



Azymuth Acoustics UK

Professional Acoustic Services

Summary Acoustic and Planning Report

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**Apartments at
Whitehouse Club,
Middleton Road,
Manchester**

On behalf of

Branley Homes Limited,
York House,
1 Bridgenorth Avenue,
Urmston, M41 9PA



Azymuth Acoustics UK
Viridor House
No.3 Bolholt Terrace
Bury/Gtr Manchester
BL8 1PP

Tel: +44 (0)161-762 1055

Fax: +44 (0)161-761 1094

Matthew@acousticsuk.com



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Ref: Z54352.3	Signature:	Name:	Date:
Produced by:		Ollie Platts, BSc (Hons)	04/06/2024
Checked by:		Dominic McCann, BEng (Hons), MIOA, Director	11/06/2024
Approved by:		Matthew Gibson, BEng (Hons) CEng CEnv Director	11/06/2024

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1.0 Introduction

Azymuth Acoustics UK has been contracted by Branley Homes Limited to provide and acoustic design review of the residential development at the Whitehouse Club in Manchester.

This document sets out a summary of the main acoustic design parameters that have been selected for the building envelope in order to comply with the planning condition(s) relating to environmental noise across the site.

This summary document is based on an earlier noise survey carried out by Branley Homes Limited and on the target noise levels set out in the planning conditions.



Figure 1 – Site location plan for the apartment building

2.0 Planning Condition relating to Noise

Notwithstanding the Acoustic Planning Report received by the City Council, as Local Planning Authority on 12 July 2021, prior to the first occupation of a building within a phase of the development a scheme for acoustically insulating the proposed residential accommodation against noise from the local traffic network shall be submitted for approval in writing by the City Council, as Local Planning Authority. The approved noise insulation scheme shall be completed before the first occupation each building of the development.

Noise survey data must include measurements taken during a rush-hour period and night time to determine the appropriate sound insulation measures necessary. The following noise criteria will be required to be achieved:

Bedrooms (night time - 23.00 - 07.00) 30 dB L Aeq (individual noise events shall not exceed 45 dB L Amax,F by more than 15 times)

Living Rooms (daytime - 07.00 - 23.00) 35 dB L Aeq

Gardens and terraces (daytime) 55 dB L Aeq

3.0 Baseline Noise Surveys

3.1 Results of Y-Acoustics noise survey

The Y-Acoustics noise measurements were said to be carried out for 24 hours from 14th to the 15th February 2020 with the microphone located on top of the flat roof of the previous Whitehouse Club building (now demolished and replaced by a new building closer to the Middleton Road boundary). It would be noted that the measurement position used by Y-Acoustics will have been relatively exposed to noise from Middleton Rd (being on a flat roof with line of sight) whereas the site of the apartments is now partially screened by the newly built Whitehouse Club.



Figure 2 – Measurement position for Y acoustics.

The Y-Acoustics noise impact assessment summarised the results of their noise surveys as follows:

Location	Period	Octave band mid frequency in Hz							Global dBA
		63	125	250	500	1k	2k	4k	
P1	Daytime L _{Aeq, 16hr}	39	43	45	48	57	55	46	60
P1	Night time L _{Aeq, 16hr}	34	39	42	45	54	50	43	56

Table 1 - Y acoustics measurement results (dBA)

Y-acoustics also reported the highest L_{max} noise levels they recorded over the nighttime period of their noise survey, they found that the 10th highest L_{max} was 71dB.

3.2 Results of Azymuth Acoustics Noise Survey

3.2.1 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 15:18hrs and 16:47hrs on Friday 24th May 2024. The night-time measurements were undertaken between 23:11hrs and 23:31hrs on Wednesday 29th May 2024.

The noise measurements were undertaken using the sound level meter at the position(s) shown in Figure 3 below:

- Position 1: Rear of Whitehouse Club car park
- Position 2: Rear of Whitehouse Club car park
- Position 3: Counthill Drive



Figure 3 – Azymuth measurement positions

3.2.2 Summary of Azymuth Acoustics Measurements

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

The highest measured L_{Amax} value was 55.7dB and the duration of the night-time survey was exactly 20 minutes.

However, based on the night-time noise data it is estimated that the 10th highest L_{Amax} value over the entire 8hr night-time period is likely to be ranging between 63-66dB or slightly lower.



Location	Period	L _{AFmax}	L _{Aeq}	L _{A10}	L _{A50}	L _{A90}
Position 1	Day	71.1	59.4	58.3	50.2	45.6
Position 2	Day	69.8	56.6	54.9	47.7	44.0
Position 3	Night	55.7	44.9	46.4	44.0	42.5

Table 2- Summary of Azymuth Acoustics Noise measurements

Azymuth assumes that all noise levels measured on-site during the baseline noise survey are typical of the site. Full results of the noise levels recorded during the course of the survey are included in Appendix B of this report.

3.3 Description of Noise Climate

The noise climate is generally quiet for both daytime and night-time noise surveys with the main noise source being Middleton Road (the A576). In addition the Metrolink line which is located ~120m to the north of the site is just about audible but does not contribute in any discernible manner to the measured noise levels.

The weather during all measurements was dry with low windspeeds.

4.0 Summary of Building Envelope Acoustic Details

4.1 Glazing Specification

Azymuth Acoustics recommend the glazing specification to be 30dB Rw / 27dB Rw + Ctr. This can be achieved with 6/16/4mm or 6/16/6mm glazing types.

4.2 Acoustic Rating of Ventilation

The dwellings will be serviced via suitably designed MVHR ventilation systems. Hence trickle ventilation will not be required and it is likely that adequate background ventilation will be provided.



4.3 Other Elements of Building Envelope

Azymuth Acoustics have been provided with details of the external walls and roof construction (set out below) and these are deemed to fully satisfy the minimum requirements set out by Azymuth Acoustics.

Element	U-Value	Construction	Estimated Rw
External Walls	0.20 W/m ² K	102.5mm facing brick, 150mm clear cavity fully filled with 150mm supawall 36 or equivalent and 100mm internal black, with plasterboard on dabs internally.	>= 55dB Satisfactory
Roof (Flat)	0.14 W/m ² K	Flat Roofs are insulated with 170mm PIR or 300mm Mineral Wool to achieve the U-Value indicated opposite.	>=45dB Satisfactory

Table 3 – details of the main elements of the external building envelope

5.0 Assessment of Internal Noise Levels

5.1 Calculated Noise Break-in

Based on the results of these noise surveys (Y-acoustics and Azymuth Acoustics), the worst case environmental noise (60 dB L_{Aeq} daytime and 55 dB L_{Aeq} night-time on the eastern site boundary and the building envelope specifications set out above Azymuth has calculated noise break-in as:

- Daytime noise levels inside living rooms and kitchens = ~32dB L_{Aeq} (or less)
- Night-time noise levels inside bedrooms = ~ 17.1 based on AAUK data to 26.2dB L_{Aeq} based on Y-Acoustics data.
- The maximum night-time noise levels in the bedrooms are calculated to be in the range 37-40dB L_{Amax} for the 10th highest typical noise events.

The above noise levels would be applicable with the windows closed but with all ventilators open position in order to provide generally comfortable conditions.

5.2 Assessment Against Planning Conditions

Based on these calculated noise break-in levels the development will comfortably comply with the internal noise targets set out in the planning conditions.

Location	Noise limits	Calculated level	Compliance
Bedrooms (night time)	30dB L _{Aeq} 45dB L _{Amax}	17-27dB L _{Aeq} 37-40dB L _{Amax}	Complies
Living Rooms (daytime)	35dB L _{Aeq}	32dB L _{Aeq}	Complies
Gardens	55dB L _{Aeq}	Likely to be at or below 55dB L _{Aeq} in areas screened by the apartment building itself	Generally compliant, noise levels in garden areas will be similar to other gardens in surrounding streets

Table 4 – summary of noise assessment against planning conditions



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.

$SRI = L_1 - L_2 + 10 \log (S/A)$, where:

L_1 = Noise level in the source room

L_2 = 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	Duration	L _{Amax}	L _{Aeq}	L _{A1} 0	L _{A5} 0	L _{A9} 0
Friday 24 th May 2024							
15:18:00	1	5min	63.7	52	54.6	50	46.7
15:23:00	1	5min	75.6	54.3	55.8	50.8	45.9
15:28:00	1	5min	68.5	53.6	56.1	49	43.2
15:33:00	1	5min	69.3	56.8	60.9	51.1	46.3
15:38:00	1	5min	67.2	51.9	55	49.3	44.1
15:43:00	1	5min	60.1	51.1	54.4	49.2	45.5
16:07:00	1	5min	83.6	68.2	71.5	53.3	47.9
16:12:00	1	5min	69	58.4	62.2	55.8	49.1
16:17:00	1	5min	73.5	54.4	56.5	47.5	44.3
16:22:00	1	5min	72.7	57.7	59.8	51.8	47
16:27:00	1	5min	77.3	58.4	57.6	49.7	46.2
16:32:00	1	5min	72.8	52.8	55	44.8	40.6
15:49:00	2	5min	60.9	49.6	52.1	48.3	45.7
15:54:00	2	5min	77.7	55.5	52.4	47.3	43.4
15:58:00	2	5min	58.9	49.5	52.4	47.7	44.7
16:38:00	2	5min	72.3	51.4	52.7	43.9	40.4
16:43:00	2	5min	79.3	62.1	65	51.2	45.9
Wednesday 29 th May 2024							
23:11:00	3	5min	61	46.6	48.5	44.7	43.1
23:16:00	3	5min	52.2	44.2	45.8	43.7	42.1
23:21:00	3	5min	51.2	43.9	45	43.7	42.3
23:26:00	3	5min	58.3	44.5	46.2	43.7	42.3

Table B1 – Fully tabulated daytime noise measurement results