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A stylized graphic of a city skyline in shades of blue and purple. In the foreground, there is a grid of squares, some solid blue and some with horizontal lines, resembling a sound wave or a data visualization. The background shows various building silhouettes and trees, all reflected in a light blue horizontal band at the bottom.

Noise Impact Assessment

Client: Eatzaz Hassan

Site: Former Huntsman Inn, 130 Wilmslow Road, Manchester, M14 5AH

Reference No. NM0612219NR

Revision: 0.0

Date of Issue: 14/01/2022

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Executive Summary

A noise impact assessment has been undertaken at The Former Huntsman Inn, 130 Wilmslow Road, Manchester, M14 5AH, where it has been proposed to convert the premises as a change of use from a disused Public House to a Restaurant/Shisha Lounge. The client requested 4 potential scenarios be the subject of the assessment.

The property is to include open façades on the north and west facing elevations, which will allow smoke to escape the premises. This has the potential to cause adverse noise impacts on the quality of life and potential sleep deprivation on nearby residential receptors.

The nearest/most-affected residential properties will be considered within the assessment and are located on Wilmslow Road, Claremont Road and Whitecliff Close.

Environmental noise monitoring was undertaken at the site over a 4-day period from Thursday 16th December – Monday 20th December 2021. Noise surrounding the development was determined to be primarily from road traffic moving along Wilmslow Road, pedestrian noise along Claremont Road, plant noise and car park activity at the adjacent 'Manchester Superstore'. Night-life activity from premises on Wilmslow Road was also noted using event wave recording.

Representative noise data of human speech levels '*ANSI 3.5 1997 Human Voice Spectrum (Normalised to reflect multiple occupants)*' and previously recorded background music '*Peak Acoustics Ltd – 2016 using a PA system in an unoccupied bar/restaurant*' have been cumulatively summed to give an overall internal noise figure of 80 dBA, considered worst-case in correlation to the size of the proposed restaurant/shisha lounge.

An assessment of noise breakout was conducted using 4 no. scenarios. Scenario 4 concluded that the predicted breakout would fall below the lowest measured $L_{A90, 15min}$ background sound level at 1 meter from each receptor façade (NSR 1 – NSR 4). This corresponds to a None / Not Substantial impact upon all surrounding receptors and achievement of NOEL in the NPSE. Mitigation advice has been provided to ensure 'Scenario 4' can be met.

Building services details have not yet been selected for the premises, so a detailed assessment of proposals has not been possible. Instead, a limiting maximum cumulative plant noise level has been calculated which should be achieved at a distance of 1m from the nearest noise sensitive window.

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1. Introduction

1.1. Proposal Overview

A Noise Impact Assessment has been conducted at The Huntsman Inn, 130 Wilmslow Road, Manchester, M14 5AH to determine the resultant noise impact from the change of use to a Restaurant/Shisha Lounge under a new scheme of development based on 4 potential scenarios at the request of the client.

Information regarding the proposals has been provided by the client and is detailed below:

- Opening times:
 - 11:00 – 23:30 Sunday to Thursday
 - 11:00 – 00:30 Friday & Saturday
- Internal background noise from television sets around the premises and spoken customer noise to be considered as internal noise source. Low level background music is proposed within the restaurant area at first floor.
- Consideration of noise impact from customers returning to their cars in the rear car park.
- Noise from externally vented odour extraction system.

1.2. Reason For Assessment

A noise assessment of 4 scenarios has been requested by the client to determine the differing amount of noise impact caused by the site by comparison.

The assessment aims to provide, if required, mitigation recommendations for the development with a view to minimising impacts from commercial noise on pre-existing residents in close proximity.

The policy and criteria set out below relate to all sources of noise.

1.3. National Planning Policies

Guidance for the assessment of noise affecting new residential development is given in the National Policy Framework (NPPF). Section 109 of the NPPF states.

“The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of...noise pollution.”

Section 123 states the following aims:

- *"avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of a new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*

- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

The NPPF seeks to limit the exposure of new development to unacceptable levels of noise, although the policy does not seek to prescribe what constitutes an unacceptable level of noise.

To avoid and mitigate adverse noise effects on health arising from and impacting on new development, the NPPF makes reference to NPSE. The Noise Policy Statement for England (NPSE) was published in March 2010 and covers all forms of noise other than occupational noise.

The Noise Policy Statement for England (NPSE) states the following aims in paragraph 2.2.

NOEL – No Observed Effect Level.

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level.

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level.

This is the level above which significant adverse effects on health and quality of life occur.

The NPSE does not define the SOAEL numerically, stating in paragraph 2.22:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the "NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

There is no local or national guidance on how the three terms should be defined numerically, it is for the assessor to collate and interpret appropriate guidance on noise, such as may be found in British Standards, and correlate the guidance with the concepts of NOEL, LOAEL and SOAEL.

1.4. Local Planning Policies

Manchester City Council, Section 3.6.1.5.1 Noise and Vibration from Fixed Plant/Equipment
– 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 5 dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location.

1.5. IEMA Guidelines for Environmental Noise Impact Assessments

Noise emissions from the internal to external breakout will comprise almost exclusively of spoken voice and background music/television noise. While BS 8233:2014 establishes the upper limit for internal and external criteria, there is no specific formal methodology for undertaking an assessment of noise from voices potentially affecting nearby residential occupiers. A general principle that can be employed in situations of potential noise disturbance where there is no formal assessment methodology to consider is whether the new noise source will likely cause a significant increase over the current sound level, or a change of character compared to the existing noise climate.

This assessment method forms the basis of the Guidelines for Environmental Noise Impact Assessment, written by the Institute of Environmental Management and Assessment (IEMA) and Institute of Acoustics in 2002.

Having established the likely change in sound levels due to the new activity, an initial indication of the significance of the change can be determined from the table below.

Effect Description	Definition
None / Not Significant	Less than L_{Aeq} 2.9 dB change in sound levels and/or all receptors are of negligible sensitivity to noise.
Slight	A L_{Aeq} 3 dB to 4.9 dB change in sound level at a receptor of some sensitivity.
Moderate	A L_{Aeq} 3dB to 4.9dB change in sound level at a sensitive or highly sensitive receptor, or a greater than L_{Aeq} 5dB change in sound level at a receptor of some sensitivity.
Substantial	Greater than L_{Aeq} 5B change in sound level at a noise-sensitive receptor, or a L_{Aeq} 5dB to 9.9dB change in sound level at a receptor of high sensitivity to noise.
Severe	Greater than L_{Aeq} 10dB change in sound level at a receptor of high sensitivity to noise.

Table 1: Effect Descriptors for change in sound level

Note that defining the change of loudness to one decimal place is not a reflection of the accuracy of any assessment undertaken but rather to provide a clear threshold between adjacent effect descriptions.

Section 7 of the Guidelines advises that the change in sound level provides an initial estimate of the impact, which should then be examined considering the context of the development, the type of noise source, nature of the change, and other factors.

Paragraph 7.6 summarises that, *"In some situations, the conclusions about the degree of the impact will be clear and straightforward; but in others it is likely that, ultimately, a professional judgement will have to be made by the assessor. It must be remembered that the effects of noise are primarily subjective, and while it is desirable to include as much objectivity as possible into the assessment process in order to obtain consistency, there should be no concern in allowing professional judgement to come into the final analysis. However, the basis for the judgement made must be clearly set out so that it is clear how the conclusion has been reached."*

Once the initial estimate of the impact has been corrected to account for the context of the assessment, the magnitude of the impact and significance of the effects can be reviewed against Table 7-7 of the Guidelines, copied below.

Magnitude of Impact	Description of Effect
Negligible	No discernible effect on the receptor.
Slight	Receptor perception = non-intrusive Noise impact can be heard but does not cause any change in behaviour or attitude. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.
Moderate	Receptor perception = Intrusive Noise impact can be heard and causes small changes in behaviour and/or attitude. Potential for non-awakening sleep disturbance. Affects the character of the area such that there is a perceived change in the quality of life.
Substantial	Receptor perception = Disruptive Causes a material change in behaviour and/or attitude. Potential for sleep disturbance. Quality of life diminished due to change in character of the area.
Severe	Receptor perception = Physically harmful Significant changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects.

Table 2: Relationship between noise impact and noise effects

From this, achieving a magnitude of impact of “slight” corresponds to designing noise to below the LOAEL. Peak Acoustics therefore recommends that where an assessment indicates an impact of “negligible” or “slight” is fully acceptable in accordance with the NPPF, NPSE, and PPG-N. Where an assessment indicates a “moderate” impact then this would potentially have an adverse impact on nearby residents and would only be acceptable where it can be adequately mitigated and minimised.

1.6. British Standard BS 4142:2014 + A1:2019

BS4142 provides a method for rating and assessing sound of an industrial and/or commercial nature.

It uses the concept of a ‘Rating Level’, which is based on the ‘Specific’ sound from the existing commercial site, (measured in terms of L_{Aeq} at the defined assessment position), with corrections applied to account for any tonal or impulsive characteristics (as these can increase the likelihood of an adverse impact). The assessment level is obtained by comparing the Rating Level with the existing Background Sound Level (measured in terms of L_{A90} at the assessment position).

The Background Sound Level is established by measuring the sound when the industrial noise (the “Specific Noise”) is not present. This is called the Residual Sound. The Background Sound Level is then the sound pressure level that is exceeded for 90% of the time, denoted $L_{A90, T}$.

However, in a situation like this, the Background Sound Level can be difficult to robustly establish. In addition, the commercial noise of people conversing is not a new process, and so has been part of the sound character of the area for many years and could perhaps be argued to be an inherent part of the noise climate, as it used to be formally run as a Public House. Therefore, a 4-day measurement period was chosen over a weekday and weekend to minimise any uncertainty.

The Standard is clear the “lowest” assessment level should not necessarily be used, but a typical level should be quantified. For example, the Guidelines for Environmental Noise Impact Assessment, (IEMA 2014) recommends use of the mode average (the most commonly occurring sound level), or, if a weighting towards the worst case is preferred, the mean average minus one standard deviation.

The Specific Sound Level is a measurement of the sound level whilst the commercial/industrial activity occurs. This then is corrected to take account of the residual sound level (the level that would be measured if the industrial activity were not occurring), corrected to take account of acoustical characteristics (e.g., tone, impulse, or other distinguishing characteristic), to determine a Rating Level, for comparison to the Background Sound Level. For daytime activity, a 1-hour time period is used. At night, a 15-minute period is used, and the sound level is an average over that time period (denoted $L_{Aeq, T}$). The same time periods are to be used when considering the Background Sound Level.

The standard advises that, where the Rating Level exceeds the Background Sound Level by around +10 dB or more this is likely to indicate a significant adverse impact. A difference of around +5 dB is likely to be an indication of an adverse impact. 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 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 low impact.

In all cases, the Standard states that the assessment is dependent on the particular context in which the sound occurs. In particular, the following factors must be considered:

- The absolute level of sound;
- The character and level of the residual sound;

- The sensitivity of the receptor and whether the design will incorporate design measures that secure good internal and/or acoustic conditions, such as acoustic screening to block the path between noise source and receiver.

Whilst BS4142 talks about “impact”, the NPSE talks about “effect”. This is an important part of the context discussion, as a noise may have a significant impact for brief period of time, and because the impact is only brief, the overall “effect” is not significant, as it does not materially affect behaviour.

It is therefore important that any assessment of sound in accordance with BS4142 takes these additional factors into consideration, and IEMA, BS8233 and WHO can assist in such a process.

1.7. BS8233:2014

BS8233 provides guidance for the control of noise in and around buildings. It is applicable to the design of new buildings.

Where industrial noise affects residential areas, the methods for rating the noise in BS 4142 should be applied. This is discussed above in section 4.2.1.

For dwellings, the standard advises the main considerations are the acoustic effect on sleep in bedrooms, and the acoustic effect on resting, listening, and communicating in other rooms.

Guidance on the assessment and design criteria will be drawn from BS8233:2014 - *Guidance on sound insulation and noise reduction for buildings*. Table 4 in Section 7.7.2 of this standard suggests indoor ambient noise levels for dwellings. A summary of this criteria is given below.

Desirable internal noise levels are to be maintained as given in BS8233:2014:

- *<35dB $L_{Aeq, 16hr}$ within living areas during the day (07:00 – 23:00)*
- *<35dB $L_{Aeq, 16hr}$ within bedrooms during the day (07:00 – 23:00)*
- *<40dB $L_{Aeq, 16hr}$ within dining areas during the day (07:00 – 23:00)*
- *<30dB $L_{Aeq, 8hr}$ within bedrooms at night (23:00 – 07:00)*

The standard also advises that *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 LAFmax depending on the character and number of events per night. Sporadic noise events could require separate values.* It does not give guidance on what might constitute a guideline value.

Where development is considered necessary or desirable, the standard says that the internal target levels may be relaxed by up to 5 dB and reasonable conditions still achieved.

Additional guidance will be drawn from ‘ProPG: Planning & Noise’ which was published “*to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England.*”

1.8. World Health Organisation – Guidelines for community noise (WHO)

The WHO give guideline noise values for community noise in specific environments. The guideline levels of BS8233 (see section 1.5 above) reflect those set out in WHO.

The preface to *Guidelines for Community Noise* – World Health Organization, 1999 (WHO) states that community noise includes road, rail and air traffic, industries, construction, and public work, and the

neighbourhood. WHO does not make the distinction that the guideline noise values apply to steady noise only. The limits it recommends are defined as limits for “community noise” which it specifically defines as including industries.

WHO guideline values for community noise inside dwellings are $L_{Aeq,8hr}$ 30 dB for bedrooms at night, and $L_{Aeq,16hr}$ 35 dB for living rooms. Outside bedrooms at night, it suggests $L_{Aeq,8hr}$ 45 dB, which represents typically a 15 dB reduction that would be achieved between the external and internal noise level if a window was open.

Whilst BS8233 did not give guidance on noise levels in terms of maximum noise (short term noise level from a sporadic event), WHO suggests L_{AFmax} 45 dB should not be exceeded inside a bedroom (L_{AFmax} 60 dB outside) more than 10-15 times per night.

These guideline levels correspond to the lowest effect level for general populations. This would suggest that these guideline values represent the boundary between NOEL and LOAEL.

2. Summary of Criteria

The impact of noise breakout $L_{Aeq, T}$ to 1 meter outside the nearest/most-affected noise sensitive receptor shall not exceed the lowest measured background sound level $L_{A90, T}$ by more than 5 dB. Where there is indication of exceedance, mitigation will be provided.

Any externally mounted extract plant will consider the lowest 15-minute night-time period to account for operations running past 23:00.

- The assessment criterion for external plant will be designed to achieve the criteria set out in MCC local planning policies, detailed in Section 1.4.

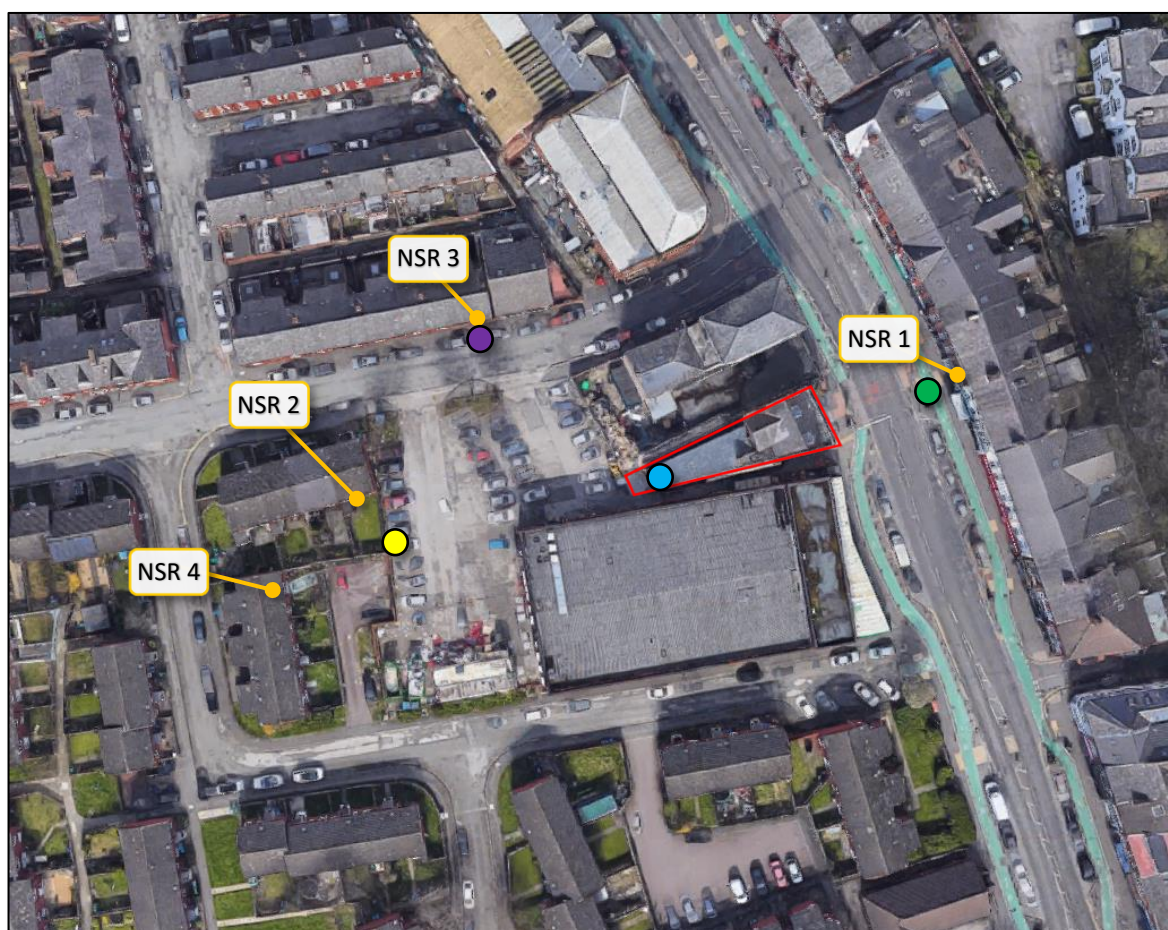
3. Site Description, NSR & Monitoring Locations

The building is in a predominately suburban area. The site has historically been a two-storey disused public house located along busy retail and restaurant focused high street, with retail business located either side of the site.

Typical common noise sources on site included cars, buses, motorbike, cyclists, and pedestrians conversing. To the rear observations of deliveries and patrons shopping with the nearby superstore were noted. Birdsong was noted as a secondary source.

The site, NSRs and noise monitoring location are shown in **Figure 1** below.

Figure 1: Site, Measurement and NSR Locations



-  Site Boundary (Approx.)
-  Background Sound Monitoring Location (M1)
-  Comparative Sound Monitoring Location (C1)
-  Comparative Sound Monitoring Location (C2)
-  Comparative Sound Monitoring Location (C3)
-  NSRs

4. Environmental Noise Survey

4.1. Survey Measurement

To assess the environmental noise levels affecting the proposed development, an unattended noise survey was undertaken at the site from Thursday 16th December – Monday 20th December 2021. This period was selected to capture events and noise levels from all surrounding sources using one main measurement position within site. A further 3 no. attended comparison measurements were conducted at each of NSR locations to gather representative noise levels at all identified receptors.

Measurements of $L_{Aeq,T}$, $L_{A90,T}$ and L_{AFmax} were logged in 5-minute intervals in accordance with the provisions of BS7445 - 'Description and Measurement of Environmental Noise'.

4.2. Measurement Locations & Noise affecting the Development

Monitoring position **M1** is located on the flat roof of the development. This position was chosen to gain an understanding of background levels near to the property. Primary noise sources such as pedestrians talking and occasionally shouting were noted. Plant noise associated with the adjacent superstore was also noted as perceptible above the residual noise climate. Secondary noise sources consisted of distant road traffic noise from Wilmslow Road, car doors in the rear car park associated with the adjacent superstore. This area of the building is pedestrianised with occasional vehicle access for deliveries.

Monitoring position **C1** is located on Claremont Road at ground floor level. Noise sources observed from this position was passing pedestrians and nearby residents. Slowly moving cars accessing Claremont Road. Faint extraction noise could be heard from nearby takeaways along Wilmslow Road.

Monitoring position **C2** is located at the rear of 'Manchester Superstore' car park. This position was chosen to best represent NSR 2 and NSR 4. Noise sources observed at this location was patrons leaving the superstore and packing cars with groceries, car door slams, patrons conversing and distant road traffic along Wilmslow Road and the surrounding access roads.

Monitoring position **C3** is located outside 211 Wilmslow Road. This position was chosen to best represent noise levels along Wilmslow Road for dwellings exposed to higher levels of road traffic noise. It was clear at this position; road traffic dominates the prevailing noise climate.

The monitoring location is shown in **Figure 1** in Section 3.

4.3. Weather Conditions

Daytime temperatures of between 2 – 8°C were noted during the survey with negligible winds; deemed appropriate for conducting environmental noise surveys.

Detailed weather conditions are given in **Appendix C**.

4.4. Measurement Equipment

Measurement equipment complies with accuracy requirements for common environmental noise measurement standards. Equipment was calibrated before and after use and no significant drift occurred during measurements. Up to date calibration certification can be provided upon request. A detailed equipment list is given in **Appendix B** with calibration information in **Appendix D**.

5. Environmental Noise Survey

5.1. Background Sound Levels

The results from the noise monitoring at positions M1, and C1 – C3 is summarised in **Tables 3 - 6** below.

The full-time history of all noise monitoring data is given in **Appendix E**.

Measurement	Date(s)	Time	Period	L _{Aeq} (dB)	L _{A90} (dB)
M1	16 th Dec 2021	11:10 – 23:00	Day (11.45hr)	58	53
	16 th – 17 th Dec 2021	23:00 – 07:00	Night (8hr)	55	45
	17 th Dec 2021	07:00 – 23:00	Daytime (16hr)	60	53
	17 th – 18 th Dec 2021	23:00 – 07:00	Night (8hr)	61	45
	18 th Dec 2021	07:00 – 23:00	Daytime (16hr)	60	51
	18 th – 19 th Dec 2021	23:00 – 07:00	Night (8hr)	63	46
	19 th Dec 2021	07:00 – 23:00	Daytime (16hr)	57	51
	19 th – 20 th Dec 2021	23:00 – 07:00	Night (8hr)	55	45
	20 th Dec 2021	07:00 – 10:40	Daytime (3.8hr)	57	50

Table 3: Noise Measurement Results

The noise levels shown above in **Table 3** are the L_{Aeq,16hr} & L_{Aeq,8hr} periods over the course of the unattended 4-day noise survey. As can be seen from the table above, recorded noise levels (L_{Aeq}) during the daytime (07:00 – 23:00) range from 57 dB to 60 dB, and noise levels during the night (23:00 – 07:00) range between 55 dB and 63 dB, with the higher levels of 61 dB and 63 dB coinciding with the busier periods of Friday and Saturday night. The recorded Background Sound Level (L_{A90}) during the daytime (07:00 – 23:00) ranges between 50 dB and 53 dB and the night (23:00 – 07:00) between 45 dB and 46 dB.

Data analysis, using wave event recording, identified that nearby music influenced Friday and Saturday night-time noise levels for both equivalent and background. To negate this influence, the noise levels for Friday and Saturday have been disregarded. The lowest background levels across the days, not impacted by nearby music, for both day (1-hour periods) and night-time (15-minute periods), have been documented in **Table 5**.

To aid in determining a difference in noise levels at the different receptors, comparative measurements were undertaken at ground level on Monday 20th December 2021. Data from measurement M1 will be utilised to directly compare with measurements C1 – C3. The exact same measurement intervals from measurement M1 and measurements C1 – C3 have been compared below.

Period	Measurement	L _{Aeq,T=5min} (dB)	L _{A90,T=5min} (dB)
10:00 – 10:05	M1.1	55.1	50.4
10:00 – 10:05	C1	59.7	45.7
Difference	M1.1 / C1	+4.6	-4.7

10:15 – 10:20	M1.2	55.9	50.7
10:15 – 10:20	C2	57.1	51.5
Difference	M1.2 / C2	+1.2	+0.8
10:25 – 10:30	M1.3	55.9	51.1
10:25 – 10:30	C3	67.8	56.6
Difference	M1.3 / C3	+11.9	+5.5

Table 4: Comparative Noise Measurement Results

As shown above, noise levels can differ between receptor locations. This can be due to the immediate noise source exposure in these locations. Measurement M1.1 & C1 show a $\sim +5$ dB in $L_{Aeq, T}$ in noise levels and a ~ -5 dB $L_{A90, T}$ in noise levels. Observations on site made it clear that the rise in equivalent noise levels was due to a small number passing cars along Claremont Road. As stated above there is an approximate -5 dB in the 90th percentile Background Sound Level recorded. This is due to the continuous noise exposure of nearby plant, traffic noise, and various other surrounding sources at position M1. These corrections will be applied to account for the noise level exposure at the differing NSR locations.

Position M1.2/C2 shows very minimal difference in noise levels. This is due to the similarity in noise sources exposed between the two locations, which both overlook the rear car park.

Position M1.3/C3 show a large increase in both the equivalent and background sound levels. Wilmslow Road is a very busy traffic network into Manchester City Centre and sees large volumes of a wide variety of vehicles. It is expected that the noise levels in these areas are much higher due to the shielding at the rear of the premises away from primary noise sources.

The following table shows the maximum, average and minimum $L_{Aeq, 1hr}$, $L_{A90, 1hr}$, $L_{Aeq, 15min}$ & $L_{A90, 15min}$ measurement intervals from position M1. Both Friday and Saturday have been disregarded due to an increased influence on noise levels.

Date(s)	Period	L_{Aeq} (dB)			L_{A90} (dB)		
		Max	Average	Min	Max	Average	Min
Thu 16 th Dec 2021	Daytime, 1-hour	60	58	56	56	54	52
16 th – 17 th Dec 2021	Night-time, 15-minutes	60	53	47	54	48	43
Sun 19 th Dec 2021	Daytime, 1-hour	59	56	52	55	52	46
19 th – 20 th Dec 2021	Night-time, 15-minutes	59	53	46	55	49	43
Mon 20 th Dec 2021	Daytime, 1-hour	58	56	55	51	50	50

Table 5: Daytime and Night-time Rolling Periods

Due to interference in noise levels during both Friday and Saturday evening, and into the night, The Maximum, Average, and Minimum values have been documented to minimise doubt over the background sound level. The noise interference was believed to be music playing nearby to the monitoring location, between approximately 21:00 – 02:00/03:00 both days. This is displayed in the survey graph provided in **Appendix E**.

In order to reduce uncertainty and provide a robust assessment, the chosen background level will consider an average of the lowest $L_{Aeq, 1hr}$, lowest $L_{A90, 1hr}$, lowest $L_{Aeq, 15min}$ and lowest $L_{A90, 15min}$ within the measured data. This ensures the assessment considers the worst-case impact upon surrounding receptors (NSRs 1 – 4).

The comparative correction factor between each location, as detailed in **Table 4**, has been applied to the lowest measured noise data to account of the differing areas of incident. The lowest night-time background sound level measured at position M1 will be considered throughout the assessment for each NSR location. This is to ensure noise activity at site is controlled and representative of a worst-case scenario of when L_{A90} levels are at their lowest. The impact against daytime noise levels has not been considered as it is expected the impact would be much less than during the night-time, due to typical diurnal patterns of activity.

The resultant external noise levels for each NSR location are summarised in the table below.

NSRs	Period	$L_{Aeq, T}$ (dB)	$L_{A90, 15-min}$ (dB)
1	Daytime (1hr)	66	55
	Night (15min)	59	48
2 & 4*	Daytime (1hr)	54	49
	Night (15min)	47	43
3	Daytime (1hr)	59	44
	Night (15min)	51	38

Table 6: Corrected Background Sound Levels for Assessment

**No correction has been applied due to the similarity in noise levels recorded at position M1.2/C2.*

The above table details the background sound levels to be utilised within the assessment.

NSR 1 target criterion – 48 dB L_{A90}

NSR 2 & 4 target criterion – 43 dB L_{A90}

NSR 3 target criterion – 38 dB L_{A90}

6. Predicted Noise Breakout Assessment

6.1. Introduction

A number of differing scenarios have been conducted to understand the type of mitigation required to ensure a low impact is achievable at all NSR locations, corresponding to a “slight” magnitude of impact in accordance with IEMA and achievement of “NOEL” in the NPSE.

The scenarios range between 1 – 5 and are detailed in **Sections 6.4 – 6.8**, below.

6.2. Sound Propagation Modelling

Sound propagation from the proposed social space has been calculated using industry standard acoustic modelling software ‘SoundPLAN’. This software uses ISO-9613-2 - *Attenuation of sound during propagation outdoors* and the model takes into account the following key factors:

- *Geometric divergence of sound*
- *Atmospheric absorption of sound*
- *Ground absorption*
- *A light downwind correction toward the NSRs*
- *Surrounding structures and objects which may reflect or block sound toward the NSRs*
- *The height of the NSRs (E.g., Ground Floor/First Floor)*

6.3. Source Noise Levels

The primary noise sources are likely to comprise of spoken voice from employees/customers, noise from television sets around the premises and potential background music at first floor level. Data for music spectra has been sourced from Peak Acoustics library data. Spoken voice data has been sourced from ‘ANSI 3.5-1997’ - *American National Standard – Methods for Calculation of the Speech Intelligibility Index (1997)*. Using these sources, a cumulative internal noise level for the expected maximum use has assumed a worst-case scenario at **80 dBA**. This level must not be exceeded to achieve compliance. The resulting noise spectra levels are tabulated below:

Source	63	125	250	500	1k	2k	4k	dBA
Bar/Restaurant (Music & Speech)	76	82	78	76	74	73	68	80

Table 7: Internal Noise Levels

*American Standard ANSI 3.5 1997 – *Human Voice Spectra (Independent of Sex) – Normalized*

*Peak Acoustics measurement of a PA System in operation in an unoccupied bar (August 2016); deemed to represent higher low frequency noise content for raised television sets.

6.4. Breakout Scenario 1 – All openings on northern and western elevations unglazed

Noise breakout has been considered with internal levels stated in Table 7. The calculated noise breakout is shown below, in **Table 8**.

NSR Location	Internal Noise Level, dB	Noise Breakout at NSR, dB L _{Aeq}
NSR 1	80	51
NSR 2		53
NSR 3		53
NSR 4		50

Table 8: Predicted Noise Breakout – Scenario 1

The predicted noise breakout level is calculated to be above the lowest background level at all NSR locations, indicating severe impact. This is summarised in **Table 9** below:

NSR Location	Noise Breakout at NSR, dB L _{Aeq, T}	Lowest Background Level, dB L _{A90, 15min}	Difference, dB
NSR 1	51	48	+3
NSR 2	53	43	+10
NSR 3	53	38	+15
NSR 4	50	43	+7

Table 9: Predicted Noise Breakout vs Lowest Background Sound Level

When comparing noise levels against the effect descriptors detailed in **Table 1**, the impact with all windows open is predicted to have severe impact upon surrounding receptors and the application could be refused on this basis. Therefore, a different scenario shall be considered.

6.5. Breakout Scenario 2 – All openings on north and west elevations unglazed & extended wall to rear

Noise breakout has been considered with internal levels stated in Table 7 and extension to the existing 5.6m brick wall. The calculated noise breakout is shown below, in **Table 10**.

NSR Location	Internal Noise Level, dB	Noise Breakout at NSR, dB L _{Aeq}
NSR 1	80	52
NSR 2		50
NSR 3		50
NSR 4		45

Table 10: Predicted Noise Breakout – Scenario 2

The predicted noise breakout level is calculated to be above the lowest background level at NSR 1 – 3 locations, indicating substantial Impact. This is summarised in **Table 11** below:

NSR Location	Noise Breakout at NSR, dB L _{Aeq, T}	Lowest Background Level, dB L _{A90} , 15min	Difference, dB
NSR 1	52	48	+4
NSR 2	50	43	+7
NSR 3	50	38	+12
NSR 4	45	43	+2

Table 11: Predicted Noise Breakout vs Lowest Background Sound Level

When comparing noise levels against the effect descriptors detailed in **Table 1**, the impact with all non-glazed openings is predicted to have substantial impact upon the worst affected receptors and the application could be refused on this basis. Therefore, a different scenario shall be considered.

6.6. Breakout Scenario 3 – First Floor Windows Closed & No Extension to Rear Wall

Noise breakout has been considered with internal levels stated in Table 7 and first floor windows to the premises closed. The calculated noise breakout is shown below, in **Table 12**.

NSR Location	Internal Noise Level, dB	Noise Breakout at NSR, dB L _{Aeq}
NSR 1	80	36
NSR 2		47
NSR 3		47
NSR 4		45

Table 12: Predicted Noise Breakout – Scenario 3

The predicted noise breakout level is calculated to be above the lowest background level at NSR 2 – 4 locations, indicating a slight to moderate impact. This is summarised in **Table 13** below:

NSR Location	Noise Breakout at NSR, dB L _{Aeq, T}	Lowest Background Level, dB L _{A90} , 15min	Difference, dB
NSR 1	36	48	-12
NSR 2	47	43	+4
NSR 3	47	38	+9
NSR 4	45	43	+2

Table 13: Predicted Noise Breakout vs Lowest Background Sound Level

When comparing noise levels against the effect descriptors detailed in **Table 1**, the impact all windows closed on the first floor is predicted to have slight impact upon the worst affected receptors and the application could be refused on this basis given the context of noise source being introduced. Therefore, a different scenario shall be considered.

6.7. Breakout Scenario 4 – First Floor Windows Closed & Extension to Rear Wall

Noise breakout has been considered with internal levels stated in Table 7 with first floor windows closed and extension to the rear wall. The calculated noise breakout is shown below, in **Table 14**.

NSR Location	Internal Noise Level, dB	Noise Breakout at NSR, dB L_{Aeq}
NSR 1	80	36
NSR 2		36
NSR 3		41
NSR 4		34

Table 14: Predicted Noise Breakout – Scenario 4

The predicted noise breakout level is calculated to be below the lowest background level at all NSR locations, indicating a None / Not Significant impact. This is summarised in **Table 15** below:

NSR Location	Noise Breakout at NSR, dB $L_{Aeq, T}$	Lowest Background Level, dB $L_{A90, 15min}$	Difference, dB
NSR 1	36	48	-12.2
NSR 2	36	43	-6.7
NSR 3	41	38	+2.6
NSR 4	34	43	-9.1

Table 15: Predicted Noise Breakout vs Lowest Background Sound Level

When comparing noise levels against the effect descriptors detailed in **Table 1**, the impact with all windows closed on the first floor and an extension to the purpose build brick wall at the rear is predicted to have None / Not Significant impact on all NSR receptors in accordance with IEMA guidelines, corresponding to NOEL in the NPSE.

Section 6.8 details the location of boundary mitigation. Noise propagation maps are provided in **Appendix F**.

6.8. Mitigation – Increase Length of Purpose-Built Wall

An image highlighting the area of mitigation is provided below in **Figure 2**.

Figure 2: Mitigation Location



Mitigation – Additional 5.6m brick wall

7. Car Park – Noise Impact Assessment

The area surrounding the rear of the building is a car park which serves the adjacent 'Manchester Supermarket'. The car park during the day has periods of business with cars arriving / departing every 2 – 5 minutes during the consultant's attendance on site. Delivery noise was also noted from analysis of noise data. During the night-time, activity from the car park lessens when the superstore closes. However, the use at the former Public House would have seen patrons utilise the car park when arriving/departing.

Claremont Road is also frequently accessed by vehicles as it is a direct network to Princess Road, a main road in and out of Manchester City Centre.

There are approximately 30 spaces. Therefore, an assessment of 60 no. of events (entering/leaving) the parking spaces within a 1-hour period is provided below. As cars are expected to leave throughout any hour of the day, it can be considered that the assessment accounts for a worst-case and the unlikely scenario.

Noise data from a parking event has previously been measured by Peak Acoustics whereby a car approached, parked, opened doors, closed doors and drove away was recorded at a level of 76 L_{AE} dB. Corrections for 'on-time' have been made to account for the scenario of 30 vehicles (60 events) within 1-hour. The on-time correction is therefore $+10\log (No. Events / T_{ref})$, where T_{ref} is 3600s; as

representative of a 1-hour period, and No. events is 60. Distance correction and loss through an open window have then been applied for the chosen (closest/most exposed) receptor location, NSR 2, relevant for the assessment. The full calculation is given in **Appendix H**.

The assessment outcome, with reference to the criteria given in WHO guidelines and BS8233:2014, are summarised below.

WHO/BS8233 Assessment Criteria			
Location	Noise Levels Receiver, dB $L_{Aeq,T}$	WHO/BS8233 Assessment Criteria, dB $L_{Aeq,T}$	Difference, dB
NSR Façade	45	50	- 5
Internal Noise Levels	30	30 at night – 35 in day	0 /- 5

Table 4: WHO/BS8233 Criteria – Noise Impact

Table 3 demonstrates that noise levels at both external and internal assessment locations considered are within the criteria of WHO/BS8233 guidelines. The noise impact of the proposed access way for the development is considered to be minimal for nearby existing and new noise sensitive properties.

It is important to note that the assessment considers an unlikely worst-case scenario of the maximum number of spaces exposed to the units, accessing the site within a 1-hour period.

8. Building Services: Limiting Noise Levels

Building services plant is yet to be selected. So, a detailed assessment of proposals is not currently possible. Instead, a limiting cumulative plant noise level has been calculated which should be achieved at a distance of 1m from the nearest noise sensitive window in accordance with the relevant criterion specified in Manchester City Council Planning, 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 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

Period	Lowest $L_{A90,T}$ (dB)	Limiting Cumulative Plant Noise Level at boundary of nearest noise sensitive premises
Day (0700-2300)	49 dB ($T=1$ -hour)	44 dB
Night (2300-0700)	43 dB ($T=15$ -min)	38 dB

Table 16: Limiting Plant Noise Levels

9. Conclusions

A noise assessment has been undertaken at The Former Huntsman Inn, 130 Wilmslow Road, Manchester, M14 5AH, where it has been proposed to convert the premises as a change of use from the former disused Public House and the 2018 planning approved restaurant to a Restaurant/Shisha Lounge.

The nearest/most-affected residential properties will be considered within the assessment and are located on Wilmslow Road, Claremont Road and Whitecliff Close.

Environmental noise monitoring was undertaken at the site over a 4-day period from Thursday 16th December – Monday 20th December 2021. Noise affecting the development was determined to be primarily from road traffic noise along Wilmslow Road, pedestrian noise along Claremont Road and plant noise and car park activity at the adjacent 'Manchester Superstore'. Night-life activity along Wilmslow Road was also noted using event wave recording.

Representative noise data of human speech levels '*ANSI 3.5 1997 Human Voice Spectrum (Normalised to reflect multiple occupants)*' and previously recorded background music '*Peak Acoustics Ltd – 2016 using a PA system in an unoccupied bar/restaurant*' have been cumulatively summed to give an overall internal noise figure of 80 dBA, considered worst-case in correlation to the size of the proposed restaurant.

Scenario 4 concluded that the predicted breakout would fall below the lowest measured $L_{A90, 15min}$ background sound level at 1 meter from each receptor façade (NSR 1 – NSR 4). This corresponds to a None / Not Substantial impact upon all surrounding receptors and achievement of NOEL in the NPSE. Mitigation has been provided to ensure 'Scenario 4' can be met.

Building services are yet to be selected for the premises so a detailed assessment of proposals is not currently possible. Instead, a limiting cumulative plant noise level has been calculated which should be achieved at a distance of 1m from the nearest noise sensitive window.

APPENDIX A – Measurement Details

Measurement(s)	Kit	Start Date	Start Time	End Date	End Time
M1	A1	16/12/2021	11:40	20/12/2021	10:40
C1	STK5	20/12/2021	10:00	20/12/2021	10:05
C2	STK5	20/12/2021	10:15	20/12/2021	10:20
C3	STK5	20/12/2021	10:25	20/12/2021	10:30

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A4	Sound Meter	Svantek	971	1	60688
A4	Pre-Amp	Svantek	SV18	1	62781
A4	Microphone	ACO	7052E	1	66703
STK 5	Sound Meter	Svantek	977A	1	69273
STK 5	Pre-Amp	Svantek	SV12L	1	71601
STK 5	Microphone	ACO	7052E	1	68217
Cal	Calibrator	Svantek	SV33A	1	90273

APPENDIX C - Meteorology Details

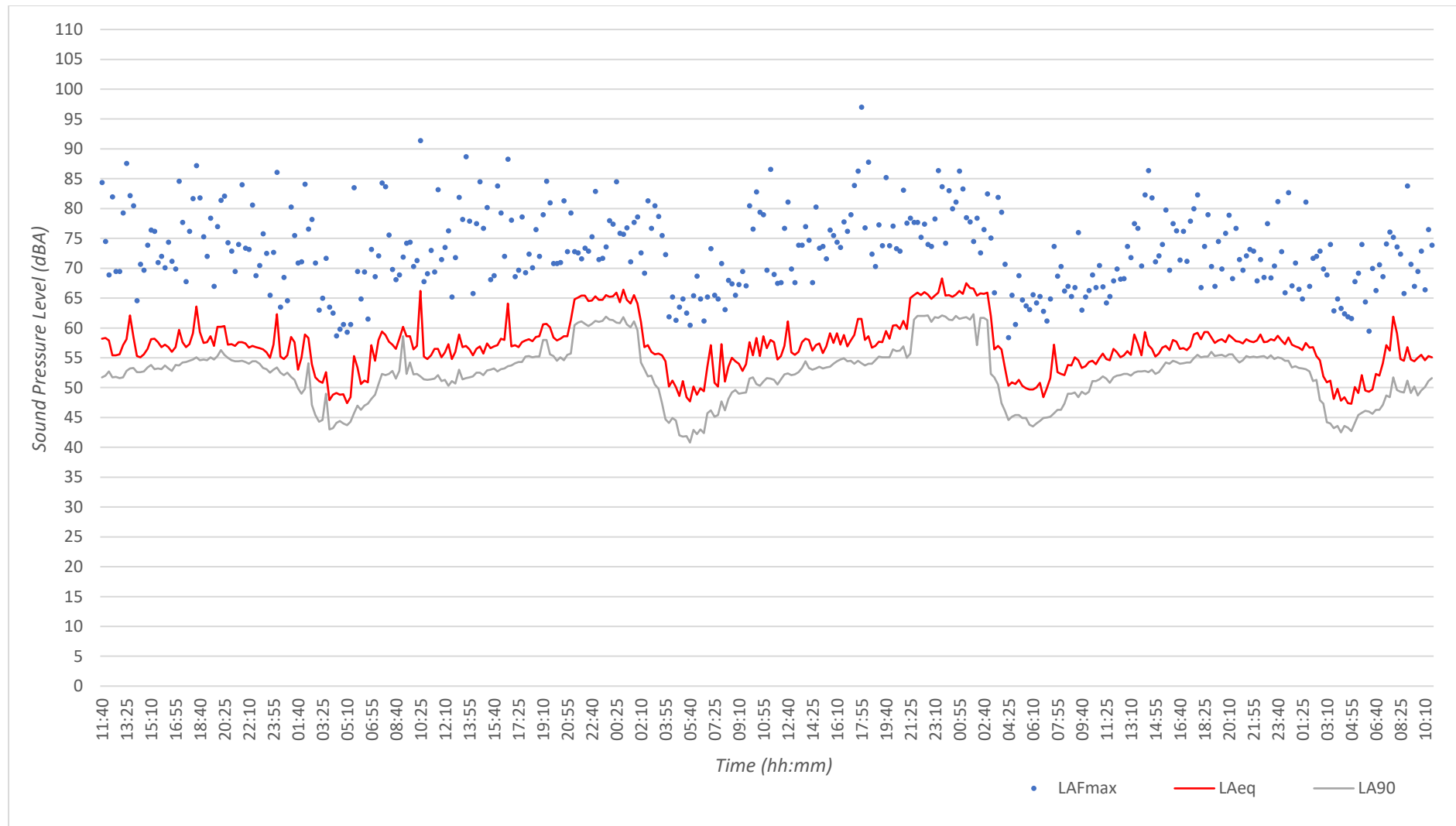
Date	Temp C°	Wind Speed m/s	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
16/12/2021	8	1.3	SSE	93	0	7/8
17/12/2021	6	0.4	ESE	81	0	4/8
18/12/2021	6	0.9	NE	87	0	5/8
19/12/2021	4	0.9	SW	100	0	8/8
20/12/2021	5	1.3	E	93	0	6/8

APPENDIX D - Calibration Details

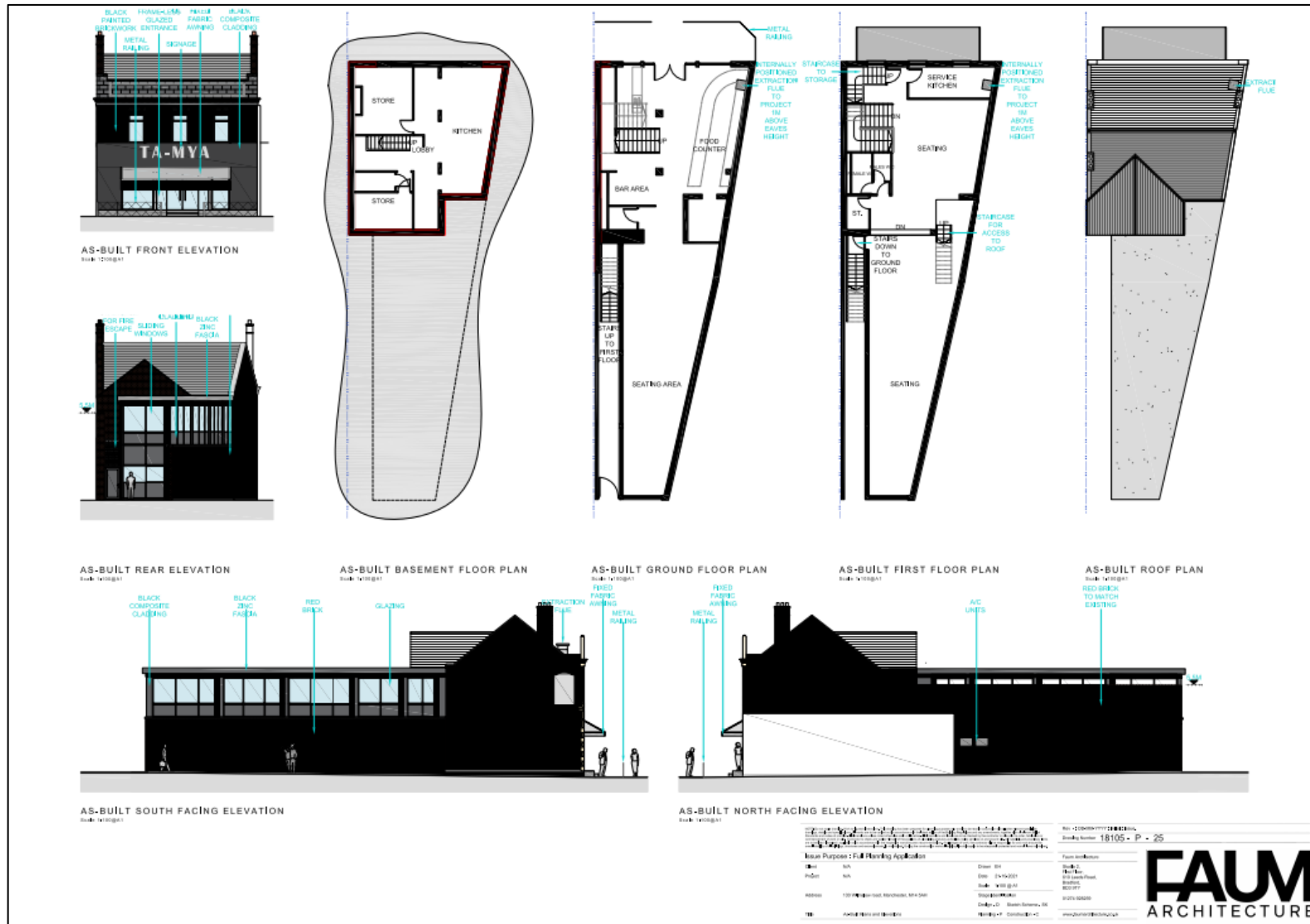
Measurement	Kit	Calibrator Ref Level (dB)	Deviation Before (dB)	Deviation After (dB)
M1	A4	113.9	-1.18	0.83
C1 – C3	STK5	113.8	0.36	0.74

APPENDIX E – Noise Survey Time History

Environmental Noise Measurement M1 Time History: 16th – 20th December 2021

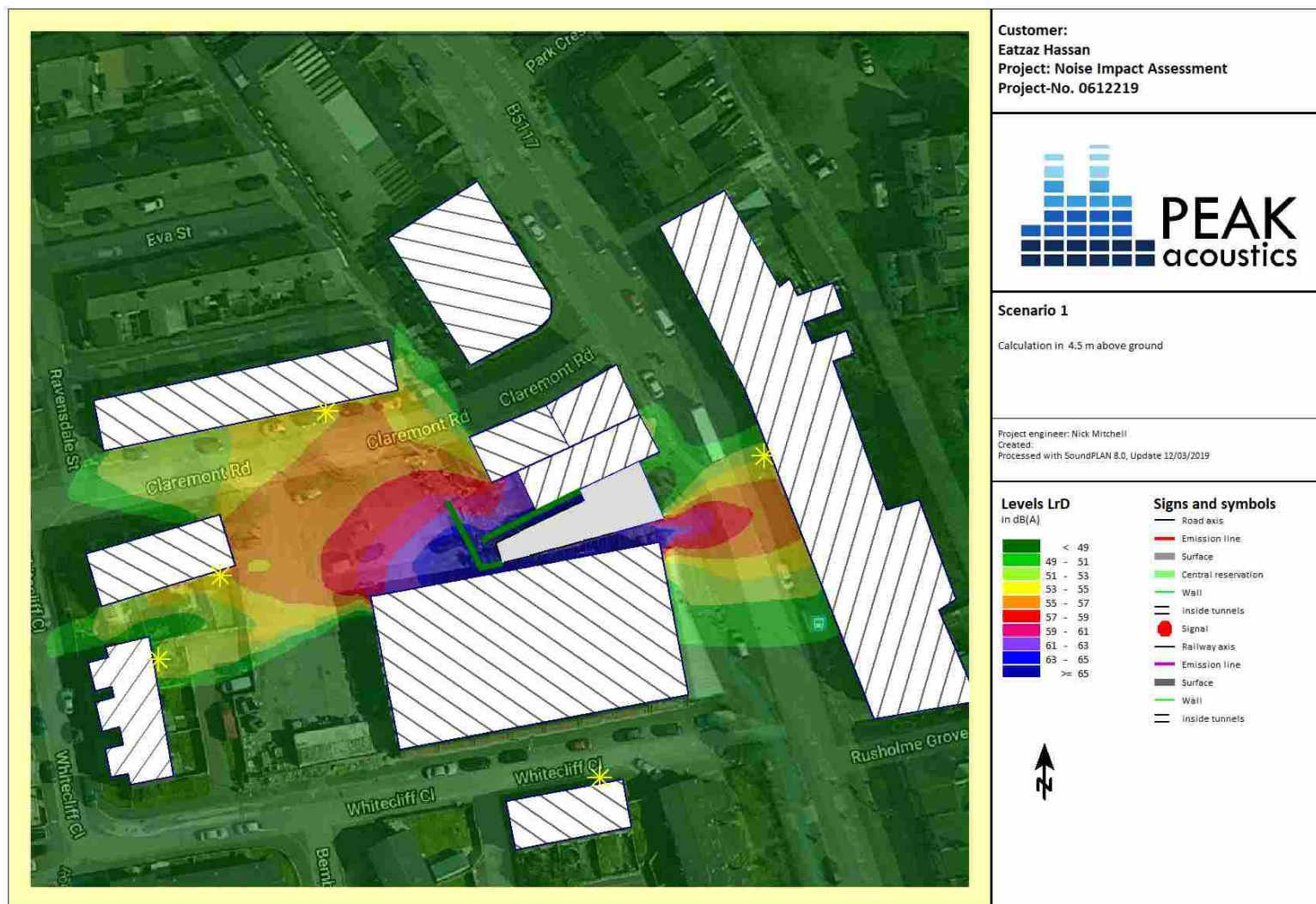


APPENDIX F – Site Plans



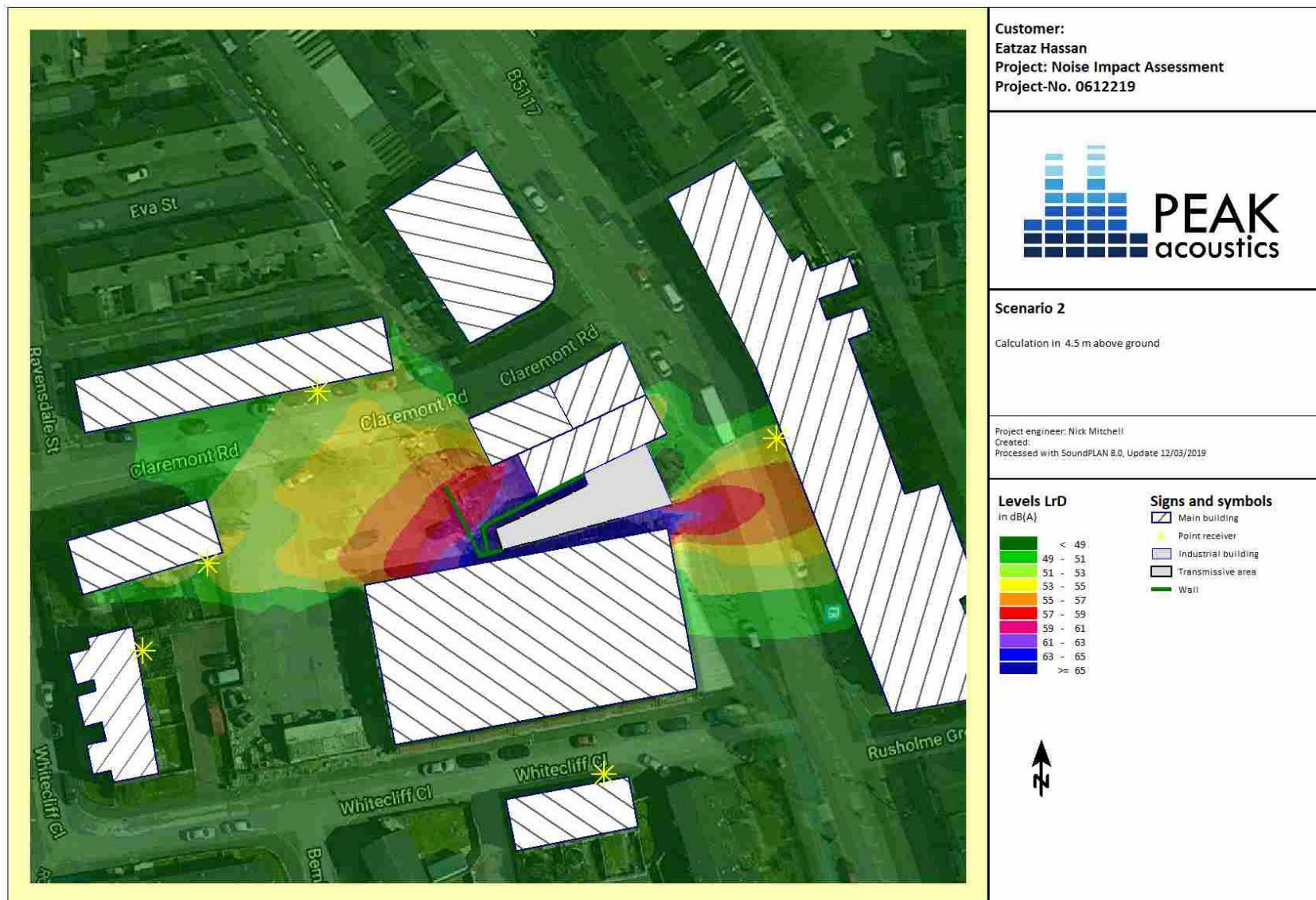
APPENDIX G – Noise Propagation Maps & 3-D Model

Scenario 1



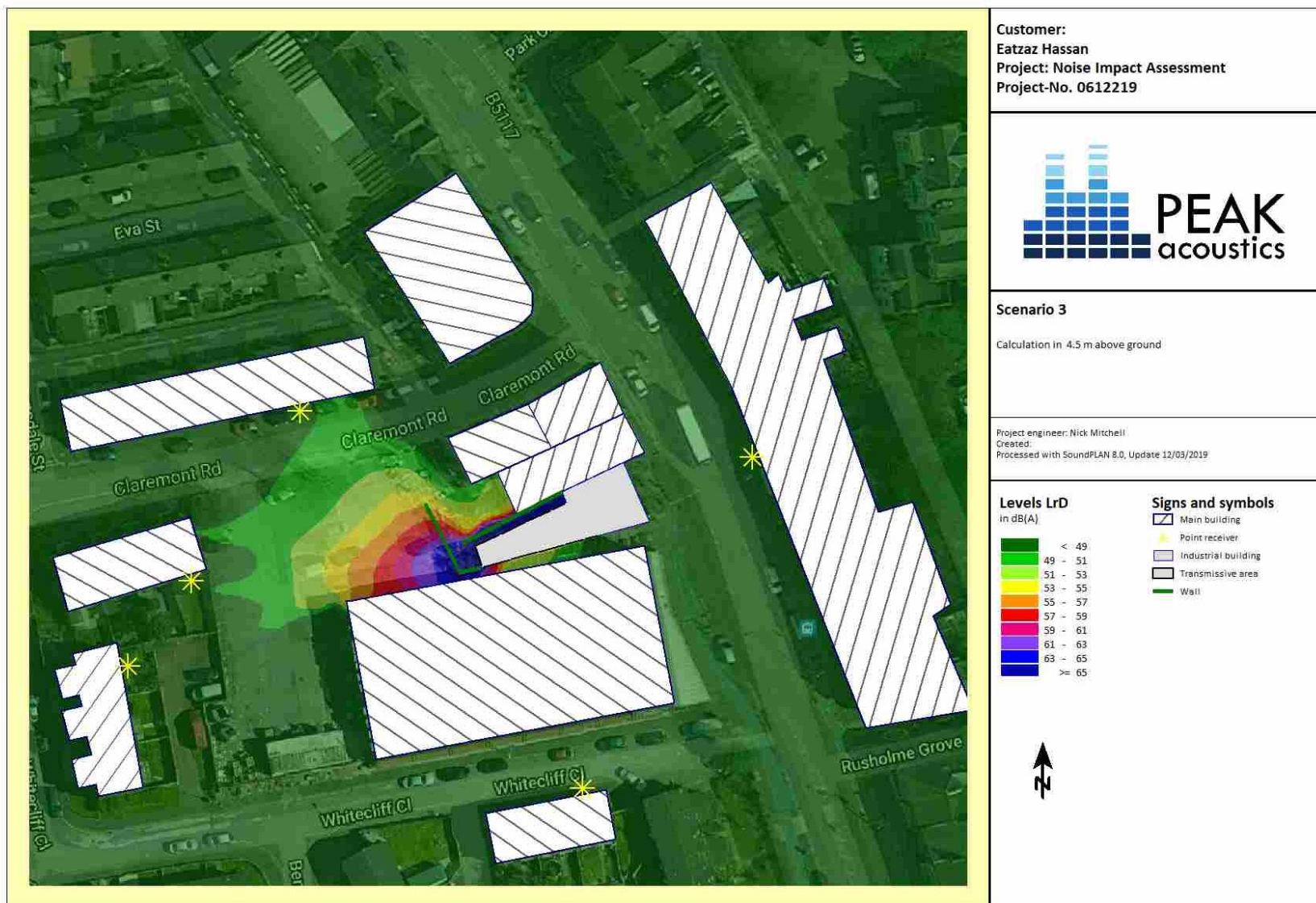
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Scenario 2



C:\Users\Nick Mitchell\Dropbox (Peak Acoustics)\1. TF - Jobs 2021\2. Jobs\0612219 - Eatraz Hassan\SoundPlan\NM0612219NR\Sheet1.sgs

Scenario 3



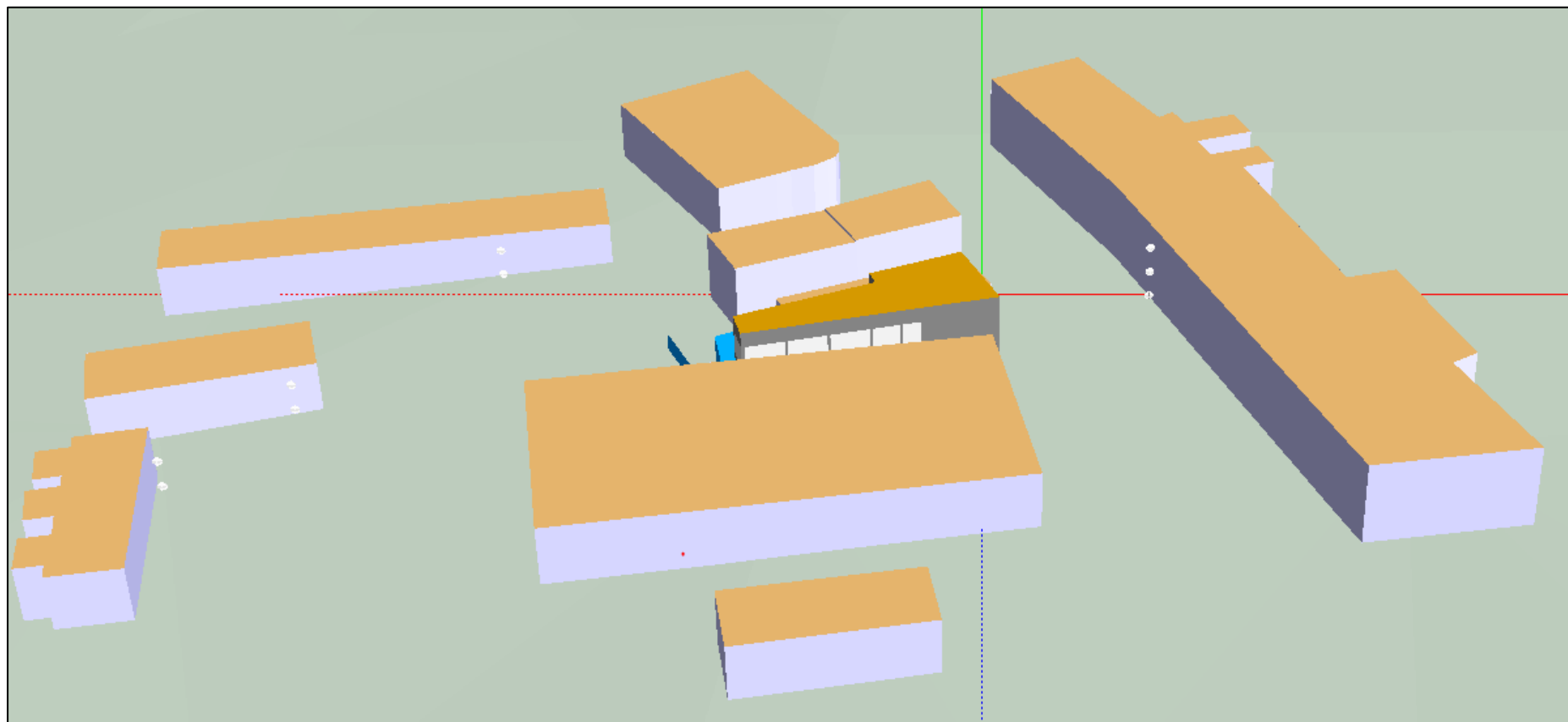
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Scenario 4

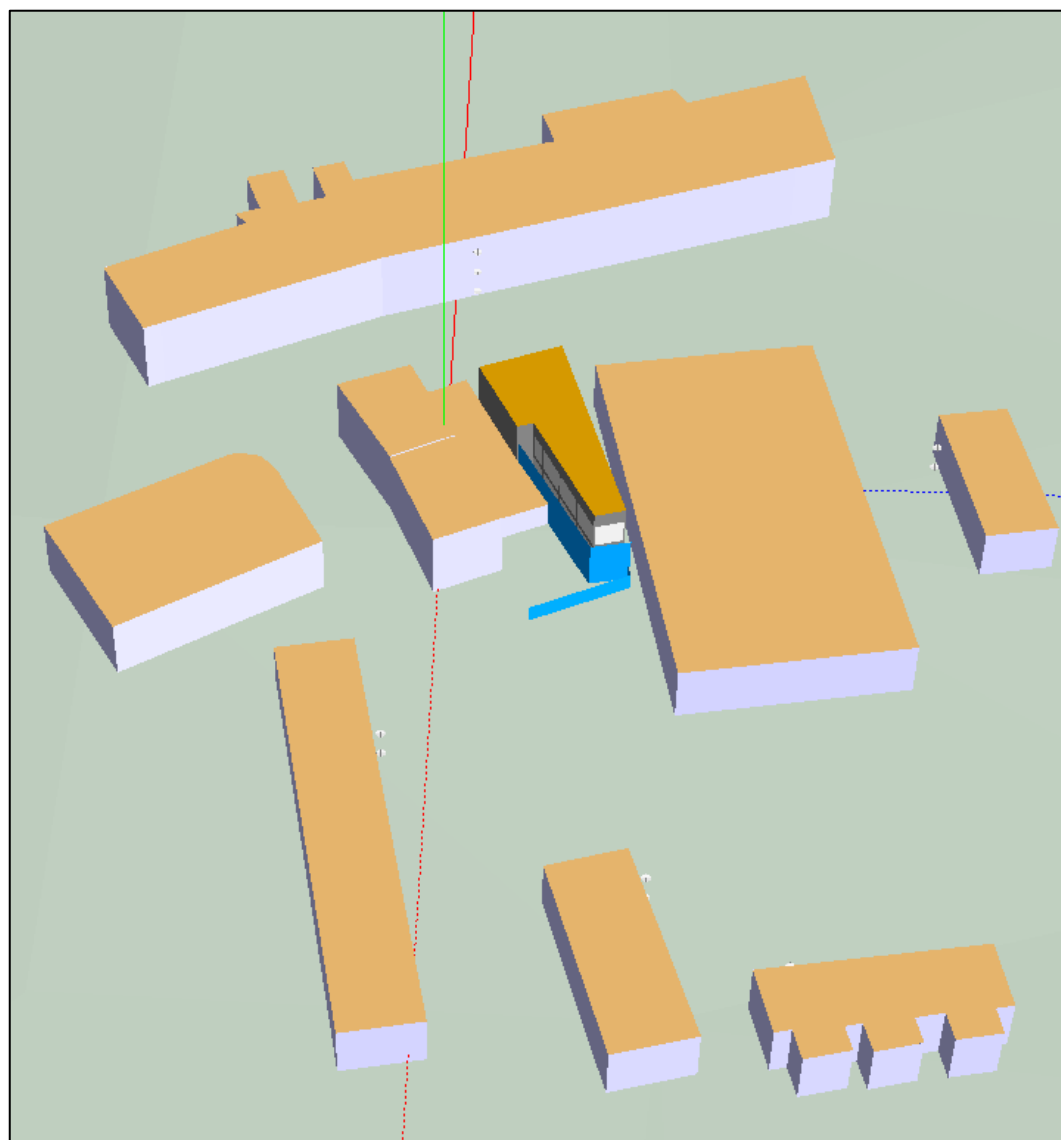


3-D Models

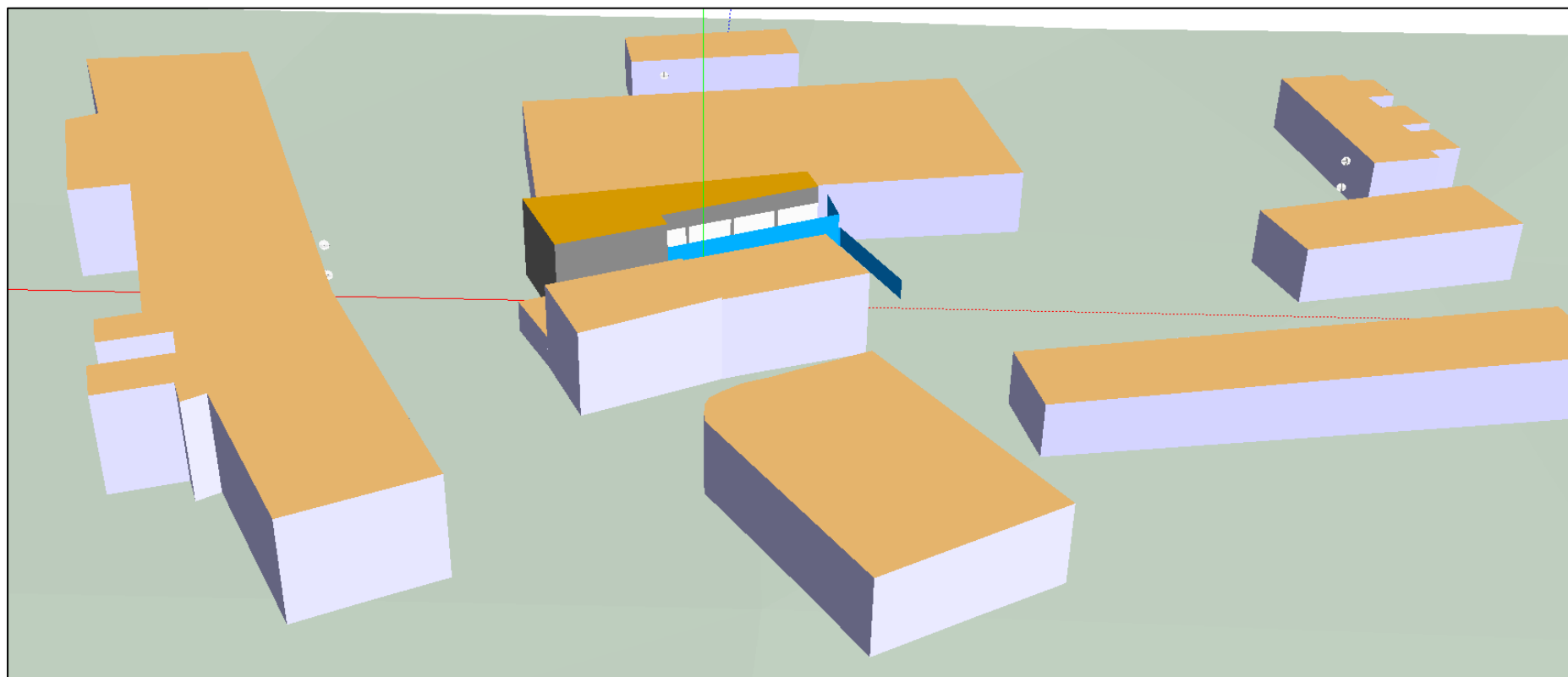
North Facing



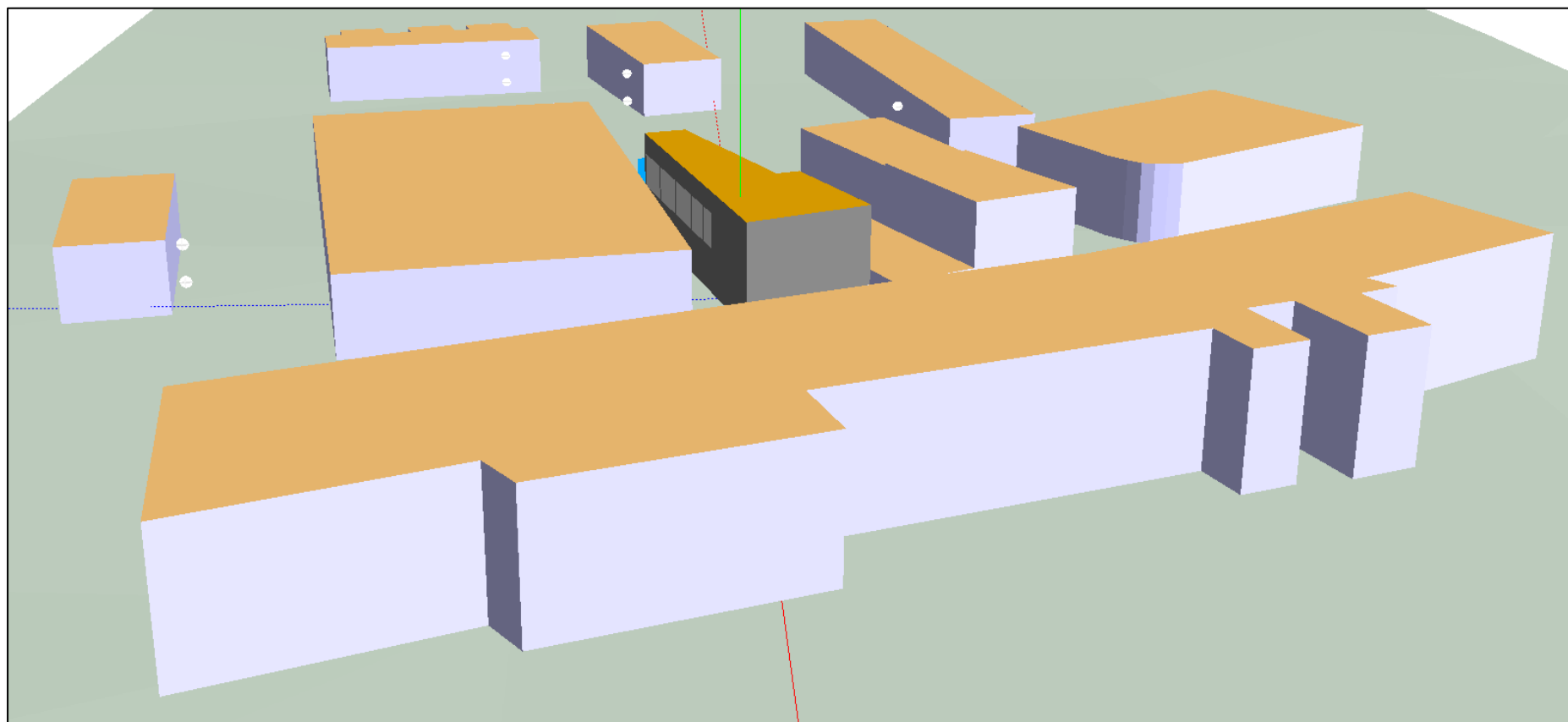
East Facing



South Facing



West Facing



APPENDIX H – Car park impact calculation

Parking Cars Calculation									
Scenario			No. Event N	T,ref (s)					
60 parking cars within 1-hour			60	3600					
	63	125	250	500	1k	2k	4k	8k	dBA (LAe)
Single Parking Car Event Level	87	79	73	72	73	68	62	57	76
Calculation to Receiver Locations									
	63	125	250	500	1k	2k	4k	8k	dBA
On Time/Event Corrected	69	62	55	54	55	50	44	39	59
Distance Correction (5m to nearest car parking spot, NSR 2)	-14	-14	-14	-14	-14	-14	-14	-14	
Level at Receiver Façades	55	48	41	40	41	36	30	26	45
Open Window	-15	-15	-15	-15	-15	-15	-15	-15	
Internal Noise Levels	40	33	26	25	26	21	15	11	30

APPENDIX I – Acoustic Terminology

To aid the understanding of acoustic terminology and the relative difference between noise levels the following background information is provided.

We perceive sound when the ear detects fluctuations in air pressure (sound waves), which are then processed by the brain and perceived as sound. Humans can hear an incredibly wide range of sound intensities ranging from jet engines to fingertips lightly brushing against each other. This range is quantified using a logarithmic scale called the decibel scale (dB). The comfortable range of the decibel scale typically ranges from 0dB (the threshold of hearing) to around 140dB. Here are some examples common environments and their typical noise levels.

Noise Level	Environment
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 moving car
60 to 70 dB(A)	Typical high street
100 to 110 dB(A)	Fire alarm at 1 metre away
140 dB(A)	Threshold of pain

Terminology

dB (decibel) – A unit used to quantify the pressure level of sound. Defined as 20 times the logarithm of the ratio between the root-mean-square pressure of a given sound field and a reference pressure level (2×10^{-5} Pa – threshold of hearing).

$L_{Aeq, T}$ – The equivalent continuous sound pressure level over a stated period. It quantifies a fluctuating sound level over a given period as the equivalent continuous sound level in which the same amount of acoustic energy is contained over. This is A-weighted in order to assess human perception.

L_{Amax} – the maximum RMS A-weighted sound pressure level occurring within a specified time period; the time weighting is typically either Fast or Slow.

A-Weighting – A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

R_w – The Weighted Sound Reduction Index (R_w) is a number used to rate the effectiveness of a soundproofing system or material.

$D_{n,e,w}$ – The Weighted Sound Reduction Index specifically for ventilators.

C_{tr} – C_{tr} is a spectrum adaptation term which method is defined in BS EN ISO 717. The standard uses a reference curve to determine the weighted value of airborne sound insulation. The spectrum adaptation terms C and C_{tr} may be used to take into account different source spectra. ' C_{tr} ' is the A-weighted urban traffic noise spectrum.



Let us introduce ourselves

Peak Acoustics formed in 2011, we are a fully accredited specialist consultancy and testing organisation.

We are a diverse team of Acoustic Consultants, Specialist Engineers and Building Compliance Technicians, with a network spanning the UK. We are proud to offer our services nationally, with no job too big or small.

We provide Acoustic Consultancy, Building Compliance Testing and Energy Services.

Additional Services

We offer an extensive range of services in the sectors of Acoustic Consultancy, Building Compliance & Energy Efficiency. We are able to put together custom packages combining multiple services which saves both time and money for you.

Building Compliance

- Sound Insulation Testing
- Air Tightness Testing
- Ventilation Testing
- Water Efficiency Calculations
- Sound Insulation Specification

Energy Efficiency

- SAP Calculations
- EPC's
- SBEM Calculations
- Energy Statements
- Sustainability Statements
- MEES Regulations
- Commercial EPC's

Acoustic Consultancy

- Noise Assessment for planning conditions
- Construction site noise monitoring
- Noise at work assessments
- Noise & Vibration Impact Assessments

Peace of mind

We are accredited and registered by all the relevant major UK authorities to provide the services we offer. Peak Acoustics is UKAS accredited for sound insulation testing, ATTMA registered for Air Leakage Testing. and our Energy team are all Domestic On-Completion Energy Assessors.

Our Added Value

We combine our detailed knowledge of building regulations with our technical understanding of building physics, acoustics and environmental sciences to maximise development quality. Our work ensures appropriate strategies and studies are prepared to demonstrate to local authorities how proposed developments will be of high quality and generate acceptable impact on the surrounding environment.

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