CAPSTONE CONSTRUCTION NW LTD

816 STOCKPORT ROAD, LEVENSHULME

NOISE ASSESSMENT FOR PLANNING PURPOSES

15 July 2024

AEC REPORT: P5188/R01a/PJK

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CITATION APPROVED HEALTH & SAFETY SYSTEMS

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1.0 INTRODUCTION

1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Capstone Construction NW Ltd to undertake a noise assessment in relation to the proposed mixed-use residential and commercial development located at 816 Stockport Road, Levenshulme.

1.2 This report details the baseline noise levels measured at the development at 816 Stockport Road, Levenshulme, 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.

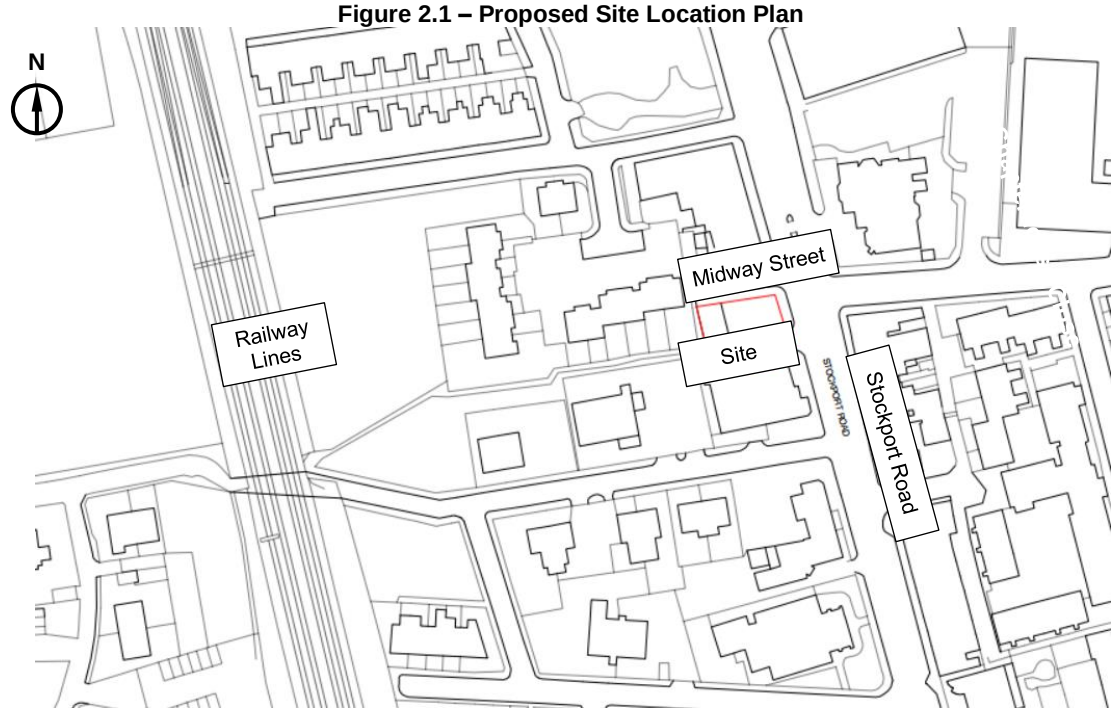
2.0 BACKGROUND AND SITE DESCRIPTION

Site Location

2.1 The proposed development involves the construction of a new four storey building at 816 Stockport Road, Levenshulme. The site is bound by Stockport Road (A6) to the east, empty commercial units to the south, residential gardens to the west and Midway Street to the north. Approximately 110m to the west are the Stockport / Manchester Piccadilly railway lines.

2.2 Stockport Road is a main arterial road linking Stockport and Manchester city centre. Midway Street a is short residential cul-de-sac.. A site location plan is presented in Figure 2.1, below.

Figure 2.1 – Proposed Site Location Plan



Proposed Scheme

2.3 The proposed scheme, which has been designed by Ollier Smurthwaite Architects, includes a four storey building, including 4 commercial units on the ground floor and 16 apartments.

2.4 It is understood that the commercial units will be used as Planning Use Class E(a) and E(g)(i) which includes shops and offices. It is expected that the any shop or office will operate during typical daytime hours of 0700 to 2300h, Monday to Sunday.

3.0 BASIS OF ASSESSMENT

Determining External Noise Levels

3.1 British Standard 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.

3.2 In relation to road traffic noise, BS8233 states that the noise from road traffic can be determined using the Department of Transport Welsh Office document '*Calculation of Road Traffic Noise'* issued in 1988 (CRTN). CRTN presents the shortened measurement procedure which can be used to convert the arithmetic mean of the measured $L_{A10,T}$ levels (measured over 3 consecutive hours during the period 1000h to 1700h) into an 18-hour L_{A10} level by subtracting 1dB.

3.3 BS8233 suggests that the conversion of the $L_{A10,18h}$ to $L_{Aeq,16h}$ can be achieved by the (approximate) relationship of $L_{Aeq,16h} = L_{A10,18h} – 2dB$. Therefore, the daytime ambient noise level can be determined by subtracting 3dB from the arithmetic mean of the $L_{A10,T}$ levels measured on-site over 3 consecutive hours (between 1000 and 1700h).

National Planning Policy Framework

3.4 Current national planning policies are set out in the National Planning Policy Framework (NPPF) published by the Department for Communities and Local Government, dated March 2012, and revised most recently in December 2023.

3.5 The planning policies which relate specifically to noise, were updated in July 2021, and are presented in paragraphs 180, 191 and 193 which are reproduced below:

"180. 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

191. 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.

193. 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.

3.6 Further to the above, the Governments '*Planning Practice Guidance'* (PPG) published on 6 March 2014 and most recently updated in December 2023 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.'

3.7 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

Residential

3.8 Manchester City Council (MCC) has outlined their requirements for noise assessments to accompany planning applications in '*Planning & Noise – Technical Guidance'* (2022) (PNTG).

3.9 Section 3.7.1.1 of this document states "*The Council has adopted the following noise limits for residential properties*:

- *Bedroom (night-time – 23.00 – 07.00) 30dBL_{Aeq} (individual noise events should not normally exceed 45dB$L_{Amax,F}$ by more than 15 times);*
- *Living Rooms (daytime – 07.00 – 23.00) 35dBL_{Aeq}.*"

3.10 These levels are based on guidance presented in BS8233 and The Association of Noise Consultants (ANC) document Professional Practice Guidance (ProPG) on Planning and Noise '*New Residential Development*' (2017).

Commercial Units

3.11 As stated above the tenants and operations within the commercial units are currently unknown. Therefore, based on the surrounding units it has been assumed that the most noise sensitive usage would for an office. The required internal noise level limits for spaces within an office are based on Section 7 of BS8233 and guidance presented in the British Council for Offices (BCO) document '*Acoustics*' issued in 2019. Based on these documents the noise level limits for noise breaking in from external sources ($dBL_{Aeq,T}$) and noise from mechanical services plant (NR) should ideally not exceed those presented in Table 3.1, below.

Table 3.1 – Maximum Allowable Internal Noise Levels

Room Type	External Sources, ($dBL_{Aeq,1h}$)	Mechanical Services Noise (NR)
Open Plan Office/Co-Working	45-50	40
Meeting Room	35-40	35
Single Person Office	35-40	35

3.12 Suitable internal ambient noise levels for uses such as takeaways, hair salons, cafés or shops would be similar to the levels allowable for an open plan office.

Ventilation Provision

Whole Dwelling Ventilation

3.13 The above internal noise level limits need to be achieved with whole dwelling ventilation, as defined in Approved Document F '*Ventilation*' (2021) of the Building Regulations.

3.14 Whole dwelling ventilation is typically achieved either via background ventilators (e.g., an open window or trickle ventilators) or mechanical means.

3.15 The Association of Noise Consultants (ANC) document '*Professional Practice Guidance on Planning & Noise: New Residential Development*' (ProPG), states that the attenuation of external to internal noise levels provided by a window partially open for ventilation is no more than -15dB.

3.16 Therefore, for whole dwelling ventilation to be provided via a partially open window, the external noise levels presented in Table 3.2 should not be exceeded.

Table 3.2 – Allowable External Free-field Noise Levels for Whole Dwelling Ventilation 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	50	-	-
Dining	Dining Room/Area	55	-	-
Sleeping (daytime resting)	Bedroom	50	45	60

3.17 ADF states that information about overheating is given in Approved Document O (ADO) *'Requirement 01: Overheating Mitigation Regulations: 40B'* (2021 edition).

3.18 In relation to purge ventilation, ProPG suggests that as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food), the internal desired noise levels are not generally applicable. Therefore, internal noise levels due to windows being opened for purge ventilation has not been discussed further.

Overheating Strategy

3.19 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).

3.20 The document then states that windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:

"a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
b. 55dB L_{AFmax}, more than 10 times a night (between 11pm and 7am)."

3.21 Paragraph 1.11 and Table 1.4 of ADO states that the opening in the external façade of a bedroom should have a minimum free area of 4% of the floor area of the room for medium-risk areas such as this site.

3.22 In relation to proposing appropriate internal noise level limits and the control of overheating in residential properties during the daytime, AEC has considered the guidance presented in the Association of Noise Consultants '*Acoustics, Ventilation and Overheating: Residential Design Guide (2020) (AVO)*. It is important to note that AVO is a design guide only and not a statutory document and the Local Authority may have their own requirements.

3.23 Whilst AVO does not specify specific limits in relation to allowable internal noise levels, it does suggest a Level 1 risk assessment should be undertaken considering the magnitude of external noise levels. Table 3.2 of AVO provides an indicative risk category assessment for different free-field external noise levels and states that above a free-field external noise level of approximately 63dB$L_{Aeq,16h}$, there is '*increasing risk of adverse impact'*. Therefore, this has been chosen as the external daytime noise level limit for which open windows cannot be relied upon for the control of overheating.

3.24 To consider the likely internal noise levels based on the above external noise levels, AVO indicates that a reduction in noise levels of around 13dB can be expected across a window that is partially open for ventilation purposes (approximately 2% or the floor area for a room).

Summary

3.25 Based on the above guidance from ADO and AVO, the free-field external noise level limits for which openable windows cannot be relied upon as an overheating strategy are presented in Table 3.3, below.

3.26 The fraction of the floor area stated by each guidance is also presented to aid in determining the corresponding internal or external noise level.

Table 3.3 – Noise Level Limits Above Which Openable Windows Should Not be Used for the Control of Overheating

Period	Minimum Fraction of Floor Area Required	Resulting External – Internal Level Difference, dB	Noise Level Limit, dB	
			External Free-field	Internal
Daytime Ambient, $L_{Aeq,16h}$	2%	-13	63	50
Night-time Ambient, $L_{Aeq,8h}$	4%	-9	49	40
Night-time Maximum, $L_{Amax,F}$			64	55

Noise from Mechanical Ventilation Systems

3.27 ADF states that "*fan units should be appropriately sized so that fans operating in normal background ventilation mode are not overly noisy*". ADF provides the following noise level limits for fans when operating under normal conditions and not at boost rates:

a. 30dB$L_{Aeq,T}$ for noise-sensitive rooms (e.g. bedrooms and living rooms) when a continuous mechanical ventilation system is running on its minimum low rate.
b. 45dB$L_{Aeq,T}$ in less noise-sensitive rooms (e.g. kitchens and bathrooms) when a continuous operation system is running at the minimum high rate or an intermittent operation system is running.

3.28 Where a mechanical system is installed to aid with the control of overheating, AVO suggests the following desirable upper internal ambient noise level limits:

- Bedrooms 30dB$L_{Aeq,T}$ (±5dB)
- Living / Dining Rooms 35dB$L_{Aeq,T}$ (±5dB)

Noise Transfer from Non-Residential Areas

3.29 In order to comply with the 2010 Building Regulations, the separating floors between these spaces and the adjacent apartments should comply with the minimum sound insulation performance requirements of Approved Document E (ADE).

3.30 Based on assumed noise levels generated, it is recommended that the separating wall and floor between an office/shop unit and the adjacent apartments achieves an airborne sound insulation performance of $45dBD_{nT,w} + C_{tr}$. This is in line with the requirements of ADE.

3.31 If the commercial unit is occupied by a tenant who will play loud amplified music, MCC's document PNTG states that new residential developments that are structurally connected to entertainment venues (or vice versa) '*Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB ($L_{eq,5min}$), respectively'*. Currently, is not expected that loud amplified music will be played in any of the units, therefore, this has not been considered at this stage.

3.32 In addition to the above, it is recommended that the separating floor between a plant room and first floor apartment should achieve an on-site sound insulation performance of $50dBD_{nT,w} + C_{tr}$.

Noise Breaking-Out from Commercial Units

3.33 In relation to an office/shop unit, there is no specific national or local guidance in relation to control of noise breaking out of these types of unit.

3.34 Based on AECs experience, it is proposed that ambient and maximum noise levels breaking out of the spaces (for sources other than loud amplified music) are controlled to not exceed the existing background and ambient noise level at the nearest noise sensitive receptors, respectively.

3.35 If loud amplified music is played, noise breaking out of the unit would need to be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (Leq,5min) in the 63Hz and 125Hz octave, respectively'.

Atmospheric Plant Noise Emissions

3.36 MCC's document PNTG, states the following in relation to setting noise level limits for industrial sources, such as external services plant, at noise sensitive premises:

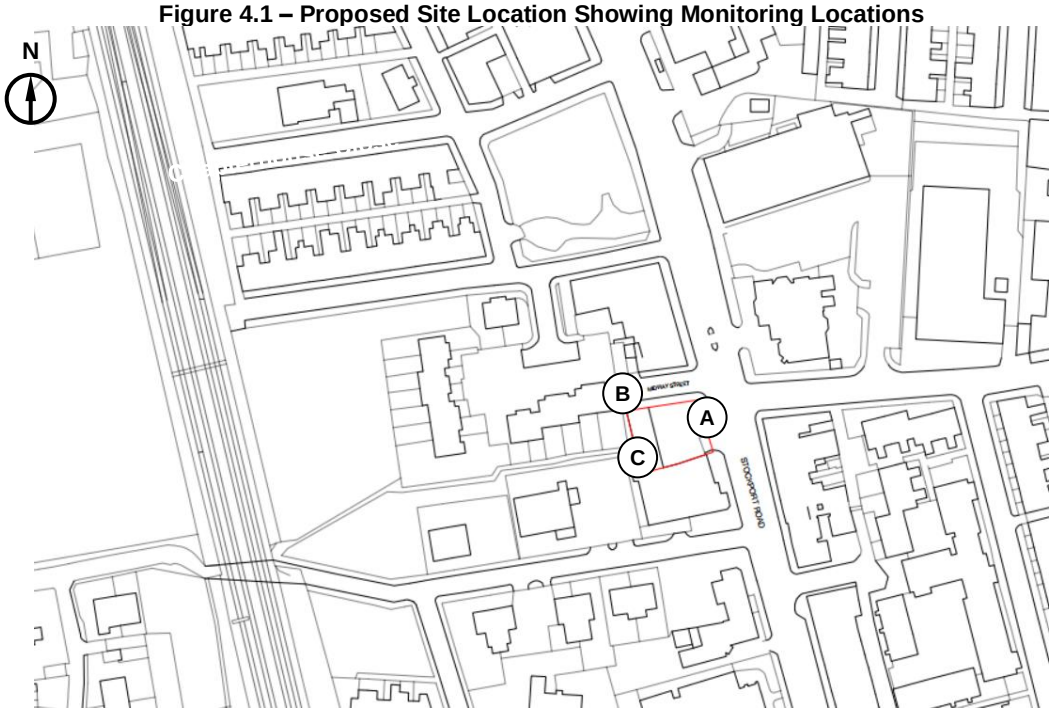
"Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location".

4.0 NOISE CLIMATE

4.1 Attended night-time and daytime noise level surveys were undertaken by AEC between 0500 and 0700h on Thursday 16 May and between 1020 and 1220h on Friday 17 May 2024, respectively. Measurements were undertaken at three locations around the development site identified as A to C on the attached Figure 4.1, below. Measurements at Location A were undertaken under free-field conditions and measurements at Locations B and C were undertaken under façade conditions.

4.2 All measurements were undertaken in general accordance with BS7445-1: 2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'. A full measurement procedure for the survey is presented in Table B.1 of Appendix B and the measured data is presented in Tables B.2 and B.3.

Figure 4.1 – Proposed Site Location Showing Monitoring Locations



4.3 In summary, the daytime ambient and $L_{A10,T}$ noise levels at Location A were relatively constant at around 68dB$L_{Aeq,T}$ and 72dB$L_{A10,T}$.

4.4 This reduced to 60dB$L_{Aeq,T}$ and 64dB$L_{A10,T}$ (free-field levels of 57dB$L_{Aeq,T}$ and 61dB$L_{A10,T}$) towards the rear of the site (Location B).

4.5 During the night-time noise survey, the ambient noise level at Location A increased from 64dB$L_{Aeq,T}$ before 0545h to 68dB$L_{Aeq,T}$ from 0545h to 0700h. Maximum noise levels at night were consistently around 82dB$L_{Amax,F}$ due to vehicle movements on Stockport Road.

4.6 At night, a spot check measurement was undertaken in an alleyway behind the site, (Location C) at this location the ambient and maximum noise levels were 47dB$L_{Aeq,T}$ and 64dB$L_{Amax,F}$ (free-field levels of 44dB$L_{Aeq,T}$ and 61dB$L_{A10,T}$), respectively.

4.7 The noise climate at all times was dominated by road traffic on Stockport Road.

4.8 Daytime background noise levels were consistently around 50dB$L_{A90,T}$ (free-field levels of 47dB$L_{Aeq,T}$), at Location B which is representative of the nearest noise sensitive receptors.

5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

Determining of External Noise Levels

5.1 The noise levels affecting the eastern, northern and southern elevations has been based on the noise levels measured at Locations A and B.

5.2 As stated above, the main source of noise affecting the site was road traffic on Stockport Road. The daytime ambient noise levels affecting the site have been determined using the calculation method presented in Section 3 to convert the arithmetic average of the three L_{A10} noise levels measured at Locations A and B into a 16-hour L_{Aeq} level.

5.3 In relation to the night-time noise levels, the ambient noise level measured between 0545 and 0700h is relatively consistent. Therefore, it has been considered that while noise levels may reduce in the hours between 0100 and 0500h, an ambient noise level of 68dB$L_{Aeq,T}$ would represent a worst-case ambient noise level for the entire night-time period.

5.4 A night-time maximum noise level of 82dB$L_{Amax,F}$ has been used in the assessment.

5.5 In relation to the noise levels effecting the western elevation (completely screened from Stockport Road), the night-time spot check measurement was around 20dB below the levels measured at Location A. Taking into account distance attenuation and screening, it is expected that daytime ambient noise levels would also be around 20dB lower on this elevation.

Determined External Noise Levels

5.6 Based on the noise levels measured on-site, distance attenuation, angle of view to the noise source and screening where applicable the determined noise levels external to the different facades of the development are presented in Figure 5.1 and Table 5.1, below.

Figure 5.1 – Determined Free-Field External Noise Levels

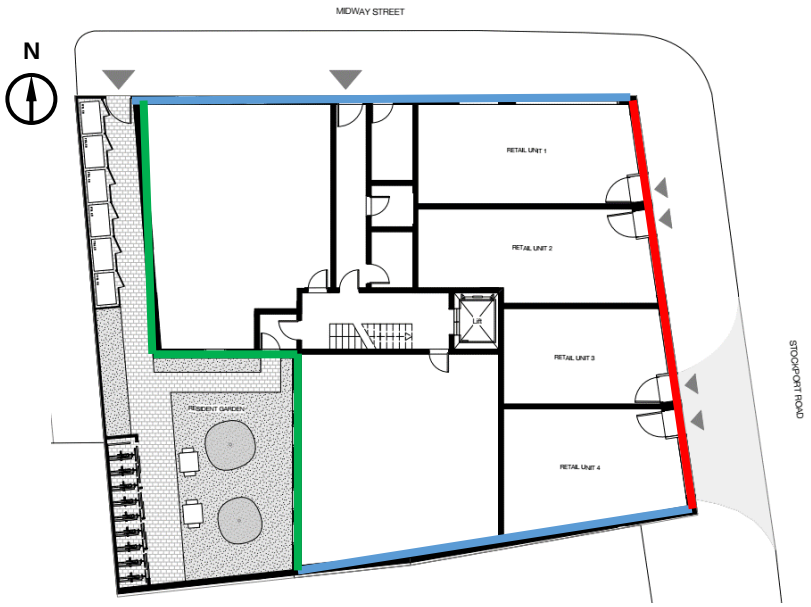


Table 5.1 – Determined Free-Field External Noise Levels

Elevation / Colour on Figure 5.1	Daytime Ambient Noise Level, $dBL_{Aeq,16h}$	Night-time Noise Level	
		$dBL_{Aeq,8h}$	$dBL_{Amax,F}$
Eastern - Red	≤69	≤68	≤82
Northern and Southern - Blue	≤63	≤62	≤76
Western - Green	≤50	≤48	≤62

Glazing and Ventilation Requirements

5.7 As stated in Section 3.0, for habitable rooms to have whole dwelling ventilation provided via a window partially open, external noise levels should not exceed $50dBL_{Aeq,T}$ during the daytime and $45dBL_{Aeq,T}$ and $60dBL_{Amax,F}$ at night.

5.8 A comparison between these levels and the determined noise levels presented in Table 3.3, indicates that alternate means of whole dwelling (background) ventilation would need to be provided to all habitable rooms in the property during the daytime and night-time periods with the exception of living rooms on the western elevation (Green), which can have windows open for whole dwelling ventilation.

5.9 The minimum sound insulation performances of the glazing and ventilators to meet the required internal noise levels limits for each noise source have been calculated based on the source noise levels and drawings issued by Ollier Smurthwaite Architects. The minimum sound insulation performances 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 / Colour on Figure 5.1	Sound Insulation Performance			
	Daytime (Living rooms etc.)		Night-time (Bedrooms only)	
	Glazing	Ventilator	Glazing	Ventilator*
Red	$41dBR_w$ / $35dBR_w + C_{tr}$	$41dBD_{n,e,w}$	$44dBR_w$ / $38dBR_w + C_{tr}$	$55dBD_{n,e,w**}$
Blue	$35dBR_w$ / $30dBR_w + C_{tr}$	$38dBD_{n,e,w}$	$41dBR_w$ / $35dBR_w + C_{tr}$	$41dBD_{n,e,w}$
Green	-	-	$29dBR_w$ / $25dBR_w + C_{tr}$	$38dBD_{n,e,w}$

***performance provided must be achieved in the open position**
****Greenwood MA301 through the wall vent**

5.10 The Greenwood MA301 vent is a high specification through the wall vent. Alternatively, if the bathrooms to the apartments are served with an extract fan, a continuous extract can be installed which would provide sufficient ventilation to comply with the whole dwelling ventilation requirements of ADF.

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
$44dBR_w$ / $38dBR_w + C_{tr}$	10mm Glass / 16mm Argon / 8.8mm Optiphon Glass
$41dBR_w$ / $35dBR_w + C_{tr}$	6mm Glass / 16mm Argon / 8.8mm Optiphon Glass
$35dBR_w$ / $32dBR_w + C_{tr}$	10mm Glass / 12-24mm TC / 6mm Glass
$29dBR_w$ / $25dBR_w + C_{tr}$	4mm Glass / 6-1612-24mm TC / 4mm 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 If it is determined by others that there is a need to control overheating within the development, a comparison can be made between the noise levels presented in Table 5.1 and those presented in Table 3.3. The comparison indicates that windows can be opened to aid with the control of overheating in all habitable rooms on the western elevation during both the daytime and night-time and on the northern and southern elevations during the daytime only.

5.16 Windows would need to be closed to the bedrooms on the northern and southern elevations during the night-time and all habitable rooms on the eastern elevation during the daytime and night-time. Alternative means of controlling overheating would need to be provided.

External Envelope

5.17 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 $55dBR'_w$. This would be readily achievable with standard construction methods.

6.0 ASSESSMENT OF PROPOSED COMMERCIAL UNIT

Glazing and Ventilation Requirements

6.1 Based on the noise levels presented in Table 5.1, the daytime ambient noise level external to the proposed commercial units, which overlook Stockport Road, would be around 69dB$L_{Aeq,T}$.

6.2 To comply with the internal noise level limits suggested in Table 3.2, the glazing would need to achieve a sound insulation performance of 35dBR_w / 30dBR_w + C_{tr}. This level of performance can be achieved with acoustic double glazing, of 10mm glass / thermal cavity / 4mm glass.

Noise Transfer from Non-Residential Areas

6.3 As stated in Section 3.0, the separating floor between an office/shop to the apartments above will need to achieve airborne sound insulation performances of 45dB$D_{nT,w}$ + C_{tr}.

6.4 This will developed at the detailed design stage.

Noise Breakout via External Envelope

6.5 It is not expected that an office/shop would generate high noise levels, therefore, noise from these sources has not been considered further.

Atmospheric Plant Noise Emissions

6.6 It is not yet known if any external plant will be associated with this development. Therefore, a full assessment cannot be undertaken at this stage.

6.7 However, based on the background noise level measured around the site and Manchester City Council's requirements, the atmospheric plant noise emissions emitted from the site should not exceed the limits presented in Table 6.1, below, at the nearest noise sensitive receptors during the daytime period.

Table 6.1 – Daytime Plant Noise Level Limits

Location	Noise Level Limit, dB$L_{Ar,Tr}$
Nearest Noise Sensitive Receptor	42

6.8 The above noise limits need to be achieved at the nearest residential receiver and assume that there is no acoustic character associated with the mechanical services plant (e.g., tonality or intermittency). It should be noted that the noise level limits to be achieved external to the nearest noise sensitive properties are not overly onerous.

7.0 SUMMARY & CONCLUSIONS

7.1 Acoustic & Engineering Consultants Limited (AEC) has been appointed by Capstone Construction NW Ltd, to undertake a noise assessment for the proposed mixed-use residential and commercial development located at 816 Stockport Road, Levenshulme.

7.2 The proposed scheme, which has been designed by Ollier Smurthwaite Architects, includes a four storey building, including 4 commercial units on the ground floor and 16 apartments.

7.3 It is understood that the commercial units will be used as Planning Use Class E(a) and E(g)(i) which includes shops and offices. It is expected that the any shop or office will operate during typical daytime hours of 0700 to 2300h, Monday to Sunday.

7.4 Based on AEC's experience of noise assessments with Manchester City Council (MCC), it is understood that that internal noise levels in new residential properties should comply with guidance presented in their document '*Planning & Noise – Technical Guidance'* (2022) (PNTG). PNTG is based on British Standard 8233:2014 '*Guidance on sound insulation and noise reduction for buildings'* (BS8233) and the Association of Noise Consultants (ANC) document *'ProPG: Planning and Noise - New Residential Development*', 2017 (ProPG). This is discussed further in Section 3.0.

7.5 These limits are based on achieving the whole dwelling ventilation requirements as set out in Approved Document F '*Ventilation*' (2021) of the Building Regulations only. The implications of the external noise levels on the control of overheating have been assessed using the design advice presented in the ANC design guide '*Acoustic ventilation and Overheating – Residential Design Guide*' (AVO) for habitable rooms during the daytime and night-time periods.

7.6 A daytime and night-time noise survey was undertaken by AEC in May 2024 and the main noise source in the area was road traffic on the A6 Stockport Road. 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 4.0.

7.7 The determined external daytime and night-time noise levels are presented in Table 5.1. An assessment of the required glazing sound insulation performances to meet the internal noise level limits provided in Section 3.0 are presented in Table 5.2.

7.8 In relation to the control of overheating, windows can be opened to aid with the control of overheating in all habitable rooms on the western elevation during both the daytime and night-time and on the northern and southern elevations during the daytime only.

7.9 Windows would need to be closed to the bedrooms on the northern and southern elevations during the night-time and all habitable rooms on the eastern elevation during the daytime and night-time. Alternative means of controlling overheating would need to be provided.

7.10 An assessment of the ground floor commercial unit, including comment on the control of noise transfer to the apartments above are presented in Section 6.0. Also presented in Table 6.1 in Section 6.0 is a daytime noise level limit for any external building services plant associated with the commercial units.

7.11 The above demonstrates that appropriate acoustic measures can be implemented into the design of the proposed development to achieve appropriate acoustic standards.

7.12 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

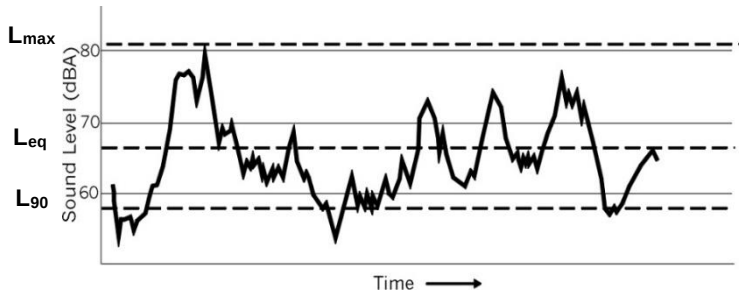
General

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 discreet 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.**
$L_{A10,T}$	The (A-weighted) sound level exceeded for 10% of a measurement period. It is the value often used to describe traffic 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.
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-816 Stockport Road, Levenshulme construction over a range of frequencies, typically 100-3150Hz.

D_w	Single number rating used to describe the on-816 Stockport Road, Levenshulme airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
$D_{nT,w}$	Weighted standardized level difference. A single number rating used to describe the on-816 Stockport Road, Levenshulme 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).
$D_{n,e,w}$	Element normalised level difference. Single number rating used to describe the sound insulation performance of small elements
C_{tr}	A road traffic spectrum adaptation term which is used to describe the low frequency sound insulation performance of building elements.

APPENDIX B – Noise Survey Details

Table B.1 – Environmental Measurement Procedure

Date & Time of Survey:	Night-time: 0500 to 0700h on Thursday 16 May 2024. Daytime: 1020 to 1250h on Friday 17 May 2024.					
Personnel:	Night-time: Andy Burke (AEC). Daytime: Will Bateman (AEC).					
Equipment Used:	B&K 2250 lite Real Time Analyser (AEC Kit 4). Cirrus CR:171B Real Time Analyser (AEC Kit 5).					
Calibration:	The sound level analysers, which conform to BS EN 61672-1: 2013 *'Electroacoustics – Sound level meters - Part 1 Specifications'* 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:	**Date**	**Period**	**Wet/Dry**	**Temp°C**	**Wind Speed & Direction**	**Cloud Cover**
	16.05.24	Night	Dry	11°C	Calm	25%
	17.05.24	Day	Dry	17°C	South 3 m/s	50%
Measurement Locations:	Measurements were undertaken at 3 locations around the development site. Identified as A to C on Figure 4.1 and described below. A – 3m from nearest carriageway of A6. B – 24m from nearest carriageway of A6. C – 24m from nearest carriageway of A6 behind a building onsite.					
Measurement Details:	Measurements were undertaken over various periods in terms of L_{eq}, L_{10}, L_{90}, and L_{max}.					
Façade / Free-Field:	A – Free field. B and C – Façade.					
Measured Data:	Full results for the attended measurements are given in Tables B.2 and B.3. Full 1/3rd octave centre frequency data was obtained for all measurements.					

Table B.2 – Measured Daytime Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	$L_{Amax, F}$	
A	1021–1036	69.8	73.0	55.7	93.6	Ambient noise level due to road traffic on the A6 and maximum noise level due to HGV pass by on the A6.
	1125–1138	67.8	71.9	54.6	79.0	
	1231–1246	67.7	72.0	55.0	83.3	
B	1037–1052	60.9	64.7	50.5	72.9	
	1142–1157	60.4	63.8	50.0	78.8	
	1203–1218	59.9	63.4	49.9	74.0	

Table B.3 – Measured Night-time Noise Levels

Location	Period, h	Noise Level, dB			Comments
		L_{Aeq}	L_{A90}	$L_{Amax, F}$	
A	0511-0521	64.0	50.4	79.9	Ambient noise level due to road traffic on the A6 and maximum noise level due to HGV pass by on the A6
	0522-0532	64.3	49.4	81.3	
	0545-0600	68.2	51.0	81.1	
	0601-0616	67.6	53.7	82.7	
	0618-0633	68.4	54.5	81.8	
	0634-0649	69.8	54.2	82.2	
C	0534-0544	46.5	35.2	63.6	Ambient noise level due to road traffic on the A6 and maximum noise level due to HGV pass by on the A6