
MILNROW PROPERTIES LIMITED

NOISE IMPACT ASSESSMENT REPORT

37-39 DALE STREET, MILNROW, ROCHDALE, OL16 3NJ

Client: Milnrow Properties Limited

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3NJ

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1 INTRODUCTION

1.1 Overview

- 1.1.1 By instruction from Milnrow Properties Limited ('the client'), NoiseAir was commissioned to undertake a noise impact assessment (NIA) to support a planning application at 37-39 Dale Street, Milnrow, Rochdale, OL16 3NJ.
- 1.1.2 General limitations with respect to this NIA are outlined in **Appendix A**.

1.2 Site Description

- 1.2.1 At the time of writing, the proposed development site contains a small party shop and beauty studio on the ground floor. The first and second floor are vacant.
- 1.2.2 The site is located in a mixed-use area in Milnrow. With commercial and residential use buildings forming the predominant land usage in the area.
- 1.2.3 The primary noise sources observed at the site is road traffic noise from Dale Street and Chapel Gate.
- 1.2.4 **Figure 1** presents a site ariel photograph of the development site with respect to the local area and its context.



Figure 1: Site ariel photograph.

1.3 Development Proposals

- 1.3.1 At the time of writing, proposals outline the conversion of the second floor and roof void of the existing building into four self-contained apartments, together with the construction of seven new residential dwellings on the land to the rear.

- 1.3.2 It should also be noted that the first floor is to be used for commercial purposes.
- 1.3.3 The proposed development plans are shown below in **Figure 2 - Figure 5**.



Figure 2: Proposed Development Plans

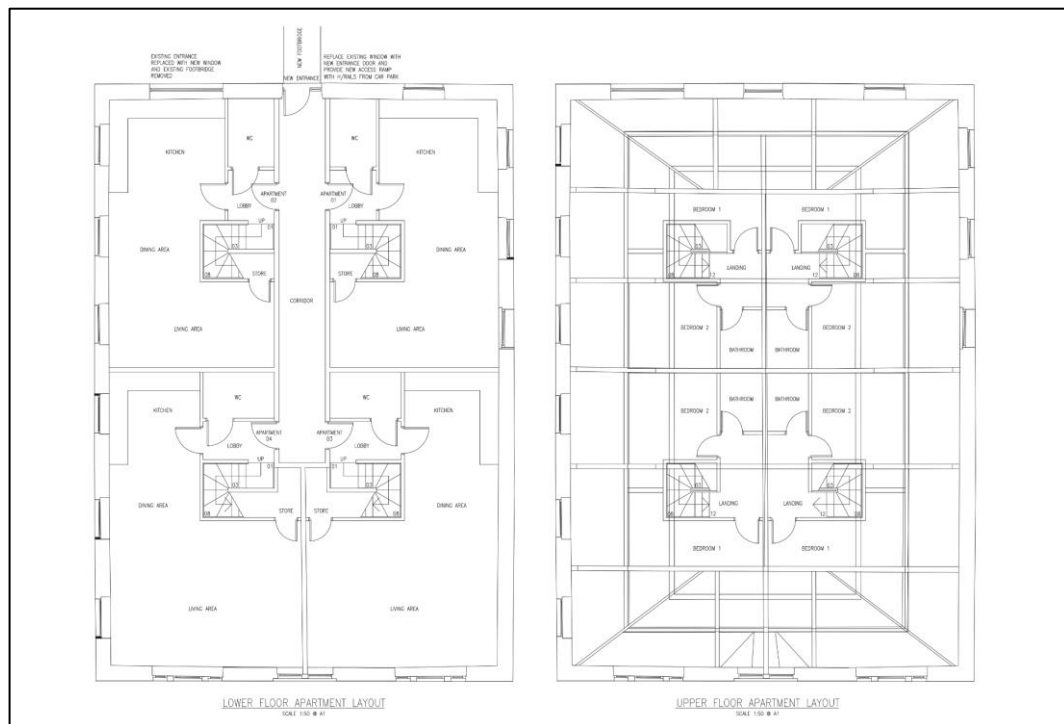


Figure 3: Proposed Floor Plans (Existing Building)



Figure 4: Proposed Floor Plans (Mews)

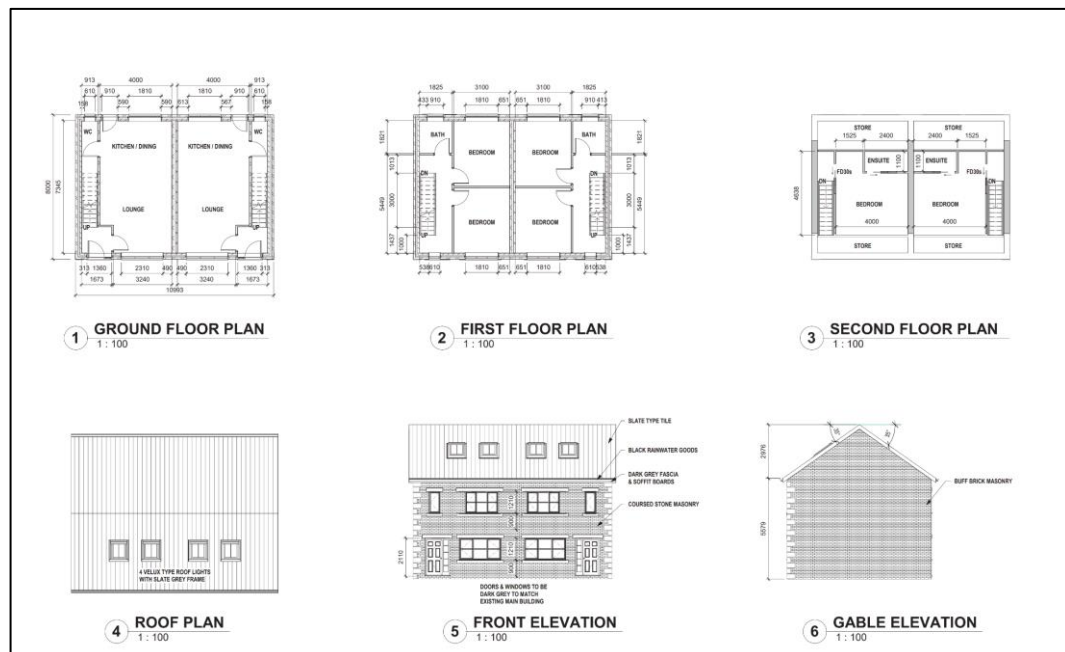


Figure 5: Proposed Floor Plans (Semi-Detached)

2 ASSESSMENT METHODOLOGY AND SCOPE OF WORKS

2.1 National Planning Policy Framework [NPPF 2023]

- 2.1.1 The NPPF sets out the government's planning policies for England and how they are expected to be applied. It aims to achieve sustainable development; stating that planning policies and decisions should prevent unacceptable levels of noise pollution from new and existing development while affirming that National Policy Statements form part of the national planning policy framework and should be considered in planning decisions.

2.2 Noise Policy Statement for England (NPSE)

- 2.2.1 The Noise Policy Statement for England (NPSE), published in March 2010, states the long-term vision of Government noise policy is to "promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".
- 2.2.2 The NPSE sets out the government's overall policy on noise within the context of sustainable development. It introduces three concepts for noise management: avoid significant adverse effects; mitigate and minimise adverse effects; and where possible, contribute to improvements in health and quality of life.
- 2.2.3 It also establishes a hierarchy of noise management actions: avoid; reduce; remedy; mitigate; compensate.
- 2.2.4 The NPSE also introduces the below categories with respect to 'adverse impacts'.

'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.'

- 2.2.5 The NPSE states that significant adverse effects on health and quality of life should be avoided. Where the impact lies somewhere between LOAEL and SOAEL, it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. In this regard, a certain degree of impact between LOAEL and SOAEL would be acceptable in

terms of planning policy, provided that the impact has been mitigated and minimised by design.

2.3 Planning Practice Guidance - Noise [PPG 2019]

2.3.1 PPG 2019 provides guidance on how noise should be considered in planning decisions. It was published in 2014 and updated in 2019. The document advises on how to avoid, mitigate, or minimise adverse effects of noise through good acoustic design and appropriate conditions or obligations.

2.3.2 **Table 1** summarises the noise exposure hierarchy outlined within the PPG.

Table 1: National Planning Practice Guidance noise exposure hierarchy		
Perception	Increasing Effect Level	Action
Not noticeable	No Observed Effect	No specific measures required
Noticeable and not intrusive	No Observed Adverse Effect	No specific measures required
Lowest Observed Effect Level		
Noticeable and intrusive	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Effect Level		
Noticeable and disruptive	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Unacceptable Adverse Effect	Prevent

2.4 Scope of Works

2.4.1 The location of the development site is mixed use setting with the predominant sources of noise being road traffic noise due to Dale Street and Chapel Gate, as well as noise from commercial units on the ground and first floor floor and in the nearby vicinity.

2.4.2 Therefore, it is reasoned that the NIA should primarily consider noise from commercial units and road traffic noise.

2.4.3 The scope of this assessment includes consideration of noise at each facade of the proposed residential dwellings where noise sensitive areas might be located, in terms of the potential impact of local noise sources.

2.5 Assessment Criteria

2.5.1 In order to achieve noise levels which are considered to be in alignment with the planning approaches and policies discussed in Section 2.1, it is considered that all efforts are made to

ensure that future occupants are unlikely to be exposed to noise levels which might breach the LOEL criteria.

2.5.2 It should be noted however that planning guidance does not preclude development where the LOEL is likely to be breached in certain circumstances as long as reasonable efforts are made to mitigate and reduce such an effect.

2.5.3 It is therefore considered that the noise assessment and subsequent criteria should be undertaken in accordance with Pro-PG:2017 Planning and Noise, a summary of which is provided below.

2.5.4 Consideration has also been given to noise transmission between the ground and first floor shared facilities and second floor dwellings.

2.6 Pro-PG – Planning & Noise [Pro-PG 2017]

2.6.1 Pro-PG:2017 Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

2.6.2 The guidance reflects the Government's overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance (including PPG-Noise) and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisers, on achieving good acoustic design in and around new residential developments.

2.6.3 Pro-PG:2017 adopts a two-stage approach to assessment:

- **Stage 1** – an initial noise risk assessment of the proposed development site; and,
- **Stage 2** – a systematic consideration of four key elements.

2.6.4 The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

- **Element 1** – demonstrating a “Good Acoustic Design Process”;
- **Element 2** – observing internal “Noise Level Guidelines”;
- **Element 3** – undertaking an “External Amenity Area Noise Assessment”; and,
- **Element 4** – consideration of other relevant issues.

2.6.5 Internal noise level guidelines are set out in Figure 2 of Pro-PG:2017 which have been reproduced in **Table 2**.

Table 2: Summary of internal noise guidelines.

Activity	Location	0700 – 2300 hours	2300 – 0700 hours
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ 45 dB L_{Amax}

2.6.6 There are multiple notes outlined within Pro-PG:2017 with respect to **Table 2** which should be considered in full however the main points for consideration are outlined below:

- The table provides recommended internal $L_{Aeq,T}$ target levels for overall noise in the design of a building. These are the sum total of structure-borne noise and airborne noise sources.
- The internal $L_{Aeq,T}$ target levels shown in the table are based on the existing guidelines issued by the World Health Organisation (WHO) and assume normal diurnal fluctuation in external noise.
- The internal $L_{Aeq,T}$ target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.
- Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. 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. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events.
- Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. 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.
- Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

2.6.7 The guidelines presented in **Table 2** reflect and extend current practice contained in BS 8233:2014.

-
- 2.6.8 In terms of external amenity noise assessment, Pro-PG:2017 again draws upon guidelines set presented by the WHO and also presented in BS 8233:2014.
- 2.6.9 BS 8233:2014 states that “the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$ ”. The standard continues... “These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited.”

3 ACOUSTIC SURVEY

3.1 Noise Monitoring

- 3.1.1 NoiseAir conducted primarily unattended noise monitoring between 18th September 2024 and 20th September 2024 at the development site. noise monitoring was undertaken at the monitoring location ML1 as presented in **Figure 6**. ML1 was positioned at the first-floor entrance approximately 1 meter from the building façade.



Figure 6: Approximate noise monitoring location

- 3.1.2 The noise measurements were made using a Class 1, integrating sound level meter (SLM).
- 3.1.3 The acoustic equipment was calibrated to comply with Section 4.2 of BS 7445-1:2003¹, before and after the noise monitoring periods.
- 3.1.4 The SLM was calibrated upon installation and collection of the survey and found to have negligible drift (< 0.1 dB). The results are summarised in **Table 3** below.

SLM (Serial No.)	Preamp (Serial No.)	Microphone (Serial No.)	Calibrator (Serial No.)	Start Calibration	End Calibration	Drift
NOR140 (1402868)	NOR1209 (12320)	NOR1225 (72835)	NOR1251 (31313)	-25.7	-25.7	0 dB

- 3.1.5 Weather conditions were monitored throughout the survey and were considered to be favourable throughout the entire duration of the measurements.

¹ BS 7445-2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

3.2 Measured Sound Levels

3.2.1 Data shown in **Figure 7** and details a level vs time graph of the recorded L_{Amax} , L_{Aeq} and L_{A90} sound level over 15-minute time periods for ML1 for the entire measurement duration.

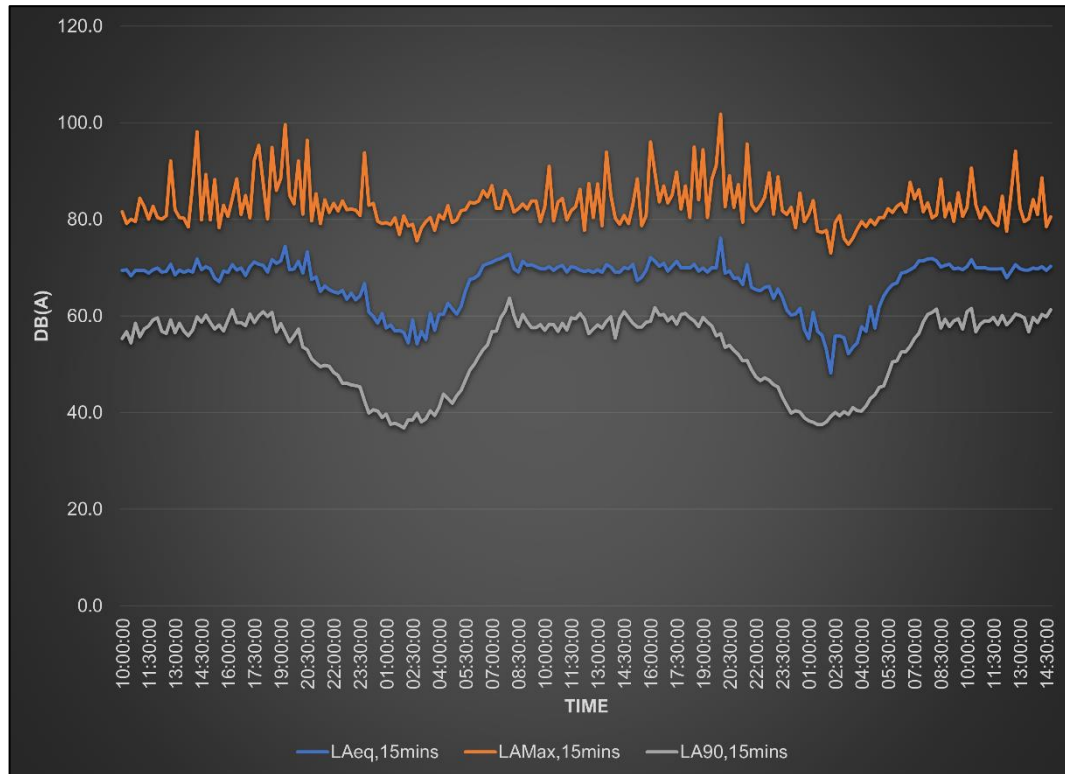


Figure 7: Level vs. time graph showing L_{Amax} , L_{Aeq} and L_{A90} sound levels – ML1

3.2.2 The results for each of the monitoring locations during the daytime and night-time periods are presented in **Table 4** below.

Table 4: Average Measured Daytime and Night-time Noise Levels		
Monitoring Location	Time	Measured Noise Level
		dB $L_{Aeq,16hour}$ / dB $L_{Aeq,8hour}$
ML1	07:00-23:00	69.6 – 70.2
	23:00-07:00	63.0 – 63.8
	23:00-07:00*	81.4 – 82.1
* $L_{AF(max)}$ noise levels exceed more than ten times per night.		

4 3D SOUND MODEL

4.1 Overview

4.1.1 A 3D sound model has been constructed in SoundPLAN™ to model the noise from nearby roads and calculate the predicted sound pressure levels at the front and rear facades of the proposed development. The model uses the calculation method from ISO 9613-2:1996² to account for the distance between the source and receiver and any screening or reflections provided by the surrounding buildings.

4.1.2 The model is based on and calibrated against road traffic noise data collected during the survey as presented in Section 3 of this report.

4.2 3D Sound Model

4.2.1 A noise contour plot illustrating the propagation of the sound from source to receptor during the daytime ($L_{Aeq,16hour}$) and night time ($L_{Aeq,8hour}$) condition is given in **Figure 8** and **Figure 9** respectively.

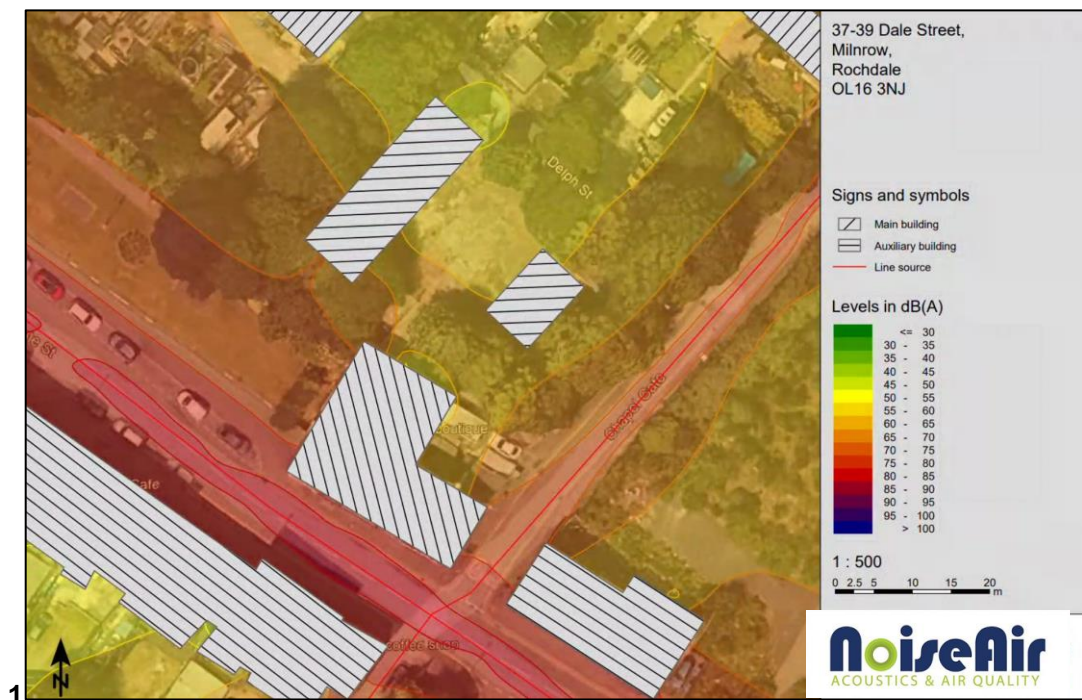


Figure 8: Noise contour plot during the daytime – $L_{Aeq,16hour}$.

² ISO9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation"



Figure 9: Noise contour plot during the night-time – $L_{Aeq,8hour}$.

4.2.2 **Figure 10** shows the receiver locations within the model. **Table 5** shows the predicted worst-case noise levels as calculated at the development site.



Figure 10: Receiver Locations

Table 5: Predicted Receptor Noise Levels					
Receptor Number	Facade	Floor	dB $L_{Aeq,16\text{hours}}$ Daytime	dB $L_{Aeq,8\text{hours}}$ Night-Time	dB $L_{Amax, Night}$
1	Front	1.FL	75.3	68.9	85.9
9	Rear	2.FL	52.8	48.5	65.2
7	Side	1FL	69.8	63.5	80.7
4	Front	2FL	61.0	55.1	71.9
3	Rear	2FL	64.4	58.0	74.8
2	Side	2FL	67.9	61.5	78.4

5 PRO-PG:2017 SITE NOISE RISK ASSESSMENT AND ACOUSTIC DESIGN STATEMENT

5.1 Pro-PG:2017 Stage 1 Risk Assessment of Noise Levels

5.1.1 Based on the results of the 3D sound model and in accordance with Pro-PG:2017, a Site Noise Risk Assessment (SNRA) has been conducted. The SNRA assesses the initial risk of noise to have an adverse impact on a proposed development based on the overall measured levels with no mitigation in place.

5.1.2 The worst-case results have been compared to the information provided on Figure 1 of Pro-PG:2017 and are presented below in **Table 6**.

Receptor Point	Façade	Daytime Noise Level (dB L_{Aeq})	Risk of Adverse Effect	Night-time Noise Level (dB L_{Aeq})	Risk of Adverse Effect
1	Front	75	High	69	High
9	Rear	53	Low	49	Low
7	Side	70	High	64	High
4	Front	61	Medium	55	Medium
3	Rear	64	Medium	58	Medium
2	Side	68	Medium	62	Medium

5.1.3 **Table 6** indicates that during the daytime and night-time periods, proposed receptors of the development can be categorised as being at a '**Low-High**' risk of adverse impact.

5.1.4 The Site Noise Risk Assessment shows that local noise mitigation there is a risk of adverse effects. Good acoustic design will be required to ensure that the potential risk of the noise impact is minimised, and guideline internal and external noise levels are achieved.

5.1.5 In accordance with Pro-PG:2017, a Stage 2 full noise assessment, which includes an acoustic design statement, is required to ensure future residents are protected and a good acoustic design has been implemented.

5.2 Pro-PG:2017 Stage 1 – Site Noise Risk Assessment

5.2.1 The results of the Pro-PG:2017 Stage 1: Initial Site Noise Risk Assessment shows that receptors at the proposed development are likely to be at a '**Low-High**' risk of experiencing an adverse noise impact, with no mitigation in place. Therefore, an assessment against the criteria in WHO and BS 8233:2014 has been undertaken with reference to the general sound levels at the site.

5.2.2 This section forms the Stage 2 Acoustic Design Statement.

5.3 BS 8233:2014 Assessment of Daytime Noise Levels in Outdoor Living Areas

- 5.3.1 At the time of writing, plans indicate external amenity to the rear of each plot.
- 5.3.2 Analyses of the 3D sound model, specifically the receiver locations placed in proposed external amenity areas across the site has been undertaken. Receiver locations and results are shown below in

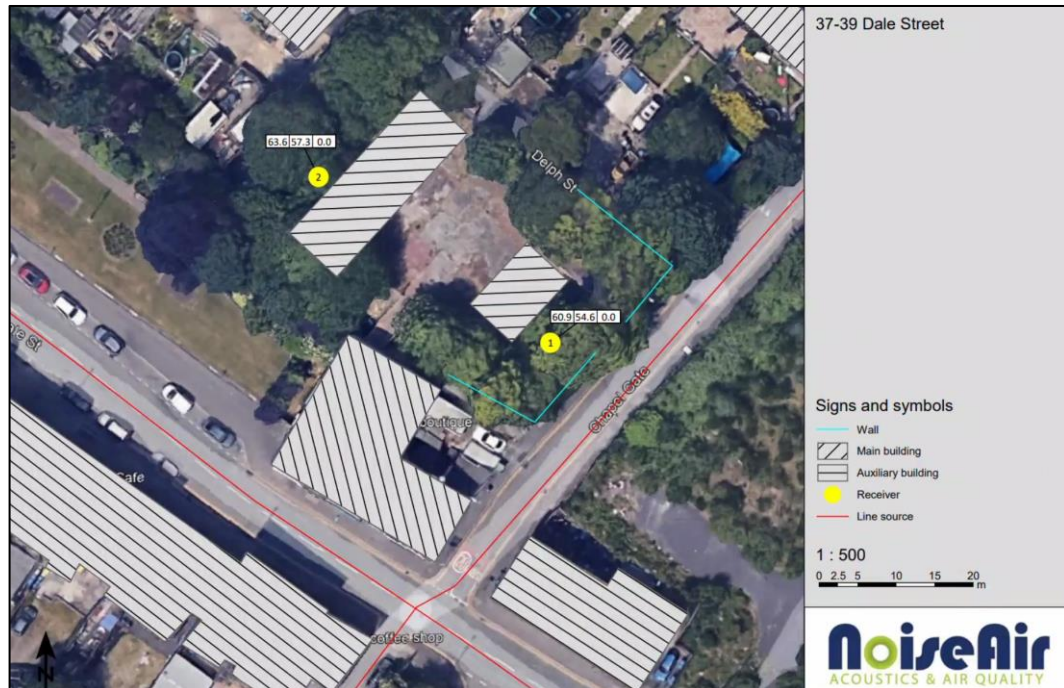


Figure 11: Receiver Locations – External Amenity Areas

Table 7: Predicted Receptor Noise Levels at External Amenity Areas	
Receptor Number	dB $L_{Aeq,16hours}$ Daytime
1	60.9
2	63.6

- 5.3.3 The analysis indicates that:
- The external amenity areas of the assessed plots have been calculated to exceed the recommended 55 dB $L_{Aeq,T}$ WHO guidance value for people being seriously annoyed.
- 5.3.4 It is considered that the inclusion of a typical 1.8 m high perimeter fence around each external amenity is likely to reduce noise levels by between 5 – 10 dB(A).

5.4 BS 8233:2014 Assessment of Daytime and Night-time Noise Levels in Living Rooms and Bedrooms

5.4.1 The predicted noise levels at the façades of the proposed building structures, as detailed in **Table 5** for the daytime and night-time period, together with the level of attenuation required in accordance with BS 8233: 2014, are presented in **Table 8**.

Façade	Daytime ($L_{Aeq,16hours}$) / Night-Time ($L_{Aeq,8hours}$ / L_{Amax})	Worst Case Noise Level at the Façade of the Property (dB(A))	BS 8233:2014 Target Internal Level (dB(A))	Worst Case Level of Attenuation Required (dB(A))
Front	Daytime $L_{Aeq,16hours}$	75	35	40
	Night-Time $L_{Aeq,8hours}$	69	30	39
	Night-Time L_{Amax}	86	45	41
Rear	Daytime $L_{Aeq,16hours}$	53	35	18
	Night-Time $L_{Aeq,8hours}$	49	30	19
	Night-Time L_{Amax}	65	45	20
Side	Daytime $L_{Aeq,16hours}$	70	35	35
	Night-Time $L_{Aeq,8hours}$	64	30	34
	Night-Time L_{Amax}	81	45	36

Façade	Daytime ($L_{Aeq,16hours}$) / Night- Time ($L_{Aeq,8hours}$ / L_{Amax})	Worst Case Noise Level at the Façade of the Property (dB(A))	BS 8233:2014 Target Internal Level (dB(A))	Worst Case Level of Attenuation Required (dB(A))
Front	Daytime $L_{Aeq,16hours}$	61	35	26
	Night-Time $L_{Aeq,8hours}$	55	30	25
	Night-Time L_{Amax}	72	45	27
Rear	Daytime $L_{Aeq,16hours}$	64	35	29
	Night-Time $L_{Aeq,8hours}$	58	30	28
	Night-Time L_{Amax}	75	45	30
Side	Daytime $L_{Aeq,16hours}$	68	35	33
	Night-Time $L_{Aeq,8hours}$	62	30	32
	Night-Time L_{Amax}	78	45	33

5.5 Building Envelope Performance – Windows Open

- 5.5.1 The sound performance requirements for bedrooms, living and dining rooms at the development during the daytime and night-time in rooms with windows closed are summarised in Section 6.
- 5.5.2 However, with windows open, the attenuation provided by the façade will be approximately 10-15 dB(A). This would potentially allow the recommended internal noise limit to be exceeded in most rooms at the development during certain parts of a typical day / night.
- 5.5.3 **Table 10** and **Table 11** show the level of exceedance for partially open windows at the front, rear and side facades for the existing building and new residential developments respectively.

Table 10: Summary of Internal Noise Levels with Windows Partially Open (based on a Partially Open Window Providing up to 15 dB(A) Attenuation).				
Receptor	Room Type	Day / Night	Yes / No	Excess (dB)
Old Build 1	Living/Dining/Kitchen Room	Day	No	+25
	Bedroom	Night	No	+26
Old Build 2	Living/Dining/Kitchen Room	Day	Yes	+3
	Bedroom	Night	Yes	+5
Old Build 3	Living/Dining/Kitchen Room	Day	No	+20
	Bedroom	Night	No	+21

5.5.4

Table 11: Summary of Internal Noise Levels with Windows Partially Open (based on a Partially Open Window Providing up to 15 dB(A) Attenuation).				
Receptor	Room Type	Day / Night	Yes / No	Excess (dB)
New Build 1	Living/Dining/Kitchen Room	Day	No	+11
	Bedroom	Night	No	+12
New Build 2	Living/Dining/Kitchen Room	Day	No	+14
	Bedroom	Night	No	+15
New Build 3	Living/Dining/Kitchen Room	Day	No	+18
	Bedroom	Night	No	+18

- 5.5.5 It is considered that in many circumstances, such as urban/ sub-urban developments, an exceedance of up to 5 dB(A) in accordance with BS 8233:2014 is likely to be acceptable to future residents and therefore is unlikely to breach the LOEL criteria discussed in Section 2 of this report.

-
- 5.5.6 Where exceedances are likely to be greater than +5 dB, on occasions, this may be acceptable to a resident, but when quiet conditions are required, the resident should be able to close the windows whilst maintaining adequate ventilation.
- 5.5.7 Active ventilation may be a consideration for habitable rooms on all facades where noise levels are considered to be elevated. However, as **Table 8** demonstrates, adequate ventilation can be achieved with passive ventilation.

6 SOUND INSULATION SCHEME

6.1 Building Envelope Requirements – Windows Closed

- 6.1.1 Proposals for the development site at the time of writing outline residential use to the first floor and above. Noise sensitive rooms are proposed to all facades of the property. Therefore, internal noise levels are required to not exceed 35 dB L_{Aeq} during the daytime hours in all rooms, 30 dB L_{Aeq} during the night-time in bedrooms and not typically exceed 45 dB L_{Amax} during the night-time hours in bedrooms.
- 6.1.2 When assessing sound levels in habitable areas of the proposed development, the sound attenuation provided by the overall building facade should be considered. To mitigate sound levels, the composition of the building facade can be designed to provide the level of attenuation required. Glazing is generally the building element which attenuates noise the least, so the proportion of glazing in a building facade is an important consideration when assessing overall sound attenuation. Additionally, any façade penetrations should also be considered such as for ventilation, e.g., trickle ventilation.
- 6.1.3 Based on the design details forwarded, worst case façade attenuation calculations have been undertaken in accordance with BS EN ISO 12354-3:2017.
- 6.1.4 Calculations assuming a passive ventilation strategy have been undertaken and presented in this section. **Table 12** and **Table 13** present a summary of the different elements for living rooms and bedrooms in the existing and new buildings respectively.

Table 12: Summary of Building Envelope Performance Requirements (Existing Building) - Passive Ventilation				
Façade	Room Type	Wall R_w+C_{tr} (dB)	Glazing R_w+C_{tr} (dB)	Ventilation $D_{ne,w}+C_{tr}$ (dB) (2500EA)
Front	Living Room	50	40	57
	Bedrooms			
Rear	Living Room	50	35	35
	Bedrooms			
Side	Living Room	50	40	40
	Bedrooms			

Table 13: Summary of Building Envelope Performance Requirements (New Buildings) - Passive Ventilation				
Façade	Room Type	Wall R_w+C_{tr} (dB)	Glazing R_w+C_{tr} (dB)	Ventilation $D_{ne,w}+C_{tr}$ (dB) (2500EA)
Front	Living Room	50	35	35
	Bedrooms			
As Rear	Living Room	50	35	35
	Bedrooms			
Side	Living Room	50	35	35
	Bedrooms			

6.1.5 It should be noted that the acoustic performance values stated are for guidance and based on information provided at the time of writing, changes to location, size and orientation of rooms/ facades can have impacts on the calculated internal noise levels and subsequently the required acoustic performance criteria.

6.1.6 **Table 14** below provides a typical example summary for each elements type outlined in **Table 12** and **Table 13** above.

Table 14: Summary of Building Element - Typical Examples		
Element Type	Acoustic Performance	Typical Example
Wall	50 dB R_w+C_{tr}	Concrete / Brick exterior wall with min. 100 mm insulated (60 kg / m ³ rockwool) cavity constructed with timber studwork and resilient bars with min. 10 mm plasterboard lining
Window	Up to 35 dB R_w+C_{tr}	Stapid Silence 10 mm pane, 9 mm air filled cavity, 6.4 mm pane
Window	Up to 40 dB R_w+C_{tr}	Stapid Silence 10 mm pane, 16 mm air filled cavity, 16.8 mm pane
Acoustic Slot Vent (Window)	Up to 35 dB $D_{ne,w}+C_{tr}$ (1 no. per room)	BS8233 Example - Sound attenuated trickle vent
Acoustic Slot Vent (Window)	Up to 39 dB $D_{ne,w}+C_{tr}$ (2 no. per room)	Titon Silentbloc Ventilator (445mm Long)
Acoustic Slot Vent (Window)	Up to 45 dB $D_{ne,w}+C_{tr}$ (2 no. per room)	Renson 771 AK

Table 14: Summary of Building Element - Typical Examples		
Element Type	Acoustic Performance	Typical Example
Acoustic Vent (Wall)	Up to 57 dB R_w+C_{tr} (2 no. per room)	Dbal Products DB-61AWV.

6.1.7 It should be noted that the examples provided in **Table 14** are for guidance only, however any adopted solution must achieve the acoustic performance values presented in **Table 12** and **Table 13**.

6.2 Ventilation Requirements

- 6.2.1 It is recommended that the acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 2010 Approved Document F1 2021 Means of Ventilation and British Standard BS5925 1991: "Code of Practice for Ventilation Principles and Designing for Natural Ventilation". Acoustic ventilation is only recommended for noise sensitive rooms, which are bedrooms and living/ dining rooms.
- 6.2.2 Where a passive ventilation system is incorporated into the design, ventilators should be acoustically treated for habitable rooms to all facades. Ventilation openings to these rooms should match or exceed the minimum values set out in **Table 12** and **Table 13**.
- 6.2.3 The implementation of the recommended glazing would ensure that the required internal daytime and night-time noise limits are achieved.
- 6.2.4 It should be further noted that the glazing configurations within this report are for guidance only. Similar products to those used in NoiseAir calculations may achieve a similar level of sound reduction, however this should be verified by the manufacturer.
- 6.2.5 As detailed in Section 6.2 it is likely that noise levels in noise sensitive rooms within some of the proposed rooms will likely rely on the windows being in the closed position and therefore appropriate ventilation design should be completed. **Table 12** and **Table 13** demonstrate that adequate ventilation can be achieved with passive ventilation.

7 CONCLUSIONS

7.1 Overview

- 7.1.1 By instruction from Milnrow Properties Limited ('the client'), NoiseAir was commissioned to undertake a noise impact assessment (NIA) to support a planning application at the site at 37-39 Dale Street, Milnrow, Rochdale, OL16 3NJ.
- 7.1.2 At the time of writing, proposals outline the conversion of the second floor and roof void of the existing building into four self-contained apartments, together with the construction of seven new residential dwellings on the land to the rear.
- 7.1.3 It should also be noted that the first floor is to be used for commercial purposes.

7.2 Conclusions

- 7.2.1 The results of the Pro-PG:2017 Stage 1: Initial Site Noise Risk Assessment shows that receptors at the proposed development are likely to be at a '**High**' risk of experiencing an adverse noise impact, with no mitigation in place.
- 7.2.2 Calculations show that to achieve a reasonable internal acoustic environment in habitable rooms as specified within BS 8233:2014, the building envelope constructions should be selected to meet the sound reduction index (SRI) values presented in **Table 12** and **Table 13**.
- 7.2.3 **Table 12** and **Table 13** demonstrate that adequate ventilation can be achieved with passive ventilation.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Milnrow Properties Limited and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

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APPENDIX B – GLOSSARY

A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network. <i>NOTE: The A-weighting network modifies the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.</i>
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure in decibels (dBA).
Acoustic environment	Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013].
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. <i>NOTE: The ambient sound comprises the residual sound and the specific sound when present.</i>
Ambient sound level, $L_a = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T <i>NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present.</i>
Background sound	Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location.
Background sound level, $L_{A90,T}$ (BS 4142:2014)	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Break-in	Noise transmission into a structure from outside.
Break-out	Noise transmission from inside a structure to the outside.
Cross-talk	Noise transmission between one room and another room or space via a duct or other path.
C_{tr}	Correction term applied against the sound insulation single-number values (R_w , D_w , and $D_{nT,w}$) to provide a weighting against low frequency performance. <i>NOTE: The reference values used within the C_{tr} calculation are based on urban traffic noise.</i>
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T, has the same mean-squared sound pressure as the sound under consideration that varies with time.
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ (BS 4142:2014)	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time.
Equivalent sound absorption area of a room, A	Hypothetical area of a totally absorbing surface without diffraction effects, expressed in square metres (m ²), which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration
Facade level	Sound pressure level 1 m in front of the façade. <i>NOTE: Facade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.</i>
Free-field level	Sound pressure level away from reflecting surfaces. <i>NOTE: Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the</i>

	reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source). Estimates of noise from aircraft overhead usually include a correction of 2 dB to allow for reflections from the ground.
Impact sound pressure level, L_i	Average sound pressure level in a specific frequency band in a room below a floor when it is excited by a standard tapping machine or equivalent.
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants. <i>NOTE: The location(s) within the room at which the ambient indoor noise is to be measured or calculated ought to be considered.</i>
Measurement time interval, T_m (BS 4142:2014)	Total time over which measurements are taken. <i>NOTE: This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.</i>
Noise criteria	Numerical indices used to define design goals in a given space.
Noise rating, NR	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves.
Normalised impact sound pressure level, L_n	Impact sound pressure level normalized for a standard absorption area in the receiving room. <i>NOTE: Normalised impact sound pressure level is usually used to characterize the insulation of a floor in a laboratory against impact sound in a stated frequency band.</i>
Octave band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.
Percentile level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting "F," which is exceeded for N% of a specified time interval.
Reference time interval, T_r (BS 4142:2014)	Specified interval over which the specific sound level is determined. <i>NOTE: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.</i>
Residual sound (BS 4142:2014)	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Residual sound level, $L_r = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T.
Rating level, L_{Ar,T_r}	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise. <i>NOTE: This is used in BS 7445 and BS 4142 for rating industrial noise, where the noise is the specific noise from the source under investigation.</i>
Reverberation time, T	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped.
Sound exposure level, L_{AE}	Level of a sound, of 1 s duration, which has the same sound energy as the actual noise event considered.
Sound level difference, D	Difference between the sound pressure level in the source room and the sound pressure level in the receiving room.
Sound pressure, p	Root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound.

Sound pressure level, L_p	Quantity of sound pressure, in decibels (dB).
Sound reduction index, R	Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.
Specific sound level, $L_s = L_{Aeq,T_r}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .
Specific sound source (BS 4142:2014)	Sound source being assessed.
Standardised impact sound pressure level, L'_{nT}	Impact sound pressure level normalized to a reverberation time in the receiving room of 0.5 s.
Standardised level difference, D_{nT}	Difference in sound level between a pair of rooms, in a stated frequency band, normalized to a reference reverberation time of 0.5 s for dwellings.
Ground borne noise	Audible noise caused by the vibration of elements of a structure, for which the vibration propagation path from the source is partially or wholly through the ground. <i>NOTE Common sources of ground-borne noise include railways and heavy construction work on adjacent construction sites.</i>
Structure-borne noise	Audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements. <i>NOTE Common sources of structure-borne noise include building services plant, manufacturing machinery and construction or demolition of the structure.</i>
Third octave band	Band of frequencies in which the upper limit of the band is 2% times the frequency of the lower limit.
Weighted level difference, D_w	Single-number quantity that characterizes airborne sound insulation between rooms, but which is not adjusted to reference conditions. <i>NOTE Weighted level difference is used to characterize the insulation between rooms in a building as they are. Values cannot normally be compared with measurements made under other conditions (see BS EN ISO 717-1).</i>
Weighted normalised impact sound pressure level, $L'_{n,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or
Weighted standardised impact sound pressure level $L'_{nT,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted standardised level difference, $D_{nT,w}$	Single-number quantity that characterizes the airborne sound insulation between rooms.

Symbols

D_w	Weighted level difference (dB)
D_{nT}	Standardized level difference (dB)
$D_{nT,w}$	Weighted standardized level difference (dB)
L_{Amax}	Maximum noise level (dB)
L_{Ar,T_r}	Rating level (dB)
L_n	Normalised impact sound pressure level (dB)
L'_{nT}	Standardised impact sound pressure level (dB)
$L'_{nT,w}$	Weighted standardised impact sound pressure level (dB)
$L'_{n,w}$	Weighted normalised impact sound pressure level (dB)
L_p	Sound pressure level (dB)
L_{pA}	A-weighted sound pressure level (dB)
$L_{AN,T}$	Percentile level (dB)
L_{AE}	Sound exposure level (dB)
$L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level (dB)
p	Sound pressure (Pa)
p_A	A-weighted sound pressure (dB)
$p_{A(t)}$	Instantaneous A-weighted sound pressure (Pa)

R	Sound reduction index (dB)
R_w	Weighted sound reduction index (dB)
T	Time interval (also used for reverberation time) (s)
t_0	Reference time interval (s)

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