



NEXT MOVE ESTATE

73 YORKSHIRE STREET, ROCHDALE

NOISE ASSESSMENT FOR PLANNING PURPOSES

8 August 2023

AEC REPORT: P4996/R1/NRS

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DOCUMENT STATUS

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1.0 INTRODUCTION

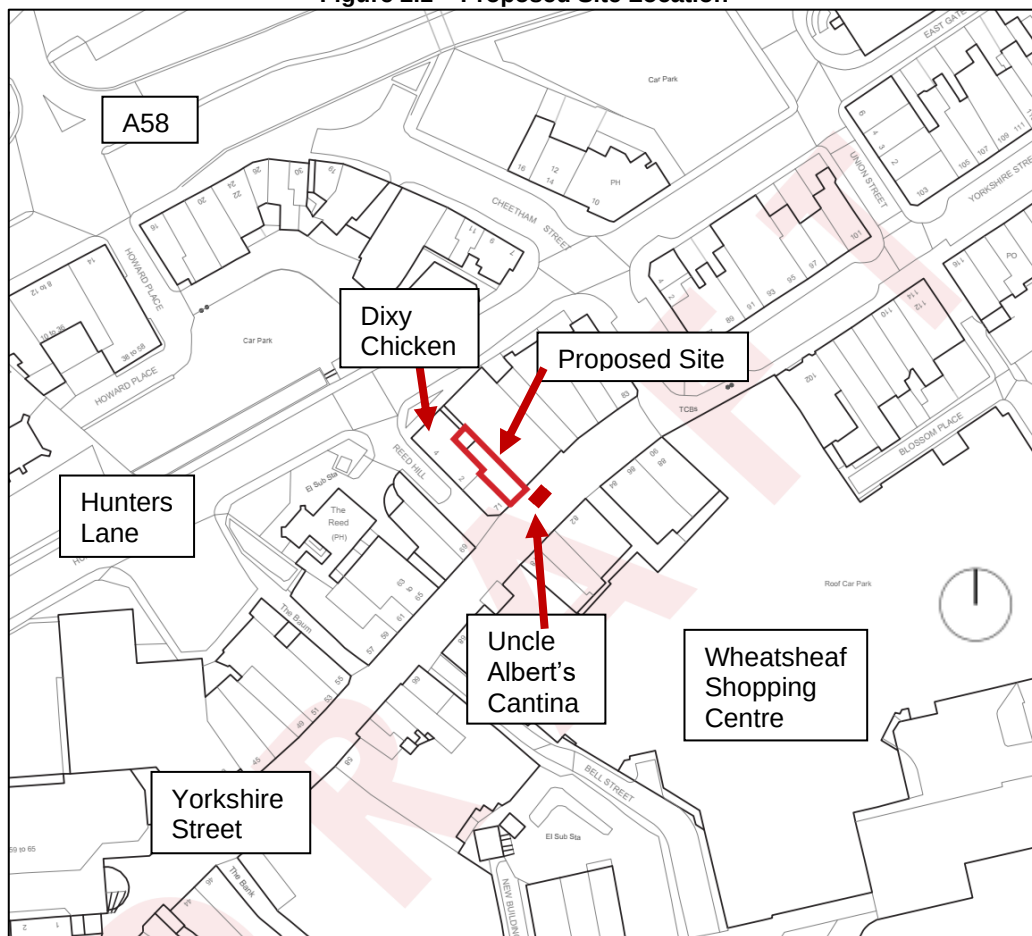
- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Next Move Estate to undertake a noise assessment in relation to the proposed conversion of a former retail unit (salon) into a single apartment on the first and second floor of 73 Yorkshire Street, Rochdale. The ground floor of 73 Yorkshire Street is currently occupied by a retail unit (A1 Fashion and watches).
- 1.2 This report details the baseline noise levels measured at the development site, presents the assessment criteria and discusses the implications on the building design, to achieve acceptable internal noise levels as required by the Local Authority.
- 1.3 Acoustic terminology is discussed in brief in Appendix A.

2.0 BACKGROUND AND SITE DESCRIPTION

Site Location

- 2.1 The proposed site is bound by Yorkshire Street to the south-east and commercial units to the north-west, north-east and south-west, as indicated in Figure 2.1, below.

Figure 2.1 – Proposed Site Location



- 2.2 Part of Yorkshire Street to the south-east of the site is completely pedestrianised.
- 2.3 About 3m to the south-east of the site on Yorkshire Street is Uncle Albert's Cantina, a street food van which operates from 1100 to 1600h, Monday to Friday. The van, along with its generator is permanently parked at this location.
- 2.4 Beyond Yorkshire Street to the south-east is the Wheatsheaf Shopping Centre.
- 2.5 To the north-west of the site is Dixy Chicken, a take-away which operates from 1100 to 0000h, Monday to Friday and 1100 to 0100h on Saturday and Sunday. The kitchen extract chimney associated with the take-away is situated about 3m from the north-western façade of the development.
- 2.6 Further north-west of Dixy Chicken is Hunters Lane which is a 30mph road and connects to the A58 which is a major road around Rochdale.

Proposed Scheme

- 2.7 The proposed scheme consists of conversion of a former retail unit (salon) into a single apartment on the first and second floor, with the ground floor of the site currently occupied by a retail unit (A1 Fashion and watches), as indicated in Figure 2.2, below.
- 2.8 As seen in Figure 2.2, below, there are no windows to the north-eastern and south-western elevation of the development and hence these elevations are not considered further in the assessment.

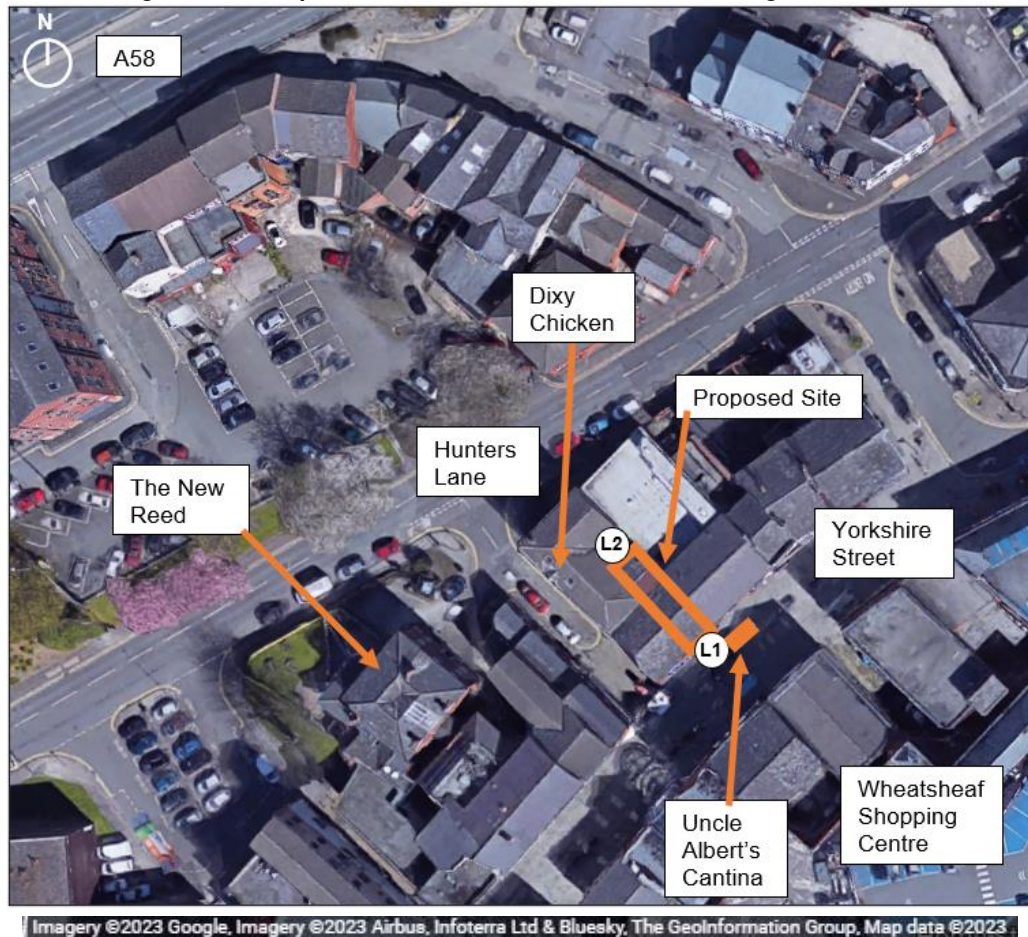
Figure 2.2 – Proposed First Floor Plan



3.0 NOISE CLIMATE

- 3.1 An extended unattended noise level survey was undertaken at two locations directly overlooking Yorkshire Street and the Dixy Chicken (take-away), identified as L1 and L2 on Figure 3.1, respectively. The survey was carried out between approximately 1430h on Friday 28 July 2023 and 1330h on Monday 31 July 2023. Full logged data over consecutive 15-minute periods is held on file by AEC and is available on request.

Figure 3.1 – Proposed Site Location and Noise Monitoring Locations



- 3.2 All measurements were undertaken under façade conditions, i.e. 1m from the façade. Therefore, a correction of -3dB is applied in order to convert them to free-field noise levels, as per guidance in BS7445-2: 1991 'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'.
- 3.3 A full measurement procedure for the survey is presented in Appendix B and the measured data is presented in Graphs B1 and B2.
- 3.4 A summary of the free-field daytime and night-time ambient, $dB_{LAeq,T}$ and background, dB_{LA90} noise levels at each location is presented in Table 3.1, below. In relation to night-time maximum noise levels, the highest and 10th highest maximum noise levels measured over the 15-minute sampling periods are also presented in Table 3.1, below.

Table 3.1 – Summary of Free-field Daytime and Night-time Noise Levels

Date (Time, h)	Noise Levels, dB					
	Location L1 - (Yorkshire Street)			Location L2 - (Dixy Chicken)		
	Ambient, L _{Aeq}	Background, L _{A90,T}	Maximum, L _{Amax,F}	Ambient, L _{Aeq}	Background, L _{A90,T}	Maximum, L _{Amax,F}
28.07.23 (1430 – 2300)	--	--	--	67	53	-
28.07.23 – 29.07.23 (2300 – 0700)	--	--	--	46	36	67/60 ¹
29.07.23 (0700 – 1200)	52	50	-	61	46	-
29.07.23 – 30.07.23 (2300 – 0700)	44	38	79/63 ¹	52	37	80/60 ¹
30.07.23 (0700 – 1200)	52	44	-	66	50	-
30.07.23 – 31.07.23 (2300 – 0700)	47	38	74/60 ¹	47	37	66/63 ¹
31.07.23 (0700 – 1330)	56	49	-	61	47	-

¹10th Highest maximum noise level measured over a 15-minute sampling period

- 3.5 The daytime and night-time ambient noise levels measured at Location L1 were due to noise from generator associated with Uncle Albert's Cantina (street food van) and noise from pedestrians, respectively. The night-time maximum noise levels measured at Location L1 were due to pedestrians shouting/speaking in a raised voice.
- 3.6 Please note that due to a technical issue with the noise measurement equipment, AEC could not measure noise levels between 1430h on 28 July 2023 and 0700h on 29 July 2023 at Location L1.
- 3.7 The daytime and night-time ambient noise levels measured at Location L2 were due to intermittent noise from the chimney associated with Dixy Chicken (take-away). The night-time maximum noise levels measured at Location L2 were due to the take-away emptying the bins at the rear.

4.0 BASIS OF ASSESSMENT

Determining External Noise Levels

- 4.1 British Standard (BS) 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' (BS8233) describes how noise levels can be determined and assessed from different sources in chapters 6.2 to 6.7.
- 4.2 Where noise from an industrial source or building services plant affects residential areas, BS8233 states that this should be assessed using guidance presented in BS 4142:2014+A:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS4142).
- 4.3 On schemes where mitigation can only be provided by acoustically enhanced glazing and ventilation, it is proposed that appropriate internal noise level limits are suggested to reduce the potential impact of industrial noise sources.
- 4.4 BS412 states that the standard is "*not intended to be applied to the assessment of indoor sound levels.*" Therefore, internal noise level limits have been proposed based on Note 7.7.1 in BS8233 and this is discussed further below.

National Planning Policy Framework

- 4.5 Current national planning policies are set out in the National Planning Policy Framework (NPPF) published by the Department for Communities and Local Government, which was published in March 2012, and last revised in July 2021.
- 4.6 The planning policies which relate specifically to noise, are presented in paragraphs 174, 185 and 187 of the framework document and are reproduced below:

"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.*

185. 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:

- (a) 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.*
- (b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

187. *Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."*

- 4.7 Further to the above, the Governments 'Planning Practice Guidance' (PPG) published on 6 March 2014 and updated on 22 July 2019 states:

'Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.'

- 4.8 In addition, the guidance indicates that, whilst noise can override other planning concerns, it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users, and its surroundings, as these can have an important effect as to whether or not noise is likely to pose a concern.

Internal Noise Level Limits due to External Noise Ingress

- 4.9 Based on AEC's experience of assessments previously undertaken for Rochdale Borough Council (RBC), it is understood that they require the scheme to be designed such that internal noise levels are controlled to meet those presented in Section 7 of BS8233 and The Association of Noise Consultants (ANC) document Professional Practice Guidance (ProPG) on Planning and Noise 'New Residential Development' (2017).
- 4.10 Where noise sources have specific character, such as being intermittent in nature, containing a distinguishable, discrete, and continuous tone, is irregular enough to attract attention, or has a strong low-frequency content, BS8233 suggests that lower internal noise level limits (than presented in 7.7.2 of BS8233) may be appropriate.
- 4.11 Therefore, to minimise the potential impact on future residents from noise associated with the generator of the street food van and kitchen extract chimney of the take-away, it is proposed that noise from these sources is controlled to no greater than NR25L_{eq} in living rooms and bedrooms during the daytime and NR20L_{eq} in bedrooms during night-time period.
- 4.12 In relation to maximum noise levels in bedrooms during the night-time period, Note 4 of ProPG states that "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."
- 4.13 Based on this AEC would propose to design the façade in order that maximum noise levels in bedrooms do not typically exceed 45dB_{L_{Amax,F}} during the night-time period 2300h to 0700h and any non-typical events such as a one-off emergency siren or noisy motorbike pass-by will be excluded in the assessment.

Ventilation Provision

Whole Dwelling Ventilation Provision

- 4.14 The above internal noise level limits need to be achieved when whole dwelling (background) ventilation, as defined in Approved Document F 'Ventilation' (2021) of the Building Regulations (ADF), is being provided to habitable rooms.
- 4.15 Whole dwelling ventilation is typically achieved either via passive ventilators (e.g. an open window or trickle ventilator) or mechanical means. If desirable, background ventilation can be provided via partially open windows provided that the external noise levels do not exceed those presented in Table 4.1 below.
- 4.16 The external noise limits specified in Table 4.1 have been set based on the understanding that a window partially open (slightly ajar) for background ventilation provides a reduction of external to internal noise levels of 15dB, as defined in The ANC document ProPG.

Table 4.1 – External Free-field Noise Level Limit to Allow for Whole Dwelling Ventilation to be Provided via a Partially Opened Window

Activity	Location	Noise Level Limit, dB		
		Daytime 0700 – 2300h $L_{Aeq,16h}$	Night-Time 2300 – 0700h	
			$L_{Aeq,8h}$	$L_{Amax,F}$
Resting	Living Room	45	-	-
Dining	Dining Room/Area	50	-	-
Sleeping (daytime resting)	Bedroom	45	40	60

- 4.17 Regarding background ventilation, ADF states that 'The ventilation provisions will not necessarily meet cooling needs' and that information about overheating is given in Approved Document O (ADO) 'Requirement 01: Overheating Mitigation Regulations: 40B' which came into force on 15 June 2022 (2021 edition).

Control of Overheating Provision

- 4.18 ADO states that in locations where external noise may be an issue (e.g. buildings close to busy roads) the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (2300 to 0700h) if ambient or maximum noise levels within bedrooms exceed the following limits:
- 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
 - 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).
- 4.19 To calculate the external noise levels that will result in the above internal noise levels, the noise reduction across an opening in a façade needs to be confirmed. This reduction will vary depending on the size of the opening.
- 4.20 With reference to the simplified method for demonstrating compliance with ADO, to adequately remove excess heat, the required free area of a bedroom façade opening is determined based on the building location in one of the following areas:
- 'Moderate risk' locations – England, excluding high risk parts of London in (b).
 - 'High risk' locations – urban and some suburban parts of London.

- 4.21 For 'moderate risk' locations such as this site, ADO indicates that the minimum free area of the façade opening required to assist with the control of overheating in bedrooms would be 4% of the floor area. With reference to the ANC's '*Guide to Demonstrating Compliance with the Noise Requirements of Approved Document O*' a reduction of approximately -9dB can be expected across a façade (external to internal) that has an open free area equivalent to approximately 4% of the floor area of the room in question.
- 4.22 Based on the above, during the night-time, opening windows to bedrooms should not be relied upon to remove excess heat where external free-field noise levels exceed $49\text{dB}_{\text{LAeq},8\text{hr}}$ or $64\text{dB}_{\text{LAmax},F}$ more than 10 times per night.
- 4.23 ADO does not set daytime noise limits above which occupants are likely to keep windows closed. As such, to propose appropriate daytime noise limits for this issue, consideration has been given to guidance presented in the ANC's guidance document '*Acoustics, Ventilation and Overheating: Residential Design Guide (2020)*' (AVO).
- 4.24 Table 3.2 of AVO presents risk categories which range from 'negligible' to 'high' depending on the external noise level. The approximate noise limits associated with the difference risk categories are defined below:
- High – greater than approximately $64\text{dB}_{\text{LAeq},16\text{h}}$;
 - Medium – between approximately $58\text{dB}_{\text{LAeq},16\text{h}}$ and $63\text{dB}_{\text{LAeq},16\text{h}}$;
 - Low – between approximately $52\text{dB}_{\text{LAeq},16\text{h}}$ and $57\text{dB}_{\text{LAeq},16\text{h}}$;
 - Negligible – below $52\text{dB}_{\text{LAeq},16\text{h}}$.
- 4.25 Based on the above, an external free-field noise level of approximately $63\text{dB}_{\text{LAeq},16\text{h}}$ is at the upper end of the 'medium' risk category and therefore this has been selected as the external daytime noise level limit above which opening windows should ideally not be relied upon for the control of overheating.
- 4.26 In summary, the allowable external noise levels above which opening windows (or equivalent openings) should not be relied upon to remove excess heat are presented in the following Table 4.2.

Table 4.2 – External Free-Field Noise Limits Above Which Openable Windows Should Not be Used to Remove Excess Heat

Period	External Free-field Noise Level Limit, dB
Daytime Ambient, $\text{LAeq},16\text{h}$	63
Night-time Ambient, $\text{LAeq},8\text{h}$	49
Night-time Maximum, LAmax,F	64

- 4.27 It is important to note that the above is a simple assessment only and if dynamic thermal modelling is undertaken based on Chartered Institution of Building Services Engineers (CIBSE) TM59, this may demonstrate that free area openings may need to be larger or smaller. As such, whilst this level of assessment is acceptable, the outcome can only be considered approximate and there is a level of uncertainty as to the actual internal noise levels that will occur on completion.

Noise Transfer from Ground Floor Retail Unit

- 4.28 In order to comply with the 2010 Building Regulations, the separating walls and floors between these spaces and the adjacent apartments should comply with the minimum sound insulation performance requirements of Approved Document E (ADE) which is $43\text{dB}D_{n,T,w} + C_{tr}$.
- 4.29 However, based on AEC's experience, it is recommended that noise from these spaces is controlled so as to not exceed a maximum noise level of no greater than $\text{NR}30L_{\text{max}}$ in habitable rooms during the daytime and $\text{NR}25L_{\text{max}}$ in bedrooms at night in the apartment above.

5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

Determining of External Noise Levels

- 5.1 As stated above, the main sources of noise affecting the site is the generator associated with the street food van, pedestrians and the kitchen extract chimney associated with the take-away. These sources are discussed separately below.

Generator Noise from Street Food Van

- 5.2 A free-field 1-hour ambient noise level of $60\text{dB}L_{\text{Aeq},1\text{h}}$ was measured at Location L1 from the generator during the daytime period. Based on the generator being in use for about 5 hours during the daytime period, an ambient noise level of $55\text{dB}L_{\text{Aeq},16\text{h}}$ is considered appropriate for the whole 16-hour period and this level has been used in the assessment below.

Noise From Pedestrians

- 5.3 The highest measured night-time free-field ambient noise level of $47\text{dB}L_{\text{Aeq},8\text{h}}$ at Location L1 from pedestrians has been used in the assessment below.
- 5.4 As stated in Table 3.1, the typical (10th highest) maximum noise levels measured at Location L1 due to pedestrians during the night-time period did not exceed $63\text{dB}L_{\text{Amax}}$, and this level has been used in the assessment below.

Noise From Take-Away Kitchen Extraction System

- 5.5 Considering the intermittent nature of the noise associated with the take-away, the highest measured free-field ambient noise level of $67\text{dB}L_{\text{Aeq},16\text{h}}$ at Location L2 during the daytime period has been used in the assessment below.
- 5.6 The highest measured free-field ambient and maximum noise levels of $52\text{dB}L_{\text{Aeq},8\text{h}}$ and $63\text{dB}L_{\text{Amax}}$, respectively, at Location L2 during the night-time period from take-away activities has been used in the assessment below.

Summary of External Noise Levels

- 5.7 A summary of the daytime ambient and night-time ambient and maximum noise levels affecting each elevation of the development is presented in Table 5.1, below.

Table 5.1 – Daytime and Night-time Noise Levels Affecting Each Elevation

Elevation	Affecting Noise Sources	Noise Level, dB		
		L _{Aeq,16h}	L _{Aeq,8h}	L _{Amax,F}
South-eastern	Generator and Pedestrians	55	47	63
North-western	Take-away	67	52	63

Glazing and Ventilation Requirements

- 5.8 A comparison between the determined noise levels presented in Table 5.1 and the noise levels limits presented in Table 4.1, indicates that all habitable rooms in the development would need to keep their windows closed and alternate means of whole dwelling (background) ventilation would need to be provided during both daytime and night-time periods. It is assumed that background ventilation will be provided by trickle vents.
- 5.9 The sound insulation performance of the glazing and acoustic ventilators to meet the requirements stated in Paragraph 4.11 have been calculated based on the spectrum data measured on-site, the room sizes and glazing areas presented on the architectural drawings and are presented in Table 5.2, below.

Table 5.2 – Outline Requirements of Glazing and Ventilation to Achieve Internal Noise Levels in Habitable Rooms

Elevation	Sound Insulation Performance	
	Glazing	Ventilator
South-eastern	32dBR _w / 28dBR _w + C _{tr}	33dBD _{n,e,w}
North-western	46dBR _w / 40dBR _w + C _{tr}	-

- 5.10 It is recommended that there are no openings to the bedrooms on the north-western elevation facing Dixy Chicken and it should to be ventilated by mechanical plant. This requires further development.
- 5.11 Example glazing build-ups, to achieve the required sound insulation performances presented in Table 5.2, are provided in Table 5.3 below. Consideration of frames and seals is more critical where the glazing acoustic performance requirement is 40dBR_w or higher, in these instances consideration should be given to secondary glazed systems or alternative means of controlling noise break-in.

Table 5.3 – Example Glazing Constructions

Sound Insulation Performance	Example Construction
32dBR _w / 28dBR _w + C _{tr}	6mm Glass / 16mm Argon / 4mm Glass
46dBR _w / 40dBR _w + C _{tr}	10mm Glass / 20mm Argon / 8.8mm Optiphon Glass

- 5.12 Prior to any glazing being installed, octave band sound insulation performance data of the glazing build-ups and ventilators selected must be verified by AEC or others.
- 5.13 All background ventilation sound insulation requirements have been based on the use of a single ventilator per room. If more than one unit is required, such as may be required to satisfy Building Control requirements, the performance of each unit might need to be increased.

Purge Ventilation

- 5.14 Windows can be openable for purge ventilation provided that they are effectively acoustically sealed when closed, and it is important that any frames and seals do not downgrade the sound insulation performance of the glazing.

Control of Overheating

- 5.15 A comparison between the noise levels presented in Table 5.1 and those presented in Table 4.2, indicates that windows can be opened to aid with the control of overheating in all habitable rooms on the south-eastern elevation during both daytime and night-time periods.
- 5.16 However, for habitable rooms on the north-western elevation an alternate means of cooling would be required such as a decentralised or separate system of cooling during both daytime and night-time periods.
- 5.17 The above is based on window opening equivalent to 4% of the floor area and different opening amounts will result in different internal noise levels.

External Envelope

- 5.18 To maintain the sound insulation performance of the external envelope the remainder of the façade construction should have a sound insulation performance of at least 10dB higher than the glazing. Therefore, the external walls and roof would need to achieve a sound insulation performance of at least around 56dBR'_w.

Noise Transfer to Adjacent Residential Areas

- 5.19 The noise levels from ground floor retail unit would need to be controlled to the residential areas above.
- 5.20 As a minimum the separating floor between the commercial unit and first floor residential areas would need to achieve an airborne sound insulation performance of $43\text{dBD}_{nT,w} + C_{tr}$ in order to comply with Approved Document E of The Building Regulations.
- 5.21 However, a higher sound insulation performance of around $48\text{dBD}_{nT,w} + C_{tr}$ is likely to be required to achieve a noise level no greater than NR30L_{max} in the apartments during the daytime period.

- 5.22 Depending on the mass and thickness of the separating floor, this level of performance can be achieved with a mass barrier ceiling in the commercial units, formed of 1 or 2 layers of 15mm thick dense plasterboard (such as British Gypsum SoundBloc) supported off resilient hangers, with mineral wool in the cavity.. This will require further development.

6.0 SUMMARY & CONCLUSIONS

- 6.1 Acoustic & Engineering Consultants Limited (AEC) has been appointed by Next Move Estate, to undertake a noise assessment for the proposed conversion of a former retail unit (salon) into a single apartment on the first and second floor of 73 Yorkshire Street, Rochdale.
- 6.2 The ground floor of 73 Yorkshire Street is currently occupied by a retail unit (A1 Fashion and watches).
- 6.3 A daytime and night-time noise measurement was undertaken by AEC in July 2023 and the main noise sources in the area are generator noise from street food van, pedestrian noise and noise from kitchen extract system associated with a take-away. Full details of the noise level survey are presented in Appendix B. A summary of the noise levels measured and the sources of noise affecting the proposed development are discussed in Section 3.0.
- 6.4 The noise assessment has been based on achieving the internal and external noise levels presented in BS8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' and the Association of Noise Consultants (ANC) document '*Professional Practice Guidance on Planning & Noise: New Residential Development*' (ProPG). This is discussed further in Section 4.0.
- 6.5 An assessment of the noise levels measured and affecting the proposed development is presented in Section 5.0. In summary, windows would need to be closed to achieve appropriate internal noise limits, and acoustically enhanced thermal double glazing will be required (as stated in Table 5.2) considering whole dwelling (background) ventilation is provided using trickle vents. It is recommended that there are no openings to the bedrooms on the north-western elevation facing the take-away and the space should to be ventilated by mechanical plant.
- 6.6 With regard to control of overheating, a simplified assessment has been undertaken with reference guidance in Approved Document O of the Building Regulations. Based on this, it should be acceptable to control summertime overheating via open windows (or other façade opening) for all habitable rooms on the south-eastern elevation during both daytime and night-time periods. However, for habitable rooms on the north-western elevation an alternate means of cooling would be required such as a decentralised or separate system of cooling during both daytime and night-time periods.
- 6.7 Based on this assessment, noise should not be considered a determining factor in relation to any planning permission being sought.

APPENDIX A – Acoustic Terminology in Brief

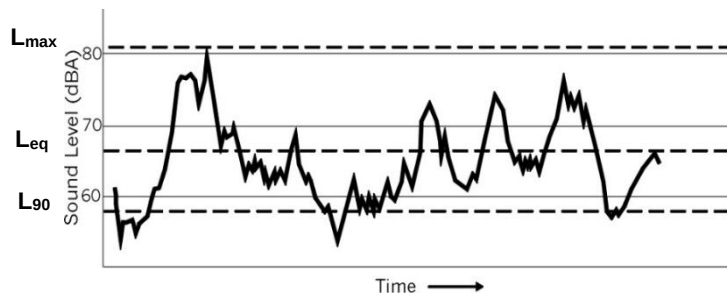
General

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most noise is made up of many different frequencies.

The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The *dBA* weighting emphasizes or reduces the importance of certain frequencies within the audible range

Sound / Noise Units

The figure below shows an example of sound level varying with time. Because of this variation over time the same period of noise can be described by several different levels. The most common of these are described below.



Commonly Used Descriptors for Sound / Noise

L_{Amax,F/S}	The maximum (A-weighted) sound level measured during a given time. 'Fast' or 'Slow' meter response should be cited.
L_{Aeq,T}	The equivalent continuous (A-weighted) sound level. It may be thought of as the "average" sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises. It can be considered as the "ambient" noise level.
L_{A90,T}	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe the "background" noise.
Free-field Level	This refers to the sound level measured outside, away from reflecting surfaces.
Façade Level	This refers to the sound level measured outside, at 1m from a hard reflecting surface, typically 3dB greater than the free-field level.

Other Common Acoustics Descriptors

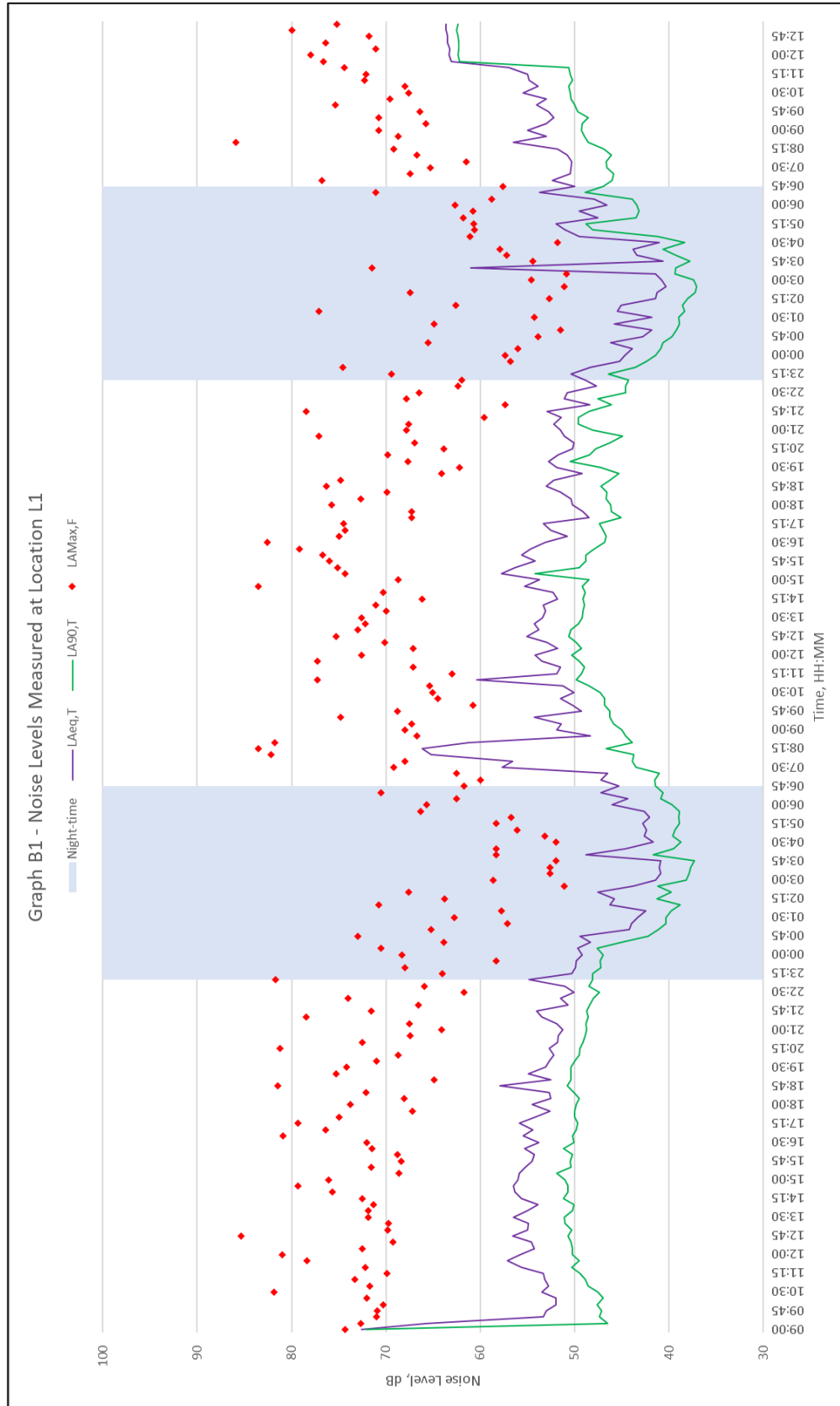
NR	Noise rating – a graphical method for assigning a single number rating to a noise spectrum and is often use to specify noise level limits for mechanical services.
R_w	Single number rating used to describe the laboratory airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
R'_w	Apparent sound reduction index - Single number rating used to describe the sound reduction index of an on-site construction over a range of frequencies, typically 100-3150Hz.

D_{nT,w}	Weighted standardized level difference. A single number rating used to describe the on-site airborne sound insulation performance properties of a material or building element over a range of frequencies, typically 100-3150Hz. Standardized to a reference reverberation time of 0.5s (unless otherwise stated).
C_{tr}	A road traffic spectrum adaptation term which is used to describe the low frequency sound insulation performance of building elements.
RT	Reverberation Time. Time (in seconds) required for the sound pressure level in a room to decrease by 60dB after the sound source has stopped

APPENDIX B – Noise Survey Details

Date & Time of Survey:	Unattended: 1430h on Friday 28 July 2023 to 1330h on Monday 31 July 2023.					
Personnel:	Naveen Ramesh Simha (AEC).					
Equipment Used:	Unattended: Cirrus CR:171B Real Time Analyser (AEC Kit 3). Cirrus CR:171B Real Time Analyser (AEC Kit 5).					
Calibration:	The sound level analysers, which conforms to BS EN 61672-1: 2013 ' <i>Electroacoustics – Sound level meters - Part 1 Specifications</i> ' for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
Weather Conditions:	Unattended:					
	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	28/07/2023	Day	Dry	19°C	Southerly and negligible	60%
		Night	Dry	15°C	Southerly and negligible	99%
	29/07/2023	Day	Dry	17°C	South-westerly and negligible	60%
		Night	Dry	13°C	South-westerly and negligible	99%
	30/07/2023	Day	Dry	16°C	Southerly and negligible	60%
		Night	Dry	16°C	Southerly and negligible	99%
	31/07/2023	Day	Dry	16°C	South-westerly and negligible	60%
		Night	Dry	16°C	Southerly and negligible	99%
Measurement Locations:	Unattended: The two microphones were connected via an extension cable and fixed externally at a location 1m from the south-eastern and north-western elevation overlooking Yorkshire Street and Hunters Lane, respectively, at first floor level, identified as L1 and L2 on Figure 1.					
Measurement Details:	Unattended: Measurements were logged continuously over 1s for post processing and assessment. This location was selected to represent the worst-case affected façade of the development that would be affected by noise from pedestrians on Yorkshire Street and noise from take-away to the rear of the site.					
Façade / Free-Field:	Unattended: Façade level					
Façade / Free-Field:	The measured daytime and night-time periods for the unattended survey is presented on Graphs B1 and B2.					
Measured Data:	Full 1/3 rd octave band centre frequency data was obtained for all measurements.					

GRAPH B1 – Noise Levels Measured at Location L1



GRAPH B2 – Noise Levels Measured at Location L2

