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Residential Development
Former Newsome Mills Site, Ruth Street, Newsome Village, Huddersfield
Noise Impact Assessment

For:

DevCom Ltd

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Contents

1 Introduction

1.1.1 Environmental Noise Solutions Ltd (ENS) has been commissioned by DevCom Ltd to undertake a noise impact assessment for a residential development on the former Newsome Mills site at 4a, Ruth Street, Newsome, Huddersfield, HD4 6JF (hereafter referred to as 'the site').

1.1.2 This noise impact assessment is intended to accompany the planning application submitted to Kirklees Council for the proposed residential development of the site.

1.1.3 The objectives of this noise impact assessment are to:

- Assess external ambient and background noise levels in the vicinity of the application site during relevant time periods.
- Assess the potential impact of the existing ambient noise climate on the proposed residential development with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary

1.1.4 This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation). It has been prepared for DevCom Ltd for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult the aforementioned and ENS as to the extent to which the findings may be appropriate for their use.

1.1.5 A glossary of acoustic terms used in the main body of the text is contained in Appendix A.

2 Site Description

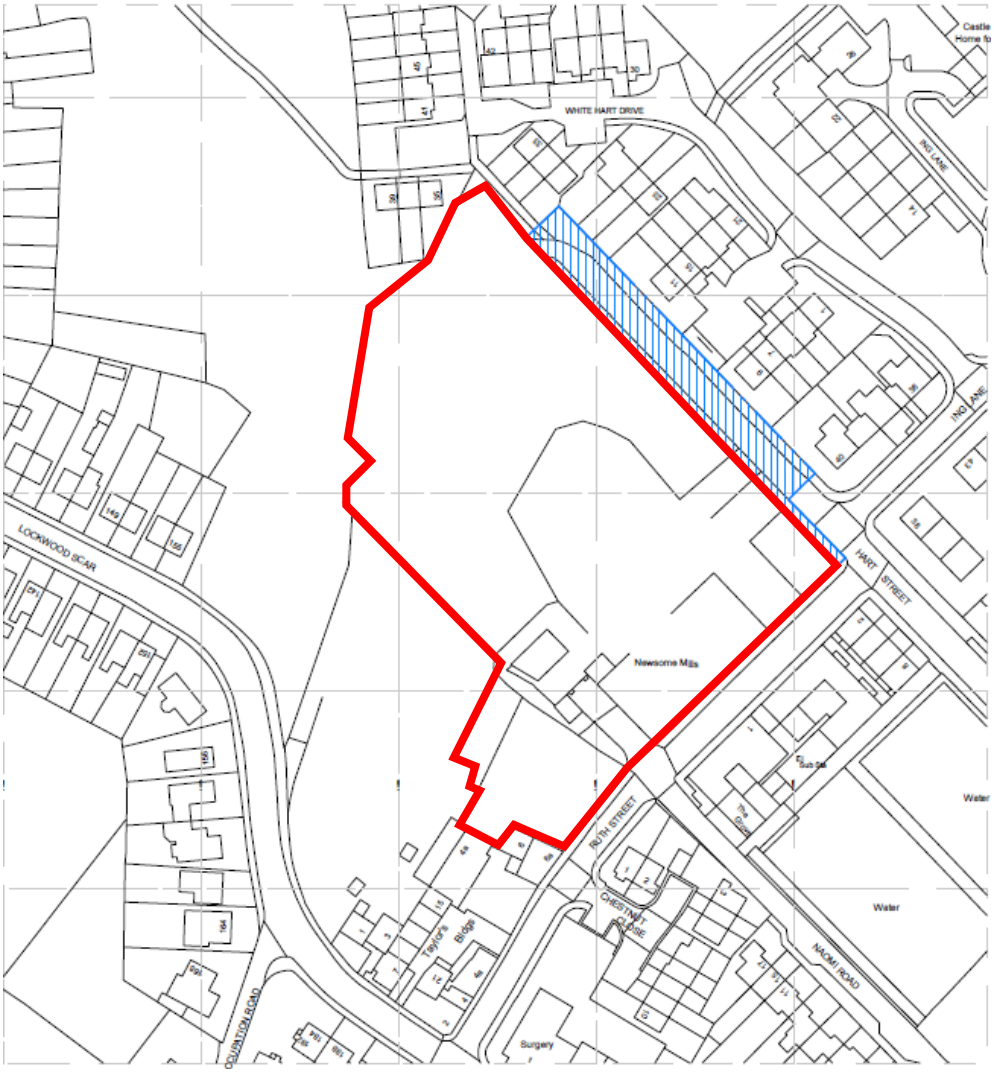
2.1.1 The proposals are for 75 new dwellings and apartments across the site with associated parking and landscaping.

2.1.2 The remaining ground floor façade of the former Newsome Mill is to be retained with a new build block of 37 apartments within, the lower floors are to be used for car parking with apartments and shared communal areas on the 4 floors above. 8 further apartments will be housed within the 2-storey block on the intersection of Hart Street and Ruth Street. 30 semi-detached and terraced new build residences are proposed over the northern section of the site.

2.1.3 The noise environment at the site is generally controlled by local road traffic noise on Ruth Street and the wider suburban area, there are commercial premises on the opposite side of Ruth Street to the former mill and clocktower.

2.1.4 An indication of the location of the site is shown in Figure 2-1, with the measurement locations used for the background noise survey shown in Appendix B and the site layout given in Appendix C.

Figure 2-1: Location Plan



3 Assessment Guidance

3.1 National Planning Policy Framework

3.1.1 The National Planning Policy Framework (NPPF)[1] was updated in July 2021 and sets out the Government's planning policies for England and how these are expected to be applied.

3.1.2 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 174 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

3.1.3 Paragraph 185 advises that:

'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should…..mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life'.

3.1.4 The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

3.2 Noise Policy Statement for England

3.2.1 The Noise Policy Statement for England[2] (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life
- Mitigate and minimise adverse impacts on health and quality of life
- Where possible, contribute to the improvement of health and quality of life

3.2.2 The NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur

3.2.3 According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

'….all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.'

[1] National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2019)
[2] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs (2010)

3.3 Planning Practice Guidance on Noise

3.3.1 Planning Practice Guidance[3] (PPG) is an online resource (last updated 24th June 2021) which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur
- Whether or not an adverse effect is occurring or likely to occur
- Whether or not a good standard of amenity can be achieved

3.3.2 In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

'...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation'.

3.3.3 The PPG also provides general advice on the typical options available for mitigating noise, suggesting that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

3.3.4 'Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed'.

3.3.5 Table 3-1 summarises the PPG noise exposure hierarchy.

Table 3-1: PPG Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

[3] Planning Practice Guidance on Noise, 2014: http://planningguidance.planningportal.gov.uk/blog/guidance/noise/

3.4 ProPG Planning and Noise: New Residential Development

3.4.1 ProPG Planning and Noise: New Residential Development (ProPG)[4] was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

3.4.2 Stage 2: Element 2 of ProPG recommends indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233), see Table 3.2.

Table 3.2: Indoor Ambient Noise Levels in Dwellings

Activity	Location	Recommended Internal Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700\text{-}2300)}$	30 dB $L_{Aeq\ (2300\text{-}0700)}$ 45 dB $L_{Amax,F\ (2300\text{-}0700)}$

3.4.3 Note 4 to the above table states:

'A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night.'

3.4.4 Note 5 to the above table states:

'Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7'.

3.4.5 This is consistent with the guidance contained within the PPG, which states that:

'... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations'.

3.4.6 On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed residential development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ during the daytime
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ and 45 dB $L_{Amax,F}$ not regularly exceeded during the night-time

[4] 'ProPG Planning and Noise: New Residential Development (ProPG)', 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

3.4.7 With regard to external amenity, ProPG reflects the advice in BS 8233, which states:

'For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'

4 Noise Survey and Results

4.1.1 In order to assess the current external noise levels at the subject site, a noise survey was undertaken on Tuesday 24th and Monday 30th January 2023.

4.1.2 Four measurement locations selected as described below, and illustrated on the site plan presented as Appendix B:

- MP1 was located at 4 metres height on Ruth Street in front of the former mill façade
- MP2 was located at 4 metres height on the NE development boundary on Hart Street
- MP3 was located at 4 metres height on the SW development boundary towards Lockwood Scar
- MP3 was located at 4 metres height on the NW development boundary

4.1.3 Noise measurements were made using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. A windshield was fitted for all measurements. The calibration of the measurement system was verified immediately before and after the survey using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted. Weather conditions throughout the survey were appropriate for monitoring with dry weather and average wind speed below 5 ms^{-1}.

4.1.4 Measurements consisted of A–weighted broadband parameters, together with linear octave band L_{eq} levels. Table 4-1 presents a summary of the measurement data for each measurement session, rounded to the nearest decibel. Measurements at MP1 were corrected by – 3dB due to the proximity to the façade.

Table 4-1 – Summary of Noise Measurement Data

Location	Date	Height	Time (hh:mm)	Length (hh:mm)	L_{Aeq} (dB)	L_{AFmax} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	30/01/2023	4m	04:16	02:45	54	80	39	53	Very low level of traffic activity in early morning Metal shutters opposite site contributing to background noise
???	24/01/2023	4m	13:15	00:30	53	71	42	55	
MP1	24/01/2023	4m	14:00	03:00	55	80	40	58	
MP2	30/01/2023	4m	04:09	01:00	45	61	42	47	Car park to east. Pedestrian footpath nearby
MP2	24/01/2023	4m	13:15	01:00	46	60	43	48	
MP3	24/01/2023	4m	15:17	01:00	48	62	45	50	Traffic on Ruth Street prevalent, infrequent noise from Lockwood scar
MP4	30/01/2023	4m	05:12	01:00	47	59	43	49	Car park and footpath nearby, traffic noise driving levels
MP4	24/01/2023	4m	14:16	01:00	45	61	43	47	

4.1.5 During the survey the ambient noise climate was predominantly controlled by traffic noise on the surrounding roads.

4.1.6 Measurements at MP1 had a relatively low level of traffic, however moving shutters, on the old commercial building opposite the mill on Ruth Street, did contribute to the background noise levels (L_{A90}). The typical $L_{Amax,F}$ of 80 dBA at MP1 was associated with passing traffic.

4.1.7 Noise levels measured elsewhere on the site (MP2-MP4) were in the range of 45 to 48 dB $L_{Aeq,T}$, with little variation in the level over the night-time periods and typical $L_{Amax,F}$ not exceeding 62 dBA.

5 Noise Assessment

5.1 Design Noise Levels

5.1.1 The noise climate across the site is generally controlled by local and distant road traffic noise.

5.1.2 Design levels for the façade facing onto Ruth Street are obtained from the highest daytime and night-time average $L_{Aeq,T}$ and the typical $L_{Amax,F}$. This gives robust design noise levels for the facade of:

- ≤ 55 dB $L_{Aeq,16hr(0700-2300)}$ during the daytime
- ≤ 54 dB $L_{Aeq,8hr(,2300-0700)}$ during the night-time
- ≤ 80 dB $L_{Amax,F}$ during the night-time

5.1.3 All other plots are expected to have levels no greater than:

- ≤ 48 dB $L_{Aeq,16hr\ (0700-2300)}$ during the daytime
- ≤ 47 dB $L_{Aeq,8hr\ (,2300-0700)}$ during the night-time
- ≤ 62 dB $L_{Amax,F}$ during the night-time

5.2 External Noise

5.2.1 All measurement locations show external noise levels to be below the BS 8233 upper guideline level of 55 dB $L_{Aeq,(0700-2300)}$ for external living areas. As rear garden areas will benefit from localised screening provided by the new building massing or garden fences, noise levels are expected to be ≤ 50 dB $L_{Aeq,16hr}$. External noise levels are therefore expected to be suitable for external amenity areas without any specific mitigation.

5.3 Internal Noise

5.3.1 Regarding internal noise levels with closed windows; Based on historic measurements taken at numerous sites, a typical thermal double-glazed window provides circa 27 dB reduction in noise level from external to internal. With regard to internal noise levels when windows are open, the World Health Organisation (WHO) Guidelines for Community Noise (1999) states: '*the noise reduction from outside to inside with the window partly open is 15 decibels*'.

5.3.2 An example of predicted internal noise levels for the western boundary is shown in Table 5-1.

Table 5-1: Predicted internal noise levels for southwestern boundary

Location	External Noise Level	Reduction	Resultant Internal Level
Old Mill façade on Ruth Street	≤ 55 dB $L_{Aeq\ (0700-2300)}$ ≤ 54 dB $L_{Aeq\ (2300-0700)}$ ≤ 80 dB $L_{Amax,F\ (2300-0700)}$	–27 dB (closed windows)	≤ 28 dB $L_{Aeq\ (0700-2300)}$
			≤ 27 dB $L_{Aeq\ (2300-0700))}$
			≤ **53** dB $L_{Amax,F\ (2300-0700)}$
		–15 dB (open windows)	≤ **40** dB $L_{Aeq\ (0700-2300))}$
			≤ **39** dB $L_{Aeq\ (2300-0700)}$
			≤ **65** dB $L_{Amax,F\ (2300-0700)}$
All Other Plots	≤ 48 dB $L_{Aeq\ (0700-2300)}$ ≤ 47 dB $L_{Aeq\ (2300-0700)}$ ≤ 62 dB $L_{Amax,F\ (2300-0700)}$	–27 dB (closed windows)	≤ 21 dB $L_{Aeq\ (0700-2300)}$
			≤ 20 dB $L_{Aeq\ (2300-0700)}$
			≤ 35 dB $L_{AFmax\ (2300-0700)}$
		–15 dB (open windows)	≤ 33 dB $L_{Aeq\ (0700-2300)}$
			≤ **32** dB $L_{Aeq\ (2300-0700)}$
			≤ **47** dB $L_{Amax,F\ (2300-0700)}$

5.3.3 Based on the summary above, internal noise levels for the apartments overlooking Ruth Street on the development are above the level at which ventilation via partially open windows would be adequate over the day and night-time periods.

5.3.4 Satisfactory internal levels are obtained for all other plots during the daytime, with a slight exceedance (- 2dB) expected for bedrooms over the night-time with windows partially open for ventilation.

5.3.5 We therefore assume that windows will be closed as part of the noise mitigation strategy for the site with passive ventilation provided by trickle vents. Windows can be opened for purge ventilation (to enable discretionary rapid air changing) with resultant internal levels slightly exceeding the noise criteria; however, this would be on a temporary basis.

5.3.6 Calculations have been performed to determine the configuration of glazing and ventilation, required for the most exposed bedrooms on Ruth Street, to satisfy the night-time internal $L_{Amax,F}$ criteria.

5.3.7 Calculations incorporate the measured external noise level data and the noise ingress calculation methodology outlined in Annex G.2 of BS8233:2014. Room and façade dimensions are based on provided drawings and calculated for the worst case, assuming a façade area of 6m² with 2.8m² of glazing and a total volume of 37 m³.

5.3.8 All plots are assumed to have passive ventilation with a minimum EA equivalent area of 8000 mm², as per guidance in Approved Document Part F[5] (ADF).

5.3.9 It was determined that the day and night-time internal noise requirements can met for all bedrooms overlooking Ruth Street, with a minimum level of façade attenuation of 30 dB R_w+C_{tr} for double glazing and 38 dB $D_{n,e,w}+C_{tr}$ for trickle ventilation.

5.3.10 Glazing to all other plots, and living rooms of the façade facing onto Ruth Street, requires a minimum performance of 25 Dnew, with tricklevents having a minimum performance of 33 dB Dnew(assuming up to 3 such units are required to achieve ADF requirements of 8000 mm² EA)..

5.3.11 Table 5-2 details the performance levels of suitable glazing and vents.

Table 5-2: Required Sound Reduction of Façade Elements

Element	Required Sound Reduction (dB)						Indicative Specification
	125 Hz	250 Hz	500 Hz	1kHz	2kHz	Weighted R_w (R_w+C_{tr}) / $D_{n,e,w}$ ($D_{n,e,w}+C_{tr}$)	
All Bedrooms on Ruth Street Façade							
Glazing	21	22	29	39	40	34(30)	4 mm glass / 16 mm cavity / 6 mm glass double glazing
Ventilation	40	37	35	37	44	39(38)	Invisivent®EVO AK High
All Other Plots and Livingrooms on Ruth Street Façade							
Glazing	21	17	25	35	37	29(25)	4 mm glass / 16 mm cavity / 4 mm glass double glazing
Ventilation	36	36	37	31	37	35(33)	SF Canopy + 25mm spacer

5.3.12 The glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing.

5.3.13 When selecting a glazing system to satisfy the requirements outlined above, it is important to ensure that the R_w+C_{tr} value is achieved (rather than simply the R_w value). Published R_w values tend to be higher than corresponding R_w+C_{tr} values; therefore, incorrect selection could result in an overestimation of sound reduction performance which in turn could result in higher internal noise levels.

[5] 'Approved Document F – Dwellings (ADF)', 2021. – Statutory Guidance - Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government

6 Summary and Conclusions

6.1.1 A noise impact assessment has been undertaken for a proposed residential development on the site of the former Newsom Mill at 4a, Ruth Street, Newsome, Huddersfield, HD4 6JF.

6.1.2 The noise environment at the subject site is controlled by road traffic in the local and surrounding area, with some contribution from building elements on the commercial unit on Ruth Street.

6.1.3 In proximity to road noise sources, internal daytime noise levels have the potential to lie above the recommended criteria with windows open for ventilation. Therefore, a minimum façade performance requirement has been recommended for the worst exposed bedrooms facing onto Ruth Street which achieves internal noise criteria, all other windows on the proposed residential development can achieve the recommended criteria with double glazing and lower performance ventilation.

6.1.4 Levels were found to be within BS 8233 guidance criteria for all external amenity areas and are considered suitable for use without specific mitigation.

Appendix A – Abbreviations and Definitions

Sound Pressure Level (L_p)
The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_o)$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_o = reference sound pressure (20 µPa).

A-weighting
A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$
The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$
The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$
The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$
The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Single Event Level / Sound Exposure Level (SEL or L_{AE})
The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_W)
Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix B – Noise Measurement Positions

Appendix C – Site Layout

Proposed Site Plan