NOISE ASSESSMENT REPORT FOR A RESIDENTIAL DEVELOPMENT AT:

102 MANCHESTER ROAD, CHORLTON-CUM-HARDY, MANCHESTER

Report date: 7th November 2016

Contents:

1.0 Introduction 2
2.0 Baseline Noise Survey 2
2.1 Measurement Procedures 2
2.2 Summary of Measured Noise Levels 3
2.3 Description of the Noise Climate 3
3.0 Noise Assessment Criteria 4
3.1 National Planning Policy Framework 2012 4
3.2 Planning Policy Guidance Note PPG24 4
3.3 World Health Organisation 4
3.4 British Standard 8233:2014 5
3.5 Summary of Noise Assessment Criteria 5
4.0 Assessment of Noise Levels 6
4.1 Assessment of Noise Levels 6
5.0 Recommendations for Noise Mitigation 6
5.1 External Glazing Specifications 6
5.2 Other External Building Envelope 7
5.3 Ventilation 7
5.4 1st Floor Structure 7
6.0 Conclusions 9
Appendix A Glossary of Acoustic Terms 10
Appendix B Full Results of Noise Surveys 12

NOISE ASSESSMENT REPORT FOR A RESIDENTIAL DEVELOPMENT AT:

102 MANCHESTER ROAD, CHORLTON-CUM-HARDY, MANCHESTER

1.0 Introduction

Azymuth Acoustics is appointed by Newpark Commercial to provide an acoustic assessment at 102 Manchester Road, located in Chorlton-cum-Hardy. The proposed development involves conversion of the existing office building into residential apartments on the 1st and 2nd floor levels with commercial premises being proposed for the ground floor.

This report is intended to provide information relating to potential noise levels affecting the site as required by Manchester City Council in order to support a prior approval application for the residential conversion of the building. In particular the report sets out the following details:

- The results of a baseline noise survey undertaken at the proposed development site.
- The appropriate assessment criteria and guidance relating to noise in the environment as associated with this kind of development.
- An assessment of the appropriate level of protection against noise that should be provided as part of the development.

2.0 Baseline Noise Survey

2.1 Measurement Procedures

The instrumentation used for the environmental noise survey consisted of a SvanTek 959 Type 1 precision sound level meter (ser. # 12976, cal. #14981/2016) and a 01dB Cal 01 SL sound calibrator (ser. # 990492, cal. #14980/2016.) The sound level meter was set to record noise levels a number of times over a nominal sample time of between 5 and 30 minutes. The equipment was calibrated before and after the noise measurements. Weather at the time of survey was clear with low wind speeds.

Dominic McCann undertook the noise measurements on 22nd / 23rd September, 17th October and 20th October 2016; the sound level meter was positioned at the following measurement locations on the site:

Measurement Location	Description
1	Outside 102 Manchester Road; approx. 4.5m from edge of road and approx. 2m from building façade
2	In car park to the rear of 102 Manchester Road (ie facing onto Albany Road)

Table 1: Summary of external noise measurement positions, 102 Manchester Road



Figure 1: Noise measurement positions marked in red on location plan

2.2 Summary of Measured Noise Levels

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

The following table summarises the results of the noise measurements undertaken around the proposed site in terms of the average daytime (07:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) statistical noise levels.

Position	Period	L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	NEC*
1	Day	81.4	70.7	73.8	61.9	C
1	Night	81.2	65.9	69.0	44.0	C / D
2	Day	70.8	56.1	58.8	49.8	B
2	Night	61.1	47.7	50.9	39.3	B

Table 2: Summary of Noise Survey Results (dBA)
* Noise Exposure Category as relates PPG24 (now withdrawn, see below)

2.3 Description of the Noise Climate

The noise climate along Manchester Road elevation is dominated by road traffic during both day and night time periods. Manchester Road is a moderately busy route connecting Chorlton-cum-Hardy with the wider road network and on into Hulme and Manchester city centre. Manchester Road is also a relatively busy bus route and traffic also generally comprises a mix of cars, vans and other commercial vehicles.

A Metrolink light rail route runs to the east of the site at a distance of approx. 75m. This lines carries trams from Manchester city centre towards Chorlton, East Didsbury and

Manchester airport. Noise levels from the trams using the line are low but nevertheless are occasionally audible on the Albany Road elevation of the building.

Albany Road itself is a relatively quiet street with only occasional vehicle movements contributing to the noise levels. This includes occasional vehicle movements and deliveries to the Unicorn Grocery store at the end of Albany Road approx. 30m from the proposed development.

3.0 Noise 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 has reviewed various guidance documents and standards, these include:

- National Planning Policy Framework (NPPF) 2012
- PPG24 - Planning and Noise (now withdrawn)
- World Health Organisation Guidance
- British Standard 8233:2014

3.1 National Planning Policy Framework 2012

The NPPF provides guidance to local authorities taking into account noise in making planning decisions. Paragraph 123 of the National Planning Policy Framework (NPPF) states that planning polices and decisions should aim to:

- Avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions

The National Planning Policy Framework states that the planning system should ‘prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability’.

3.2 Planning Policy Guidance Note PPG24

PPG24 has now been withdrawn but does provide specific guidance on acoustic assessment and design criteria for residential developments which is not provided in the current NPPF document. PPG24 sets out government guidance on the use of planning powers by local authorities in order to minimise the adverse effects of noise in the built environment.

In particular, PPG establishes Noise Exposure Categories that are applicable in the case of new residential developments affected by transport noise or by mixed noise sources in which industrial noise does not dominate.

3.3 World Health Organisation

In 1980 the World Health Organisation proposed environmental health criteria for community noise including consideration of noise levels at which sleep disturbance may take place. These guidelines were amended by the World Health Organisation in 1999. The guidance suggests that an internal L_{Aeq} below 30 dB is required to fully preserve the restorative process of sleep.

3.4 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 criteria / limits for a variety of different situations including residential properties.

The following table summarises the noise limits suggested by BS 8233:2014 applying to residential properties.

Room Type	Noise limit 07:00-23:00 $L_{Aeq,16hr}$	Noise limit 23:00-07:00 $L_{Aeq,8hr}$
Living Room	35	-
Dining Room	40	-
Bedroom	35	30

Table 3: Noise Limits for Residential Properties Suggested in BS 8233:2014

3.5 Summary of Noise Assessment Criteria

Based on the guidance outlined above, Azymuth Acoustics has carried out a noise assessment with the primary aim of providing satisfactory conditions inside the apartments. The recommended criteria can be summarised as follows:

- Daytime noise levels not to exceed 35dB $L_{Aeq, 16hr}$ in living rooms
- Daytime noise levels not to exceed 40dB $L_{Aeq, 16hr}$ in dining rooms
- Noise levels in bedrooms not to exceed 35dB $L_{Aeq, 16hr}$ for daytime periods
- Night-time noise levels in bedrooms not to exceed 30dB $L_{Aeq, 8hr}$

It is important to note that in both cases the noise levels detailed above should be deemed to apply with windows closed but with passive ventilators open.

4.0 Assessment of Noise Levels

4.1 Assessment of Noise Levels

Measured noise levels on the Manchester Road elevation are in the range 69 – 71dB $L_{Aeq,30\ min}$ for daytime periods and 57 – 67 dB $L_{Aeq,30\ min}$ for night time periods.

Daytime free-field noise levels at locations along Albany Road (rear elevation of proposed apartment building) are generally significantly lower in the range 54 – 57dB $L_{Aeq,\ 5\ min}$.

The measured noise levels suggest that noise mitigation measures will be required to provide suitable acoustic conditions inside the residential apartments.

On the basis of the measured noise levels it is estimated that an overall noise reduction of approx. 36dB will be required in order to achieve satisfactory conditions inside residences facing onto Manchester Road and approx. 24-25dB for rooms facing solely onto Albany Road.

5.0 Recommendations for Noise Mitigation

This section sets out the recommended minimum noise mitigation measures required in order to satisfy noise assessment criteria and ensure satisfactory noise conditions inside the apartments.

Potential issues relating to noise can be summarised as follows:

- Break in due to road traffic, external passer-by noise etc on Manchester Road.
- Break in due to tram noise, deliveries to Unicorn Grocery store and general traffic on the Albany Road elevation.
- Noise break-through via the separating floor between the proposed commercial premises and the 1st floor apartments.

5.1 External Glazing Specifications

The recommended specification for the glazing to apartments is summarised in Table 4 below.

Location	Glazing Specifications (overall to include frame)	Proposed Glazing Types
Windows of habitable rooms facing (or with line of sight) onto Manchester Road	Airborne sound insulation R_W 38dB	Windows replaced with high quality acoustic double glazing (eg 4/12/11mm glass) in a well sealed frame.
Windows facing onto Albany Road only	Airborne sound insulation R_W 32dB	New or refurbished windows to provide an airtight seal, glass good quality thermal double glazing (eg 4/12/4mm).

Table 4: Recommended glazing specifications for the apartment development

5.2 Other External Building Envelope

Other elements of the building envelope should have the following minimum sound insulation performance:

- External Walls: minimum sound insulation R_W 50dB. This minimum is likely to be significantly exceeded by the existing masonry building structures, but may require the replacement of the composite cladding below each window.
- Roof: minimum sound insulation R_W 45dB. This minimum is likely to be exceeded by the existing building structure with the addition of thermal insulation and internal plasterboard ceilings.

5.3 Ventilation

Inhabitants of bedrooms and living rooms with an aspect onto Manchester Road should not rely solely on opening windows for enhanced background ventilation.

Some form of additional ventilation method should be provided to these rooms to preclude or minimise the need for opening windows for enhanced background ventilation in periods of warm weather.

Where trickle ventilation is required through window frames this should be acoustically rated to achieve min. $D_{n,e,w}$ 41dBA.

5.4 1st Floor Structure

Azymuth Acoustics carried out a baseline sound insulation test to the existing 1st floor between existing ground and 1st floor office accommodation.

The existing 1st floor / ground floor ceiling comprises of the original structure which is deemed to consist of a cast in situ concrete floor (probably 150-200mm thickness) with a mineral fibre suspended ceiling tile below.

The result of the test is summarised in the following table, in addition a graphical representation of the test result is presented in Appendix B5 of this document.

Test	Source room	Receiver room	Measured D_{nTw}	Measured $D_{nTw+Ctr}$
1	Ground floor office	1st floor office	57dB	53dB

Table 5: Summary of sound insulation test result, existing first floor

While the test result indicates the floor would currently comply with the minimum requirements of Part E Building Regulations between dwellings, the potential noise levels in the ground floor units means the floor will need to perform significantly better than at present to achieve compliance with targets in Section 3.5.

Manchester City Council guidance stipulates that internal noise levels should not exceed 47dB and 41dB in the 63Hz and 125Hz octave bands respectively inside dwellings due to

entertainment noise. As such, remedial work may be required in order to sufficiently mitigate low frequency sound break-through.

It is understood that a variety of proposed commercial operations are possible within the ground floor retail / commercial units, ie below new apartments.

Assuming that the commercial premises could potentially accommodate a restaurant or licensed café with opening hours to 23:00hrs. Using this type of accommodation as the potential noise source on the ground floor then significant up-rating will be in order to provide sufficient mitigation of noise from these premises to the 1st floor apartments. The up-rating work should be carried out to the ceiling within the ground floor space rather than at 1st floor level where mitigation would be more of a challenge e.g. potential problem of creating steps, lowered door heights etc.

The following additional build-up would be recommended as a minimum upgrade to between ground and 1st floor:

- Make good any penetrations through the existing concrete floor.
- New independent secondary (timber or metal frame) acoustic ceiling suspended on sprung / acoustic resilient hangers to create a minimum 250mm void below existing.
- 100mm mineral wool quilt within new ceiling void
- 2 no. layers of 12.5mm BG Soundbloc or equal approved plasterboard fixed to new suspended frame, joints staggered. Any gaps around perimeter etc. sealed with flexible mastic. **There must be no significant penetrations through this ceiling**
- If recessed lighting / ceiling cassette ventilation etc. is required then an additional cosmetic ceiling should be installed below the acoustic ceiling.

It is anticipated that the additional construction details outlined above would result in an improvement of between 10 to 13 dB in the performance of the separating floor.

Recommended Noise limit on ground floor	Floor / Ceiling Structure	Sound Insulation Provided		
		D_{nTw}	D_{125Hz}	$D_{nTw+Ctr}$
82dBA	Test result between Ground floor office and1st floor office	Measured 57dB	Measured 43dB	Measured 53dB
90dBA	Uprate ceiling / floor construction (see above for details)	Estimated 66-70dB	Estimated 52-54dB	Estimated 60-63dB

Table 5: Summary of sound insulation test result, existing first floor

It will be important to ensure that noise levels in the commercial units does not generally exceed the 90dBA set out above. Where leisure premises are proposed this can be enforced (where appropriate) through the use of an electronic noise limiting unit in the sound system used in the premises.

6.0 Conclusions

Azymuth Acoustics has undertaken an environmental noise assessment of the proposed apartment development at 102 Manchester Road, located in Chorlton-cum-Hardy in Manchester.

Noise levels along Manchester Road are typically 69 – 71dB $L_{Aeq,30\ min}$ for daytime periods and 57 – 67 dB $L_{Aeq,5\ min}$ for night time periods. The rear elevation facing onto Albany Road is somewhat quieter with daytime noise levels in the range 54 – 57dB $L_{Aeq,\ 5\ min}$.

As such it would be recommended that the development be protected by noise mitigation measures including:

- R_w38dB (R_W + C_{tr} 34dB) glazing to all bedrooms and living rooms facing onto or with line of sight to Manchester Road.
- Enhanced background ventilation to all bedrooms / living rooms with an aspect facing Manchester Road to preclude the need to open windows for ventilation in periods of warm weather.
- Good quality thermal double glazing for the Albany Road elevation.
- Adequate sound insulation for the façade and roofing elements of the building.
- Upgrading of the separating ceiling between the proposed ground floor commercial premises and the 1st floor apartment accommodation (target D_{nTw} + C_{tr} 60 dB or better). A noise limit of 90dBA would be appropriate for the general operation of the ground floor commercial units.

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 20 Hz to 20 kHz. 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.

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 flowing towards the wall in the source room and the total amount of energy entering the receiving room (usual range 100 - 3150 Hz 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.

Vibration Dose Value (VDV)

VDV is defined in BS6472: 1992 and is calculated by taking the fourth root of the integral (with respect to time) of the fourth power of acceleration after it has been frequency-weighted, ie VDV takes account of both the spectral and the time domain characteristics of the vibration. The frequency-weighted acceleration is measured in m/s^2 and the time period over which the VDV is measured is in seconds. This yields VDVs in $m/s^{1.75}$.

Appendix B

Full Results of Noise Surveys

Start	Location	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}	63	125	250	500	1k	2k	4k	8k	16k	Total dBA
11:22	1	5min	80	70.6	77.1	74.2	60.4	73.4	69.4	67.9	65.9	67.8	62.8	54.7	47.3	39	70.6
11:27	1	5min	80.2	70.3	77.6	73.9	60.5	70.9	68.6	67.3	65.1	68	62.1	53.3	46.5	35.4	70.3
11:32	1	5min	78.8	70.6	76.7	73.8	63.1	71	70.3	67.3	65.4	68.2	62.5	53.7	46	34.7	70.6
11:37	1	5min	82	71.6	77.9	74.8	64	72.1	69.9	68.6	67	69.1	63.6	54.3	47.4	38.9	71.6
11:42	1	5min	79.5	70.4	76.2	73.9	63.6	69.7	67.3	66.6	65.2	68.3	62.1	52.5	44.8	36.9	70.4
11:47	1	5min	78.1	69.4	75.9	72.8	61.1	72.5	69.7	67.5	65	66.7	61.1	52.7	46	38.5	69.4
11:52	1	4min	87.7	71.6	81	74.1	63.2	72.9	68.6	70.1	68	68.3	63.5	58.2	50.5	39.2	71.7
11:58	2	5min	76.4	57.6	69.5	59.2	48.2	62.6	52.6	50.4	48	51	52.4	50.3	48.2	42.4	57.6
12:04	2	5min	69.9	56.1	64.2	58.9	51.3	66.2	54.5	51	50.3	52.2	48.7	43.1	47.7	25	56.1
12:09	2	5min	70.8	54.8	62.8	58	50	63.9	55.5	52.2	50.7	51.5	47	41.7	35.1	25.9	54.8
12:14	2	5min	70.8	56.3	65.5	59.8	48.1	66.1	56.4	52.7	51.9	52.8	49.1	43.8	40.7	33	56.3
12:19	2	2.5min	64	54	61.4	57	49.7	63.7	53.9	49.7	49	50.9	46.6	41.6	35.5	26.9	54
13:03	2	5min	74.1	55.3	62.2	57.9	49.4	65.1	52.8	50.5	49.9	52	48.4	44.2	33	22.8	55.3
13:08	2	5min	69.5	57.6	63.7	60.7	51.6	66.6	56.2	53	53.4	54.3	50.2	44.7	38.1	27.7	57.6
23:46	1	5min	78.9	67.6	76.4	71.9	53	67.7	65.4	64	62.6	65.3	59.2	51.6	47.7	37.9	67.6
23:51	1	5min	87.5	67.8	77.1	72	47.3	67.1	64.4	62.1	62.1	65.7	59.7	52.7	42.3	28.7	67.8
23:56	1	5min	86.3	67.7	77	71.9	46.4	69.4	69.9	64.7	64.9	65.1	58.2	47.4	37.7	26.8	67.7
00:01	1	5min	76.7	65.9	75	71.2	48.1	62.5	62	61.4	60.4	64	57.7	47.6	38.7	31.7	65.9
00:06	1	5min	80	66.9	76.8	72	46.6	62	61.5	61.7	61.4	64.9	58.9	48.1	38	25.5	66.9
00:11	1	5min	79.4	67.2	77	72	50	64.5	62.7	62.7	61.6	65.1	59.1	48.5	38.8	25.5	67.2
00:16	1	5min	83.9	68.8	78.7	72.9	51.6	63.7	62.5	63.6	63.4	67	60.4	49.6	40	26.8	68.8
00:22	1	5min	79.9	66.3	76.5	70.9	47	63.5	62.9	61.9	60.9	64.3	58.2	48.3	38.9	25.5	66.3
00:27	1	5min	83.2	69.1	78.1	73.1	54	67.6	65	65.5	64.3	66.8	60.9	51.2	41.8	29.7	69.1

Appendix B1: Full results of noise survey 22-23/09/16, 102 Manchester Road, Chorlton (dB, fast response time)

Start	Location	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}	63	125	250	500	1k	2k	4k	8k	16k	Total dBA
12:30	1	5min	95.5	73.1	82.8	73.9	62	71.6	67.9	66.6	65.2	68.8	67.9	63.8	48.1	36.2	73.1
12:35	1	5min	78.3	69.9	76.5	73.3	61.4	70.1	67.4	66.1	64.5	67.7	61.8	52.5	44.2	32.9	69.9
12:40	1	5min	79.2	70.4	77.6	73.9	63.2	72.7	67.9	66.9	65.4	68	62.4	54.6	46.2	34.4	70.4
12:45	1	5min	80.8	70.3	76.6	73.7	61.6	70	66.7	66.1	64.8	68.2	62.4	52.2	43.3	32.8	70.3
12:50	1	5min	79.8	69.9	77.6	73.3	60.9	71.1	66.8	66.2	64.9	67.5	62.1	53.6	47	33.7	69.9
12:55	1	5min	83.8	71	79	74.2	61.4	71.5	68.6	67.6	66.8	68.4	62.8	54.1	45.8	34	71
13:00	1	5min	79	69.6	77	73.1	60	73.9	69	66.4	65	67	61.6	53.7	45.9	46.9	69.6
13:05	1	5min	80.8	70.9	77.8	74.4	62.3	71.3	67.2	66.9	65.8	68.6	62.7	53.6	45	34.7	70.9
13:10	1	2min43	78.5	70	76.5	73	62.1	70.2	67	66	64.7	68	61.8	52.3	43.5	45.2	70

Appendix B2: Full results of noise survey 17/10/16, 102 Manchester Road, Chorlton (dB, fast response time)

Start	Location	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A90}	63	125	250	500	1k	2k	4k	8k	16k	Total dBA
00:17	2	5min	65.1	49.1	58.2	51.7	41	53.2	47.4	44.1	43.8	47.4	40.4	28.2	17.6	13.9	49.1
00:22	2	5min	55.4	45.3	52	49.4	38.9	53.8	45.5	42.2	41	42.6	37.3	26.1	16	13.7	45.3
00:27	2	5min	62.5	49.3	60.6	52.1	40.8	53	46.1	42.8	42.2	47.8	41.4	28.2	16.5	13.7	49.4
00:32	2	5min	58.5	46.9	56	51.1	38.6	51.4	46.2	41.9	40.9	45.1	38.8	25.7	15.1	13.7	46.9
00:37	2	5min	64.9	47.5	58.4	50.7	38.4	52.2	46.5	42.8	41.5	45.6	39.1	26.6	15.9	13.7	47.5
00:42	2	5min	60	46.8	57.9	50.5	38.2	55.2	46.9	43.8	42.1	44.7	37.1	27.4	18.5	14.5	46.8
00:51	1	5min	82.7	66	77.6	69.8	40.4	63.7	62.1	61.5	59.1	64.2	57.8	45.7	34.2	22.1	66
00:56	1	5min	80.1	66.4	77.3	71.2	44.6	66	64.3	60.9	60.5	64.5	58.4	47.6	37.3	24.3	66.4
01:01	1	5min	90	67.2	77.5	69.5	41.8	64.8	65.8	63.7	63.8	64.3	59	50.6	41.6	29.2	67.2
01:06	1	5min	87.4	67.1	79.2	69.9	39.2	65.2	60.5	61.3	60.3	65.5	58.8	47.3	36.7	23.2	67.1
01:11	1	5min	82	67.4	78.4	71.5	42.5	75.3	64.9	63.5	62.6	65	59.2	49.6	40.9	34.1	67.4
01:16	1	5min	78.4	64.1	74.8	69.2	40.9	62.2	58.4	59	57.7	62.2	56.3	45.1	35.4	23.3	64.1
01:21	1	5min	80	59.9	71.8	62.8	37.9	56.8	54.2	54.6	53.1	58.2	52	40.3	29.8	18.3	60
01:26	1	5min	78.4	58.5	72.9	56.5	37.3	54.1	51.8	51.9	51.9	56.7	50.9	38.7	27.8	17.3	58.5
01:31	1	5min	77	63.8	74.8	69	38.3	65.4	60.6	59.4	58	61.8	55.5	46.5	36.2	22.8	63.8
01:36	1	5min	76.1	57.3	71.6	57.2	36.3	57.3	51.7	53	51.4	55.6	48.6	36.9	26.3	16.7	57.3
01:41	1	4min20	75.6	61.3	72.8	65.8	36.8	58.7	57.8	57	55.5	59.3	53.2	42.3	32.1	24.4	61.3

Appendix B3: Full results of noise survey 20/10/16, 102 Manchester Road, Chorlton (dB, fast response time)

Standardised level difference according to ISO 140-4
Field measurements of airborne sound insulation between rooms

Client:	Newpark Commercial	Project:	102 Manchester Road
Test number:	01	ANC test ref:	01
Source room:	Ground floor	Receiver room:	1st floor office

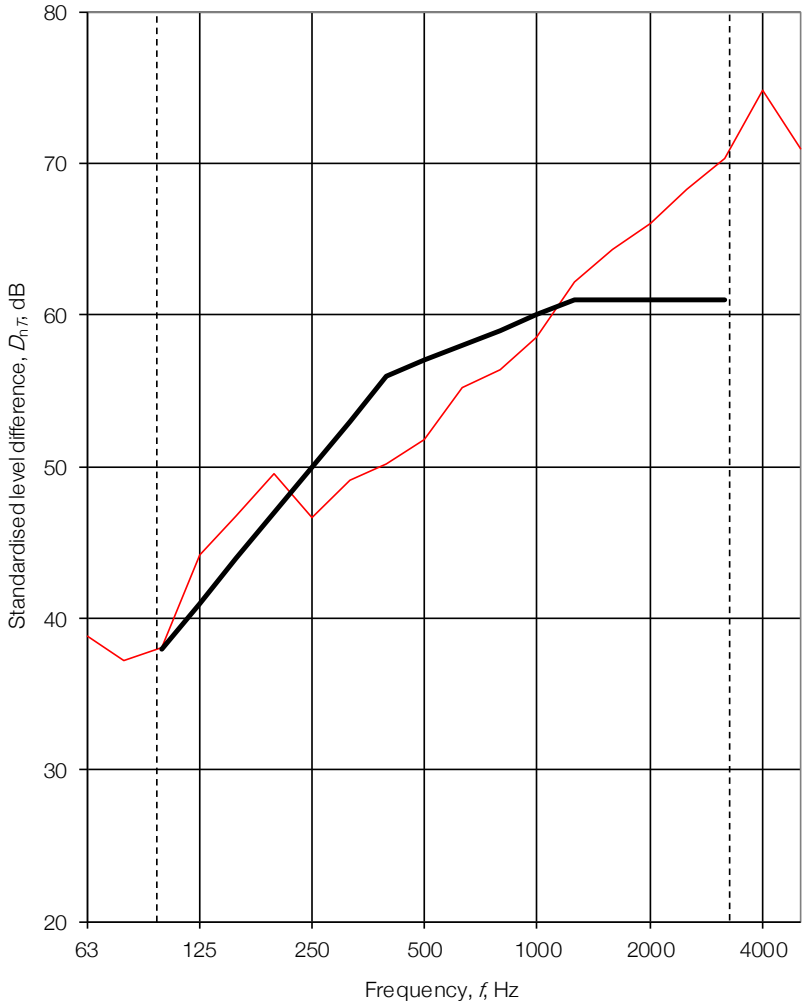
Description and identification of the building construction and test arrangement, direction of measurement:

See report

Source room volume: m^3
Receiving room volume: m^3

---- Frequency range according to the
——— curve of reference values (ISO 717-1)

Frequency f Hz	D_{nT} (1/3 octave) dB	
50	> 35.7	**
63	> 38.8	**
80	37.2	
100	38.1	
125	44.1	
160	46.8	
200	49.6	
250	46.6	
315	49.1	
400	50.2	
500	51.8	
630	55.2	
800	56.4	
1000	58.5	
1250	62.2	
1600	> 64.3	*
2000	> 66.1	*
2500	> 68.3	*
3150	> 70.3	*
4000	> 74.8	**
5000	> 70.9	**



Rating according to ISO 717-1

** measurement significantly affected by ambient / activity noise
* measurement partially affected by ambient / activity noise

$D_{nT,w}(C;C_{tr})$ = 57 (-1; -4) dB; $C_{50\text{-}3150}$= -1 dB; $C_{50\text{-}5000}$= 0 dB; $C_{100\text{-}5000}$= 0 dB

$C_{tr,50\text{-}3150}$= -6 dB; $C_{tr,50\text{-}5000}$= -6 dB; $C_{tr,100\text{-}5000}$= -4 dB

Evaluation based on field measurement results obtained by an engineering method

Test date:	22-Sep-16	Name of test institute:	Azymuth Acoustics
No. of test report:	A1749		
Report date:	20-Oct-16	Signature:	