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Noise Impact Assessment – Proposed Roof Terrace

Crown & Anchor

41 Hilton St, Manchester M1 2EE

REPORT REFERENCE NO. J006472-9865-CW-01

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This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.

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1.0 SUMMARY

PDA Ltd has carried out a noise impact assessment in relation to the proposed roof terrace development at the Crown & Anchor public house on Hilton Street in Manchester City Centre.

The proposal is to apply for a change of use to convert the existing flat roof section to the rear of the building to form an external terrace with capacity for approximately 25 – 30 seats with an external TV to show football and other sporting events.

A noise survey has been conducted at site to establish the existing acoustic climate at the nearest noise sensitive receivers (NSRs).

Noise egress from proposed development has been calculated at the NSRs and compared against the existing ambient noise climate in accordance with the IEMA Guidelines for Environmental Noise Impact Assessment. Our assessment also considers the noise criteria contained within BS8233 and the WHO Guidelines for Community Noise, with consideration given to both the absolute noise levels and the character of the noise relative to the existing ambient noise climate.

The worst case noise level at the nearest residential receptor is predicted to be low relative to the existing noise climate. With reference to the guidance contained with the IEMA Guidelines for Environmental Noise Impact Assessment the increase in noise level is calculated to be ≤0.6 dB this would suggest that the proposed development is likely to have a 'negligible' impact.

Our assessment has considered L_{AFmax} levels at the nearest residential receptors due to patrons cheering. The worst case level is predicted to be 62 dB L_{AFmax}. During our noise survey, L_{AFmax} noise levels of between 62 – 89 dB were recorded due to existing sources in the vicinity of the proposed development and nearby sensitive receptors. Predicted L_{AFmax} noise levels associated with the proposed development are at the bottom end of this range and therefore, would not significantly affect the acoustic character of the area. For all other residential receptors, it can be seen that the predicted L_{AFmax} levels are well below the range of measured maximum levels due to existing sources.

With regards to non-residential receptors, there is a permitted mixed use development including office space at Marlsboro House immediately to the north of the proposed terrace which was found to be the worst affected non-residential use. The results of our assessment indicate that suitable internal noise levels are likely to be achieved within the office space with partially open windows for ventilation.

The proposed development is located in the Northern Quarter, an area characterised by its night time economy (which was found to have a contribution to the existing ambient noise climate). In addition, The Crown & Anchor is located at the end of a terrace which comprises various existing pubs and restaurants including Port Street Beer House (39-41 Port Street) and Stage and Radio (43 Port Street). It was observed during our survey that there is an existing beer garden associated with Port Street Beer House in addition to an external seating area on the pavement to the front of both Port Street Beer House and Stage & Radio.

As such, the character of the noise associated with the proposed roof terrace will not be significantly different to that of the existing noise climate and would be in keeping with the character of the area.

The National Planning Policy Framework (NPPF) requires that significant adverse impacts due to a new development should be avoided and other adverse impact should be mitigated and reduced to a minimum. Based on the results of our assessment it is concluded that noise emissions associated with the operations of the Proposed Development will not result in an adverse impact and will therefore comply with the requirements of the NPPF. Therefore, we see no reason why the proposed development should be refused on the grounds of noise.

2.0 SITE DESCRIPTION

The Crown & Anchor public house is located at 41 Hilton Street in Manchester City Centre. The proposal is to apply for a change of use to convert the existing flat roof section to the rear of the building to form an external terrace with capacity for approximately 25 – 30 seats with an external TV to show football and other sporting events.

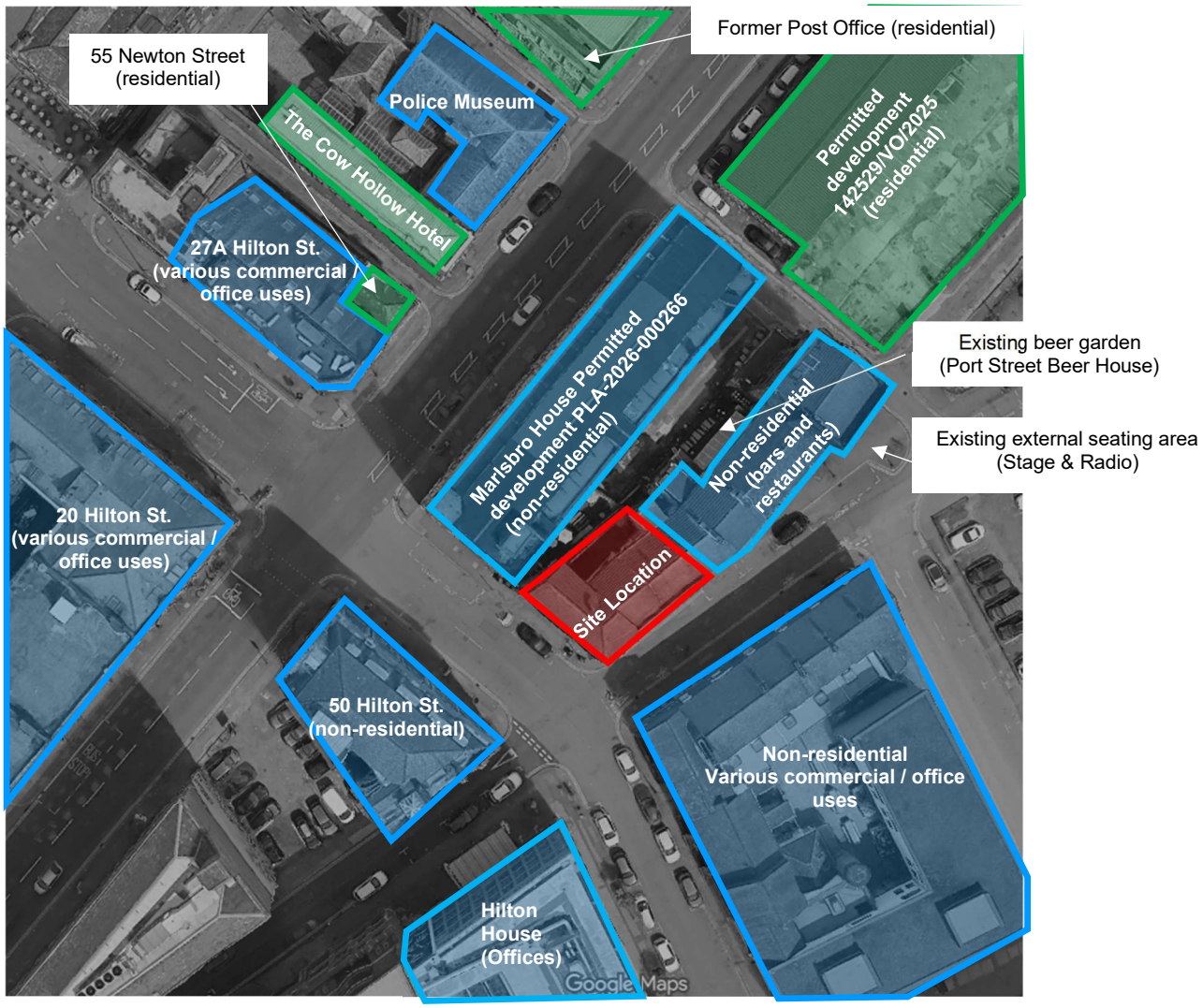
We understand that the premises is licensed to operate between 09:00 – 01:00 daily however, actual opening hours are as follows:

- Sunday – Thursday: 11:00 – 23:00
- Friday – Saturday: 11:00 – 01:00

There is no change to the current operating hours as a results of the proposal, with the terrace expected to operate within these hours. In addition, the proposal does not include music (live or amplified) within the external space with the TV only being used on occasion to show football matches or other sporting events.

The site location and its surroundings can be seen in the Figure below:

Figure 1. Site location and surroundings.



The area immediately surrounding the site is of mixed use and comprises a number of residential apartment blocks, retail/commercial units, offices, pubs and restaurants typical of an urban city centre environment.

The site is located in a row of terraced properties comprising various existing pubs and restaurants including Port Street Beer House (39-41 Port Street) and Stage and Radio (43 Port Street). It was observed during our survey that there is an existing beer garden associated with Port Street Beer House to the rear of the building in addition to an external seating area on the pavement to the front of both Port Street Beer House and Stage & Radio.

The site is overlooked to the rear by a 5 storey tower block (Marlsboro House) which we understand is currently vacant however, forms part of a non-residential permitted development (PLA-2026-000266). The permitted development is for a change of use to; bar and music venue/recording studio at basement level, restaurant at ground level and office space at levels 1 – 3.

The nearest existing residential receptors (NSRs) relative to the proposed development are understood to be as follows:

- NSR1 – Apartments at 55 Newton Street
- NSR2 – The Cow Hollow Hotel at 57 Newton Street
- NSR3 – Former Post Office Apartments at 63 Newton Street
- NSR4 – Permitted residential development (142529/VO/2025) on Faraday Street comprising an 8 storey block of 126 apartments.

With regards to the non-residential uses in the vicinity of the site we have considered the potential noise impact to the following receptors:

- NSR5 – Offices at permitted mixed use development (Marlsboro House) adjacent to Crown & Anchor
- NSR6 – Offices at Hilton House, 26 – 28 Hilton Street
- NSR7 – Offices at 20 Hilton Street
- NSR8 – Offices at 27A Hilton Street
- NSR9 – Offices adjacent to Crown & Anchor on Port Street.

It was noted during our site visit that the property at 50 Hilton Street to the west of Crown & Anchor appeared to be vacant. In addition, we are not aware of any proposed or permitted developments associated with this property. Notwithstanding this, we have included this in our assessment (NSR10) for information purposes.

3.0 ASSESSMENT CRITERIA

3.1 National Planning Policy Framework

National Planning Policy is guided by the National Planning Policy Framework (NPPF) Aug 2026 edition. With regard to Noise the Framework states the following;

National Planning Policy is guided by the National Planning Policy Framework (NPPF) updated in August 2026. With regard to noise, Policy P3 of the framework states that;

- *Development proposals should be appropriate for their location, taking into account the likely effects, (including cumulative effects), of pollution on health, living conditions and the natural environment. Consideration should also be given to whether such effects arise from the development itself or from preexisting conditions in its vicinity, together with the sensitivity of the site, its intended occupiers and users, and the surrounding environment and population.*
- *Provide healthy living conditions for occupiers and users in terms of adequate access to light and avoiding exposure to levels of air, noise, artificial light or other sources of pollution which could have an unacceptable adverse effect on health and the quality of life. Where necessary suitable mitigation measures should be incorporated to secure acceptable living conditions;*

And should not give rise to:

- *Unacceptable levels of air, noise, artificial light, water, soil or other forms of pollution on or beyond the site. Adverse impacts of this nature should be avoided where possible, or else mitigated to an acceptable degree.*

In relation to potential noise impacts associated with new development, Policy P3 stipulates the following requirements:

- *Mitigate and reduce to a minimum potential adverse impacts resulting from noise, and avoid levels of noise exposure which would have a significant observed adverse effect;*
- *Maintain the character of tranquil areas (those areas that have remained relatively undisturbed by noise from human sources and are prized for their recreational and amenity value for this reason).*

With regard to 'Significant observed adverse effect' the NPPF defines this as follows:

> **Significant observed adverse effect level**: This is the level of noise exposure above which significant adverse effects on health and quality of life occur.

Although no specific noise limit for Significant Observed Adverse Effect Level (SOAEL) has been defined, in 2014 the UK Government published a planning practice guidance document for noise which indicates where this limits falls with relation to the perception of noise. A summary is reproduced in Section **Error! Reference source not found.** below; the full document is published at https://www.gov.uk/guidance/noise--2.

With regards to the potential impact of development on existing activities Policy P4 of the framework introduces the 'Agent of Change' principle stating that:

- *Existing businesses, community facilities, public services and defence and security activities should not have unreasonable restrictions placed on their current or permitted operation as a result of development being approved after they were established. This means that development proposals should be capable of being integrated effectively with existing business, community and public service activities and infrastructure in their vicinity (including, but not limited to, uses such as pubs, music venues, places of worship, sports clubs, blue light services, defence, electricity network infrastructure and industrial and waste sites).*

Where the operation of an existing activity could have a significant adverse effect on a proposed new development in its vicinity, development proposals should:

- *Identify the nature of the potential impacts, informed where necessary by early discussions between the applicant (i.e. the 'agent of change') and those existing uses which could be affected by the proposal to inform the scope for mitigation; and*

- *Be able to demonstrate that suitable mitigation can be provided before first occupation of the development, if it is to be acceptable. Planning conditions or obligations should be used to secure agreed mitigation measures*.

This policy applies to new development involving changes of use of land and property, as well as to new construction…. Both lawful current and permitted levels of operation of existing activities should be taken into account when applying this policy.

3.2 Planning Practice Guidance – Noise

In March 2014 (updated July 2019) the UK Government published further guidance on the assessment of noise for planning purposes in the form of the on-line publication, Planning Practice Guidance on noise (http://www.gov.uk/guidance/noise--2). This document offers further guidance on the typical levels which constitute the NOEL, LOAEL and SOAEL. The relevant section is reproduced in the table below;

Table 1: *Planning Practice noise level guidance*

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

It is notable from the above planning guidance that development should not normally be permitted above Significant Observed Adverse Effect Levels, and should aim to minimise other Adverse Effect Levels

(below SOAEL but above LOAEL). However, it is clear that noise is permitted to approach and/or exceed the Lowest Observed Adverse Effect Level, providing that noise is mitigated and reduced to a minimum.

3.3 WHO Guidelines for Community Noise

In 1999, the WHO (World Health Organisation) published Guidelines for Community Noise, stating the following noise levels are applicable to residential dwellings.

Table 2: *WHO Guidelines for Community Noise criteria*

Specific Environment	*Critical Health Effect(s)*	*L_{Aeq} dB*	*Time Base (hours) **
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime & evening	35	16
Inside bedrooms	Sleep disturbance, night time	30	8
Outdoor Living Area	Serious annoyance, daytime & evening	55	16
Outdoor Living Area	Moderate annoyance, daytime & evening	50	16

* Typically taken to be daytime/evening - 07:00 – 23:00 hours and night time 23:00 – 07:00 hours.

3.4 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

British Standard 8233:2014, *Guidance on Sound Insulation and noise reduction for buildings*, gives guidance on internal noise levels within dwellings, flats and rooms in residential use when unoccupied. The following criteria are for Living and Dining Rooms for daytime use and Bedrooms for night time.

Table 3: *BS8233 Recommended Indoor Ambient Noise Levels (residential)*

Activity	*Location*	*07:00 to 23:00*	*23:00 to 07:00*
Resting	Living room	35 $L_{Aeq,16hour}$	–
Dining	Dining room/area	40 $L_{Aeq,16hour}$	–
Sleeping (daytime resting)	Bedrooms	35 $L_{Aeq,16hour}$	30 $L_{Aeq,8hour}$

In addition, BS 8233 suggests, '*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 $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values'.*

In addition, BS8233 provides guideline internal noise criteria for various non-residential uses as summarised below:

Table 4. *BS8233 Recommended Indoor Ambient Noise Levels (non-residential)*

Activity	*Example*	*Design Range dB L_{Aeq}*
Speech or telephone communications	Department store, cafeteria, canteen, kitchen	50 – 55
	Concourse corridor, circulation space	45 – 55
Study and work requiring concentration	Open plan office	45 – 55
	Library, gallery, museum	40 – 50

	Staff/meeting room, training room	35 – 45
	Executive office	35 – 40

3.5 Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment, Version 1.2, 2014

The Institute of Acoustics of Environmental Management and Assessment has produced a guidance document regarding noise impact assessments. The values given in Table 5 below are taken from the document that sets out a guide as to how changes in noise level may be assessed.

Table 5: *IEMA Impact from the Change in Sound Levels*

Long-term impact classification	Short-term impact classification	Sound Level Change dBA
Negligible	Negligible	> 0 dB and < 1 dB
	Minor	> 1 dB and < 3 dB
Minor	Moderate	> 3 dB and < 5 dB
Moderate	Major	> 5 dB and < 10 dB
Major		> 10 dB

The above criteria reflect key benchmarks of human response to changes in noise level. For example, a 3dB change is generally taken to be the smallest change perceptible to the human ear and a 10dB change is heard as a doubling or halving of loudness.

3.6 Local Authority Consultation

Manchester City Council have indicated that a noise impact assessment will be required to support the planning application stating that:

> *"A noise assessment will be required to demonstrate the noise from the TV and patrons does not harm residential amenity. This should consisted an acoustic study by a qualified acoustician identifying ambient noise levels during daytime, night time and weekends along with details of the noise levels expected at various times during operating hours. The study should reference the impact on nearby residential windows and other surrounding Noise Sensitive Receptors.*

10/09/2026 - An acoustic assessment prepared by a suitably qualified individual must be submitted. The proposed use would see the siting of an external seating area in a raised area and is thus distinctly different than that of the existing arrangement on site".

MCC have provided the operators of the Crown and Anchor with further clarification regarding the scope of the assessment noting that:

> *"A noise assessment must be submitted to demonstrate that noise from patrons and the TV on the proposed first-floor external seating area does not harm residential amenity.*
>
> *The Council requires:*
>
> *Ambient noise measurements during:*
>
> - *Daytime*

- *Night-time*
- *Weekend*

Predicted noise levels from:

- *Patrons using the raised external seating area*
- *Occasional TV use during football matches*
- *Any associated crowd reaction noise*

Assessment of noise impact on:

- *Nearby residential windows*
- *Other surrounding Noise Sensitive Receptors*

Reference to relevant standards, including:

- *BS8233*
- *BS4142*
- *WHO / IOA guidance as appropriate"*

3.7 Proposed Assessment Criteria

There is currently no nationally agreed standard or specific guidance for the assessment of noise from roof terraces or beer garden areas. In the absence of specific guidance, our assessment will consider absolute noise levels, the change in noise levels and the character of the noise relative to the existing acoustic environment.

Our assessment will be undertaken with reference to the noise criteria contained within BS8233 and the WHO Guidelines for Community Noise, with consideration given to both the absolute noise levels and the character of the noise relative to the existing ambient noise climate.

In addition, the potential change in noise levels resulting from the proposed roof terrace will be considered with reference to the IEMA Guidelines for Environmental Noise Impact Assessment, as described in Section 3.5.

In their consultation response, Manchester City Council (MCC) make reference to BS4142. However, we would note that BS4142 is intended for the assessment of sound from industrial and commercial premises. The scope of BS4142 specifically excludes the assessment of noise from: "*music and other entertainment, people, public address systems for speech*". The latter may be considered akin to televised commentary associated with sporting events.

On this basis we would not consider the methodology of BS4142 to be appropriate for the assessment of noise generated by patrons on the roof terrace or televised sporting events.

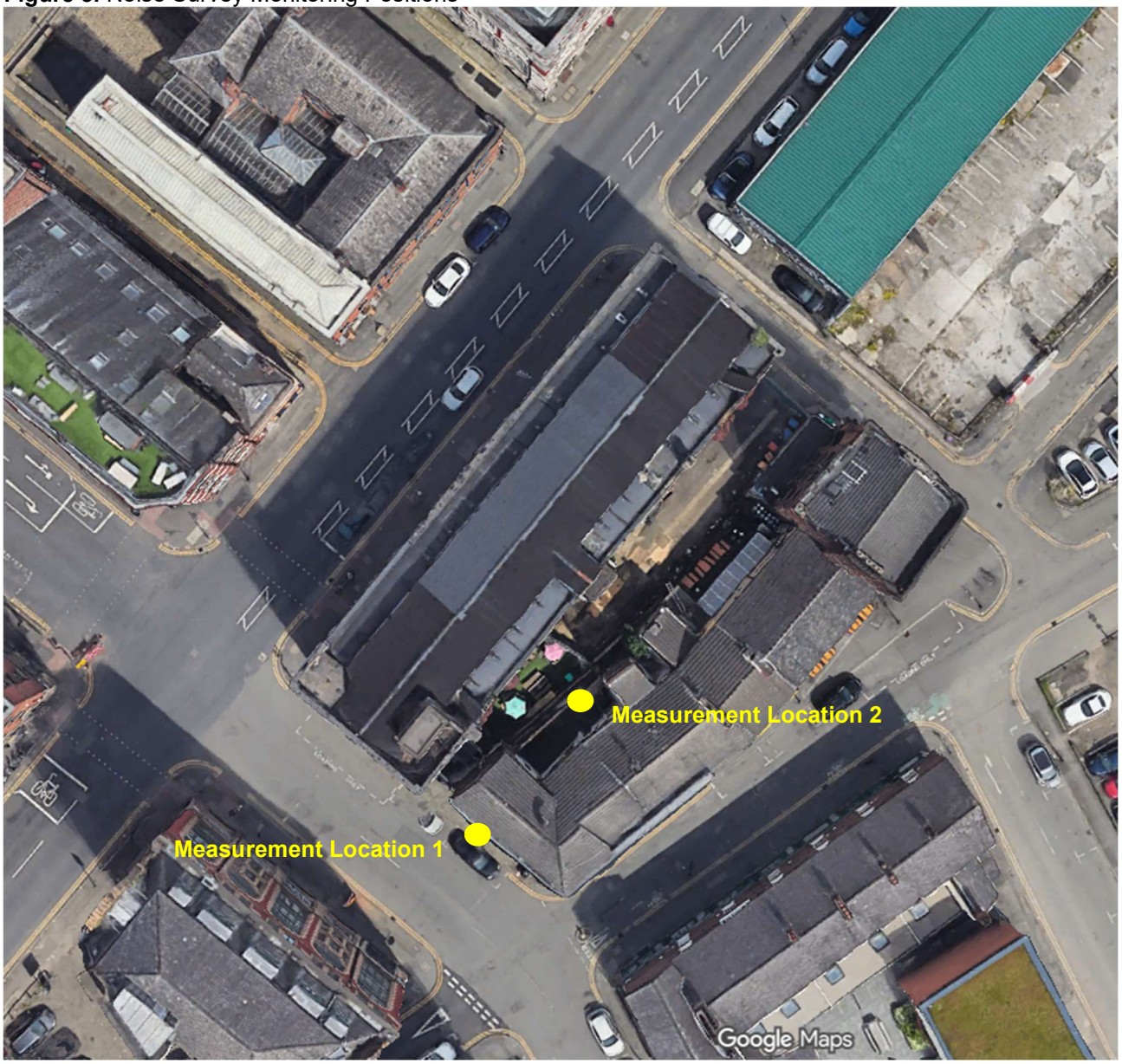
4.0 SURVEY DETAILS AND RESULTS

4.1 Noise Survey Details

In order to determine the existing ambient noise climate in the vicinity of the site and nearby sensitive receptors a survey was undertaken over a period of approximately 72 hours. Measurements were undertaken over an entire weekend period between 12:45 hours on Friday 2nd until 10:20 hours on Monday 5th October 2026.

Measurements were undertaken from a 2 locations deemed to be representative of the noise climate at the closest noise sensitive receptors to the proposed development. The locations of which are illustrated in the Figure below:

Figure 3. Noise Survey Monitoring Positions



A description of the measurement locations is provided below:

- Measurement Location 1 (MP1) – Measurements were undertaken at first floor level of the existing pub approximately 4.5m above ground level overlooking Hilton Street. Measurements at this location were deemed to be representative of the noise climate at the more exposed NSRs on Hilton Street, Port Street and Newton Street.

- Measurement Location 2 (MP2) – Measurements were undertaken from the existing flat roof to the rear of the pub approximately 3m above ground level. Measurements at this location were deemed to be representative of the noise climate at the more shielded NSRs i.e. Marlsboro House and Faraday Street.

All measurements were made and partially attended by Mr C Wright of PDA Ltd. All measurements were undertaken with a fast time-weighting and broadband statistics were measured throughout. In addition, octave band frequency spectra and audio were recorded. Measurements were of continuous 5 minute samples.

The noise survey was conducted using 2no. NTi XL2 sound level meters for which valid calibration certificates are held. In addition, the meters were field calibrated both before and after the measurement period, during which time no significant deviation from the calibrated level was observed. The NTi XL2 has a Class 1 frequency response as per BS EN 61672-1:2003 and was fitted with a windshield at all times.

Weather

Weather conditions varied throughout the survey however typical conditions were as followed:

Temperature	-	7-21°C
Wind	-	0 – 4 m/s (E/ ESE)
Events	-	Generally dry with some short periods of light rain

Weather conditions were deemed to be conducive to noise measurements, note that our observations are based on Weather Underground Station 'IMANCH162' located approximately 100m from the development site on Tariff Street.

4.2 Existing Noise Climate

The noise climate in the vicinity of the site comprised mixed sources typical for an urban city centre environment. The ambient noise climate was dominated by local and distant road traffic on the surrounding road network including cars, motorbikes, buses, HGV's and emergency sirens.

Noise associated with the city centre and night-time economy also had a reasonably significant contribution to the overall noise climate. This was predominantly due to pedestrians and patrons gathering outside the nearby pubs. It was noted that noise from the existing beer garden at Port Street Beer House had a contribution to the noise climate at the rear of the development during the afternoon and evening periods.

Plant noise from various chillers and condensers units was also audible at the rear of the Crown and Anchor.

4.3 Noise Survey Results

A summary of the measures noise levels is provided in the Table below. The full survey results are available in the Appendix.

***Table 6**: Summary of noise survey results*

Location	Period[1]	$L_{Aeq,T}$ (dB)	Range of L_{AFmax} (dB)
Position 1 (Hilton St)	Friday (12:45 – 23:00)	65	66 – 101
	Friday Night (23:00 – 01:00)	62	69 – 88
	Saturday (11:00 – 23:00)	66	68 – 100
	Saturday Night (23:00 – 01:00)	68	71 – 100
	Sunday (11:00 – 23:00)	62	64 – 100
Position 2 (Rear / Marlsbro House)	Friday (12:45 – 23:00)	60	56 – 88
	Friday Night (23:00 – 01:00)	56	62 – 80
	Saturday (11:00 – 23:00)	64	56 – 95
	Saturday Night (23:00 – 01:00)	62	62 – 89
	Sunday (11:00 – 23:00)	57	56 – 88

Notes:
1 It is understood that the proposed development is likely to operate between 11:00 – 23:00 hours Sunday – Thursday and 11:00 – 01:00 Friday – Saturday as such, for the purposes of this assessment measurements undertaken outside of this period have not been considered.

The results of our noise survey indicate that for the more exposed NSRs on Hilton Street, Port Street and Newton Street existing ambient noise levels range from between 62 – 66 dB L_{Aeq} during the daytime and 62 – 68 dB L_{Aeq} during the night-time (23:00 – 01:00) with L_{AFmax} levels ranging from between 64 – 101 dB.

For more shielded NSRs – Marlsboro House and the permitted development (142529/VO/2025) on Faraday Street existing ambient noise levels range from between 57 – 64 dB L_{Aeq} during the daytime and 56 – 62 dB L_{Aeq} during the night-time (23:00 – 01:00) with L_{AFmax} levels ranging from between 56 – 95 dB.

5.0 NOISE IMPACT ASSESSMENT

5.1 Noise Sources Associated With Development

The proposal is to convert the existing flat roof section to the rear of the building to form an external terrace with capacity for approximately 25 – 30 seats with an external TV to show football and other sporting events.

In terms of noise sources associated with the proposed development we have considered the following scenarios:

- **General day to day use:** 15 patrons communicating simultaneously with 'raised' voices without television. Note that this is based on the maximum 30 seat capacity accounting for the 'call and response' nature of conversation and assumes an approximately even distribution of male and female vocal efforts.
- **Sporting events including TV:** Up to 30 patrons cheering simultaneously with 'loud' voices. Television operating at typical level as measured during our site visit.

5.1.1 Speech Levels

A comprehensive data collection and study was carried out by Pearson, Bennet & Fidell to document typical noise levels and frequency spectrum of females, males and children under various vocal efforts. The findings of the study are published in *Average Speech Levels and Spectra in Various Speaking/Listening Conditions: A Summary of the Pearson, Bennett & Fidell (1977) Report (Olsen, 1998)*.

The Table below summarises the results of both 'raised' and 'loud' vocal efforts measured at 1m under free field conditions:

Table 7: *Typical 'raised' and 'loud' vocal effort sound pressure levels (L_p)*

Description	Sound Pressure Level (dB) in Octave Bands (Hz)						dBA
	125	250	500	1000	2000	4000	
Male (raised)	55	59	64	58	54	49	64
Male (loud)	57	65	72	71	66	60	74
Female (raised)	32	56	61	60	56	52	64
Female (loud)	31	56	64	67	65	58	71

The sound pressure (L_p) levels above were measured at 1m (r) under free field anechoic conditions and therefore, the sound power level (L_w) has been calculated as follows:

$$Lw = 20\log(r) + 11$$

The resulting sound power level is as summarised in the table below:

Table 8: *Typical 'raised' and 'loud' vocal effort sound power levels (L_w)*

Description	Sound Power Level (dB) in Octave Bands (Hz)						dBA
	125	250	500	1000	2000	4000	
Male (raised)	66	70	75	69	65	60	75
Male (loud)	68	76	83	82	77	71	85
Female (raised)	43	67	72	71	67	63	75
Female (loud)	42	67	75	78	76	69	82

It is estimated that at peak capacity there may be up to 30 patrons on the roof terrace. As such, for the purposes of this assessment it is assumed that up to 15 patrons may be conversing simultaneously 'raised' vocal efforts during general operation (8 males / 7 females).

During televised sporting events we have assumed up to 30 patrons cheering simultaneously with 'loud' vocal efforts allowing for an even distribution of males and females.

Therefore, based on the levels in Table 8 the total sound power has been estimated as follows;

$$Lw\ total = Lw + 10\log(n)$$

Where;
n = Total number of patrons talking / cheering simultaneously

We have calculated the total sound power level for each scenario to be as follows:

Table 8: *Overall patron sound power levels (L_w)*

Description	Sound Power Level (dB) in Octave Bands (Hz)						dBA
	125	250	500	1000	2000	4000	
General use (raised voices)	75	81	85	82	78	73	86
Cheering during sports events (loud voices)[1]	80	88	96	95	91	85	99

Notes:
1 Note that we have assessed the potential noise impact associated with cheering during sporting events in terms of LAFmax given the sporadic nature of cheering during goals etc…

5.1.2 Televised Sporting Events

It is understood that on occasion, sporting events will be broadcast on an externally mounted television within the roof terrace area. In order to characterise likely noise levels associated with sports broadcasts, additional measurements were undertaken of the existing external TV within the former beer garden area to the rear of the Crown and Anchor. Measurements were taken from an approximately central location 3m from the TV and included football coverage and an advertisement break. The volume was turned up until the level was considered to be representative of what may typically be expected had the beer garden been occupied at, or near to capacity.

The measured sound pressure levels are summarised in the Table below:

Table 9: *Reference noise levels for typical televised sporting event*

Description	Sound Pressure Level dB, Octave Band Centre Frequency Hz							dBA
	63	125	250	500	1k	2k	4k	
Football coverage & advertising break	58	65	60	66	61	60	56	67

5.2 Predicted Noise Levels at Receivers

Using the sound power levels calculated in Section 5.1 above we have modelled noise emissions from the site using SoundPLAN V9.1 noise modelling software.

The software uses the method of ISO 9613 '*Acoustics – attenuation of sound during propagation outdoors – general method of calculation' and* takes into account geometric spreading, ground effects, air absorption, barrier attenuation and reflections from the surroundings to calculate the noise levels incident at various points.

Noise due to patrons has been inputted to the model as an area source assuming an even distribution across the roof terrace area. The TV has been modelled as point source. A ground absorption coefficient of 0 has been used representative of hard surfaces surrounding the site (hardstanding, roads, etc.).

The results of the noise model can be seen in the Figures below.

Figure 4. SoundPLAN Noise Model Results – General Use (patron noise only)

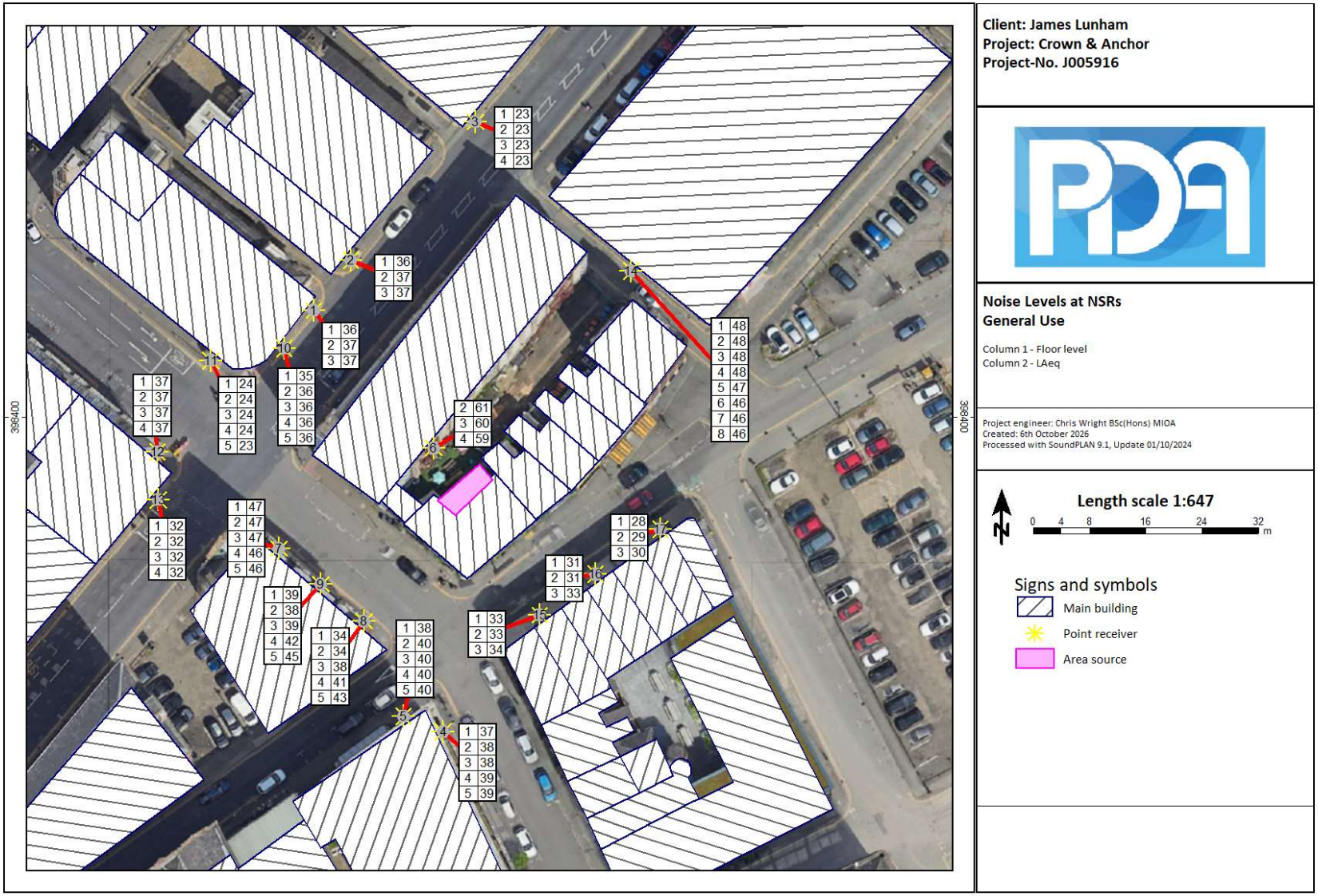
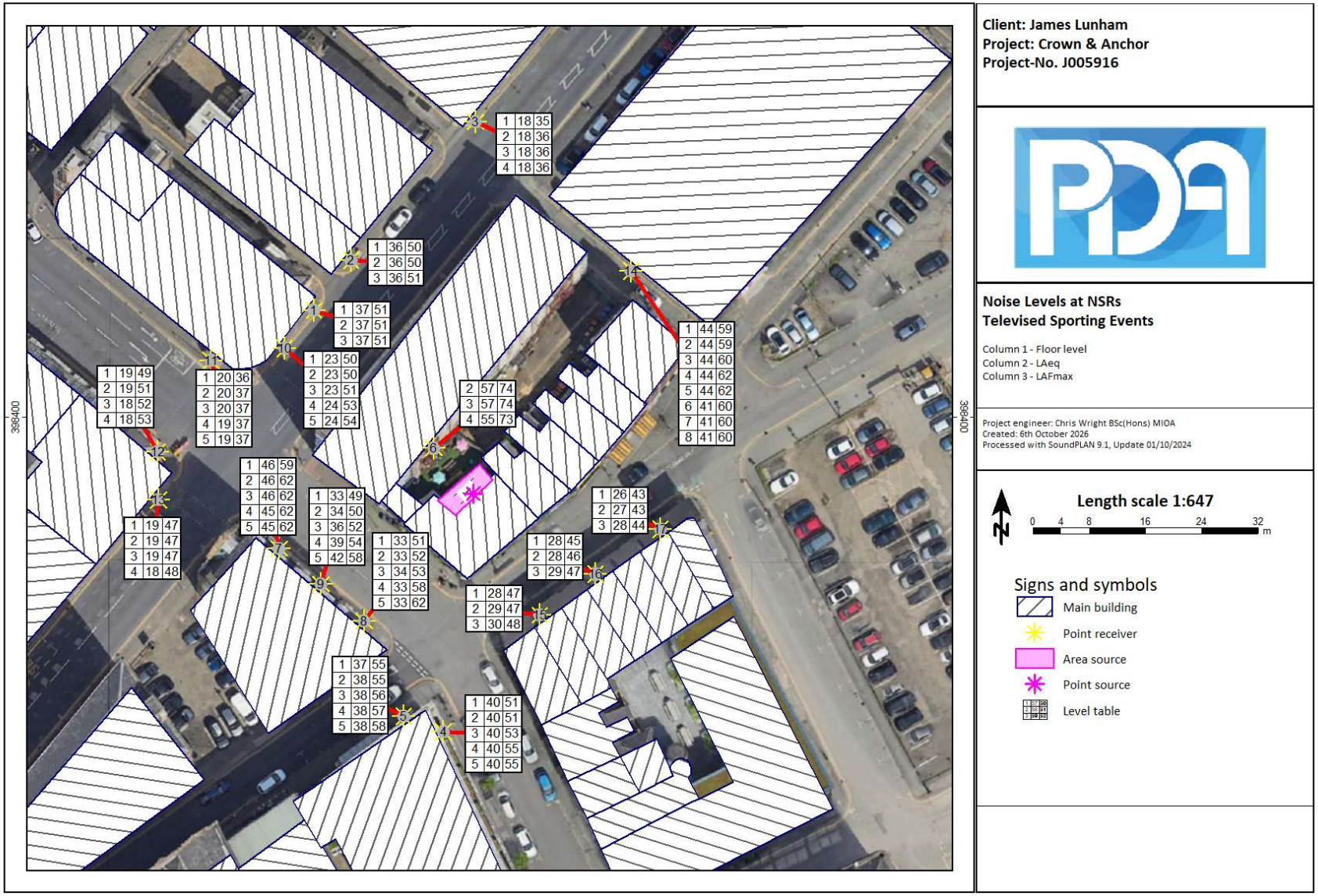


Figure 5. SoundPLAN Noise Model Results – Televised Sporting Events (TV & cheering)



5.3 Discussion of Results

5.3.1 General Use

Based on the predicted noise levels we have undertaken an initial assessment in accordance with the IEMA Guidelines for Environmental Noise Impact Assessment. In order to determine the noise impact associated with the proposed development it is necessary to consider how the changes will affect the existing noise levels at the nearby dwellings.

During general use of the roof terrace assuming up to 15 patrons conversing simultaneously with 'raised' voices (likely representative of peak capacity) the results of our noise model suggest noise levels of between 23 – 61 dB at the nearest sensitive receptors.

With regards to the existing ambient noise levels it should be noted that for residential receptors (NSRs 1 – 3) our assessment is based on the lowest measured ambient noise level during the survey period (62 dB - Sunday 4th October).

With reference to the permitted residential development on Faraday Street (NSR4) our assessment is based on the lowest measured ambient level at monitoring location 2 (56 dB measured during night-time period on Friday 2nd October). This approach is considered be conservative as an increased ambient noise level is expected at other times; further reducing the potential noise impact.

Note that for non-residential receptors (NSRs 5 – 10) our assessment is based on existing ambient noise levels measured during the daytime only as it is considered unlikely that offices would be occupied during the night-time.

Comparison is made in the Table below, note that the increase is determined by logarithmically summing the existing and predicted noise levels to determine the change in noise level as a step change.

Table 8. Comparison of Noise Emissions with Existing Noise Level – (General Use)

NSR	Worst-case Predicted Noise Level $L_{Aeq,T}$ (dB)	Existing noise climate $L_{Aeq,T}$ (dB)	Cumulative Noise Level $L_{Aeq,T}$ (dB)	Sound Level Change dBA	Magnitude of Impact
1 – Apartments at 55 Newton St. (Resi.)	37	62	62.0	0.0	Negligible
2 – The Cow Hollow Hotel (Resi.)	37	62	62.0	0.0	Negligible
3 – Apartments at 63 Newton St. (Resi.)	23	62	62.0	0.0	Negligible
4 – Permitted development on Faraday St. (Resi.)	48	56	56.6	0.6	Negligible
5 – Permitted development Marlsboro House (Non-Resi.)	61	57	62.5	5.5	Moderate
6 – Hilton House (Non-Resi.)	40	62	62.0	0.0	Negligible
7 – 20 Hilton St. (Non-Resi.)	37	62	62.0	0.0	Negligible
8 – 27A Hilton St. (Non-Resi.)	36	62	62.0	0.0	Negligible
9 – Units on Port St. (Non-Resi.)	34	62	62.0	0.0	Negligible
10 – 50 Hilton St (Non-Resi)	47	62	62.1	0.1	Negligible

Residential Receptors – General Use

With reference to the guidance contained with the IEMA Guidelines for Environmental Noise Impact Assessment, the increase in noise level is calculated to be ≤0.6 dB. This would suggest that the proposed development is likely to have a 'negligible' impact.

Our assessment suggests that NSR 4 is likely to be the worst affected with a level of 48 dB L_{Aeq} predicted at the facade. This is 8 dB below the existing ambient noise climate and as such, noise emissions associated with the proposed development will not have a significant contribution to the overall noise climate. Reduced noise levels are predicted at all other residential receptors due to increased distance and shielding.

On this basis, our initial assessment indicates that the proposed development will have a low impact on the nearby residential receptors. Note that further contextual factors which are considered to further reduce the impact are discussed in Section 5.4 below.

Non-residential Receptors – General Use

For the majority of non-residential receptors no change in noise level is predicted in accordance with the IEMA Guidelines, this would suggest that the proposed development is likely to have a 'negligible' impact with noise emissions associated with the use of the roof terrace effectively being inaudible at these locations.

Our assessment suggests that the worst affected non-residential receptor, is likely to be the permitted office development at Marlsboro House to the rear of the Crown & Anchor (NSR 5). An increase in noise level of up to 5.5 dB is predicted and therefore, in accordance with the IEMA Guidelines would suggest a 'moderate' impact.

The worst-case specific noise level at the facade of the permitted office development premises is predicted to be 61 dB. Allowing for an attenuation of ~13 dB for a partially open window this would result in an internal noise level of 48 dB.

BS8233 recommends that the "study and work requiring concentration" an internal ambient noise level of between 35 – 55 dB L_{Aeq} should be targeted. Internal noise levels due to the proposed roof terrace are predicted to be comfortably within this range and as such, are unlikely to significantly impact the proposed office use.

Further, it was noted during our site inspection that that existing single pane windows of Marlsboro House which overlook the Crown & Anchor were in a poor state of repair and in some instances, were broken or boarded shut. As such, it seems likely that the existing glazing would be replaced as part of the development.

For a modern office development such as this, typically (non-acoustic) double glazing in combination with either passive or mechanical ventilation would be expected. Where these systems are present within the offices, the need to open windows for ventilation would be reduced and as such, significantly lower noise levels would be expected.

Assuming standard double glazing is installed (approximately 25 dB R_w) internal noise levels due to the proposed roof terrace are predicted to be in the region of ~36 dB and as such, is unlikely to be significantly audible against other sources of masking noise associated with typical office use.

On this basis, our initial assessment indicates that the proposed development will have a low impact on the nearby non-residential receptors. Note that further contextual factors which are considered to further reduce the impact are discussed in Section 5.4 below.

5.3.2 Televised Sporting Events

Our assessment of potential noise impact associated with televised sporting events considers both noise from the TV and also the associated cheering from patrons on the terrace.

During televised sport events on the proposed roof terrace our assessment assumes the television is operating continuously with up to 30 patrons cheering simultaneously with 'loud' voices (likely representative of peak capacity).

The results of our noise model suggest noise levels of between 18 – 57 dB L_{Aeq} and 36 – 62 dB L_{AFmax} at the nearest sensitive receptors. Comparison is made against the existing ambient noise climate in the Tables below:

Television noise has been assessed in accordance with the IEMA Guidelines given that it is a relatively continuous source. Given the relatively sporadic nature of cheering during goals etc… we have assessed noise associated with patrons during sporting events with regards to the L_{AFmax} level and considered this against the existing L_{AFmax} noise levels in the vicinity of the proposed development and NSRs.

Note that the L_{AFmax} criteria provided in the WHO Guidelines are associated with sleep disturbance and hence have not been considered for non-residential receptors.

Table 9. Comparison of Noise Emissions with Existing Noise Level – (TV during sport events)

NSR	Worst-case Predicted Noise Level $L_{Aeq,T}$ (dB)	Existing noise climate $L_{Aeq,T}$ (dB)	Cumulative Noise Level $L_{Aeq,T}$ (dB)	Sound Level Change dBA	Magnitude of Impact
1 – Apartments at 55 Newton St. (Resi.)	37	62	62.0	0.0	Negligible
2 – The Cow Hollow Hotel (Resi.)	36	62	62.0	0.0	Negligible
3 – Apartments at 63 Newton St. (Resi.)	18	62	62.0	0.0	Negligible
4 – Permitted development on Faraday St. (Resi.)	44	56	56.3	0.3	Negligible
5 – Permitted development Marlsboro House (Non-Resi.)	57	57	60.0	3.0	Minor
6 – Hilton House (Non-Resi.)	40	62	62.0	0.0	Negligible
7 – 20 Hilton St. (Non-Resi.)	19	62	62.0	0.0	Negligible
8 – 27A Hilton St. (Non-Resi.)	24	62	62.0	0.0	Negligible
9 – Units on Port St. (Non-Resi.)	30	62	62.0	0.0	Negligible
10 – 50 Hilton St (Non-Resi)	46	62	62.1	0.1	Negligible

Table 10. Comparison of Noise Emissions with Existing L_{AFmax} levels – (Patrons cheering)

NSR	Worst-case Predicted Noise Level L_{AFmax} (dB)	Existing noise climate Range of L_{AFmax} (dB)
1 – Apartments at 55 Newton St. (Resi.)	51	69 – 88
2 – The Cow Hollow Hotel (Resi.)	51	69 – 88
3 – Apartments at 63 Newton St. (Resi.)	36	69 – 88
4 – Permitted development on Faraday St. (Resi.)	62	62 – 89

Residential Receptors – Sporting Events

With reference to the guidance contained with the IEMA Guidelines for Environmental Noise Impact Assessment, the increase in noise level is calculated to be ≤0.3 dB. This would suggest that the proposed development is likely to have a 'negligible' impact.

Our assessment suggests that NSR 4 is likely to be the worst affected with a level of 44 dB L_{Aeq} predicted at the facade. This is 12 dB below the existing ambient noise climate and as such, noise emissions associated with televised sporting events will not have a significant contribution to the overall noise climate. Reduced noise levels are predicted at all other residential receptors due to increased distance and shielding.

With regards to L_{AFmax} levels due to patrons cheering the worst case level is predicted to be 62 dB at NSR 4. During our noise survey L_{AFmax} noise levels of between 62 – 89 dB were recorded due to existing sources in the vicinity of the proposed development and nearby sensitive receptors. The predicted noise levels are at the bottom end of this range and therefore, would not significantly affect the acoustic character of the area.

For all other residential receptors, it can be seen that the predicted L_{AFmax} levels are well below the range of measured maximum levels due to existing sources.

On this basis, our initial assessment indicates that the proposed development will have a low impact on the nearby residential receptors. Note that further contextual factors which are considered to further reduce the impact are discussed in Section 5.4 below.

Non-residential Receptors – Sporting Events

For the majority of non-residential receptors no change in noise level is predicted in accordance with the IEMA Guidelines, this would suggest that the proposed development is likely to have a 'negligible' impact with noise emissions associated with televised sporting events effectively being inaudible at these locations.

Our assessment suggests that the worst affected non-residential receptor, is likely to be the permitted office development at Marlsboro House to the rear of the Crown & Anchor (NSR 5). An increase in noise level of up to 3 dB is predicted and therefore, in accordance with the IEMA Guidelines would suggest a 'minor' impact.

As discussed in Section 5.3.1, at this level, it is expected that suitable internal noise level would be achievable in the office space even with partially open windows for ventilation. In addition, should double glazing be installed as part of the development significantly lower internal noise levels are anticipated.

On this basis, our initial assessment indicates that the proposed development will have a low impact on the nearby non-residential receptors. Note that further contextual factors which are considered to further reduce the impact are discussed in Section 5.4 below.

5.4 Further Contextual Factors to be Considered

When determining the potential for noise impact associated with a specific sound source, it is necessary to consider not only the relative change / absolute level but also the character of the noise and the context in which it occurs.

The primary noise source associated with the proposed development will be due to patrons talking / cheering. It is noted that the development is located to the rear of an existing pub which previously had a beer garden area at this location. We understand that the beer garden was located on land belonging to Marlsboro House which has been disused for a number of years however, as a result of the permitted development in May 2026 the use of this land was revoked. As a result, the operators are now seeking permission to utilise the flat roof space to form an external terrace.

The proposed development is located in the Northern Quarter, an area characterised by its night time economy which was found to have a contribution to the existing ambient noise climate.

The Crown & Anchor is located at the end of a terrace which comprises various existing pubs and restaurants including Port Street Beer House (39-41 Port Street) and Stage and Radio (43 Port Street). It was observed during our survey that there is an existing beer garden associated with Port Street Beer House to the rear of the building (adjacent to Marlsboro House) in addition to an external seating area on the pavement to the front of both Port Street Beer House and Stage & Radio.

As such, the character of the noise associated with the proposed roof terrace will not be significantly different to that of the existing noise climate and would be in keeping with the character of the area.

In addition, it should be borne in mind that our assessment assumes that the roof terrace is operating at peak capacity (~30 seats/patrons) and is therefore, representative of likely worst case noise emissions. For the majority of the time, it is likely that the terrace would be operating at a reduced capacity and subsequently noise emissions would be somewhat lower than predicted.

The National Planning Policy Framework (NPPF) requires that significant adverse impacts due to a new development should be avoided and other adverse impact should be mitigated and reduced to a minimum. Based on the results of our assessment it is concluded that noise emissions associated with the operations of the Proposed Development will not result in an adverse impact and will therefore comply with the requirements of the NPPF.

6.0 CONCLUSION

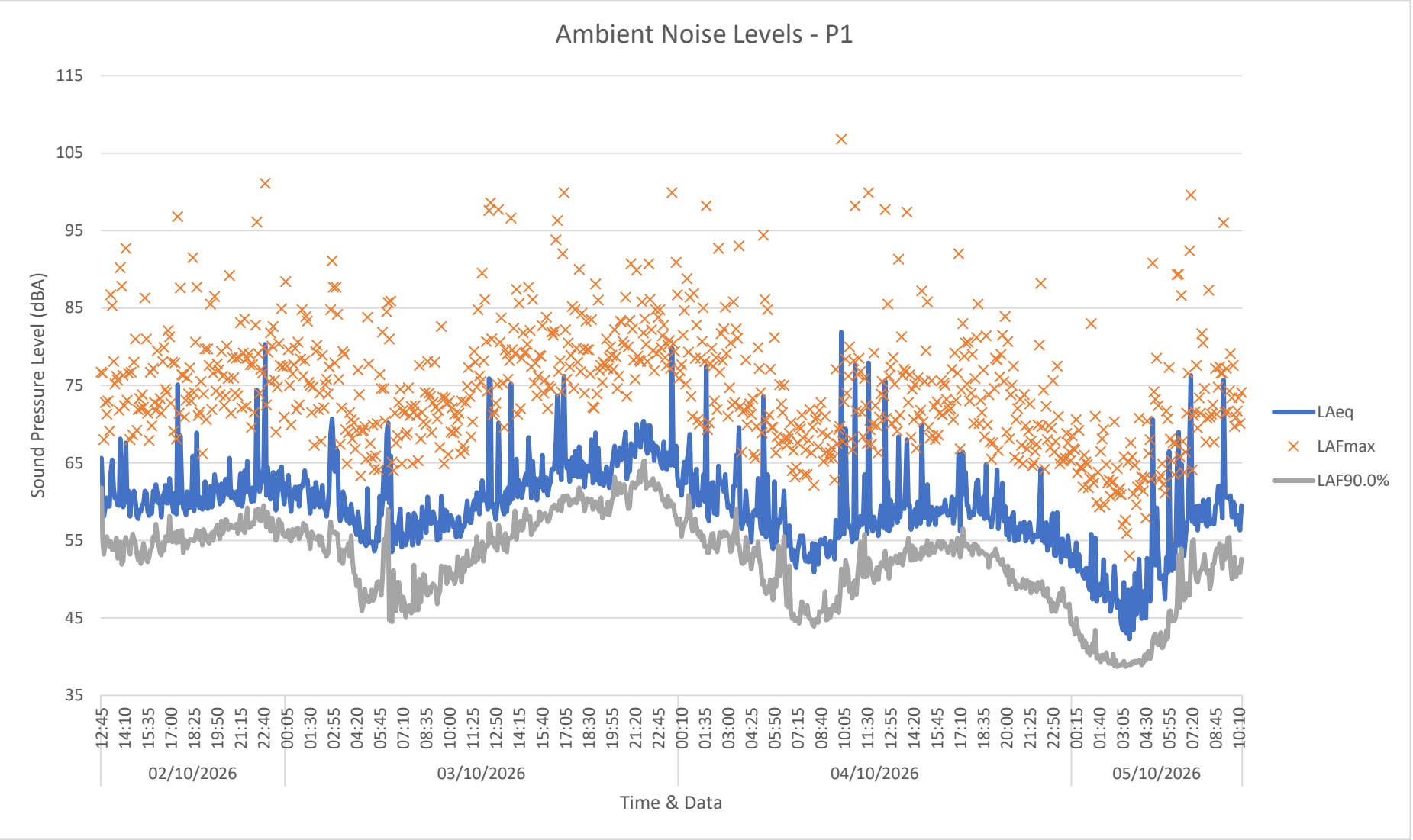
PDA Ltd has carried out a noise impact assessment in relation to the proposed roof terrace development at the Crown & Anchor public house on Hilton Street in Manchester City Centre.

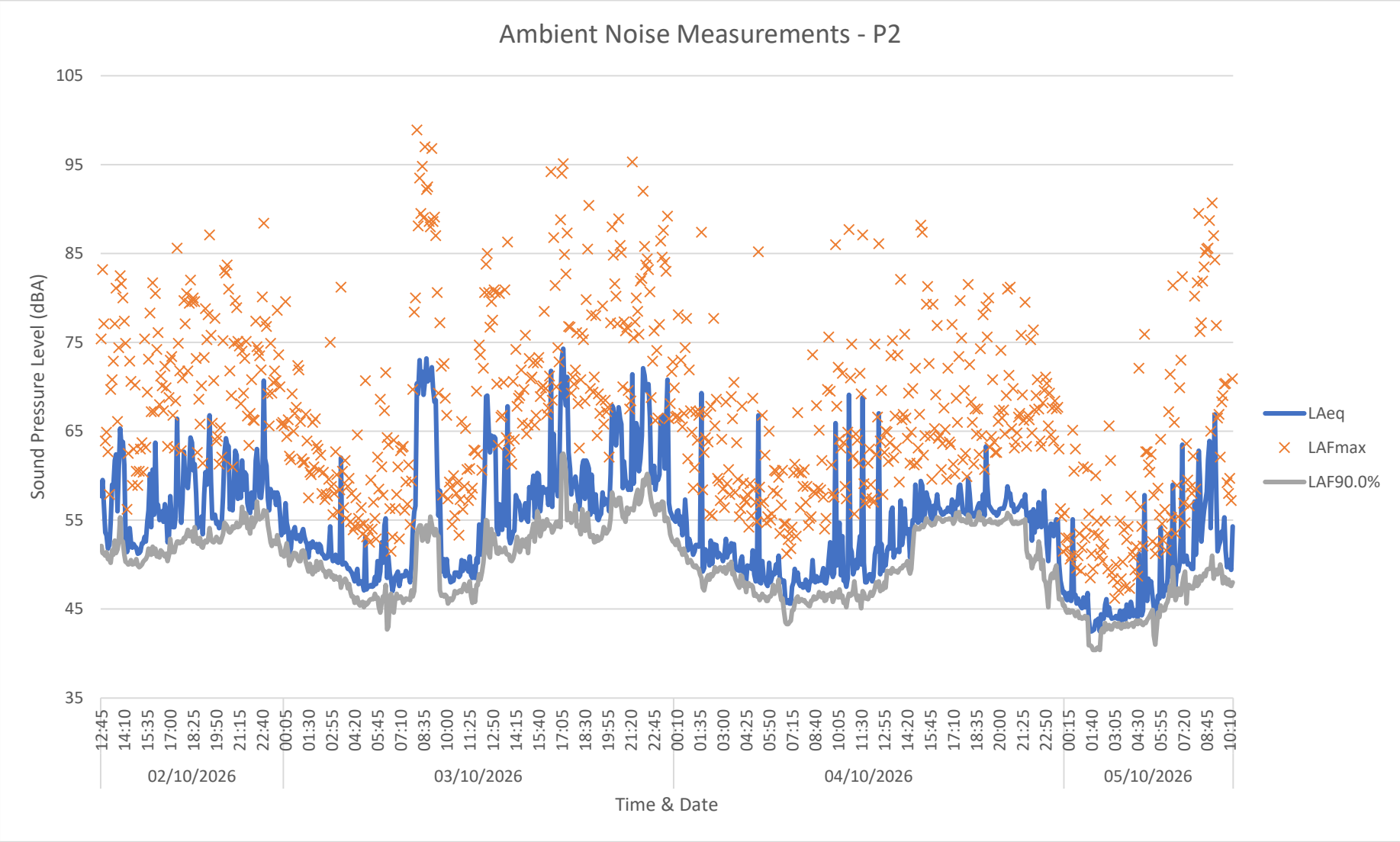
Noise egress from proposed development has been has calculated at the NSRs and compared against the existing ambient noise climate in accordance with the IEMA Guidelines for Environmental Noise Impact Assessment. Our assessment also considered the noise criteria contained within BS8233 and the WHO Guidelines for Community Noise, with consideration given to both the absolute noise levels and the character of the noise relative to the existing ambient noise climate.

The results of our assessment suggest that the noise impact associated with the proposed development will be low.

The National Planning Policy Framework (NPPF) requires that significant adverse impacts due to a new development should be avoided and other adverse impact should be mitigated and reduced to a minimum. Based on the results of our assessment it is concluded that noise emissions associated with the operations of the Proposed Development will not result in an adverse impact and will therefore comply with the requirements of the NPPF. Therefore, we see no reason why the proposed development should be refused on the grounds of noise.

APPENDIX I - NOISE SURVEY FULL RESULTS




Ambient Noise Measurements - P2
Sound Pressure Level (dBA)
105
95
85
75
65
55
45
35
12:45
14:10
15:35
17:00
18:25
19:50
21:15
22:40
00:05
01:30
02:55
04:20
05:45
07:10
08:35
10:00
11:25
12:50
14:15
15:40
17:05
18:30
19:55
21:20
22:45
00:10
01:35
03:00
04:25
05:50
07:15
08:40
10:05
11:30
12:55
14:20
15:45
17:10
18:35
20:00
21:25
22:50
00:15
01:40
03:05
04:30
05:55
07:20
08:45
10:10
02/10/2026
03/10/2026
04/10/2026
05/10/2026
Time & Date
LAeq
LAFmax
LAF90.0%

APPENDIX II – DEFINTION OF ACOUSTIC TERMS

The decibel

This is the basic unit of noise, denoted dB.

A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A) L_{eq} or 50 dB $L_{Aeq.}$ Both mean the same thing. (See below for a definition of L_{eq}). The dB(A) level can be regarded as the overall level perceived by human beings.

L_{eq} and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB L_{eq} or, for A-weighted figures dB(A) L_{eq} or dB L_{Aeq}. It can also be expressed in terms of frequency analysis (see later). $L_{eq(s)}$ is the sample L_{eq} level.

L_n

This is the level exceeded for n% of the time. It is denoted dB L_n or, for A-weighted figures dB(A) L_n or dB $L_{An.}$ It can be expressed in terms of frequency analysis (see later). L_{90} is the level exceeded for 90% of the time and is a measure of the lowest level typically reached. L_{10} is the level exceeded for 10% of the time and is the highest level typically reached. L_{50} is the level exceeded for 50% of the time and, mathematically, it is the median.

L_{max}

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB L_{max} or, for A-weighted figures dB(A) $L_{max,}$ dB $L_{Amax,}$ etc. It can also be expressed in terms of frequency analysis.

Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g. L_{eq}, L_{90}, L_{max} etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.