ATELIER **CRESCENDO**

Aclo Assets MH Limited

Marlsbro House

ACC-00130

Noise Impact Assessment

00130-NIA-01

6 May 2026

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Document Control

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1 EXECUTIVE SUMMARY

This assessment evaluates the potential noise impact associated with the proposed redevelopment of Marlsbro House on Newton Street, within Manchester's Northern Quarter.

The project includes the creation of a multi-purpose commercial facility comprising **offices**, **co-working spaces**, a **restaurant**, a **bar**, and **music studios** at basement level.

The **nearest existing noise sensitive receptor is the Cow Hollow Hotel**, located approximately 16 metres from the site, with an additional **future residential development planned across Faraday Street**.

A detailed **environmental noise survey** was carried out, capturing both daytime and night time conditions. Background sound levels in the area are influenced primarily by road traffic and nearby entertainment venues, with additional building services noise noted at the rear of the site. Modal background levels were recorded at 54 dB L_{A90} during the day and 46 dB L_{A90} at night at the site frontage.

Manchester City Council's Planning and Noise Technical Guidance (2022) establishes stringent criteria for both plant noise emissions and entertainment noise, requiring plant to operate at least 5 dB below background (L_{A90}) and music noise to remain 5 dB below background in each octave band at the nearest sensitive receptors.

The proposals incorporate significant noise mitigation measures.

The basement **music studios** will be constructed as isolated box-in-box structures, ensuring **negligible external noise breakout**.

Noise from the **basement bar** will be controlled through limiting internal music levels and installing secondary glazing with a minimum 200 mm cavity. Calculations indicate that break-out noise would be approximately **38 dB(A)** at neighbouring facades - well below background levels - with **no adverse impact expected**.

Similarly, operational noise from the **ground floor restaurant** has been assessed based on conservative peak-use sound levels. With **glazing** achieving at least **R_w 30 dB**, predicted external noise levels (approx. 35 dB(A)) remain substantially below night-time background levels, indicating **no significant effect on sensitive receptors**.

Mechanical plant installations - including VRF condenser units, heat pumps, MVHRs, a kitchen supply fan and a kitchen extract fan - have been assessed against local authority requirements. With appropriate **acoustic enclosures**, **screening**, and propagation distances accounted for, predicted noise levels at both NSR1 and NSR2 **meet Manchester City Council's 5 dB below background criterion**. All proposed plant configurations are therefore **compliant**, subject to detailed design and equipment selection.

Overall, the assessment demonstrates that the development can operate **without causing adverse noise impacts on surrounding sensitive receptors**.

With the recommended acoustic treatments in place, the proposals are fully capable of meeting local planning noise requirements.

A summary of our assessment findings is presented in Table 1.1.

Table 1.1: Summary of noise impact assessment

Operation	*Potential noise sources*	*Mitigation*
Music studio	Music noise.	Box-in-box constructions, located within the floor plate.
Office and co-working spaces	None.	No specific mitigation.
Basement bar	Music noise.	Suitable secondary glazing and limiting noise levels.
Ground floor restaurant	Chatter and customers during peak times.	Suitable glazing.
Condenser units at rear	Mechanical plant.	Acoustic enclosures
Kitchen extract fan and MVHRs	Mechanical plant.	Locate fan internally and provide suitable in-duct attenuators (to be specified at detailed design stage).
Kitchen supply fan	Mechanical plant.	Locate plant internally and provide suitable in-duct attenuators.
Rooftop VRV	Mechanical plant.	Suitable screening from receptor.

2 INTRODUCTION

2.1 SITE LOCATION AND DESCRIPTION

The site is located on Newton Street in the Northern Quarter of Manchester, within the administrative boundaries of Manchester City Council. The site is bounded by Newton Street to the northwest, commercial premises to the southeast, Postal Street to the northeast and Faraday Street to the southwest.

The surrounding area is primarily commercial. The Northern Quarter is a nightlife centre, with a high concentration of bars and restaurants.

A map showing the site context is presented in Figure 2.1.

A satellite image of the local area is presented in Figure 2.2.

The nearest **noise-sensitive receptor** to the front of site is considered to be the Cow Hollow Hotel **(NSR1)** on Bradley's Court, approximately 16 metres from the centre of the front facade of Marlsbro House.

To the north east of site across Faraday Street is a building site which is proposed at a residential block **(NSR2)**. See Figure 2.2.

Figure 2.1: Site context

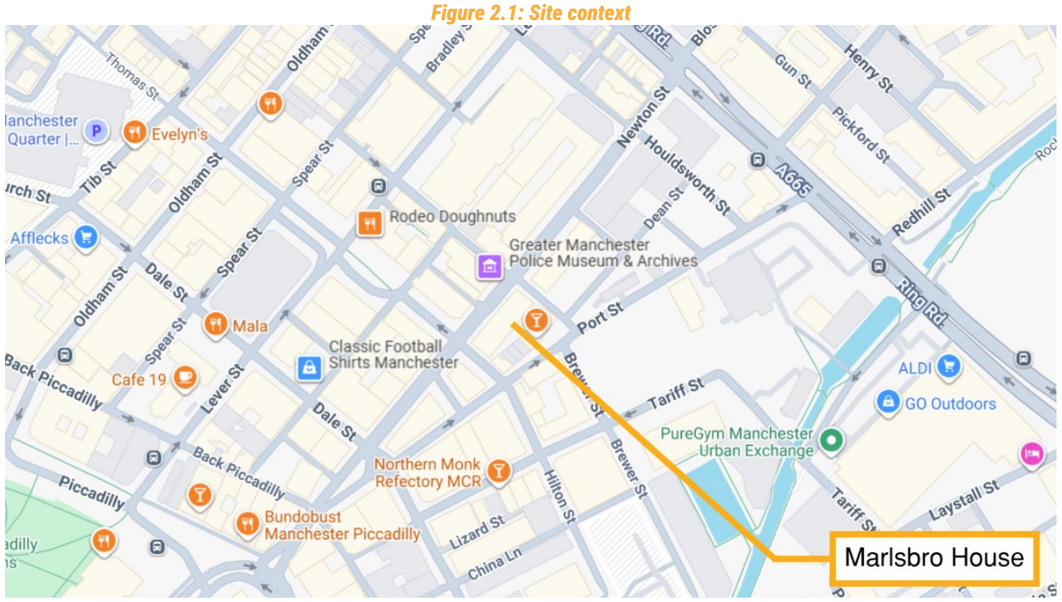
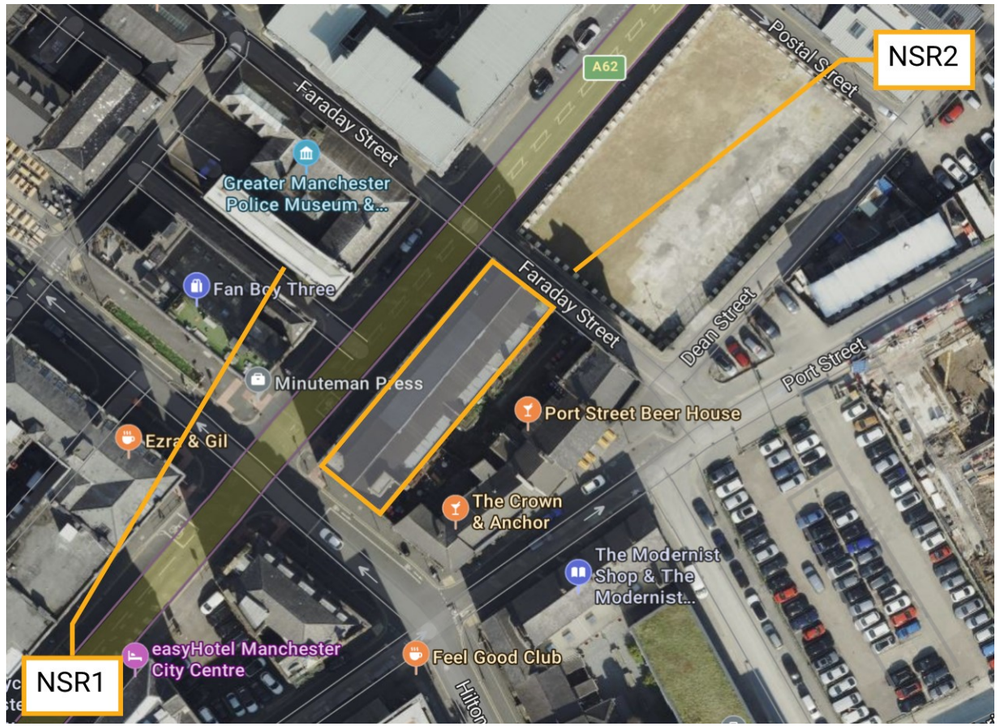


Figure 2.2: Satellite image



2.2 PROPOSALS

The client proposes to redevelop the site into a multi-purpose commercial space, including offices, a co-working space, a restaurant, a bar and music studios.

The building will be served by heat pumps and condenser units, and a kitchen extract fan.

Figure 2.3: Proposed basement plan

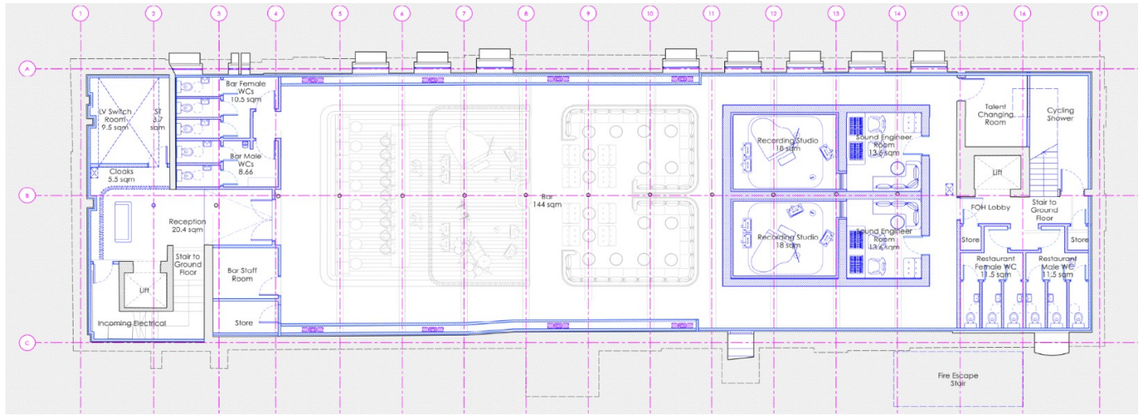


Figure 2.4: Proposed first floor plan

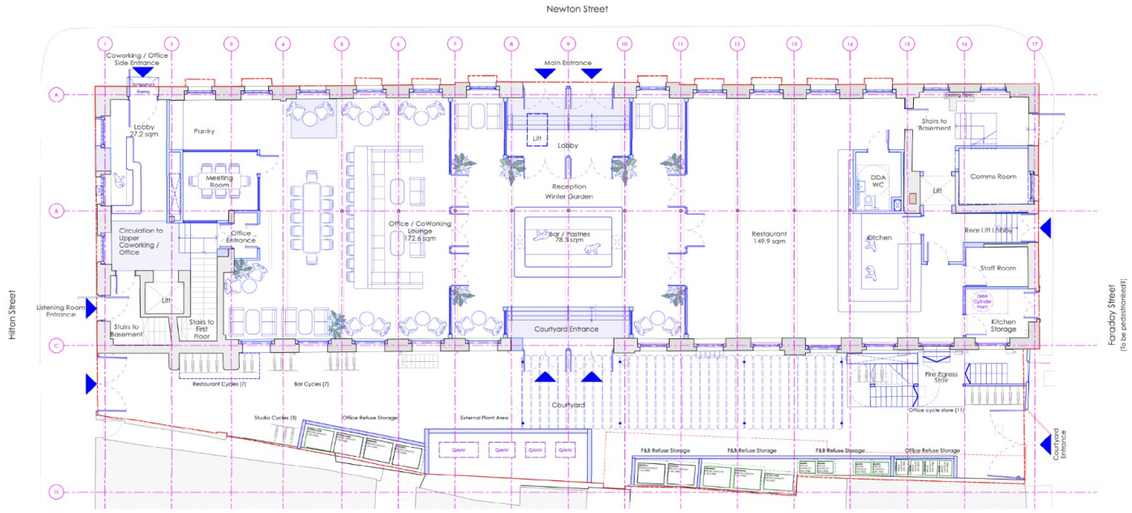
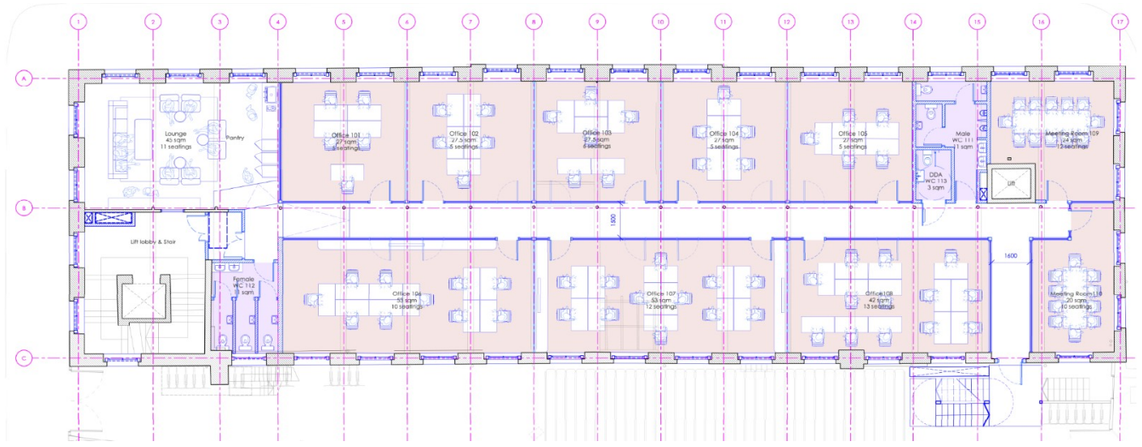


Figure 2.5: Proposed office floor plan (floors 1 to 3)



3 CRITERIA, POLICY AND GUIDANCE

A summary of relevant national planning policy and industry guidance in presented in Appendix B.

3.1 Local policy and guidance

Manchester City Council's policy is described in their document *Planning and Noise, Technical Guidance (2022)*.

3.1.1 Plant noise impact

Manchester City Council's requirement with regards to plant noise emissions is as follows,

> *"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 (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.*

In mathematical terms, the Local Authority's requirement can be summarised as follows:

$$L_{Ar,Tr} = L_{A90,bg} - 5\,dB$$

Where:

- $L_{Aeq,T}$ is the cumulative sound pressure level of mechanical plant noise emissions, predicted at the nearest noise-sensitive facade.
- $L_{A90,bg}$ is the representative background sound level for the period under assessment.

3.1.2 Entertainment noise

Manchester City Councils policy regarding entertainment venues that are not structurally adjoined to residential premises is as follows:

> *Entertainment noise ($L_{Aeq,5min}$) should be controlled to 5dB below the typical background noise level (L_{A90}) in each octave band at the nearest noise sensitive location.*

In mathematical terms, the Local Authority's requirement can be summarised as follows:

$$L_{eq,EN} = L_{90,WEN} - 5\,dB$$

Where:

- $L_{eq,EN}$ is the continuous equivalent sound pressure level of entertainment noise predicted at the nearest noise-sensitive facade, in each octave band.
- $L_{90,WEN}$ is the representative background sound level in the absence of entertainment noise, in each octave band.

4 SURVEY OVERVIEW

A detailed description of our survey is presented in Appendix C.

4.1 SUBJECTIVE IMPRESSIONS

Subjectively, the dominant sources of noise in the area are local road traffic, and music and patron noise from nearby entertainment venues. At the rear of site, building services noise was also prevalent.

4.2 SUMMARY RESULTS

A broadband summary of the unattended survey results is presented in Table 4.1.

Table 4.1: Summary results of unattended noise survey (dB sound pressure levels)

Position	Period	Daytime (07:00 to 23:00 hours) $L_{Aeq,16hr}$	Night-time (23:00 to 07:00 hours) $L_{Aeq,8hr}$
Front (UA1)	Friday 13 February	69*	68
	Saturday 14 February	68	71
	Sunday 15 February	69	63
	Monday 16 February	70	72
	Tuesday 17 February	69	65
Rear (UA2)	Wednesday 18 February	61*	56
	Thursday 19 February	59	55
	Friday 20 February*	62*	-

*These measurements are not full 16-hour periods.

The modal $L_{A90,T}$ background sound pressure levels are presented in Table 4.2.

Table 4.2: Modal $L_{A90,T}$ background sound levels (dB)

Position	Daytime, T=60min (07:00 to 23:00 hours)	Night-time, T=15min (23:00 to 07:00 hours)
Front (UA1)	54	46
Rear (UA2)	54, 55	52

The daytime and night-time $L_{eq,T}$ measurements are presented in Table 4.3.

Table 4.3: Measured $L_{eq,T}$ spectra (dB sound pressure levels)

Position	Period	63	125	250	500	1000	2000	4000	8000	dB(A)
UA1 (Front)	Daytime (07:00 to 23:00)	70	63	60	60	65	65	56	53	69
	Night-time (23:00 to 07:00)	68	60	56	56	63	66	55	51	69
UA2 (Rear)	Daytime (07:00 to 23:00)	63	64	62	56	58	55	53	51	63
	Night-time (23:00 to 07:00)	56	68	62	52	53	50	47	44	59

Unless stated otherwise, all results are presented as measured, i.e. no corrections have been made for facade reflections.

Graphs of survey time history and L_{A90} value counts are presented in Appendix D.

It is assumed that, at NSR2, the residential development across Faraday Street, background sound levels will be closer to those measured at the front of Marlsbro House on Newton Road (i.e. lower than those measured at the rear). This is because noise at the rear was influenced by plant noise, which will be relatively quieter at the proposed residential development. In our assessment of plant noise, we therefore apply the background sound level measured on Newton Street to NSR2.

5 COMMERCIAL OPERATIONS

5.1 MUSIC STUDIOS

Music studios are proposed at basement level. The studios are proposed to be located internally within the floor plate, and enclosed within **box-in-box** constructions. See Figure 2.3.

The box-in-box construction is intended to mitigate noise between the adjacent bar and the studio to very low levels. For this reason, it is considered that noise break-out from the music studios to the environment is **not a material concern**.

5.2 CO-WORKING SPACE AND OFFICES

Co-working spaces and offices are **not expected to give rise to any noise impacts** on surrounding noise-sensitive receptors.

5.3 BASEMENT BAR

The bar proposed at basement level is located mostly below street level. Small windows are present at high level within the basement, looking out just above pavement level.

The bar usage may include amplified and/or live music.

It is recommended that these windows are provided with **secondary glazing**, with a **minimum cavity of 200 mm** between the existing and new panes of glass. The assumed minimum Sound Reduction Indices of such a system are presented in Table 5.1

Table 5.1: Minimum sound reduction indices of windows in bar (R dB)

63	*125*	*250*	*500*	*1000*	*2000*	*4000*	*R_w*
29	35	46	46	46	56	64	49

Music within the venue should be limited to the sound pressure levels presented in Table 5.2.

Table 5.2: Proposed limiting sound pressure levels for music in basement bar ($L_{eq,T}$ dB)

Period	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*dB(A)*
Daytime (07:00 to 23:00)	101	101	107	108	108	108	108	115
Night-time (23:00 to 07:00)	91	89	96	96	103	103	103	109

A prediction of sound pressure levels from music in the basement bar is presented in Table 5.3.[1]

Table 5.3: Predicted sound levels at NSR1 from entertainment noise ($L_{eq,T}$ dB)

Period	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*dB(A)*
Predicted SPL at NSR1 Daytime (07:00 to 23:00)	50	43	39	40	40	30	22	43
Target 5dB below background sound level	50	43	39	40	45	45	36	39
Exceedance	***0***	***0***	***0***	***0***	***-5***	***-15***	***-14***	***-4***
Predicted SPL at NSR1 Night-time (23:00 to 07:00)	40	32	28	28	34	25	17	36
Target 5dB below background sound level	40	32	28	28	34	38	27	41
Exceedance	***0***	***0***	***0***	***0***	***0***	***-13***	***-10***	***-5***

Our assessment indicates that, with secondary glazing installed in the basement as recommended, and with noise limits within the bar, **the requirements of the Local Authority can be achieved**.

These levels are predicted NSR1 (Cow Hollow Hotel). NSR2 – the proposed residential development across Faraday Street – is further from the bar windows, with the benefit of no direct line of sight. Noise at this receptor is therefore expected to be **lower than at NSR1**.The precise glazing build-ups and performances may vary, but this assessment illustrates that the requirements can be achieved in principle, with standard constructions and limiting noise levels.

1 Due to measurement equipment limitations, the spectral targets applied in this assessment are the L_{eq} spectra adjusted down to the broadband L_{A90} level measured during our survey. This is considered a reasonable estimate of the actual L_{90} spectral values, suitable for the purposes of this assessment.

5.4 Ground floor restaurant

The restaurant at ground floor may include some nominal background music, and but is otherwise expected to constitute a typical restaurant sound levels from speech at busy times.

The operational sound levels assumed during peak times are presented in Table 5.4. It should be noted that these are assumed for peak operation (e.g. a private networking event). Typical restaurant operational levels would be significantly quieter.

Table 5.4: Assumed restaurant operating sound pressure levels during peak times ($L_{eq,T}$ dB)

63	*125*	*250*	*500*	*1000*	*2000*	*4000*	*dB(A)*
62	74	80	87	85	81	74	89

The opaque elements of the facade are brick, assumed minimum 200 mm thick with minimum mass per unit area 320 kg/m^2.

The minimum Sound Reduction Indices of windows in the bar are presented in Table 5.5. These could be achieved with conventional double or secondary glazed systems, or suitably-specified single glazing if required due to heritage constraints.

Table 5.5: Minimum sound reduction indices of windows in restaurant (R dB)

63	*125*	*250*	*500*	*1000*	*2000*	*4000*	*R_w*
17	24	20	25	35	38	34	30

The predicted sound pressure levels at then nearest noise-sensitive receptor, from restaurant peak operation, are presented in Table 5.6.

Table 5.6: Predicted sound levels at NSR1 from entertainment noise ($L_{eq,T}$ dB)

Period	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*dB(A)*
Predicted SPL at NSR1 Daytime (07:00 to 23:00)	19	25	34	37	24	17	15	35
Target 5dB below background sound level	40	32	28	28	34	38	27	41
Exceedance	***-21***	***-7***	***-6***	***-9***	***-10***	***-21***	***-12***	***-6***

Our assessment indicates that, with glazing installed in restaurant as recommended, **the requirements of the Local Authority can be achieved**. For the majority of the time, noise levels will be substantially lower than those assumed in our assessment.

These levels are predicted NSR1 (Cow Hollow Hotel). NSR2 – the proposed residential development across Faraday Street – is further from the bar windows, with the benefit of no direct line of sight. Noise at this receptor is therefore expected to be **lower than at NSR1**.The precise glazing build-ups and performances may vary, but this assessment illustrates that the requirements can be achieved in principle, with standard constructions.

The precise glazing build-ups and performances may vary, but this assessment illustrates that the requirements can be achieved in principle, with standard constructions.

6 MECHANICAL PLANT NOISE

6.1 PROPOSED INSTALLATION

Plant is proposed at various locations around the site:

- MVHR units serving floor plates.
- Kitchen supply fan.
- VRF condenser units and heat pumps located at roof and ground level.
- Kitchen extract fan serving the ground floor kitchen.
- Toilet extract fans (expected to be negligible).

Final selections and co-ordination of air handling plant (AHUs and MVHRs), and toilet extract fans are subject to co-ordination at the detailed design stage. As these items are ducted and can be attenuated prior to their terminations at the building facade, we propose limiting sound power levels, to be met at the detailed design stage.

VRF condensers and heat pumps are the primary sources of noise externally and are assessed in this section in accordance with Local Authority requirements.

6.1.1 PLANT

The proposed plant is presented in Table 6.1.

Table 6.1: Proposed plant items

Ref	*Quantity*	*Location*	*Make and model*
Kitchen HW	1	Ground floor rear courtyard	Mitsubishi QAHV-N560YA-HPB
GF Office/Bar VRF	1	Ground floor rear courtyard	Mitsubishi PURY-EP200YNW-A2
Restaurant VRF	1	Ground floor rear courtyard	Mitsubishi PURY-EP200YNW-A2
Basement live band area VRF	1	Ground floor rear courtyard	Mitsubishi PURY EP350YNW-A2
1-2F Office VRF	1	Roof terrace (front)	Mitsubishi EP550YSNW-A2
Kitchen extract fan	1	TBC	TBC
Kitchen supply fan	1	Ground floor, ducted to Faraday Street facade	Air Handlers Unit A18120-02-B

Approximate ground floor plant locations are shown in Figure 6.1. Rooftop plant location is shown in 6.2.

Figure 6.1: Ground floor plant location

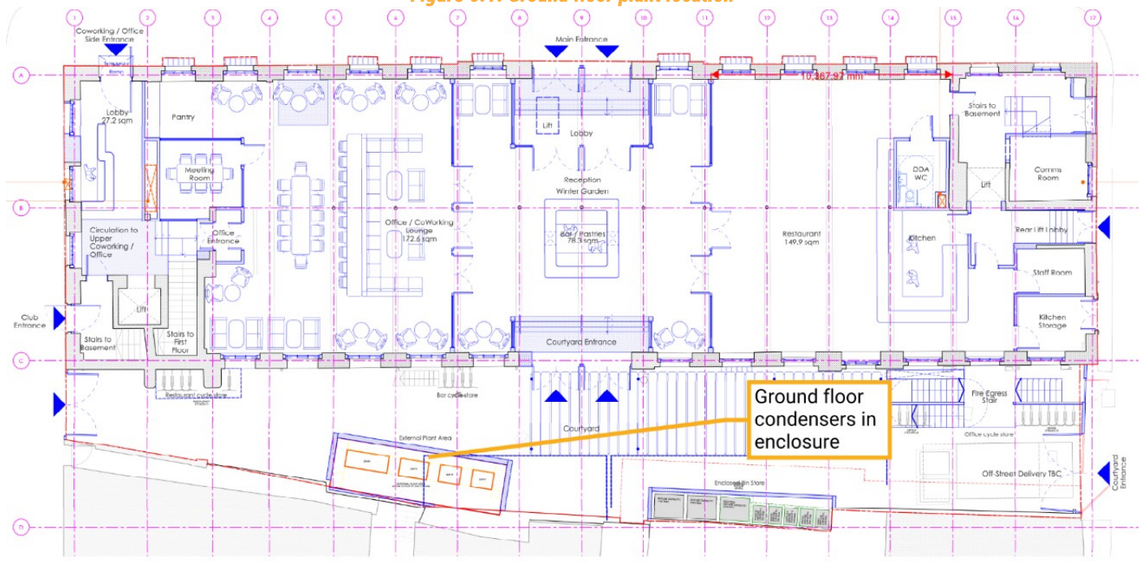
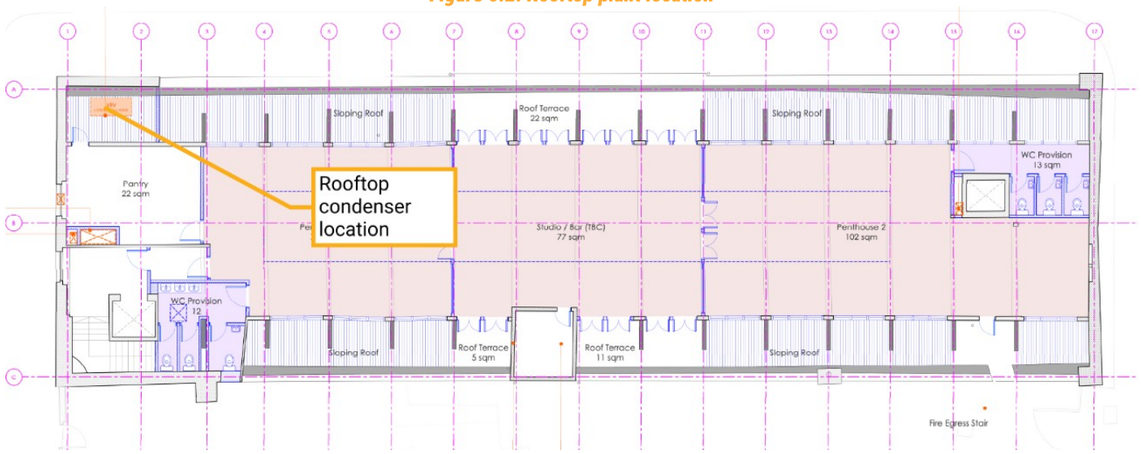


Figure 6.2: Rooftop plant location



6.1.2 Manufacturer noise data

Manufacturer plant noise data is presented in Table 6.2.

Table 6.2: Manufacturer dB sound levels at 1m (hemispherical)

Description	*Lp/Lw*	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*8000*	*dB(A)*
Mitsubishi QAHV-N560YA-HPB	Lp at 1m (hemi)	71	58	59	56	52	49	44	38	58
Mitsubishi PURY-EP200YNW-A2	Lp at 1m (hemi)	69	61	61	58	52	48	48	43	59
Mitsubishi PURY EP350YNW-A2	Lp at 1m (hemi)	72	71	64	62	57	54	52	48	64
Mitsubishi EP550YSNW-A2	Lp at 1m (hemi)	78	68	71	69	63	61	56	54	70
Air Handlers supply fan inlet	Lw in-duct	45	46	68	66	63	63	61	55	-
Kitchen Extract Fan and MVHRs	-	To be developed at detailed design stage.								

6.2 Predictions

6.2.1 Ground floor rear courtyard condenser units

6.2.1.1 Attenuation

The ground floor condenser units are proposed to be installed in an **acoustic enclosure providing at least 9 dB(A) attenuation.**

The enclosure could comprise a proprietary metal box with labyrinth airpath (e.g. Environ), or a masonry builderswork enclosure with suitable acoustic louvres e.g. SS150 acoustic louvres by CAICE.

The static insertion losses assumed in our calculations, based on an SS150 acoustic louvre by CAICE, are presented in Table 6.3.

Table 6.3: Minimum insertion loss of louvres in acoustic enclosure (dB)

63	*125*	*250*	*500*	*1000*	*2000*	*4000*	*8000*
3	4	6	10	12	13	13	14

The MEP engineers and plant manufacturers must be consulted for acceptability from an airflow and overheating perspective.

The precise specification of the acoustic enclosure is subject to detailed design following grant of planning permission.

6.2.1.2 Propagation

The condenser units will be approximately 30 metres from the proposed residential development across Faraday Street (NSR2).

6.2.1.3 Acoustic characteristics

Due to the distance of receptors, directivity and acoustic enclosure, it is expected that tonal characteristics will not be present at the receptor location.

6.2.1.4 Uncertainty

Uncertainty in the measurement and assessment has been minimised through the following methods:

- Background sound level measurements carried out over multiple days to account for variability between different days.
- Calculations made for both heating and cooling mode to account for variability in plant operation.
- The measurement location chosen is considered representative of nearby noise-sensitive receptors.
- Suitable level of accuracy and rounding maintained throughout measurements and analysis of noise levels.
- Use of accepted noise propagation and calculation methods.

6.2.1.5 Result

A summary of our calculations and the predicted impact are presented in Table 6.4.

Our assessment demonstrates that **the Local Authority's requirement can be achieved** using conventional attenuation methods.

Table 6.4: Assessment of ground floor rear courtyard condenser units

Item	*Heating (winter)*	*Cooling (summer)*
Cumulative sound pressure level dB(A)	72	72
Enclosure	-9	-9
Propagation (30 metres, additional reflections)	-27	-27
Sound level at facade of NSR2 (residential development across Faraday Street) including reflections	36 dB(A)	36 dB(A)
Background sound level	46 dB(A)	46 dB(A)
Local Authority requirement	41 dB(A)	41 dB(A)
Compliance with Local Authority requirement	✓	✓

6.2.2 Roof terrace condenser unit

6.2.2.1 Attenuation

The rooftop VRV is proposed at the front of site at roof level. A imperforate screen should be erected around the VRV with a minimum mass per unit area of 10 kg/m^2. The screen should extend at least 1 metre above the top of the VRV unit, and 1 metre across the horizontal line of sight between the VRV and the Cow Hollow Hotel (NSR1).

The screen could comprise builderswork materials with a minimum mass per unit area of 10 kg/m^2, and should be designed and constructed to be suitable for adverse weather conditions and longevity. Sound absorbing-lining should be provided to the inner face of the acoustic screen.

6.2.2.2 Propagation

The condenser units will be approximately 30 metres from the proposed residential development across Faraday Street (NSR2).

6.2.2.3 Result

A summary of our calculations and the predicted impact are presented in Table 6.5.

Table 6.5: Assessment of ground floor rear courtyard condenser units

Item	*Heating (winter)*	*Cooling (summer)*
Cumulative sound pressure level dB(A)	70	70
Propagation (26 metres, acoustic screen, additional reflections)	-29	-29
Sound level at facade of NSR2 (residential development across Faraday Street) including reflections	41 dB(A)	41 dB(A)
Background sound level	46 dB(A)	46 dB(A)
Local Authority requirement	41 dB(A)	41 dB(A)
Compliance with Local Authority requirement	✓	✓

6.2.3 Kitchen supply fan

The kitchen supply fan is proposed with a 900 mm in-duct attenuator meeting the Insertion Losses presented in Table 6.6. These can be achieved with a 900 mm 3M attenuator from IAC.

Table 6.6: Minimum insertion losses of kitchen supply fan attenuator (dB)

63	*125*	*250*	*500*	*1000*	*2000*	*4000*	*8000*
5	10	16	30	34	30	21	13

With this attenuator, and including directivity and reflections at the receptor, the sound pressure level at proposed residential facades is predicted as **20 dB(A)**.

No acoustic characteristics are expected from the kitchen supply fan.

At this level, the kitchen supply fan would not contribute materially to the overall level of noise from the site, and is considered to **comply with the Local Authority's requirements**.

6.2.4 Limiting noise levels for other plant items

The kitchen extract fan and MVHRs are to be selected at the next stage of design following grant of planning permission.

Atelier Crescendo have undertaken calculations of sound propagation from proposed plant terminations, to estimate the reduction in sound levels between the terminations and the proposed residential facades. Our calculations include:

- Louvre directivity
- Distance propagation
- Reflections at the receptor

Our calculations indicate that, the requirements of the Local Authority can be achieved if sound power levels at terminations are limited to the values presented in Table 6.7.

Table 6.7: Limiting sound power levels at terminations for plant items (dB re 10-12 W)

Description	*63*	*125*	*250*	*500*	*1000*	*2000*	*4000*	*8000*	*dB(A)*
Kitchen extract discharge	76	64	56	50	45	42	40	38	55
MVHR inlet and outlet (combined)	79	67	58	52	47	45	42	41	58

These sound power levels should include the cumulative attenuation of all ducting and attenuator losses, and end reflections.

It should be noted that the precise spectrum of these plant items will vary depending on the actual equipment selection and attenuation measures specified at detailed design stage. However, in principle this assessment demonstrates that the **requirements of the Local Authority can be achieved**.

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Appendix A Terminology

AC

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions. An indication of the range of sound levels commonly found in the environment is given in the following list:

- **0 dB(A)** Threshold of hearing
- **20 to 30 dB(A)** Quiet bedroom at night
- **30 to 40 dB(A)** Living room during the day
- **40 to 50 dB(A)** Typical office
- **50 to 60 dB(A)** Inside a car
- **60 to 70 dB(A)** Typical high street
- **70 to 90 dB(A)** Inside factory
- **100 to 110 dB(A)** Burglar alarm at 1m away
- **110 to 130 dB(A)** Jet aircraft on take off at 1m away
- **140 dB(A)** Threshold of pain

Term	***Explanation***
Sound pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20mPa ($2x10^{-5}$ Pascals) on a decibel scale.
Decibel (dB)	Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.
A-weighting, dB(A)	The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is generally regarded as just perceptible.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Facade level	Sound pressure level at a distance of 1m in front of a large sound reflecting object such as a building façade.
Octave band	Octave Band A range of frequencies whose upper limit is twice the frequency of the lower limit.

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Appendix B Policy and Guidance

National Policy and Guidance

Noise Policy Statement for England (NPSE)

The Government's policy on noise is set out in the Noise Policy Statement for England. Its vision is to:
"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development."
Its aims are to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimize adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The NPSE provides the policy framework to assist the implementation of the Environmental Noise Directive and the Environmental Noise (England) Regulations 2006 ('the Regulations'). Whilst the NPSE is not legislation and local authorities are not legally bound by it, it is expected that local authorities will take it into account in relevant situations.

The NPSE encourages relevant stakeholders, including Local Planning Authorities (LPAs), to review and revise existing policies and practices so that *"the policies and any noise management measures being adopted accord with the vision, aims and principles of the NPSE"*.

Planning Practice Guidance (Noise) (PPG(N))

The PPG(N) is published by the Ministry of Housing, Communities & Local Government and aims to provide guidance on the implementation of government policy in planning and noise.

In summary, it states that noise can override other planning concerns where justified, although the context of the wider characteristics of the development, its likely users and surroundings all can have an effect on whether noise is likely to pose a concern. It emphasizes that 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.

The PPG(N) also includes a Noise Exposure Hierarchy Table which, in summary, emphasizes that increasing noise levels have adverse effects on behaviour, attitude, physiology, sleep and quality of life. The PPG(N) does not contain objective targets for noise levels and thus further guidance and studies should be referred to, in order to quantify appropriate targets.

National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. The NPPF must be taken into account in preparing the local development plans and is a material consideration in planning decisions.

The excerpts of the NPPF relevant to the proposed development are as follows:

> *"187. 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... noise pollution."*
>
> *"198. 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 ..."*
>
> *"200. 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."*

Climate Change Act 2008 (Amended 2019)

The United Kingdom is legally committed to achieving net zero greenhouse gas emissions by 2050 under the Climate Change Act 2008, which was amended in 2019 to set this ambitious target. This legislation obligates the UK government to implement policies and measures that drastically reduce carbon emissions across all sectors, including energy, transportation, and housing. Meeting this target requires a transition to low-carbon technologies, such as widespread adoption of heat pumps and renewable energy sources, as well as continued efforts to improve energy efficiency nationwide.

The **UK government is actively promoting the installation of heat pumps** through financial incentives and relaxation of planning rules, and it clearly recognises their importance in achieving a reduction in greenhouse gas emissions.

Industry Guidance

Approved Document O Noise Guide

The Guide (published by the Association of Noise Consultants in November 2024) explains that, the highest external noise levels that would be compliant with Approved Document O using the simplified method are presented in Table B.1.

Table B.1: External noise levels above which the Simplified Method of ADO cannot be used

Parameter	*High Overheating Risk Location*	*Moderate Overheating Risk Location*
$L_{aeq,8hr}$ night-time (23:00 to 07:00)	45 dB	50 dB
L_{AFmax} more than 10 times per night (23:00 to 07:00)	60 dB	65 dB

In locations exceeding these external noise levels, dynamic thermal modelling should be used for a more detailed assessment of solar gains and heat rejection.

The Guide also provides a method for approximating the maximum Equivalent Area of a façade opening based on the external noise levels.

On demonstrating compliance, the Guide states,

> *"Given the uncertainty of measuring noise levels internally and the complexity of remedial work to adapt a completed building to remove excess heat by means other than opening a window, it is recommended that determination of compliance with AD-) is completed at the design stage only."*

World Health Organization

In 1999, The World Health Organization produced a set of guidelines to provide recommendations for protecting human health from exposure to environmental noise originating from various sources called the Guidelines for Community Noise.

Night-time noise levels and environmental noise impacts upon sleep were reviewed in the Night Noise Guidelines for Europe in 2009 and the recommendations were revisited.

These were again reviewed in 2018, resulting in the Environmental Noise Guidelines for the European Region. The Guidelines for Community Noise makes recommendations for both internal and external noise levels, whereas the two subsequent documents only revisit recommendations for external noise levels.

On internal noise levels, the Guidelines for Community Noise state,

> *"If negative effects on sleep are to be avoided the equivalent sound pressure level should not exceed 30 dBA indoors for continuous noise. If the noise is not continuous, sleep disturbance correlates best with LAmax and effects have been observed at 45 dB or less. This is particularly true if the background level is low. Noise events exceeding 45 dBA should therefore be limited if possible. For sensitive people an even lower limit would be preferred. It should be noted that it should be possible to sleep with a bedroom window slightly open (a reduction from outside to inside of 15 dB). The prevent sleep disturbances, one should thus consider the equivalent sound pressure level and the number and level of sound events. Mitigation targeted to the first part of the night is believed to be effective for the ability to fall asleep."*

The Night Noise Guidelines recommend a lower limit than 45dB L_{amax}.

The Guidelines for Community Noise also recommended that noise levels in outdoor living areas be 50 dB during the daytime and evening, with an upper limit of 55 dB in noisier environments.

Environmental Noise Guidelines for the European Region (2018)

The World Health Organization produced a set of guidelines to provide recommendations for protecting human health from exposure to environmental noise originating from various sources including road traffic. In forming these recommendations, systematic reviews of the expanded evidence base were conducted to assess the relationship between environmental noise and the following health outcomes: cardiovascular and metabolic effects; annoyance; effects on sleep; cognitive impairment; hearing impairment and tinnitus; adverse birth outcomes; and quality of life, mental health and well-being.

The WHO guidelines for road traffic noise can be summarized as 53 dB L_{den} average noise exposure, and 45 dB L_{night} night-time exposure.

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

BS 8233:2014 is currently under revision.

BS 8233 is commonly referred to by planning authorities and acousticians looking to quantify target noise levels for residential development, both internally and externally. Table 4 of BS 8233 is reproduced in Table B.2.

Table B.2: Internal ambient noise level targets, Table 7 of BS 8233:2014 (dB sound pressure levels)

Location	***Activity***	***Daytime 07:00 to 23:00***	***Night-time 23:00 to 07:00***
Living room	Resting	35 dB $L_{Aeq,16hr}$	-
Dining room/area	Dining	40 dB $L_{Aeq,16hr}$	-
Bedroom	Sleeping (daytime resting)	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

BS 8233 also states,

> *"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments."*

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

BS 4142:2014 is widely used by local authorities to determine whether a new industrial noise source is likely to give rise to complaint from people living nearby.

The Standard sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS 4142:2014 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the L_{As} 'specific sound level', immediately outside the dwelling with the $L_{A90,T}$ background sound level.
Where the sound contains a tonality, impulsivity, intermittency and other attention-catching acoustic characteristics, then a penalty depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the $L_{Ar,Tr}$ 'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS 4142:2014 states: "The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs". An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- "Typically, the greater this difference, the greater the magnitude of the impact."
- "A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."
- "A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."
- "The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a negligible impact, depending on the context."

During the daytime, the assessment is carried out over a reference time-period of 1-hour, and 15-minutes during the night-time. The periods associated with day and night, for the purposes of the assessment, are 07.00 to 23.00 and 23.00 to 07.00, respectively.

The initial estimate of the impact may need to be modified due to the context of the assessment. Section 11 of BS 4142:2014+A:2019 states that where background sound levels and rating levels are low, absolute levels might be more relevant than the margin by which the rating level exceeds the background.

Heat Pumps, Professional Advice Note (CIEH, IOA)

The Heat Pumps, Professional Advice Note was jointly published by the Institute of Acoustics and Chartered Institute of Environmental Health in November 2022. Its aims are stated as follows:

- To provide guidance on the assessment of noise from air source heat pumps, and to enable the use of heat pumps (HP) as a source of low carbon heating and cooling, whilst minimising the risks of sound and vibration from the units causing significant adverse impacts or statutory nuisance.
- To outline the expectations for mitigation to minimise impacts as far as reasonably practicable, to protect amenity and quality of life and the quality of the existing acoustic environment.

The Note explains that **Permitted Development (PD)** rights allow MCS-approved heat pump installations **without the need for planning consent**, but cautions that the MCS scheme may not avoid the creation of significant adverse impacts.

The Note states, "Where planning consent is required, this advice note provides an alternative approach to an assessment based on BS4142… For the majority of domestic installations, it is recommended that an absolute rating level target, which takes account of the sound character, is a proportionate approach. This advice draws on expertise available at the time of writing and provides an alternative criterion to the implied limit within Permitted Development Rights MCS criteria of 38dB $L_{Aeq,T}$. Larger heat pump installations, which require full planning applications, may require a more comprehensive noise assessment to be undertaken (typically based on BS 4142:2014+A1:2019).

Where it is practical to do so, it is recommended that the installation sound rating level does not exceed 35dB at any noise sensitive façade of neighbouring residential premises. If it can be demonstrated that it is not practical to achieve this value, and the local context supports a relaxation, then a higher criterion may be suitable … it is recommended that the sound rating level should not exceed 40dB."

The term **'Rating level'** refers to the sound level of the heat pump adjusted to account for acoustic features such as tonality or impulsivity, as defined in BS 4142.

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Appendix C Survey Methodology

AC

Overview

An unattended survey was conducted between approximately noon on Friday 13 February and 14:00 hours on Friday 20 February.

Measurements were undertaken at the front of site between Friday 13 February and approximately 09:00 hours on Wednesday 18 February. The sound level meter was then relocated to the rear of site, and measurements were undertaken at the rear until approximately 14:00 hours on Friday 20 February.

Sound pressure level measurements were undertaken using Class 1 sound level meters, in general accordance with BS7445 Description and measurement of environmental noise.

Measurements were undertaken of the L_{Aeq}, L_{AFmax} and L_{A90} indices (along with 1/3 octave-band data) in 5-minute intervals, and the data has been processed to compute longer periods, where required for assessment or as recommended by industry guidance.

Personnel

The survey was undertaken Marc Fuzellier-Hart, MSc, MIOA . Marc has over a decade of experience in acoustics consultancy, having previously worked at national and multidisciplinary firms. Marc has been responsible for the acoustics on the design of performance space projects, high end offices and restaurants, and nationally-significant infrastructure projects.

The impact assessment was undertaken Tony Trup, BMus, MSc, MIOA, MAES. Tony has over a decade of experience in acoustics consultancy, having previously worked at national and multidisciplinary firms. Tony has been responsible for the acoustics on luxury residential and office tower developments, and was also previously the acoustics project manager for a nationally-significant infrastructure project.

Measurement positions

Measurement positions are described in Table C.1 and shown in Figure C.1.

Table C.1: Measurement positions

Ref	*Description*
UA1	The microphone was attached to a telescopic pole protruding approximately 0.3 m from the facade at first floor level, at the front of site overlooking Newton Street.
UA2	The microphone was attached to a telescopic pole protruding approximately 0.3 m from the facade at first floor level, at the rear of site, facing towards Stage & Radio.

Equipment

The equipment used in the survey is presented in Table C.2.

Table C.2: Equipment

Item	*Make and model*	*Serial No.*	*Laboratory calibration due*
Class 1 sound level meter	Svantek SV971A	133607	20 June 2026
Preamplifier	Svantek SV18A	130491	20 June 2026
½" microphone	ACO 7152	85914	20 June 2026
Field calibrator	Svantek SV33B	139040	20 June 2026

Weather

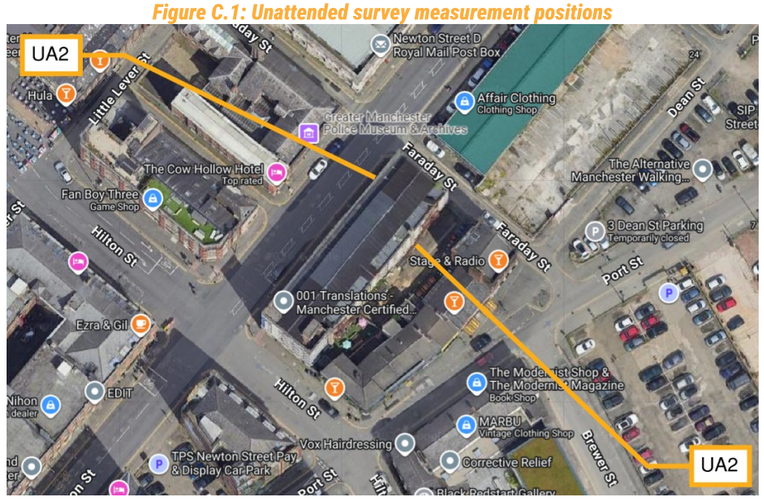
According to timeanddate.com, the ambient temperature ranged between -4 and 10 degrees Celsius over the course of the unattended survey. There were some short intermittent periods of light rain. Wind speeds were generally below 5 m/s.

Subjective Impressions

Subjectively, the dominant source of noise during the day is road traffic in the surrounding area.

In the evening and at night, the Northern Quarter is a primary nightlife centre, and noise from revellers, bars and entertainment venues is prevalent, along with underlying road traffic noise.

Figure C.1: Unattended survey measurement positions



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Appendix D Figures

Figure D.1: Unattended survey time history, Position UA1, T=5min

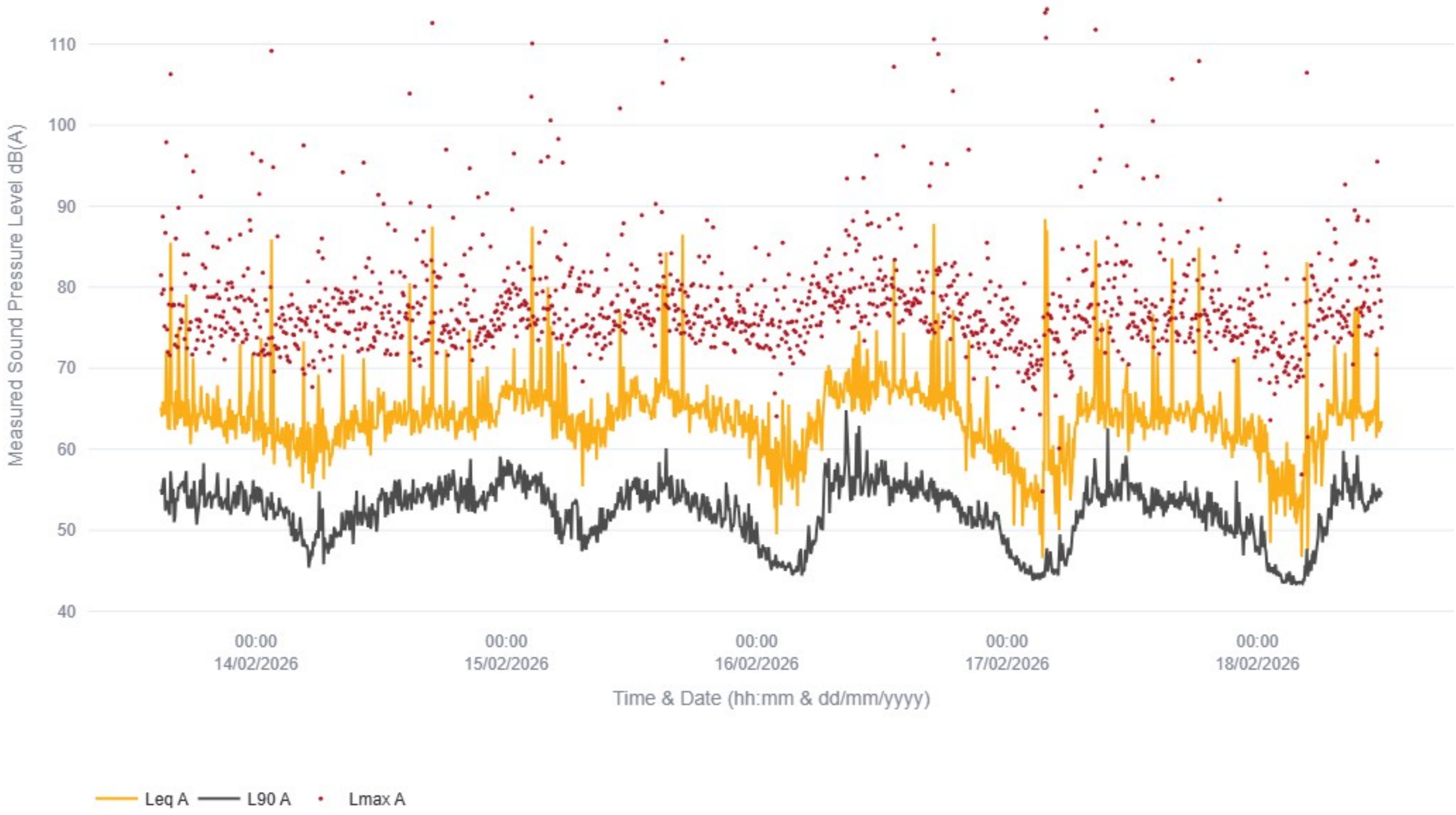


Figure D.2: LA90,T counts, Position UA1 (Front)

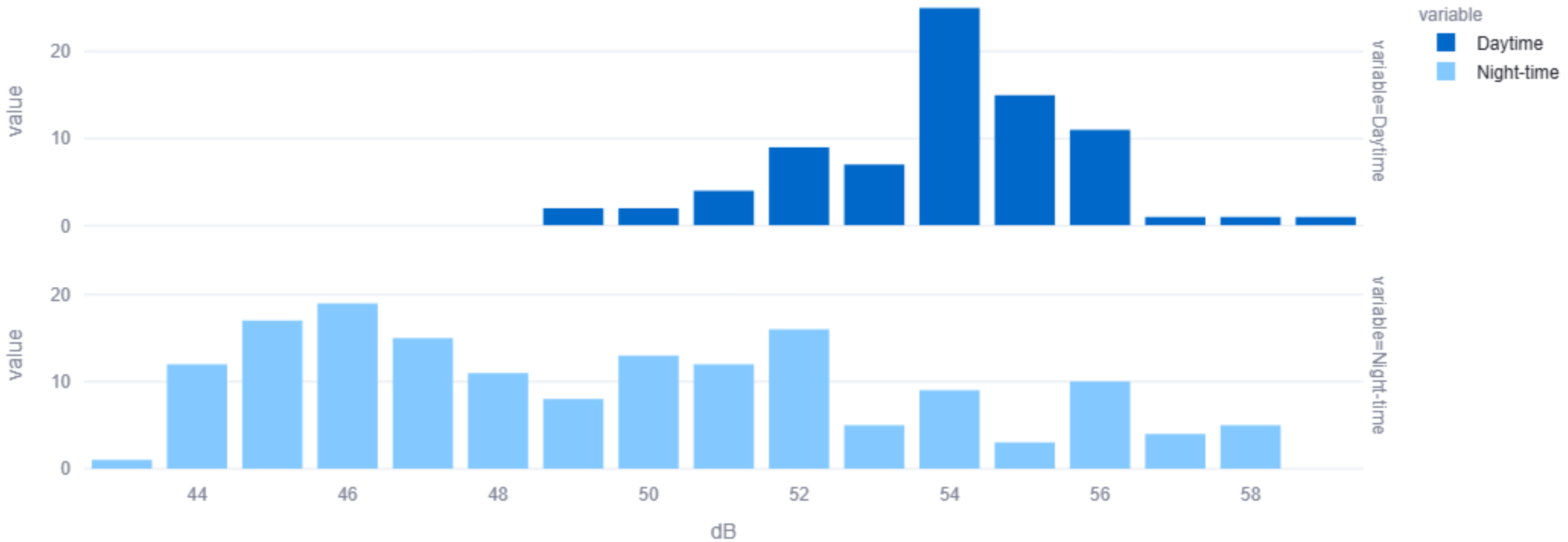


Figure D.3: Unattended survey time history, Position UA2, T=5min

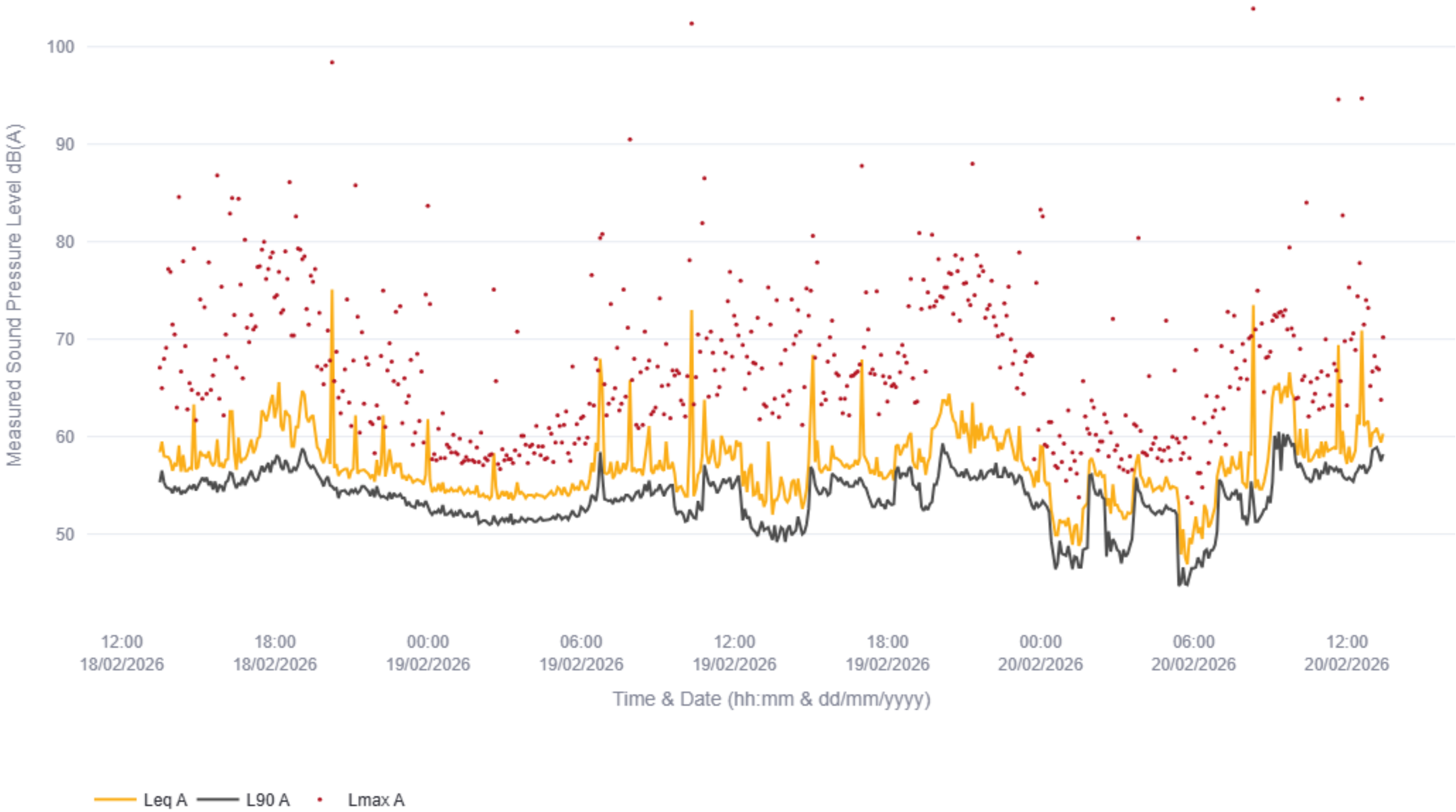


Figure D.4: LA90,T counts, Position UA2 (Rear)

