Azymuth Acoustics UK

Professional Acoustic Services

Approved by: Matthew Gibson
Date: 31/10/2018

Environmental Noise Report
Ref: AA0126

Proposed Residential Apartment Development

Former Kirklees College Buildings
New North Road / Highfields Road
Huddersfield HD1 5LS

For

San Pedro Properties Ltd
St George's House
Village Street
Norwood Green
Halifax HX3 8QG



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Contents

1.0 Introduction

Azymuth Acoustics UK is appointed by San Pedro Properties Ltd to provide a Noise Impact Assessment of a proposed residential and retail development at New North Road, Huddersfield.

The development site is bounded by New North Road and Highfields Road. The project involves the conversion of a set of buildings that were previously occupied by Kirklees College into 33 apartments.

This report is intended to provide information relating to potential noise levels affecting the site as required by Kirklees Council to support the detailed planning application. 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 and the level of noise control that is deemed to be appropriate in order to protect the future residents of the proposed dwellings.
- Guide noise limits for any external mechanical plant installed as part of the development.

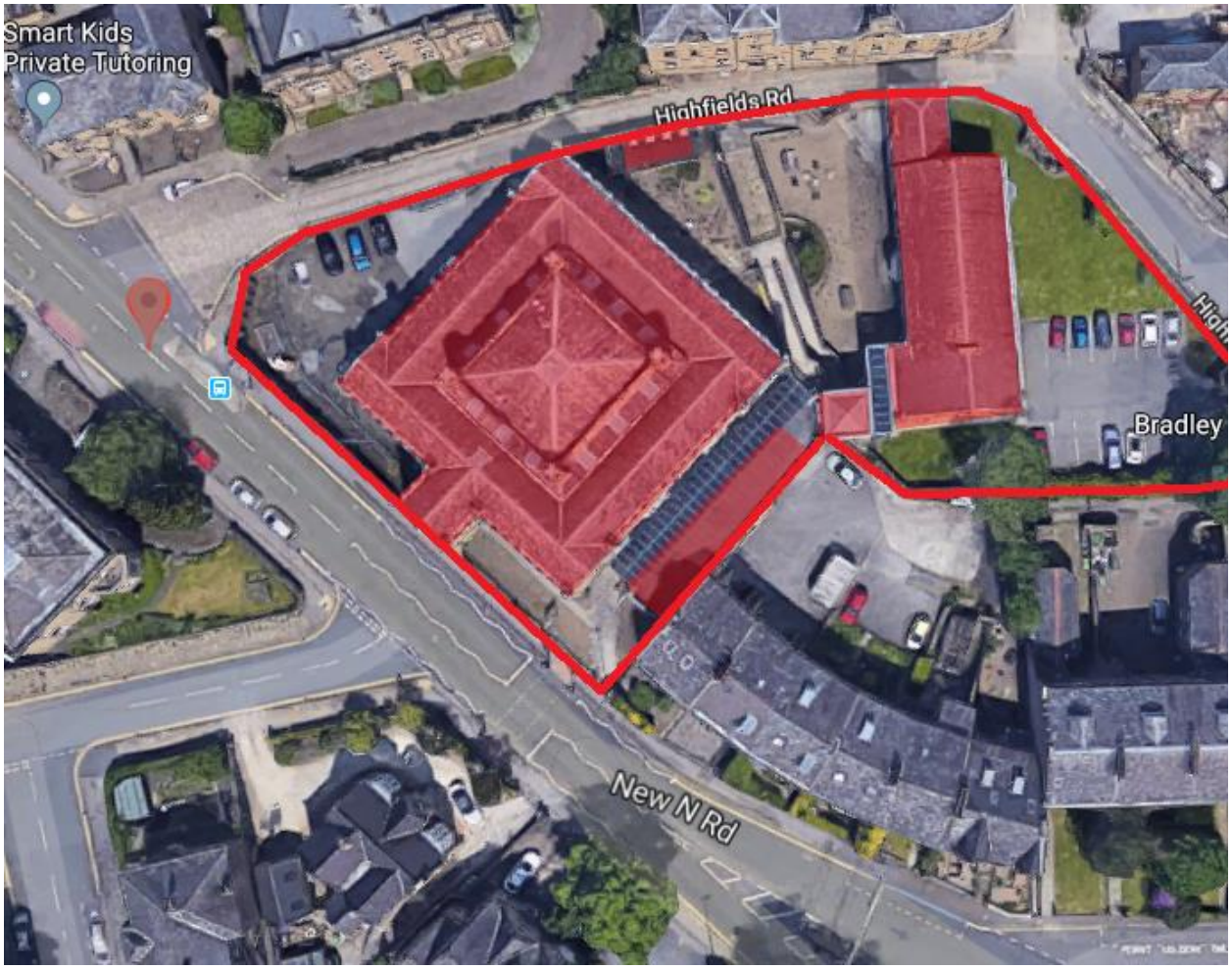

Figure 1: Aerial photograph indicating site boundaries (marked in red)

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 and 01dB calibrator. The meter was calibrated before and after the noise measurements. The sound level meter records A-weighted (fast response) noise levels as well as octave band data for all measurements recorded.

The survey was completed in two stages; the first stage being undertaken with a fixed noise monitoring position (at position 1) covering a period between 12:15hrs on Monday 20th August – 13:45hrs on Tuesday 21st August 2018.

Additional sampled noise measurements were made at positions 2 to 4 which were undertaken on Wednesday 22nd August 2018 between 11:05 – 12:41hrs.

The ambient noise measurements were undertaken using the sound level meter microphone at the locations shown in Figure 1 below.

The sound level meter was positioned at the following measurement locations on the site:

- Position 1: Fixed measurement position outside 1st floor window on New North Road elevation nominally 7m from edge of road.
- Position 2: On-site at location between Highfields Road and New North Road (approx. 18m from main road).
- Position 3: New North Rd, meter just within boundary on site at ≈3.5m unscreened road.
- Position 4: Highfields Rd, close to car park, screened from New North Road.

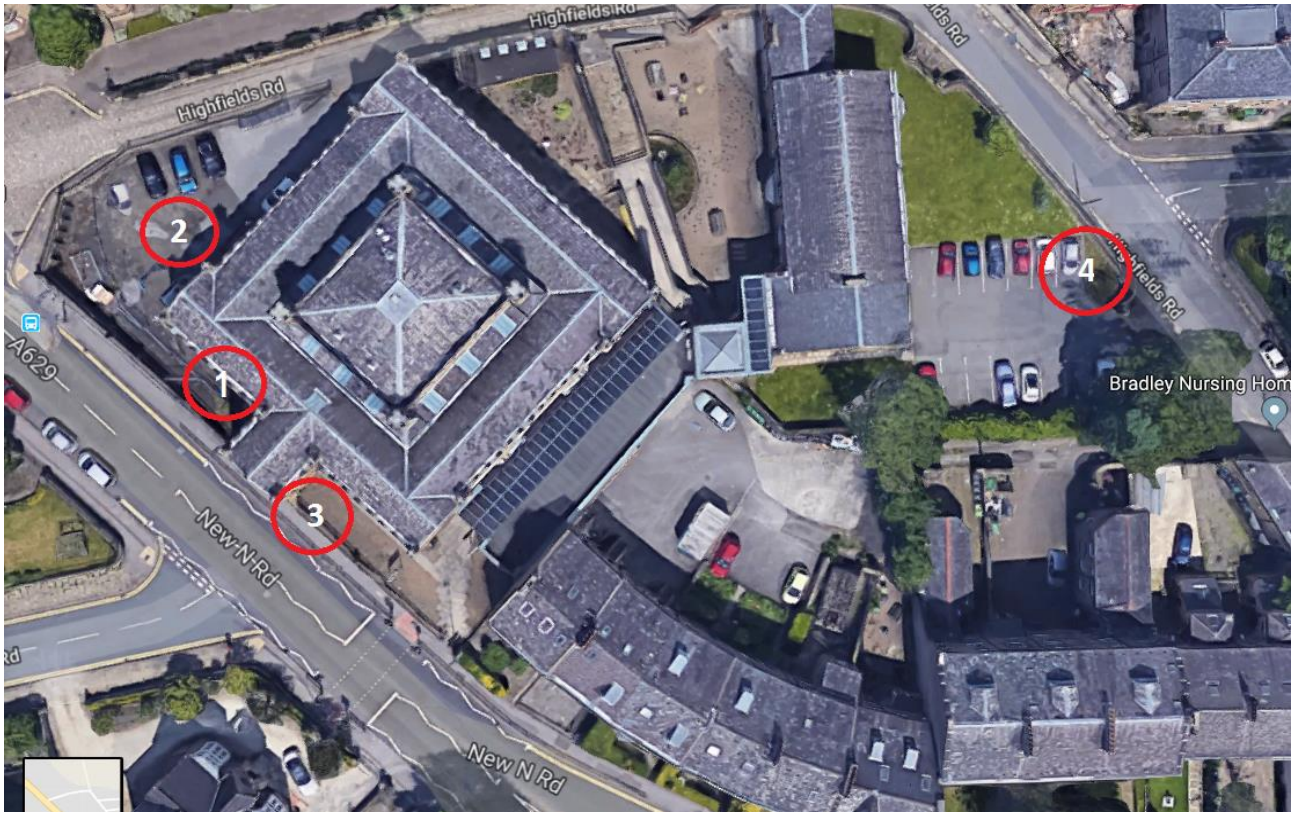

Figure 2: Site plan with noise measurement positions marked in red

2.2 Results of Noise Measurements

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

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

Location	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A50}	L_{A90}
1. New North Road (6.5m from road)	Day	89.8	72.8	80.5	75.9	70.2	60.3
	Night	85.9	67.3	77.7	66.7	46.6	36.3
2. Northfields / New North Road (18m from main road)	Day	73.4	64.2	70.9	67.2	62.9	56.9
	Night						
3. New North Road (2.5m from road)	Day	87.9	73.6	82.3	76.5	71.4	61.0
	Night						
4. Northfields Road / rear of site	Day	57.9	48.1	56.4	51.2	46.6	43.7
	Night						

Table 1: Results of Azymuth Acoustics UK noise measurements, August 2018

2.3 Description of Noise Climate

The noise climate in the area is dominated by road traffic using New North Road (the A629) which is one of the main arterial roads into Huddersfield and connects with junction 24 of the M62 motorway (approx. 2 miles to NW of site).

Noise levels in the vicinity of New North Road are typically in the range 70 - 74 L_{Aeq} during the day and typically 60-70 dB L_{Aeq} during the majority of the night-time periods.

Levels away from New North Road fall away fairly rapidly with distance from this road with levels at 18m from this road being typically 63 - 65 dB L_{Aeq} during the daytime and at other locations that are fully screened from New North Road the daytime noise levels are in the range 47 - 49 dB L_{Aeq}.

New North Road is a busy thoroughfare serving the centre of Huddersfield and as such is busy during day and early night time periods. Noise levels gradually reduce over the course of the night and the lowest noise levels were found to be measured between 02:00 to 03:00hrs. The lowest background sound level measured in the vicinity of the site was at 03:45hrs when a value of 30.2 dB $L_{A90,\ 15min}$ was recorded.

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 has reviewed various guidance documents and standards, these include:

- ProPG: Professional Practice Guidance on Planning and Noise (New residential development)
- National Planning Policy Framework (NPPF) 2018
- British Standard 8233: 2014
- World Health Organisation Guidelines on Community Noise
- British Standard 4142: 2014

3.1 ProPG: Planning and Noise - May 2017

This Professional Practice Guidance on Planning and Noise (ProPG) has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England. The National Planning Policy Framework (NPPF) encourages improved standards of design. The CIEH, IOA and the ANC have worked together to produce this guidance which encourages better acoustic design for new residential development and aims to protect people from the harmful effects of noise.

The Professional Practice Guidance on Planning and Noise States 'The recommended approach is intended to give the developer, noise practitioner, and decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perceptive and the extent of acoustic issues that would be faced'. It is important that acoustic design is reviewed at an early stage of the development process.

3.2 National Planning Policy Framework (NPPF) 2018

The NPPF provides guidance to local authorities taking into account noise in making planning decisions. Paragraph 180 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'.

3.3 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 rooms	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

3.4 W.H.O. Guidelines on Community Noise

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 30dB is required to preserve the restorative process of sleep. This is equivalent to a free-field level of around 42 to 45dB L_{Aeq} or a façade level of 45 to 48dB L_{Aeq}, assuming open windows.

3.5 British Standard 4142: 2014

The test that is generally applied to assess the potential for noise from industrial and commercial installations to give rise to community response is contained in British Standard BS 4142: 2014. This standard predicts the likelihood of complaint due to noise from a new or modified source.

BS 4142 describes a method for determining the specific source and background noise levels outside residential buildings and for assessing whether the noise is likely to give rise to complaints from the occupants. The specific noise level from the commercial source is rated based on any tonal or intermittent characteristics of the sound. BS 4142 assessment methodology involves comparing the existing background level with the predicted noise from the new development. This predicted level is adjusted to allow for any tonal or impulsive characteristics and is called the Rating Level. The difference between the two levels can be used to indicate the likelihood of complaints arising, e.g. a predicted level of 10dB greater than the background level indicates a significant adverse impact; an increase of around 5dB indicates an adverse impact and where the rating level does not exceed the background sound level (BSL) this is an indication of the source having a low impact.

In the context of proposed new noise sensitive receptors in the vicinity of industrial sources, the document states that ‘where a new noise-sensitive receptor is introduced and there is extant industrial and / or commercial sound, it ought to be recognized that the industrial and / or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation’.

3.6 Recommended Noise Assessment Criteria

Based on the guidance above it is recommended that the following criteria would be reasonable with the aim of minimising the impact of the environmental noise on the proposed new residential accommodation:

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

Table 4, Note 5 of BS 8233:2014 states: 'If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.'

4.0 Assessment of Noise Levels

4.1 Noise Risk Assessment (ProPG)

The risk assessment is based on survey data and incorporates a worst-case approach to potential night time adverse effects.

Adverse effect risk levels affecting the site are summarised in Table 3 below.

Façade Location	Noise Level Range (free field) dBA		Risk of Adverse Effect
	DAY	NIGHT	
New North Road	68-74	60-70	High
Northfields Road / facing away from New North Rd	47-49	-	Low / negligible
Beyond 15m of New North Rd and facing 90° to road	63-65	-	Low / medium

Table 3: Potential adverse risk effects, various locations on New North Rd site

The proposed façade facing New North Road would represent the most significant risk in terms of potential adverse impact. Incorporation of standard glazing and openable windows would likely result in significant adverse impact to new residents.

Other elevations of the building would present a lower risk of adverse impact and as such standard glazing may be incorporated; in some cases natural ventilation may be acceptable.

4.2 Road Traffic Noise Assessment

Daytime noise levels along the New North Road boundary are typically 68-74 dB $L_{Aeq,\ 1hr}$ during the day and 60-70 dB $L_{Aeq,\ 1hr}$ during early night-time periods with the lowest noise levels being recorded around 02:00-03:00hrs. In relation to ProPG pre-planning guidance the measurements would indicate a high risk of adverse effects during the daytime and also a high risk during the measured night-time period.

On the basis of the measured noise levels it is estimated that an overall noise reduction of 36-42 dB would be required through the façade in order to achieve satisfactory conditions inside habitable rooms near New North Road (effectively the ground and 1st floor windows).

Road traffic noise levels would have a lesser impact on the 2nd / upper mezzanine floor levels of the façade facing New North Road as these locations are approx. 18m from the main road and are partially screened by the lower floors of the building. Hence the noise levels in these locations present a low to medium risk in relation to noise as defined in ProPPG.

Locations that are fully screened from New North Road experience significantly lower noise levels and these locations present a low or negligible risk in relation to noise. As such these areas can be treated with normal glazing, ventilation and other building envelope specifications.

5.0 Recommendations for Noise Mitigation

This section sets out the recommended minimum noise mitigation measures required to ensure satisfactory acoustic conditions inside habitable rooms throughout the scheme.

5.1 Glazing Specifications

The appropriate glazing specifications for the proposed dwellings (based on the current design layout) are summarised in Table 4 and Figures 3-4 below.

Location (Bedrooms, Living Rooms, Dining Rooms)	Glazing Specifications	Appropriate Glazing Types
Zone G1 (ORANGE): New North Road elevation	Airborne sound insulation min. R_W 42 dB and R_W+C_{tr} 33dB	Acoustically rated double glazing (e.g. 6mm float glass /16mm argon filled cavity / 12mm laminated glass) or suitable secondary glazing specifications
Zone G2 (BLUE): Locations visible from but greater than 15m distance from New North Road	Airborne sound insulation min. R_W 34dB and R_W+C_{tr} 30dB	Acoustically rated double glazing (e.g. 6mm float glass /16mm cavity / 8mm float glass) or suitable secondary glazing specifications
Zone G3 (GREEN): Locations facing away from New North Road	Airborne sound insulation min. R_W 31dB and R_W+C_{tr} 27dB	Standard good quality thermal double glazing with robust acoustic test data to prove SI performance

Table 4: Recommended glazing specifications for new apartments, New North Road site

Figure 3: New North Road elevation glazing zones

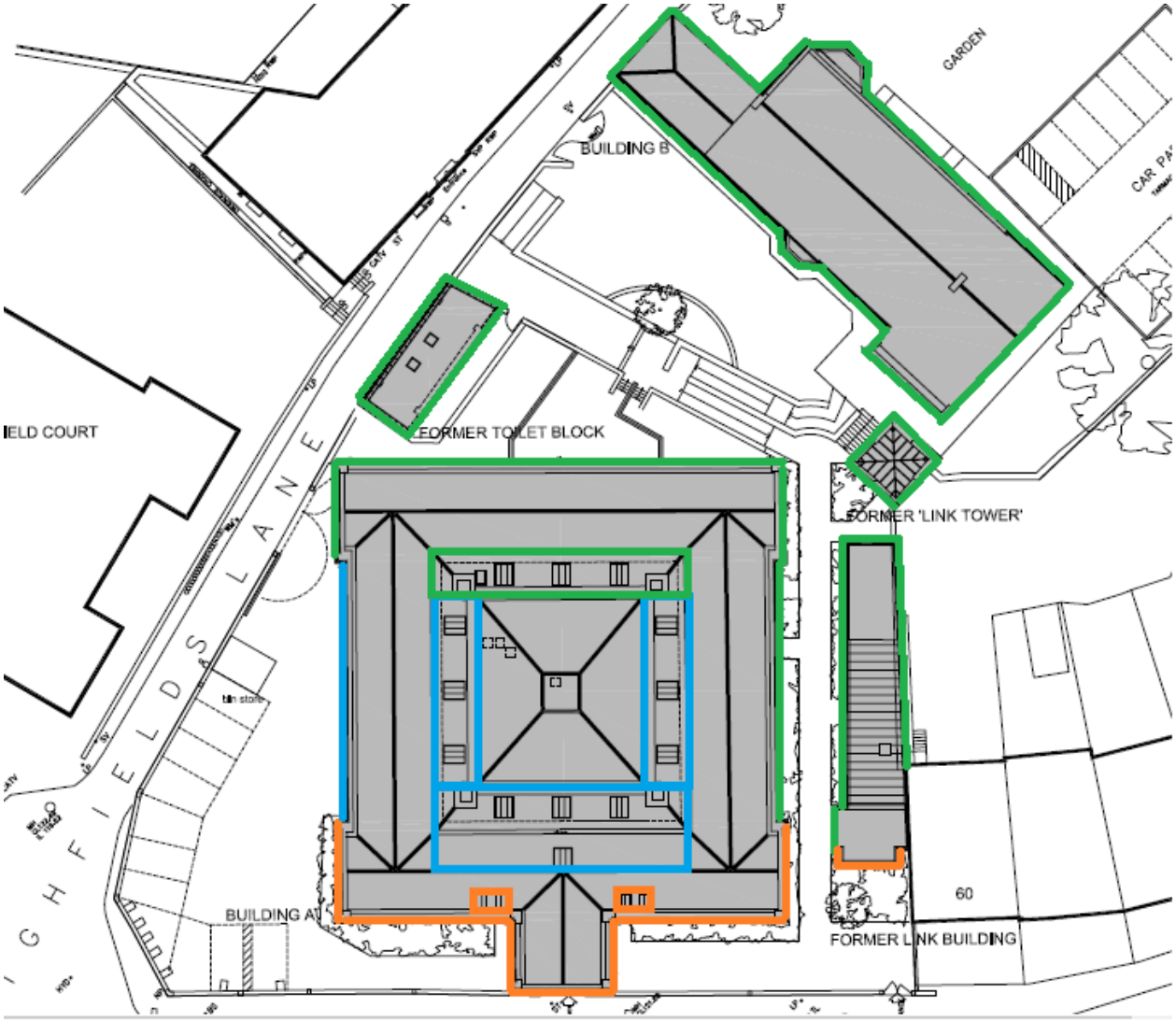

Figure 4: Glazing zone plan

5.2 Ventilation Specifications

The recommended ventilation strategy based on the current proposed layout are summarised in Table 5 and Figure 5 below.

Location (Bedrooms, Living Rooms, Dining Rooms)	Ventilation Specifications	Window slot vent trickle ventilation (where applicable)
Zone V1 (ORANGE): All floor levels, New North Rd elevation	System 4 MVHR mechanical (windows can be opened but MVHR has purge ventilation)	No Trickle Vents MVHR
Zone V2 (BLUE): Locations visible from but greater than 15m distance from New North Road	System 3 fan assisted enhanced background ventilation Opening windows generally acceptable during hottest days of the year (daytime)	*No Trickle vents owing to listed building constraints*
Zone V3 (GREEN): Locations facing away from New North Road	Natural ventilation via opening windows and standard trickle vents or other methods of background ventilation	Standard / *No Trickle vents owing to listed building constraints*

Table 5: Recommended ventilation strategy for the New North Road site

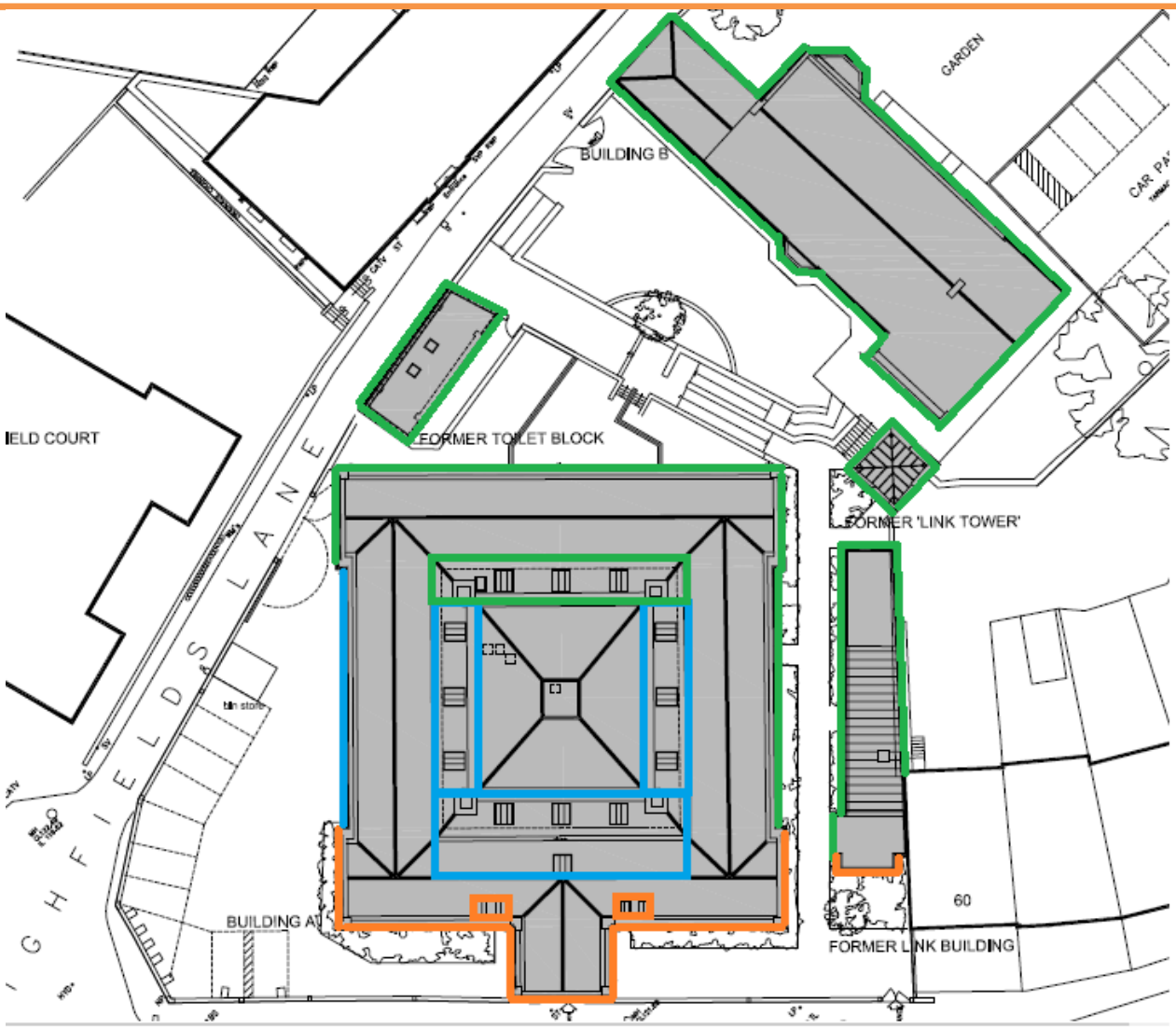

Figure 5: Ventilation zone plan: All floor levels

5.3 Other Elements of Building Envelope

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

- External Walls: minimum sound insulation R_W 52dB. This minimum is likely to be significantly exceeded by the existing stone / masonry façade. Where alternative external wall types are proposed on habitable areas it will be appropriate to check compliance with the R_W 52dB target.
- Roof: minimum sound insulation R_W 42dB. This is likely to be achieved with a suitable upgrades to the thermal insulation of the existing roof build-up.

5.4 Noise limits for externally mounted plant / atmosphere connections

The exact location(s) or quantity/type of proposed fixed external plant is unclear at time of writing. Based on the guidance set out above and the results of the noise survey it is recommended that the following criteria represent suitable targets for noise levels emanating from new plant associated with the building.

Table 9 below lists noise limits for externally mounted plant at various distances. Assuming plant items could be running during both day and night-time periods, internal noise levels in next door or adjacent rooms should not exceed 30dB $L_{Aeq,\ 5min}$ (NR25) or regularly exceed 45dB L_{Amax} for any period.

Location	Period	Indicative Noise Limit $L_{Aeq,T}$
Any item located on the façade of the buildings @ 1m from any single item or group of items (cumulative) Installations should be min. 2m from any habitable room window.	All	48 dBA
Roof level, any location @ 1m from any atmosphere connection Installations should be min. 2m from any habitable room window	All	53 dBA
NB a noise limit of 42 dBA at the nearest neighbouring property applies for heat pumps covered by permitted development under the Micro-generation Certification Scheme (where applicable – e.g. outdoor condensers for AHPs)		

Table 6: Plant noise limits at various distances (dBA)

The noise levels set out above have been developed so as to ensure that noise from any plant associated with the development does not have a significant effect on ambient noise level within habitable rooms in the development and the wider environment beyond the site perimeter.

The general plant noise levels limits indicated above would be subject to review at the detailed design stage of the project.

6.0 Conclusions

Azymuth Acoustics has undertaken a noise impact assessment of the proposed residential and retail development situated at New North Road / Highfields Road, Huddersfield.

The noise climate in the area is dominated by road traffic using New North Road (the A629) which is one of the main arterial roads into Huddersfield.

The recommended glazing and ventilation specifications for elevations facing New North Road have been designed taking into consideration the road traffic noise and low frequency sound from the HGVs.

The residential development should be protected by noise mitigation measures including:

- Acoustic double glazing or suitably rated secondary glazing to rooms on all elevations exposed to traffic noise along New North Road.
- Mechanical ventilation with heat recovery for the areas requiring the highest levels of noise protection. Elsewhere system 3 ventilation with suitable measures to provide make up air is generally recommended.
- Noise limits applicable to any externally mounted plant or atmosphere connections proposed as part of the submission.

Appendix A – Glossary of 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.

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 60 dB, after the source has been switched off, is known as the reverberation time. 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 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.
Appendix B – Graphical Results of Sound Insulation Tests

Appendix B – Full Tabulation of Noise Survey Results

Start	Position	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A50}	L_{A90}
20-21/08/2018								
12:15	1	00:30'00	85.6	73.0	80.5	76.1	71.4	64.0
12:45	1	00:30'00	103.6	74.6	82.4	75.8	70.1	61.6
13:15	1	00:30'00	90.8	73.2	81.2	75.8	71.7	62.6
13:45	1	00:30'00	90.0	73.3	83.4	76.0	70.7	60.7
14:15	1	00:30'00	88.0	72.8	80.9	76.2	71.1	61.8
14:45	1	00:30'00	91.2	73.7	81.9	76.5	71.9	64.3
15:15	1	00:30'00	91.8	72.3	80.6	75.4	69.8	60.6
15:45	1	00:30'00	89.4	73.0	81.0	75.8	71.5	61.3
16:15	1	00:30'00	90.7	73.6	81.1	76.6	72.1	64.4
16:45	1	00:30'00	93.3	73.2	80.7	76.3	71.5	62.3
17:15	1	00:30'00	88.2	72.3	80.6	75.5	70.1	62.2
17:45	1	00:30'00	91.0	72.4	78.9	75.6	70.6	61.3
18:15	1	00:30'00	91.0	73.0	80.0	76.5	71.4	60.4
18:45	1	00:30'00	92.4	73.2	80.3	76.6	71.2	60.4
19:15	1	00:30'00	86.1	72.0	78.9	75.9	70.0	56.3
19:45	1	00:30'00	91.3	72.1	79.3	75.6	68.8	58.0
20:15	1	00:30'00	83.1	70.6	78.2	74.9	66.8	53.7
20:45	1	00:30'00	82.8	69.8	78.2	74.3	65.1	52.1
21:15	1	00:30'00	86.9	70.0	78.9	74.4	64.7	51.3
21:45	1	00:30'00	84.7	69.4	78.6	74.1	62.9	47.9
22:15	1	00:30'00	81.3	68.3	77.7	73.4	61.0	46.3
22:45	1	00:30'00	84.3	68.2	79.4	72.6	58.1	44.2
23:15	1	00:30'00	85.3	67.0	78.9	70.9	53.1	35.6
23:45	1	00:30'00	88.6	66.1	77.6	69.3	49.3	36.3
00:15	1	00:30'00	84.7	65.1	77.6	68.4	48.5	33.2
00:45	1	00:30'00	83.3	63.2	76.9	64.0	38.5	32.2
01:15	1	00:30'00	83.6	61.9	74.8	62.0	37.5	31.0
01:45	1	00:30'00	82.8	63.0	76.6	63.3	36.6	31.0
02:15	1	00:30'00	86.3	60.7	74.0	55.6	36.3	31.3
02:45	1	00:30'00	82.4	60.2	74.7	53.7	34.0	30.8
03:15	1	00:30'00	84.2	63.5	77.3	63.0	38.4	31.3
03:45	1	00:30'00	86.8	62.6	76.6	62.0	34.0	30.2
04:15	1	00:30'00	88.9	65.8	79.3	66.0	39.7	31.7
04:45	1	00:30'00	82.9	63.4	76.5	65.6	41.0	34.3
05:15	1	00:30'00	84.7	68.6	78.9	73.9	57.8	39.4
05:45	1	00:30'00	89.6	70.7	80.8	75.4	61.4	43.7
06:15	1	00:30'00	91.1	72.2	80.5	76.4	67.8	53.3
06:45	1	00:30'00	89.8	73.2	81.4	76.9	71.1	55.9
07:15	1	00:30'00	90.5	73.7	81.5	76.9	72.2	61.4
07:45	1	00:30'00	95.5	73.5	81.2	76.5	72.1	63.2
08:15	1	00:30'00	88.1	73.5	81.2	76.6	71.9	63.3
08:45	1	00:30'00	85.4	73.3	80.6	76.4	71.9	64.7

Start	Position	Time	L_{Amax}	L_{Aeq}	L_{A1}	L_{A10}	L_{A50}	L_{A90}
09:15	1	00:30'00	95.8	74.3	81.8	76.6	71.8	63.5
09:45	1	00:30'00	91.1	73.0	80.9	76.2	71.3	62.8
10:15	1	00:30'00	90.6	73.4	80.9	76.6	71.6	62.9
10:45	1	00:30'00	90.0	73.2	81.2	76.4	71.4	61.5
11:15	1	00:30'00	90.9	73.0	80.7	76.0	71.6	63.1
11:45	1	00:30'00	89.2	72.7	80.9	75.8	70.9	61.6
12:15	1	00:30'00	95.1	73.5	81.6	76.0	71.1	62.2
12:45	1	00:30'00	90.1	73.4	82.2	76.0	71.7	63.5
13:15	1	00:30'00	88.4	72.7	80.1	75.8	71.3	63.4
22/08/2018								
11:05	2	00:05'00	74.7	64.9	71.4	68.0	63.6	58.7
11:11	2	00:05'00	73.8	64.6	71.4	67.8	63.3	58.0
11:16	2	00:05'00	72.3	63.4	70.8	66.9	61.8	53.7
11:21	2	00:05'00	74.7	64.6	72.4	67.1	63.3	58.3
11:26	2	00:05'00	71.4	63.1	68.4	66.1	62.6	55.9
11:38	3	00:05'00	89.4	73.7	83.6	76.3	71.5	61.5
11:43	3	00:05'00	92.5	74.4	84.0	76.8	71.9	63.8
11:48	3	00:05'00	84.7	74.0	82.6	76.9	72.3	57.0
11:53	3	00:05'00	88.6	72.6	80.5	75.9	70.2	57.5
11:58	3	00:05'00	82.9	73.0	80.9	76.4	71.2	61.2
12:03	3	00:05'00	89.4	73.4	82.0	76.4	71.2	64.9
12:14	4	00:05'00	56.9	47.9	57.9	51.3	46.5	43.1
12:20	4	00:05'00	57.1	47.5	56.7	50.1	46.9	44.5
12:25	4	00:05'00	57.6	47.8	54.8	50.4	46.9	43.1
12:31	4	00:05'00	57.6	48.4	56.2	51.8	46.2	43.6
12:36	4	00:05'00	60.1	48.7	56.4	52.6	46.5	44.2