

Project

The Trilogy, Manchester
Noise Impact Assessment

Prepared for

Ellesmere Manchester Operations
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London
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Version History

Version	Date	Comments	Approved by
PI	10/09/2025	First issue	Jenny Wilkin BMus (Hons) MIOA
P2	26/09/2025	Updated client information, added assessment of noise for additional external amenity areas, and assessment of noise from gym to residential dwellings	Jenny Wilkin BMus (Hons) MIOA

Summary

SRL Technical Services Ltd. has been appointed by Lichfields on behalf of Ellesmere Manchester Operations to provide a noise impact assessment to support their planning application for the expansion of the existing amenity provision for residents, and to build an additional storey on top of Block A to create 8 new apartments.

SRL has measured noise levels at the site. This data has been used to create an acoustic model to predict the noise levels at the proposed apartments.

Using our predicted noise levels, I have proposed suitable glazing and ventilation specifications capable of controlling indoor ambient noise levels within dwellings to the recommended levels set out in BS 8233:2014.

Glazing criteria and proposed ventilation specifications are given in Section 5.1 and summarised below.

Table 1 – Glazing and Ventilation Specification

Façade Colour	Room / Time	Minimum Glazing Performance	Proposed Ventilation Strategy
Yellow	Living Room (Day)	27 dB $R_w + C_{tr}$	Mixed Ventilation [1]
	Bedroom (Night)		Mechanical Ventilation
Orange	Living Room (Day)	30 dB $R_w + C_{tr}$	Mixed Ventilation[1]
	Bedroom (Night)	33 dB $R_w + C_{tr}$	Mechanical Ventilation

[1] The main means of ventilation will be mechanical ventilation, but windows will be openable at the tenants discretion. TM59 Assessment Design Note 2 states that:

“The proposed development utilises a mixed mode strategy to ventilate the building. Natural ventilation is provided via top hung windows, with openings assumed to open to 10°. The rest of the ventilation is to be provided by a Mechanical Ventilation Heat Recovery (MVHR) unit.

Windows are simulated to shut throughout the night to reduce acoustic disturbance, however the resident may open the window during this period at their own discretion.”

The proposed mechanical ventilation strategy is capable of controlling noise break in and complying with Approved Document O.

I have also used our model to assess noise levels in external amenity areas. The noise levels are all below the upper guideline limit of 55 $L_{Aeq,T}$ dB.

Contents

Summary.....	3
Contents.....	4
1.0 Introduction.....	5
2.0 Noise Policy and Guidance	6
3.0 Local Policy	10
4.0 Noise Survey	11
5.0 Noise Modelling.....	14
6.0 Noise from the Gym	21
Appendix A - Survey Details	24
Appendix B – Survey Data.....	25

1.0 Introduction

Ellesmere Manchester Operations is preparing a planning application for the expansion of the existing amenity provision for residents, and to build an additional storey on top of Block A to create 8 new apartments.

SRL Technical Services Ltd. has been appointed to assess the impact the surrounding noise will have on the proposed expansion.

Figure I - The Trilogy Site



The main noise source affecting the site is road traffic on the A56. The site is also affected by infrequent noise from the tram and railway lines to the north.

2.0 Noise Policy and Guidance

2.1 ProPG Planning and Noise

Professional Practice Guidance on Planning and Noise (ProPG) was published in June 2017. It provides guidance on a recommended approach for managing noise appropriately within the planning system for new housing. It is not an official government code of practice, nor does it replace or provide an authoritative interpretation of the law or government policy, but it does help to draw together existing policies, such as the National Planning Policy Framework (NPPF) and provides additional guidance which helps fill in some of the current gaps.

This document has been jointly created by three bodies: The Institute of Acoustics, the Association of Noise Consultants and the Chartered Institute of Environmental Health. The key message is the drive to adopt Good Acoustic Design for every new housing scheme to protect people from the harmful effects of noise.

ProPG aims to establish a framework for assessing proposed developments by looking at the potential 'risks' from noise affecting the site and establishing suitable noise criteria. The fundamental approach is to do an initial Risk Assessment of the site in terms of noise and unless the risk is deemed to be negligible, you are expected to do a full noise assessment. This involves establishing suitable noise criteria and developing a Good Acoustic Design to achieve them, wherever possible.

However, the foreword of ProPG also points out that:

'Good acoustic design does not mean "gold plating" or significantly increasing costs. This guidance seeks to encourage and promote design outcomes that are proportionate and reasonable in the particular circumstances of each development site.'

2.2 British Standard 8233:2014 – ‘Guidance on sound insulation and noise reduction for buildings’

In residential developments, external noise levels must be controlled so that acceptable internal noise levels are achieved. For this assessment, I have used guidance in British Standard 8233:2014 ‘Guidance on sound insulation and noise reduction for buildings’ (BS 8233). The recommended internal noise criteria, depending on room type and time of day are summarised in Table 2.

Table 2 - Summary of indoor ambient noise levels from BS 8233:2014

Room Type	Noise Level / Time Period, hh:mm	
	07:00 to 23:00	23:00 to 07:00
Living Room	≤35 dB $L_{Aeq,T}$	-
Dining Room/Area	≤40 dB $L_{Aeq,T}$	-
Bedroom	≤35 dB $L_{Aeq,T}$	≤30 dB $L_{Aeq,T}$

BS8233 does not recommend a maximum noise level criterion. Note 4 (pg 29) of the standard states:

‘NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFmax} , depending on the character and number of events per night. Sporadic noise events could require separate values.’

For outdoor areas, such as gardens, BS 8233:2014 states the following design guidance:

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

2.3 Approved Document O of the Building Regulations

Approved Document O (ADO) of the Building Regulations (2021 Edition) applies to new residential buildings, or buildings which containing residential accommodation (apart from hotels), where planning has been submitted after 15 June 2022. ADO sets out requirement O1 and the normal means of meeting that requirement.

Requirement O1 “Overheating mitigation” requires that:

- 1) Reasonable provision must be made in respect of a dwelling, institution or any other building containing one or more rooms for residential purposes, other than a room in a hotel (“residences”) to
 - a) limit unwanted solar gains in summer;
 - b) provide an adequate means to remove heat from the indoor environment.
2. In meeting the obligations in paragraph (1)
 - c) account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence; and
 - d) mechanical cooling may only be used where insufficient heat is capable of being removed from the indoor environment without it.

To allow the occupant to have ‘reasonable enjoyment of the residence’, the design of the building needs to take noise intrusion into account. Section 3 of ADO says that “*In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood **that windows will be closed during sleeping hours (11pm to 7am)***”.

It also adds that if internal night-time noise levels, when windows are open, are higher than 40dB $L_{Aeq,T}$ (averaged over 8 hours) or the L_{AFmax} exceeds 55dB more than 10 times a night, occupants would likely need to keep their windows closed.

2.4 Impact of Industrial and Commercial Noise - BS 4142

BS 4142:2014+A1:2019 ‘*Methods for rating and assessing industrial and commercial sound*’ provides a method to assess whether “sound of an industrial and/or commercial nature” is likely to have an adverse impact at noise sensitive receptors.

BS 4142’s assessment methodology considers how loud the noise is and its character (for example whether it contains hisses, bangs, or clicks). The assessment is then based on how loud (and how annoying) the source noise is compared with the existing background noise at the receptor.

The following corrections can be added to the actual noise level (the “specific level”) to account for the acoustic character to obtain the “rating level”:

Impulsivity – a correction of up to +9 dB depending on how impulsive the specific noise is.

Tonality – a correction of up to +6 dB depending on how tonal the specific noise is.

If the source is both tonal and impulsive it is usual to only apply the correction for the characteristic which is most dominant.

Intermittency – 3 dB is added when the noise source has clearly audible on/off conditions (such as an item of plant which switches on and off).

Other sound characteristics – 3 dB can be added where the noise source is not tonal or impulsive but has another characteristic that is clearly distinguishable against the acoustic environment.

The difference between the rating level and the typical background level can then be interpreted using the following guidance from BS 4142, depending on the context:

- If the rating level is +10 dB or more above the background level, this indicates a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

3.0 Local Policy

The Manchester City Council Planning and Noise Technical Guidance document states that:

“when undertaking residential environmental noise assessments noise break-in calculations (as per BS 8233: 2014) must be made to determine what ventilation strategy is required to achieve the internal noise level criteria.

Based on the results of the break-in calculations, the acoustician should advise the developer / design team when trickle ventilators are not a suitable background ventilation strategy, and include a suitable recommendation for a mechanical scheme in the acoustic report to accompany the planning application. In areas where there are particularly high noise levels and attaining the internal target levels for bedrooms may be particularly difficult, consideration will be given to the installation of sealed glazed units with the provision of mechanical ventilation. It is up to Building Control and developers to ensure that adequate provision for ‘purge ventilation’, as required under the Building Regulations Part F is met.”

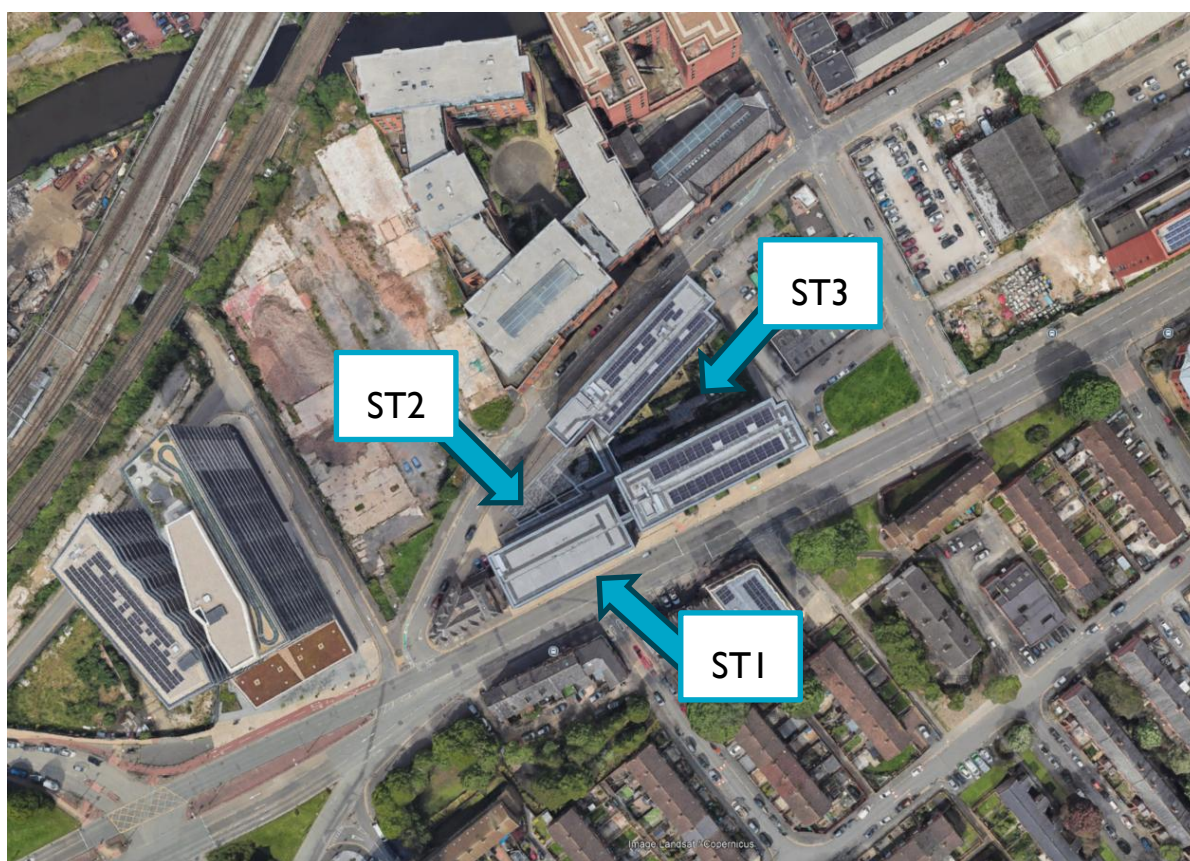
4.0 Noise Survey

Daytime attended noise measurement were taken from 10:00 to 13:00 on Tuesday 26th August 2025. Night-time attended noise measurement were taken from 23:00 to 00:00 on Tuesday 26th August 2025 and 06:00 to 07:00 on Wednesday 27th August 2025.

Details of the survey are presented in Appendix A and tabulated results are given in Appendix B.

The dominant noise sources affecting the development site are road traffic along A56 and infrequent noise from the tram and railway lines to the north. Road and railway traffic was noted as regular during the day, and less frequent at night.

Figure 2 – Measurement Locations



4.1 Attended Measurement Data

Table 3 and Table 4 summarise the noise levels measured.

Table 3 - Measured Noise Levels (Daytime)

Measurement Position	Description of Measurement Location	Measured Noise Levels	
		dB L _{Aeq, 16hr} *	Typical dB L _{A90}
ST1	1m from the façade of the Trilogy on the Chester Road	73	64
ST2	1m from the façade of the Trilogy on Ellesmere Road	57	52
ST3	In the external amenity area of the Trilogy	52	49

* Calculated from the measured L_{Aeq} using the shortened measurement procedure given in Department of Transport's 'Calculation of Road Traffic Noise' (CRTN) and the methodology in Transport Research Laboratory 'Method for Converting the UK Road Traffic Noise Index L_{Aeq, 18h} to the EU Noise Indices for Road Noise Mapping'.

Table 4 - Measured Noise Levels (Night-time)

Measurement Position	Description of Measurement Location	Measured Noise Levels		
		dB L _{Aeq, 15min}	Typical dB L _{AFmax}	Typical dB L _{A90}
ST1	1m from the façade of the Trilogy on the Chester Road	68	85	59
ST2	1m from the façade of the Trilogy on Ellesmere Road	51	69	47

4.2 Plant Noise Limits

Based on the survey data above, the following rating noise limits are adopted at the nearest noise sensitive receptors. Position ST1 has been used as the noise levels are representative of the dwellings opposite off of the A56.

Table 5 – Plant Noise Limits

Period	Typical Background Noise Level dB L _{A90, T}	Highest Permissible Plant Noise Rating Level dB L _{Ar, Tr} *
Daytime 07:00 – 23:00	64	64

Period	Typical Background Noise Level dB $L_{A90,T}$	Highest Permissible Plant Noise Rating Level dB $L_{Ar,Tr}^*$
Night-time 23:00 – 07:00	59	59

**Please note that this figure includes rating correction for the characteristic explained in Section 2.4.*

5.0 Noise Modelling

Using our survey data, I have created an acoustic model of the site using proprietary software package CadnaA by Datakustik. The proposed additional storey is highlighted in **blue**.

Figure 3 and Figure 4 show the predicted noise levels on the façade of the additional storey of flats during the day-time period.

Figure 3 Predicted day-time noise levels on the South and East facing façades (dB L_{Aeq}, 16 hour)



Figure 4 – Predicted day-time noise levels on North and West facing façades (dB L_{Aeq}, 16 hour)

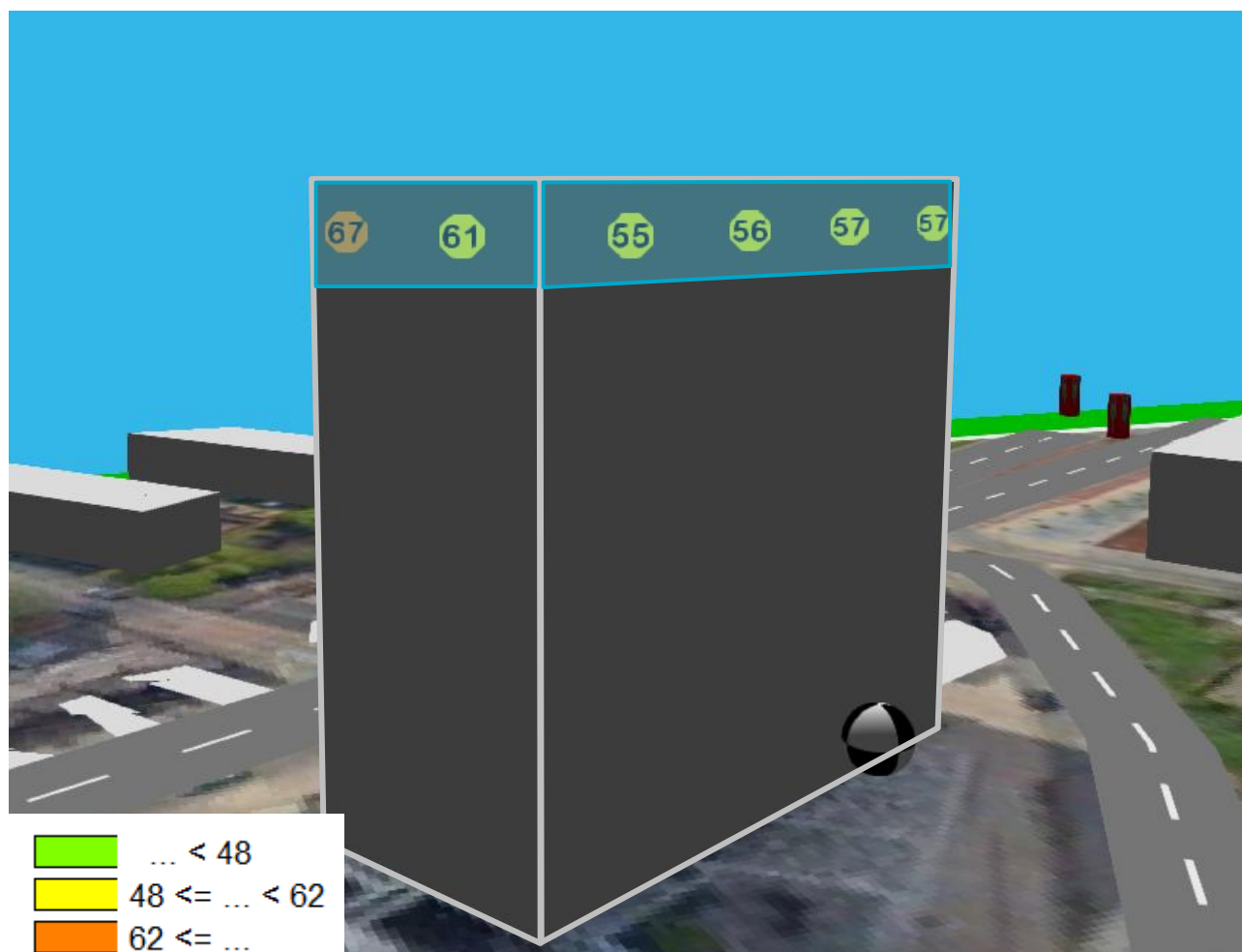


Figure 5 and Figure 6 show the predicted noise levels on the façade of the additional storey of flats during the night-time period.

Figure 5 - Predicted night-time noise levels on South and West facing façades (dB L_{Aeq}, 8 hour)

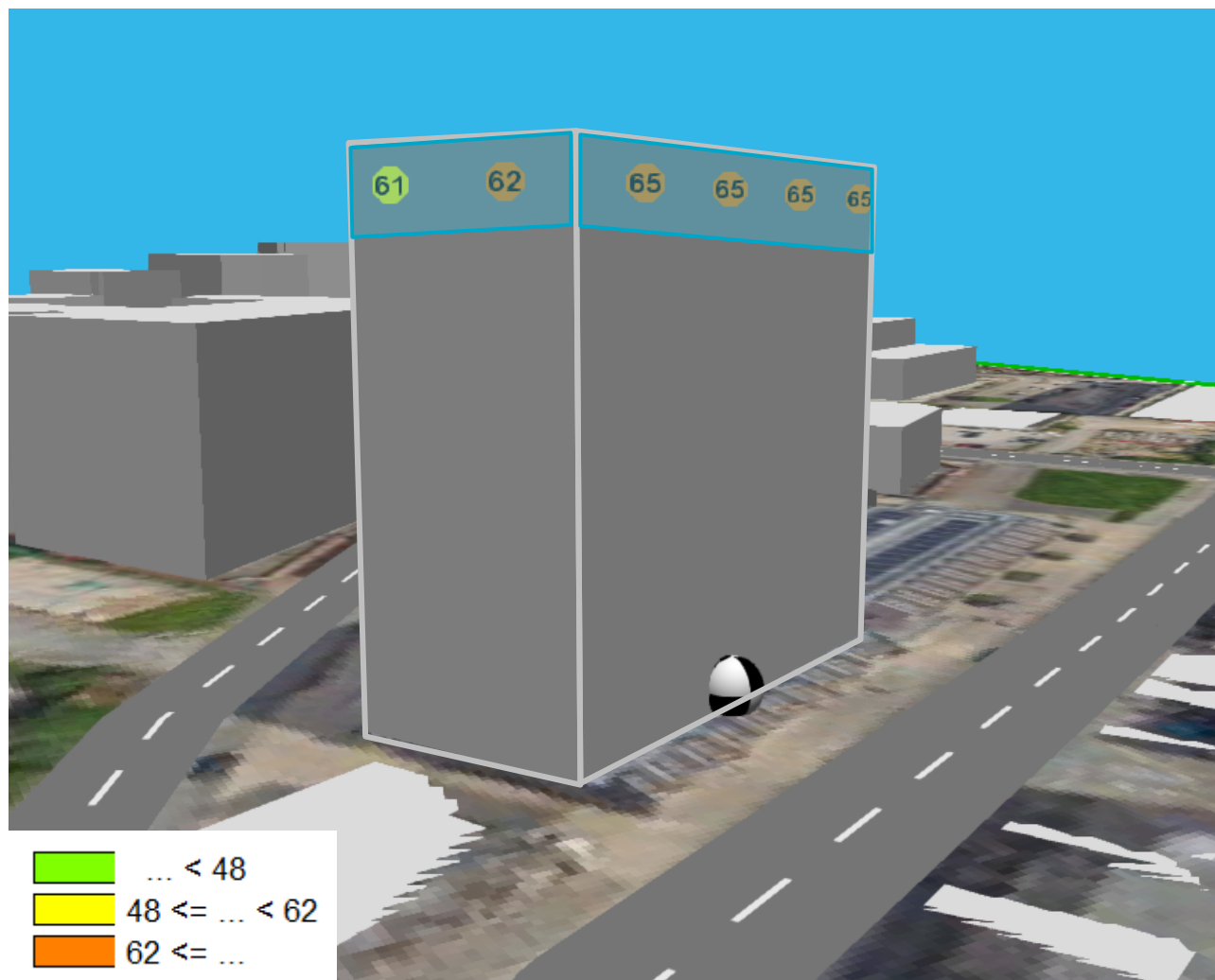
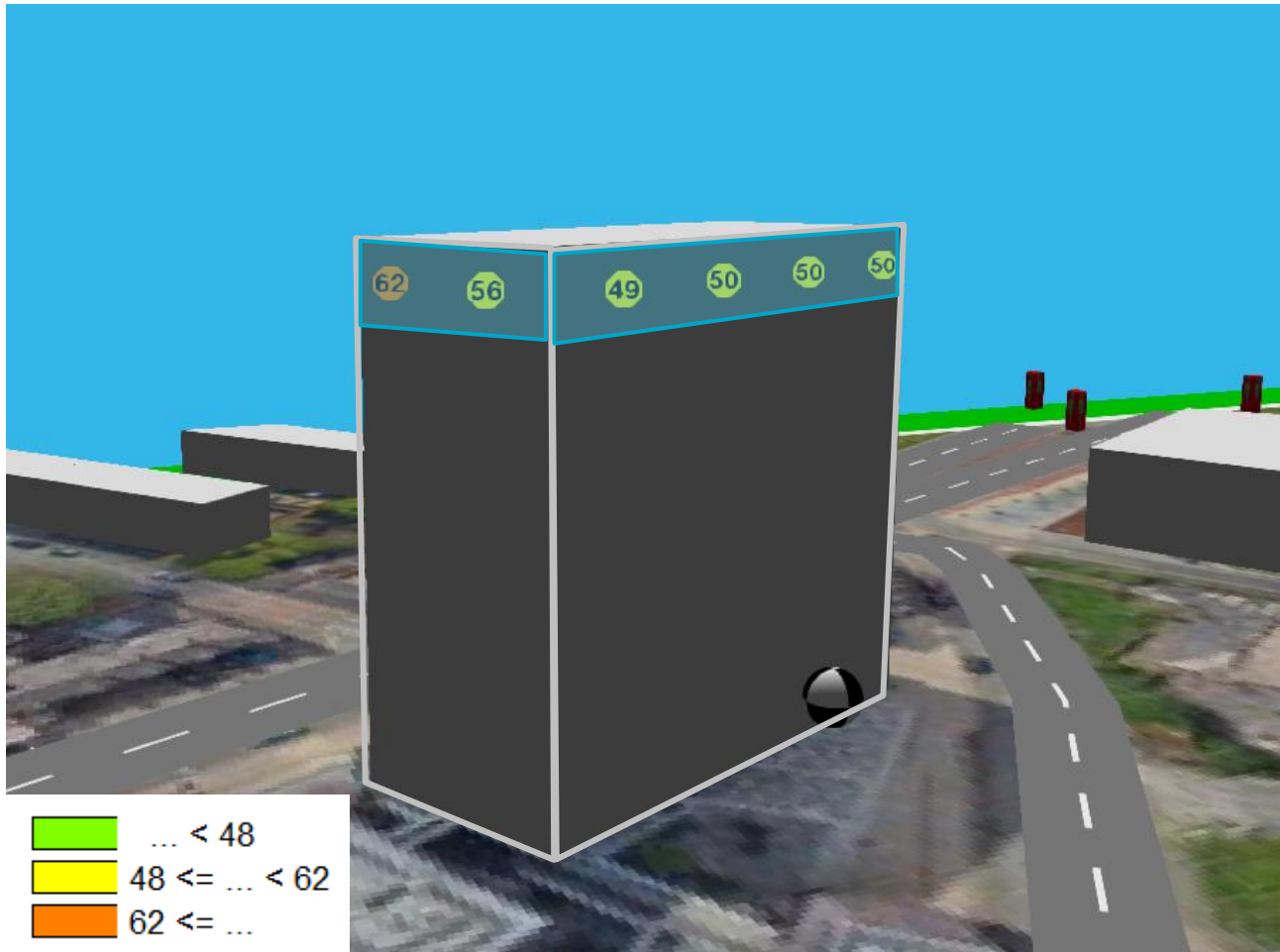


Figure 6 - Predicted night-time noise levels on North and West facing façades (dB L_{Aeq}, 8 hour)



5.1 Indoor Ambient Noise Levels

We understand that you are proposing to use a mixture of natural and mechanical ventilation throughout the development. The proposed development utilises a mixed mode strategy to ventilate the building. Natural ventilation is provided via top hung windows, with openings assumed to open to 10°. The rest of the ventilation is to be provided by a Mechanical Ventilation Heat Recovery (MVHR) unit.

We understand that windows are expected to shut throughout the night to reduce acoustic disturbance, however the resident may open the window during this period at their own discretion.

Table 6 below provides the required glazing specification alongside the proposed ventilation strategy.

Table 6 – Glazing and Ventilator Specification

Façade Colour	Room / Time	Minimum Glazing Performance	Proposed Ventilation Strategy
Yellow	Living Room (Day)	27 dB $R_w + C_{tr}$	Mixed Ventilation
	Bedroom (Night)		Mechanical Ventilation
Orange	Living Room (Day)	30 dB $R_w + C_{tr}$	Mixed Ventilation
	Bedroom (Night)	33 dB $R_w + C_{tr}$	Mechanical Ventilation

The sound reduction performance of the glazing must be achieved by both the frame and the glass when combined and tested in laboratory as a single unit. The suitability of the glazing and ventilation selected will depend on the performance in each octave band frequency as well as the single overall figure.

Our assessment assumes that the windows are closed and mechanical ventilation is used at night.

My calculations assume that the external wall achieves a minimum sound insulation performance at least 10 dB greater than the sound insulation performance of the glazing. This is readily achievable with a traditional brick-and-block external wall separated by a cavity containing mineral wool insulation. Any lightweight facades must be selected such that they are at least 10dB better than the minimum sound insulation performance of the glazing given above (subject to review of the area of each element).

5.2 Overheating Assessment

Approved Document O requires that an adequate strategy is used to mitigate overheating during sleeping hours (23:00 – 07:00). It requires that for open windows to be a sufficient strategy, the noise levels within bedrooms must not exceed 40 dB $L_{Aeq, 8hrs}$, or 55dB L_{AFmax} more than 10 times during the night.

We understand you intend to install mechanical ventilation in all bedrooms. This ventilation strategy is sufficient to control noise break-in.

5.3 External Amenity Area Noise

The Trilogy has three external amenity areas, these are:

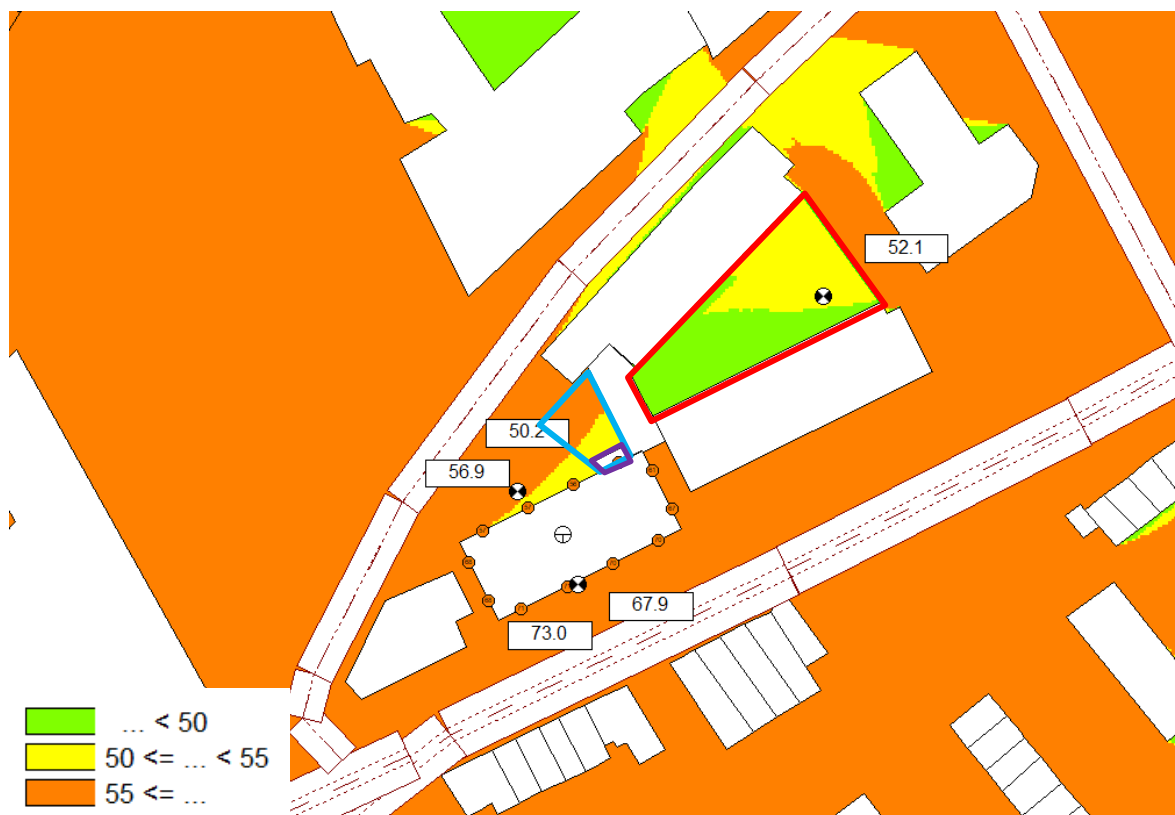
1. a large external amenity, housed in by the blocks B and C outlined in **red** in Figure 7
2. a smaller area towards Ellesmere street. outlined in **blue** in Figure 7.
3. a first floor outdoor terrace situated above the smaller area outlined in **purple** in Figure 7

Figure 7 shows that most of the external amenity area outlined in **red** will have noise levels below the desirable upper noise level 50 dB $L_{Aeq,16hr}$. All of this external amenity space will have noise levels below the upper guidance value of value of ≤ 55 dB $L_{Aeq,16hr}$.

Figure 7 shows the external amenity area outlined in **blue** will have an area of space that will have noise levels below the upper guidance value of value of ≤ 55 dB $L_{Aeq,16hr}$.

Figure 7 shows that all of the external amenity outlined in **purple**, the proposed first floor external amenity area, will be under the upper guidance value of value of ≤ 55 dB $L_{Aeq,16hr}$.

Figure 7 - Predicted noise levels in external amenity areas at height of 1.5m, day, dB L_{Aeq} 16 hour



6.0 Noise from the Gym

The separating floor between the gymnasium and the apartments above must be capable of satisfying the requirements of Approved Document E as well as controlling noise break-out to the nearby residential receptors.

I understand that activities inside the gym may include use of a sound system. The system will be under the control of the building operator rather than any third party.

Condition 13 requires that noise from the gym is 'inaudible in any habitable living spaces' and the building 'to be designed to achieve 10dB below the existing noise climate.'

In addition, the noise climate requires entertainment noise to 'achieve 10dB below the L_{A90} (without entertainment noise) at the façade of the nearest noise sensitive location, and internal noise levels at structurally adjoined properties in the 63Hz and 125Hz octave frequency bands should be controlled so as not to exceed (in habitable rooms) 42dB and 36dB, respectively.'

6.1 Separating Floor

Based on our own measurements at other gyms, typical noise levels within the gym are expected to be less than 80dB L_{AFmax} . Table 6 below shows the maximum spectrum measured at a typical commercial gym (without loud music playing).

Table 7 – Maximum Noise Levels in a Typical Gym

Description	L_{max} @ Octave Band Centre Frequency, Hz						
	63	125	250	500	1k	2k	4k
Maximum noise levels in a typical gym	69	75	74	77	77	71	66

The floors of the development are composite concrete systems with a 140mm overall depth and 70mm depth at the shallowest part of the floor (approx. 260kg/m²).

As the gym may include a sound system, I recommend the ceiling of the gymnasium has the following build up:

- minimum ceiling void of 200mm
- 50mm glass wool in the void
- Resilient channel system (e.g. GypLyner) or MF system on resilient hangers
- Ceiling of 2 x 15mm dense plasterboard, with each board at least 13kg/m²

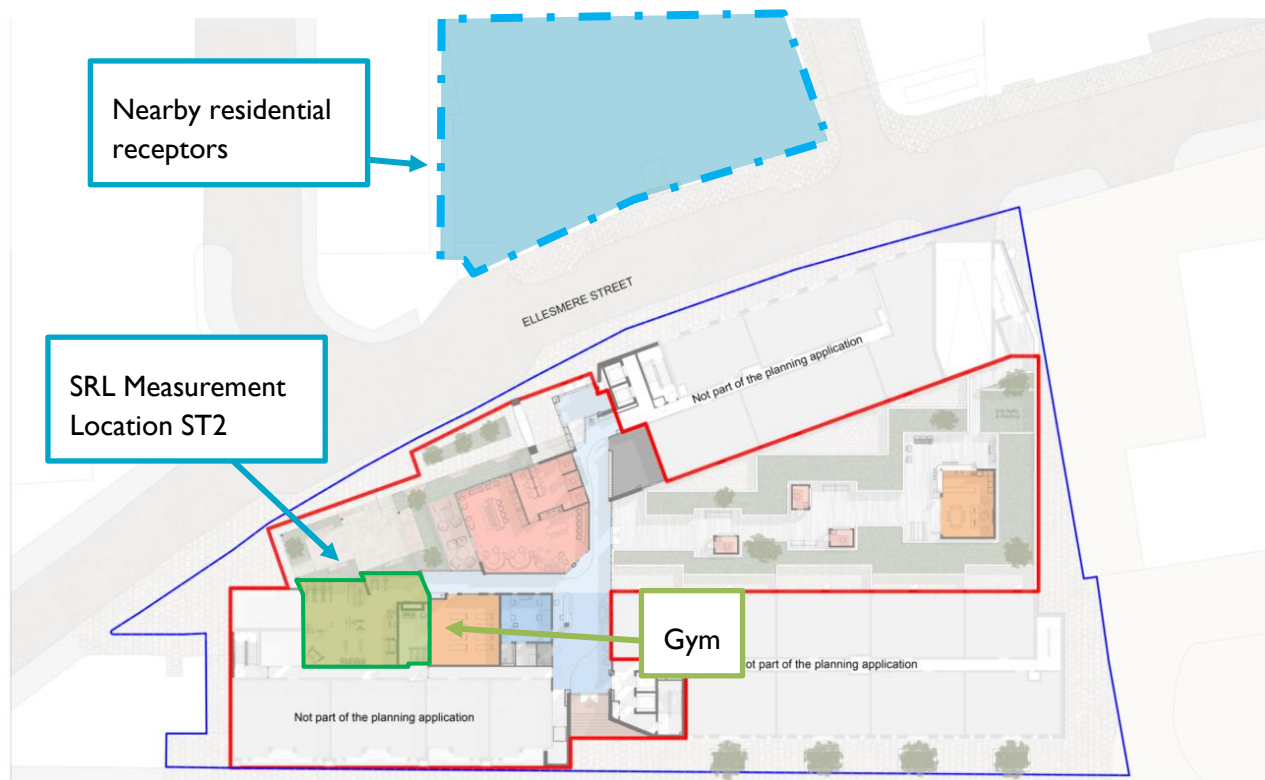
Should a sound system be used in the gym, the noise level in the gym in the 63 and 125Hz octave bands should not exceed 77 or 86dB L_{max} , respectively. This would result in noise levels in the apartment that do not exceed 42dB L_{max} at 63Hz and 36dB L_{max} at 125Hz as required by Condition 13.

The above floor specification is suitable to control the noise levels in Table 7 to noise levels of around 15 dB L_{Amax} for typical gym activities, and around 22dB L_{Amax} where the music system is provided.

6.2 Noise Breakout From Gym to Nearby Receptors

REC report AC100715-IR0 identifies that the typical daytime background noise levels at their noise measurement position NMP2 is approximately 55dB L_{A90} which is acoustically representative of the nearest off-site noise sensitive receptors to the gym. These receptors on the opposite side of Ellesmere Street are approximately 31m from the façade of the gym, as shown in Figure 8 below.

Figure 8 – Gym in Context of Surrounding Receptors



As shown in Table 3, we measured noise levels of 52 dB L_{A90} in a nearby location (as shown in Figure 8 on the opposite side of Ellesmere Street and are therefore satisfied that REC's data is valid to form the basis of this assessment.

Based on an internal noise level of 80dB L_{Amax} , with a spectrum shape as shown in Table 6, noise levels at the nearest receptors across Ellesmere Street would be around 25dB L_{Amax} . I have based my assessment on

standard thermal glazing as proposed, with an overall façade surface area of around 30m² and any openings for ventilation limited to no more than 10% of the façade area. Gym noise levels will be approximately 10dB below existing daytime background levels at the nearest affected residential receptor.

Appendix A - Survey Details

A1. Location of Survey

The Trilogy, Manchester

A2. Date of Survey

26th and 27th August 2025

A3. Personnel Present During Survey

Tom Farris

A4. Weather Conditions during Survey

19°C, 11 km/h SW wind

A5. Instrumentation

Brüel & Kjaer - Noise Meter AT2

Description	SRL No.	Make	Type	S/N
Sound Level Meter (AT2, Green)	814	Brüel & Kjaer	2250	2575775
Pre-amp	814	Brüel & Kjaer	ZC0032	5843
Microphone	814	Brüel & Kjaer	4189	2573767
Calibrator	815	Brüel & Kjaer	4231	2575525

A6. Calibration Procedure

Before and after the survey the measurement apparatus was check calibrated to an accuracy of ± 0.3 dB using the type 4231 Sound Level Calibrator. The Calibrator produces a sound pressure level of 93.8 dB re 2×10^{-5} Pa at a frequency of 1 kHz.

Appendix B – Survey Data

Table 8 – Attended Survey Data

Position	Project Name	Start Time	L _{Aeq}	L _{AF90}	L _{AFmax}
ST1	Project 001	26/08/2025 10:12	73	64	85
ST2	Project 002	26/08/2025 10:29	57	52	69
ST3	Project 003	26/08/2025 10:47	52	49	65
ST1	Project 004	26/08/2025 11:04	73	66	85
ST2	Project 005	26/08/2025 11:22	57	53	68
ST3	Project 006	26/08/2025 11:40	52	50	63
ST1	Project 007	26/08/2025 12:00	73	66	89
ST2	Project 008	26/08/2025 12:27	56	52	69
ST3	Project 009	26/08/2025 12:48	52	49	68
ST1	Project 010	26/08/2025 23:00	70	61	85
ST2	Project 011	26/08/2025 23:07	52	48	62
ST1	Project 012	26/08/2025 23:15	69	60	77
ST2	Project 013	26/08/2025 23:22	52	46	62
ST1	Project 014	26/08/2025 23:28	69	51	80
ST2	Project 015	26/08/2025 23:35	51	45	60
ST1	Project 016	27/08/2025 06:00	71	59	82
ST2	Project 017	27/08/2025 06:06	53	47	64
ST1	Project 018	27/08/2025 06:13	73	62	88
ST2	Project 019	27/08/2025 06:20	54	46	69
ST1	Project 020	27/08/2025 06:27	73	63	85
ST2	Project 021	27/08/2025 06:35	58	51	73

Acoustics

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