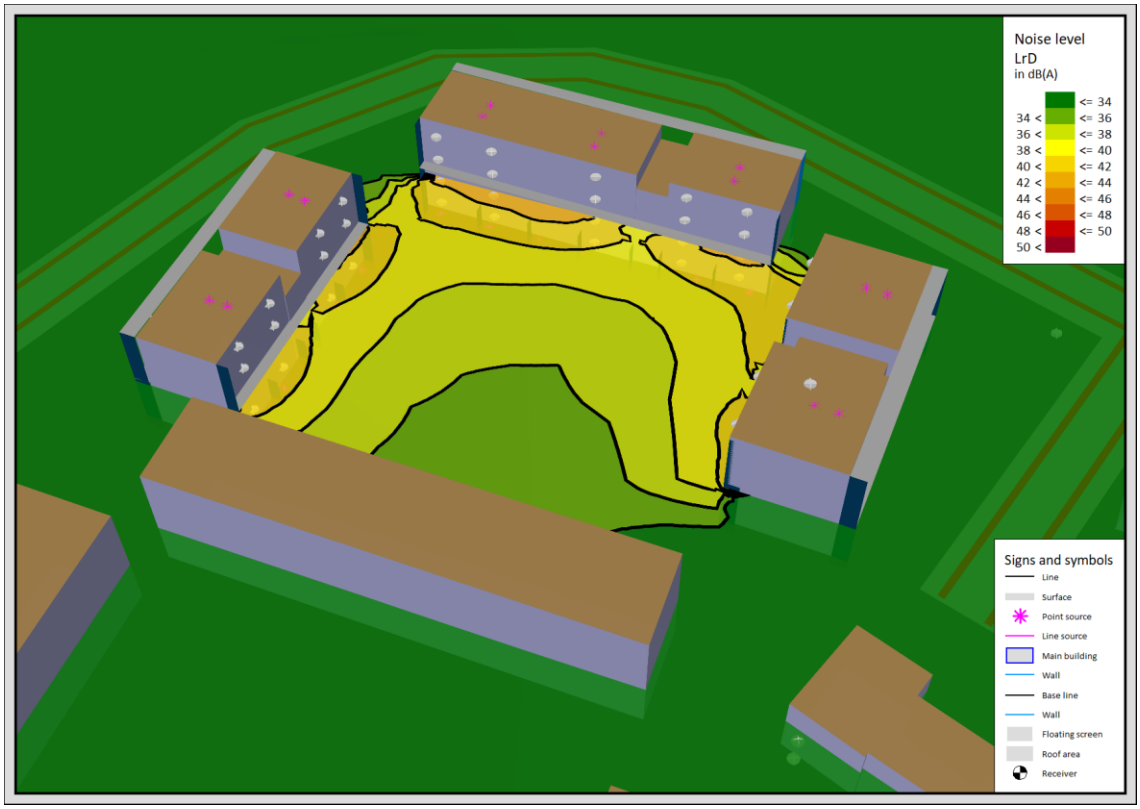

Figure 7 – GNM (4.5m height)

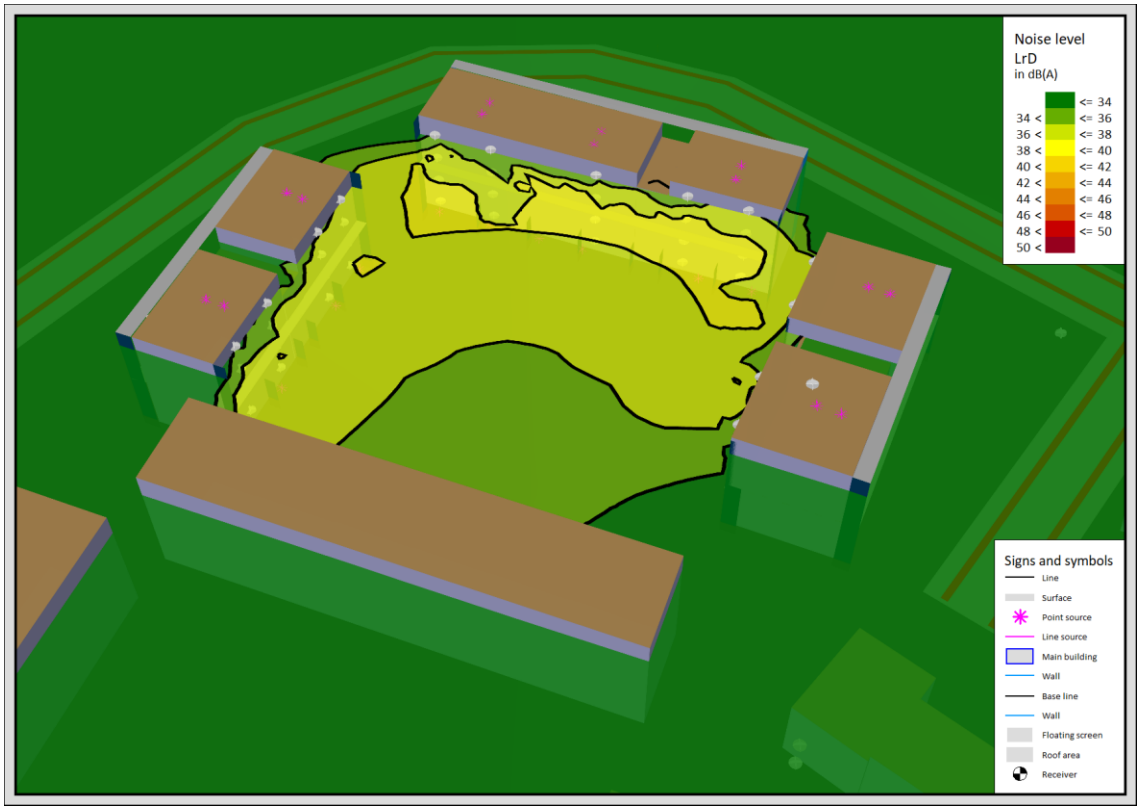

Figure 8 – GNM (9m height)

4.4 Assessment of Noise Levels against MCS 020a Limits

The predictions are based off a scenario in which the ASHPs are running at full capacity 24/7. If the ASHPs are running for a lesser amount of time (e.g. if restricted to predominantly the daytime hours only) the overall impact shall be less. Source receiver distances have been measured as the distance between the closest ASHP unit to each respective receptor.

4.4.1 On-site Receptors – Prior to Mitigation

The below table assesses the predicted noise levels for each on-site receptor location from SoundPLAN against the MCS 020a noise limit of ≤37.0dBA. The noise limit is applicable only for noise from a neighbouring ASHP on a receptor location and doesn't include noise from the receptors own ASHP.

Receptor Location	ASHP Location	Source – Receiver Distance (~m)	MCS 020a Noise Limit (dBA)	Predicted Noise Level (dBA)	Noise Level re. Noise Limit
Riverdale Maisonettes					
North Block					
No. 2 (GF)	No. 13	7	≤37	32.9	-4.1
No. 4 (GF)	No. 13	12	≤37	29.4	-7.6
No. 6 (GF)	No. 8	5	≤37	28.0	-9.0
No. 8 (GF)	No. 6	5	≤37	28.5	-8.5
No. 10 (1F)	No. 13	9	≤37	31.3	-5.7
No. 12 (1F)	No. 13	13	≤37	30.7	-6.3
No. 14 (1F)	No. 6	6	≤37	30.0	-7.0
No. 16 (1F)	No. 8	6	≤37	30.0	-7.0
West Block					
No. 13 (GF)	No. 15	6	≤37	35.9	-1.1
No. 15 (GF)	No. 13	6	≤37	35.0	-2.0
No. 17 (GF)	No. 19	4	≤37	37.3	+0.3
No. 19 (GF)	No. 17	4	≤37	38.5	+1.5
No. 21 (GF)	No. 19	5	≤37	37.2	+0.2
No. 23 (GF)	No. 21	5	≤37	36.8	-0.2
No. 25 (1F)	No. 4	13	≤37	28.7	-8.3
No. 27 (1F)	No. 4	17	≤37	28.5	-8.5
No. 29 (1F)	No. 37	25	≤37	25.4	-11.6
No. 31 (1F)	No. 37	23	≤37	26.8	-10.2
No. 33 (1F)	No. 37	20	≤37	34.4	-2.6
No. 35 (1F)	No. 39	23	≤37	23.6	-13.4
South Block					
No. 37 (GF)	No. 39	5	≤37	35.3	-1.7
No. 39 (GF)	No. 37	5	≤37	34.6	-2.4
No. 41 (GF)	No. 43	5	≤37	34.6	-2.4
No. 43 (GF)	No. 41	5	≤37	34.6	-2.4
No. 45 (1F)	No. 21	22	≤37	29.2	-7.8
No. 47 (1F)	No. 23	23	≤37	27.0	-10.0
No. 49 (1F)	No. 41	6	≤37	24.0	-13.0
No. 51 (1F)	No. 43	6	≤37	24.0	-13.0

Table 4 – MCS 020a assessment, on-site receptors – without mitigation

4.4.2 Off-site Receptors

For off-site receptors, the predicted noise level is the total accumulative noise level from every ASHP at the receptor being assessed. This predicted level has been assessed against the MCS 020a noise limit of ≤37.0dBA.

The worst-case level for each block has been used for assessment purposes.

Receptor Location	ASHP Location	Source – Receiver Distance (~m)	MCS 020a Noise Limit (dBA)	Predicted Noise Level (dBA)	Noise Level re. Noise Limit
Off-site Receptors					
105-115 Printon Avenue (1F)	No. 43	6	≤37	36.7	-0.3
84-94 Printon Avenue (2F)	No. 8	11	≤37	34.6	-2.4
93-106 Printon Avenue (2F)	No. 51	16	≤37	25.5	-11.5
Sowerby Walk (1F)	No. 39	16	≤37	25.9	-11.1
13 Riverdale Road (1F)	No. 16	27	≤37	21.7	-15.3

Table 5 – MCS 020a assessment, off-site receptors – prior to mitigation

5.0 Mitigation

5.1 Fin Walls

In order to ensure there are no exceedances of the MCS 020a noise limits, Azymuth would recommend the installation of 2.8m high fin walls to act as noise barriers in the locations shown below for the west and south blocks only.

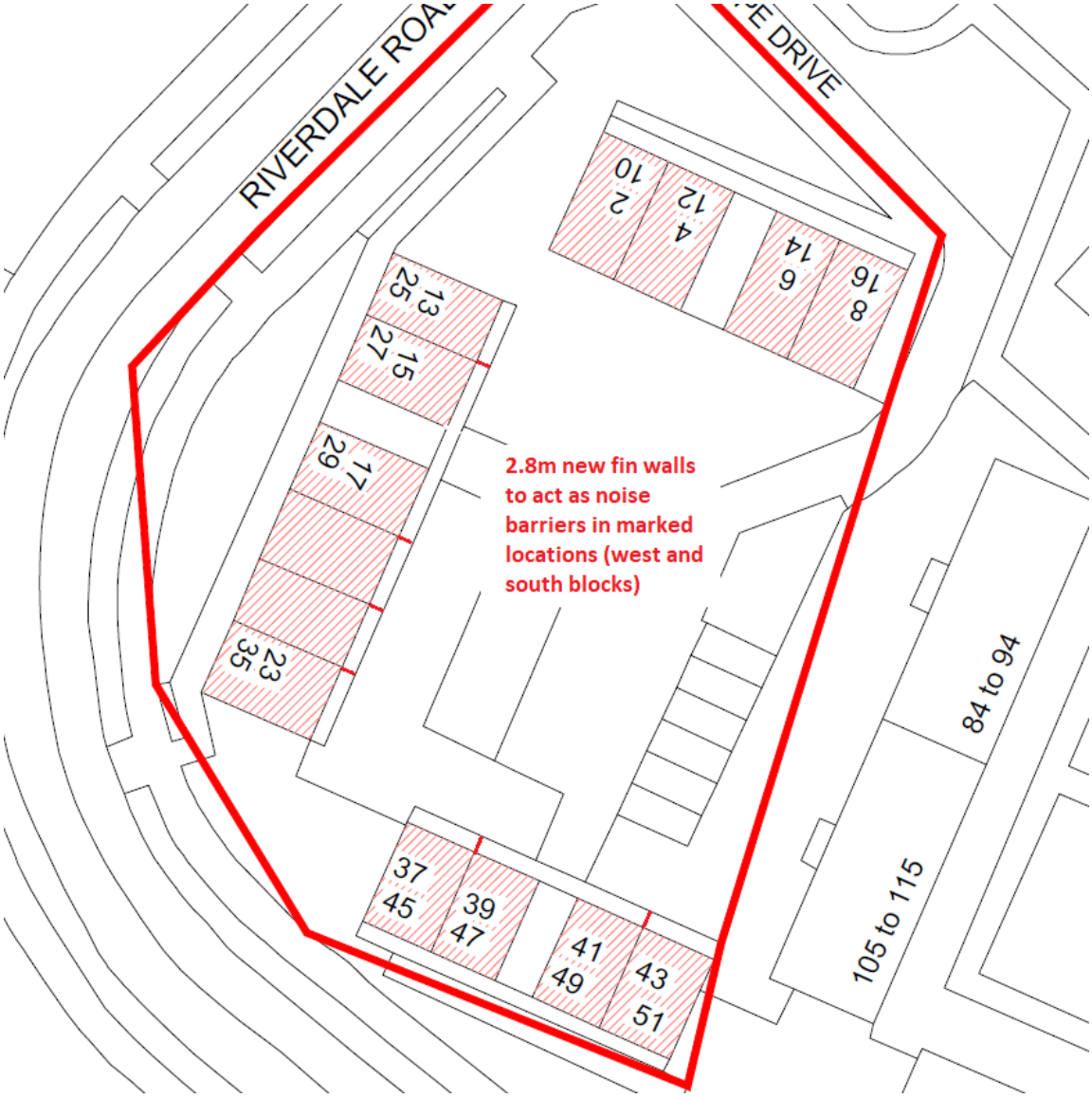

Figure 9 – Proposed locations of fin walls to act as noise barriers

The implementation of these noise barriers shall ensure that there are no noise impact both on and off-site.

6.0 Assessment of Noise Post Mitigation

6.1 Assessment of Noise Levels against MCS 020a Limits

Azymuth have produced the following assessment with the proposed fin walls/noise barriers in place.

The assessment methodology is the same as is contained in Section 4.0.

6.1.1 On-site Receptors – Post Mitigation

Receptor Location	ASHP Location	Source – Receiver Distance (~m)	MCS 020a Noise Limit (dBA)	Predicted Noise Level (dBA)	Noise Level re. Noise Limit
Riverdale Maisonettes					
North Block					
No. 2 (GF)	No. 4	5	≤37	28.4	-8.6
No. 4 (GF)	No. 13	12	≤37	29.4	-7.6
No. 6 (GF)	No. 8	5	≤37	28.0	-9.0
No. 8 (GF)	No. 6	5	≤37	28.5	-8.5
No. 10 (1F)	No. 25	13	≤37	26.2	-10.8
No. 12 (1F)	No. 13	13	≤37	29.8	-7.2
No. 14 (1F)	No. 13	20	≤37	25.5	-11.5
No. 16 (1F)	No. 8	6	≤37	25.5	-11.5
West Block					
No. 13 (GF)	No. 15	6	≤37	29.7	-7.3
No. 15 (GF)	No. 13	6	≤37	29.1	-7.9
No. 17 (GF)	No. 15	4	≤37	28.5	-8.5
No. 19 (GF)	No. 37	18	≤37	24.6	-12.4
No. 21 (GF)	No. 37	15	≤37	28.4	-8.6
No. 23 (GF)	No. 21	5	≤37	23.2	-13.8
No. 25 (1F)	No. 4	13	≤37	27.7	-9.3
No. 27 (1F)	No. 4	17	≤37	27.9	-9.1
No. 29 (1F)	No. 37	20	≤37	25.1	-11.9
No. 31 (1F)	No. 37	19	≤37	26.5	-10.5
No. 33 (1F)	No. 37	16	≤37	27.4	-9.6
No. 35 (1F)	No. 45	12	≤37	24.1	-12.9
South Block					
No. 37 (GF)	No. 21	5	≤37	27.1	-9.9
No. 39 (GF)	No. 41	5	≤37	28.7	-8.3
No. 41 (GF)	No. 39	5	≤37	29.1	-7.9
No. 43 (GF)	No. 41	5	≤37	22.5	-14.5
No. 45 (1F)	No. 21	22	≤37	26.4	-10.6
No. 47 (1F)	No. 23	23	≤37	27.3	-9.7
No. 49 (1F)	No. 21	28	≤37	23.3	-13.7
No. 51 (1F)	No. 49	5	≤37	23.2	-13.8

Table 6 – MCS 020a assessment, on-site receptors – with mitigation

6.1.2 Off-site Receptors

Receptor Location	ASHP Location	Source – Receiver Distance (~m)	MCS 020a Noise Limit (dBA)	Predicted Noise Level (dBA)	Noise Level re. Noise Limit
Off-site Receptors					
105-115 Printon Avenue (1F/2F)	No. 43	6	≤37	36.0	-1.0
84-94 Printon Avenue (2F)	No. 8	11	≤37	34.4	-2.6
93-106 Printon Avenue (2F)	No. 51	16	≤37	25.3	-11.7
Sowerby Walk (1F)	No. 39	16	≤37	25.5	-11.5
13 Riverdale Road (1F)	No. 16	27	≤37	21.3	-15.7

Table 7 – MCS 020a assessment, off-site receptors – with mitigation

6.1.3 Comments on Mitigation

As can be seen in Tables 6 and 7, the introduction of the 2.8m high fin walls/noise barriers result in noise levels compliant with the MCS 020a noise limits for both on and off-site receptors. For on-site receptors all of the predicted receptor noise levels are at least 7.2dB below the 37dBA noise limit, for off-site receptors noise levels are at least 1dB below the noise limit at the worst-affected receptor location.

7.0 Conclusions

Azymuth have been contracted by Manchester City Council (MCC) to perform a Noise Impact Assessment (NIA) in relation to 28no. proposed ASHPs units at 3no. blocks of maisonettes located on Riverdale Road, Higher Blackley. The purpose of this assessment was to reassess the accumulative noise levels produced by the ASHPs with 14no. units relocated to ground floor from the roof.

Azymuth have undertaken a baseline noise survey surrounding the site to measure the typical background sound level. The lowest average background sound level was measured to be 37.7dB L_{A90} during the daytime and 33.1dB L_{A90} during the night-time in the car park associated with the 3no. blocks.

After discussions with the MCC planning department the following noise limits were agreed:

For on-site receptors a noise limit of ≤37dBA from a neighbouring ASHP on an individual receptor location i.e. not inclusive of receptors own ASHP. For off-site receptors a noise limit of ≤37dBA from all ASHP units accumulatively. These noise limits have been derived from the MCS 020a document.

Azymuth have produced a SoundPLAN 9.1 noise model to predict and visualise the effect of ASHP noise on the surrounding environment.

It has been found that noise levels at each on-site receptor location are generally below the 37dBA noise limit, there are 3 instances of minor exceedances with the greatest being +1.5dB above the target (prior to adding mitigation measures).

For off-site receptors, predicted noise levels are all below the MCS 020a noise limit.

NB the assessment has been based on a scenario in which ASHPs are running at full capacity 24/7, the noise impact shall be less if ASHPs are running for a lesser amount of time e.g restricted to daytime hours.

Azymuth have proposed a mitigation strategy in the form of 2.8m high fin walls/noise barriers surrounding the inward facing ground floor ASHP units to the west and south blocks. The inclusion of these barriers shall ensure that the MCS 020a external noise limit is not exceeded for both on and off-site receptors.

Appendix A – Glossary of Acoustic Terms

Decibel (dB)
This is the unit used to measure sound. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro Pascal to 100 Pascal).

dB (A)
This is a measure of the overall noise level of sound across the audible spectrum with a frequency weighting (i.e. A-weighting) to compensate for the sensitivity of the human ear to sound of different frequencies. The A-weighting curve is implemented in sound level meters using an electronic filter that approximately corresponds to the frequency response of the ear.

Octave Band Noise Level
The human ear is sensitive to sound over a range of frequencies between approximately 20Hz to 20kHz. The ear is also generally more sensitive to medium and high frequencies than to low frequencies. In order to define the frequency content of a noise, the spectrum can be divided into frequency bands. The most commonly used frequency bands are octave bands, in which the mid-frequency of each band is twice that of the band below it.

L_{Aeq}
This is the equivalent steady sound level in dB(A) containing the same acoustic energy as the actual fluctuating sound level over a given time period.

Reverberation Time (RT or sometimes T_{30} or T_{60})
This is the time taken for the reverberant sound energy in an enclosure to decay one millionth of its equilibrium value, i.e. by 60dB, after the source has been switched off. The reverberation time is frequency dependent and it is customary to measure its value in octave or one-third octave bands. Reverberation occurs when sound waves are repeatedly reflected from each surface of the room.

Sound Reduction Index (SRI)
Difference measured between the amount of energy flowing towards the wall in the source room and the total amount of energy entering the receiving room (usual range 100 - 3150Hz for one third octave band values). The SRI varies with frequency and is measured in a laboratory in either octave or one-third octave bands.

SRI = L1 - L2 + 10 log (S/A), where:
L1 = Noise level in the source room
L2 = Noise levels in the receiving room
S = Surface area of test specimen
A = Equivalent acoustic absorption area in the receiving room

Weighted Sound Reduction Index (R_w)
This is a weighted single figure descriptor of the sound insulation performance of a partition measured under laboratory conditions. The procedure used to quantify the R_w is to compare the sound reduction index (SRI) in each of the one-third octave bands from 100Hz to 3150Hz against a set of standard reference curves.

Appendix B – Noise Survey Data

Start	Position	Time	L_{Amax}	L_{Aeq}	L_{A10}	L_{A50}	L_{A90}
Monday 8th July 2024							
09:48:00	1	00:05:00	71.5	53.2	55.5	44.7	36.8
09:53:00	1	00:05:00	74.7	55.1	56.7	42.8	35.2
09:58:00	1	00:05:00	75.5	54.1	55.4	43.8	36.2
10:03:00	1	00:05:00	70.2	47.4	47.9	39.8	35.7
10:08:00	2	00:05:00	70.5	42.3	39.9	34.9	32.6
10:13:00	2	00:05:00	79.6	51.4	49.4	42.1	35.3
10:29:00*	2	00:05:00	73.1	50.9	51.9	36.8	17
10:34:00	2	00:05:00	63.1	50.5	54.3	47.6	38.1
10:39:00	2	00:05:00	85.5	59.2	60.9	52.6	38.4
10:44:00	2	00:05:00	73.4	51.2	53.4	46.1	39.3
11:12:00	3	00:05:00	78.6	54.2	55.7	53.1	49.7
11:17:00	3	00:05:00	78.5	56.6	58.2	53.6	49.3
11:22:00	3	00:05:00	85.1	61.4	58.6	53.4	47.3
11:27:00	3	00:05:00	79.7	62.2	64.3	48.8	45.4
11:37:00	1	00:05:00	71	51.3	53.1	50.1	44
11:42:00	1	00:05:00	71.7	48.5	47.4	43.8	40.3
11:47:00	1	00:05:00	53.9	42.6	44.7	41.9	38.7
11:52:00	1	00:05:00	62.5	44.5	46.9	43.1	38.9
11:57:00	1	00:05:00	64	45	46.9	42.8	38.8
12:06:00	2	00:05:00	56.5	40.2	42.1	38	36.4
12:11:00	2	00:05:00	61.9	44.3	45.7	40.9	38.1
12:16:00	2	00:05:00	78.1	57.9	58.9	42.3	39.9
12:21:00	2	00:05:00	73.8	59.8	64.7	47.7	41.2
12:26:00	3	00:05:00	75.9	61.3	65.6	51.8	42.5
12:36:00	3	00:05:00	68.6	49.8	52.8	44.8	40.9
12:41:00	3	00:05:00	62.1	48.4	51.6	44.9	41.7
12:46:00	3	00:05:00	64.4	50.7	54.1	44.8	41.1
12:51:00	3	00:05:00	76.8	55.1	55.2	46.4	43.5
** Denotes invalid measurement, removed from averaging*							

Table B1 – Azymuth fully tabulated daytime noise measurement results

Start	Position	Time	L_{Amax}	L_{Aeq}	L_{A10}	L_{A50}	L_{A90}
Tuesday 16th July 2024							
23:06:00	1	00:05:00	60.8	38.4	39.2	37.3	36
23:11:00	1	00:05:00	57.4	41	43.2	38.1	36.5
23:16:00	1	00:05:00	49.6	39.5	41.5	38.5	36.4
23:21:00	1	00:05:00	60.8	41.8	44.6	38.2	36.6
23:26:00	1	00:05:00	55.3	41.6	43.6	39.1	37.5
23:33:00	2	00:05:00	46.1	36.9	38.4	35.8	34.4
23:38:00	2	00:05:00	50.8	36.7	38.9	34.5	33
23:43:00	2	00:05:00	40.2	34.1	35.7	33.5	32.2
23:48:00	2	00:05:00	43.5	34.6	36.2	34.1	32.6
23:53:00	2	00:05:00	49.3	38.2	41.3	35.9	33.4
Wednesday 17th July 2024							
00:01:00	3	00:05:00	75.7	55.4	50.2	37.5	35.5
00:06:00	3	00:05:00	48.8	37.9	38.6	36.6	35.4
00:11:00	3	00:05:00	52.3	40.4	41	38	36.4
00:16:00	3	00:05:00	40.2	37.3	38.3	37.1	36
00:21:00	3	00:05:00	55.9	41.8	46.1	38.1	36.2

Table B2 – Azymuth fully tabulated night-time noise measurement results