

Corsham House Hotel

**Noise Impact
Assessment**

Revision 02

10th October 2025

Max Fordham LLP
Beacon Tower
Colston Street
Bristol
BS1 4XE

T 0117 329 0874

maxfordham.com

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Registered in England and Wales
Number OC300026.

Registered office:
42–43 Gloucester Crescent
London NW1 7PE

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ISSUE HISTORY		
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1.0 INTRODUCTION

This report, prepared by Max Fordham LLP (MFLLP) Acoustics Team, provides an updated Noise Impact Assessment supporting the planning submission for the proposed conversion of the former bank at 13 High St. Corsham, into the Corsham House Hotel, comprising of 11no. ensuite bedrooms, lounges, and office and ancillary accommodation.

This updated report reflects the changes to the plant strategy that have developed during RIBA Stage 4. It is intended to supersede all previous iterations of the Noise Impact Assessment (issued on 31st October 2023 and 25th February 2025) and the associated Supplement (issued on 14th March 2024).

As well as the refurbishment of the Grade II listed building, the development will also include the building of new plant rooms, a small commercial kitchen, and outdoor social areas. This Noise Impact Assessment aims to assess any potential noise impact from introduced items of plant and operational activities as a result of the development.

Max Fordham LLP Acoustics Team is a corporate member of the Association of Noise Consultants (ANC). A glossary of the common acoustics terms used in this report is given in Appendix A, for reference.

1.1 Summary of Changes since Initial Submission

This update captures the following changes to the plant strategy:

- The Air Source Heat Pumps have been relocated from the roof of the kitchen to an acoustically attenuated enclosure at ground level in the rear car park.
- The arrangement of the kitchen ventilation plant has been repositioned to allow for a greater degree of in-duct attenuation.
- A mitigation strategy has been developed for breakout noise from the intake and exhaust fans.

Additionally, the information from the Supplement to the Noise Impact Assessment (issued on 14th March 2024) has been incorporated into the Activity Noise section of this document.

1.2 Site Overview

The site of the proposed development is a former bank at 13 High St. in Corsham, including its rear car park. It is bounded by a pedestrianised section of Corsham High Street to the east, and the pedestrianised Martingate to the south. The nearest road is Post Office Lane, to the north, which the site is well shielded from. To the west of the site is an access/delivery road, a supermarket (with notable items of associated plant), and Newlands Road.

The nearest noise-sensitive receptors (NSRs) are two residential properties immediately to the north and south of the proposed development. Both of these residences are at 1st floor level. They have been indicated in Figure 1 as NSR 1 and NSR 2, along with the proposed plant, outdoor dining areas, and the shape of the proposed site.

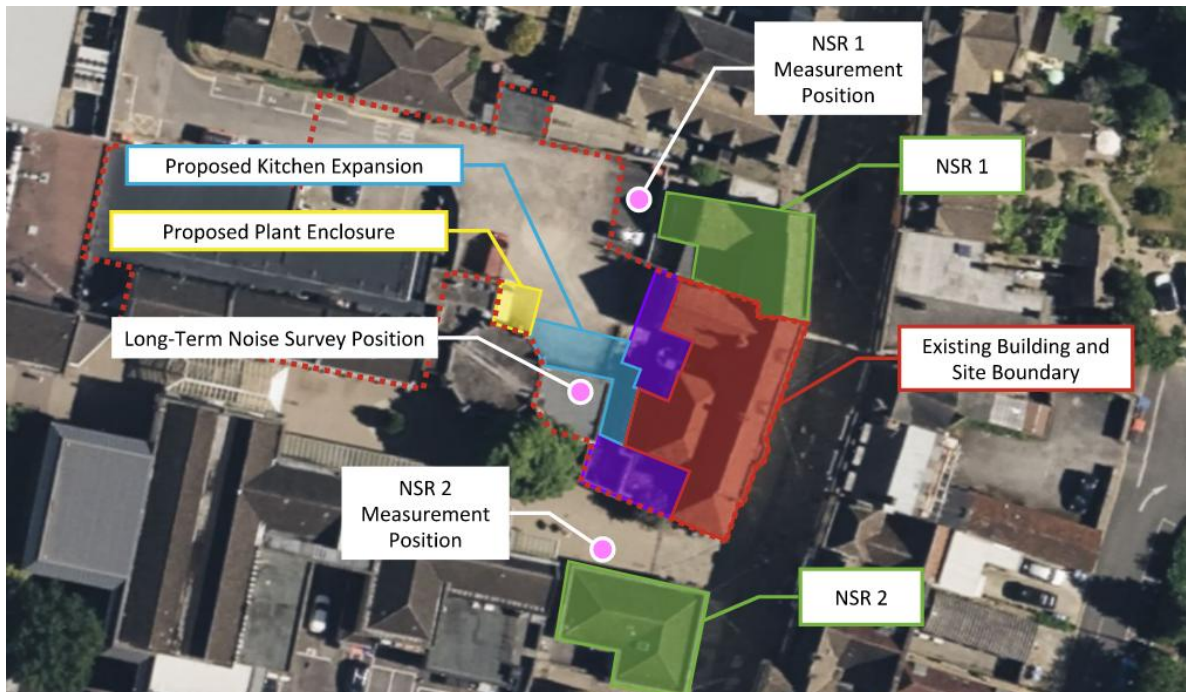


Figure 1: Overview of the site, NSR locations, and other relevant items for the Noise Assessment.

2.0 RELEVANT POLICY AND GUIDANCE

2.1 National Planning Policy and Guidance

National Planning Policy Framework

The NPPF (last update, September 2023) states that planning policies and decisions should contribute to and enhance the natural and local environment by *“preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability”*.

It gives guidance to be followed in planning decisions, which is summarised as followed:

- mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development and avoid noise giving rise to significant adverse impacts on health and the quality of life
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason
- be integrated effectively with existing businesses and community facilities

Noise Policy Statement for England

The NPPF document also refers to the Noise Policy Statement for England (March 2010). The Noise Policy Statement for England (NPSE) sets out (paragraph 1.6) the long-term vision of Government noise policy: *“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”*

Planning Practice Guidance

The government’s Planning Practice Guidance web pages provide advice of various issues, including noise (<https://www.gov.uk/guidance/noise--2>). The noise advice (March 2014, last update July 2019) states in the context of considering when noise is relevant to planning, *“noise needs to be considered when new development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced).”* (Paragraph: 001, Reference ID: 30-001-20190722, Revision date: 22-07-2019.)

2.2 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 “Methods for Rating and Assessing Industrial and Commercial Sound” addresses the likelihood of adverse impact from noise generated by plant equipment. In the standard, a noise rating is determined and compared with the existing local background sound level, and several cumulative acoustic feature corrections to the noise rating are available to apply where appropriate. For example, if the noise includes a distinguishable tone, impulse, intermittency, or other readily distinguishable sound characteristic, then additional cumulative penalties individually ranging from 0 to 9 dB may be applied depending on the type of noise.

BS 4142:2014 seeks to determine a “representative” background sound level, stating that “...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.

The assessment of the impact depends upon the margin by which the rating level of the specific sound source exceeds the background sound level but also promotes a consideration of the context in which the sound occurs when making an assessment. BS 4142:2014 states that an initial estimate of the impact of the specific sound is made by subtracting the measured background sound level from the rating level, while considering the following points:

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

Expanding on the factors that may form part of the context, and thus influence the impact of a given sound source, the standard includes the following clarification:

Where background sound levels and rating levels are low, absolute levels might as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

While BS 4142:2014+A1:2019 does not give a numeric definition of what should be considered “low” levels of background sound levels and rating levels, the earlier version of the same standard, BS 4142:1997, includes a note stating that “Background noise levels below about 30dB and rating levels below about 35dB are considered to be very low”.

2.3 WHO Guidance

The World Health Organisation’s (WHO) “Guideline levels for Community Noise” (1999), provides guideline noise levels based on values for the onset of health effects from noise exposure for a variety of situations – including for ambient noise on dwellings during day and night. The relevant section of this table is reproduced below:

Table 4.1: Guideline values for community noise in specific environments.

Specific environment	Critical health effect(s)	LAeq [dB]	Time base [hours]	LAm _{ax, fast} [dB]
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	
Inside bedrooms	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

2.4 Local Planning Policy

Wiltshire Core Strategy

The Wiltshire Core Strategy presents Core Policy 57 – Ensuring High Quality Design and Place Shaping, which is reproduced below:

A high standard of design is required in all new developments, including extensions, alterations, and changes of use of existing buildings. Development is expected to create a strong sense of place through drawing on the local context and being complementary to the locality. Applications for new development must be accompanied by appropriate information to demonstrate how the proposal will make a positive contribution to the character of Wiltshire through:

vii. having regard to the compatibility of adjoining buildings and uses, the impact on the amenities of existing occupants, and ensuring that appropriate levels of amenity are achievable within the development itself, including the consideration of privacy, overshadowing, vibration, and pollution (e.g. light intrusion, noise, smoke, fumes, effluent, waste or litter.

2.5 Planning Consultation Response

The proposal was responded to by an Environmental Control and Protection Officer for Wiltshire Council, and the included comments on noise, among other things. The comments relating to noise are reproduced here in full:

The proposals would see the introduction of a kitchen extraction system, air handling plant and air source heat pump to the location. A brasserie garden and garden near the reception and entrance are proposed. There may be noise implications for nearby noise sensitive receptors. There is no exploration of the noise impact currently included with the application.

To provide more information on noise impacts, the applicant should engage a noise consultant and submit a noise assessment to include;

- 1) All mechanical ventilation and plant proposed to be used at the premises should be assessed using BS4142 (2019). A scheme of mitigation works may be required, but all plant should be designed to meet a rated level of -5dB below the background noise level. Background levels are to be taken as a 15 minute LA90 at the boundary of the nearest residential noise-sensitive receptors.*
- 2) The use of the outside areas of the premises for drinking and dining. Clarification on the times the gardens will be in use and the maximum capacity of customers at any one time should be provided. An assessment of the impact of the use of these areas on residential receptors should take place and if necessary, attenuation measures proposed to reduce the impact from the noise of customers. A management plan for the use of the garden may also be relevant. We would expect an assessment of people noise based on a raised level of speech from the "Handbook of Acoustical Measurements and Noise Control" Cyril M Harris (1991). A raised level of speech is given for males as 65LAeq dB @1m, females 62LAeq dB@1m. We expect that the following calculations are carried out to derive a noise level at the nearest noise sensitive receptor, based on an accurate number of people using the outside areas at any time. An assumption that 50% present are women and 50% present are men is reasonable.*
 - 1) Base level at 1 metre = 64dBA*
 - 2) Add factor for x persons (10 log x)*
 - 3) Correction for 50% "on time" (10 log 0.5)*
 - 4) Correction for any screening*
 - 5) Correction for distance.*

3.0 NOISE SURVEY

In order to determine typical ambient (L_{Aeq}) and background (L_{A90}) noise levels in the vicinity of the proposed development, a noise survey was undertaken from Wednesday 21st to Tuesday 27th September 2023.

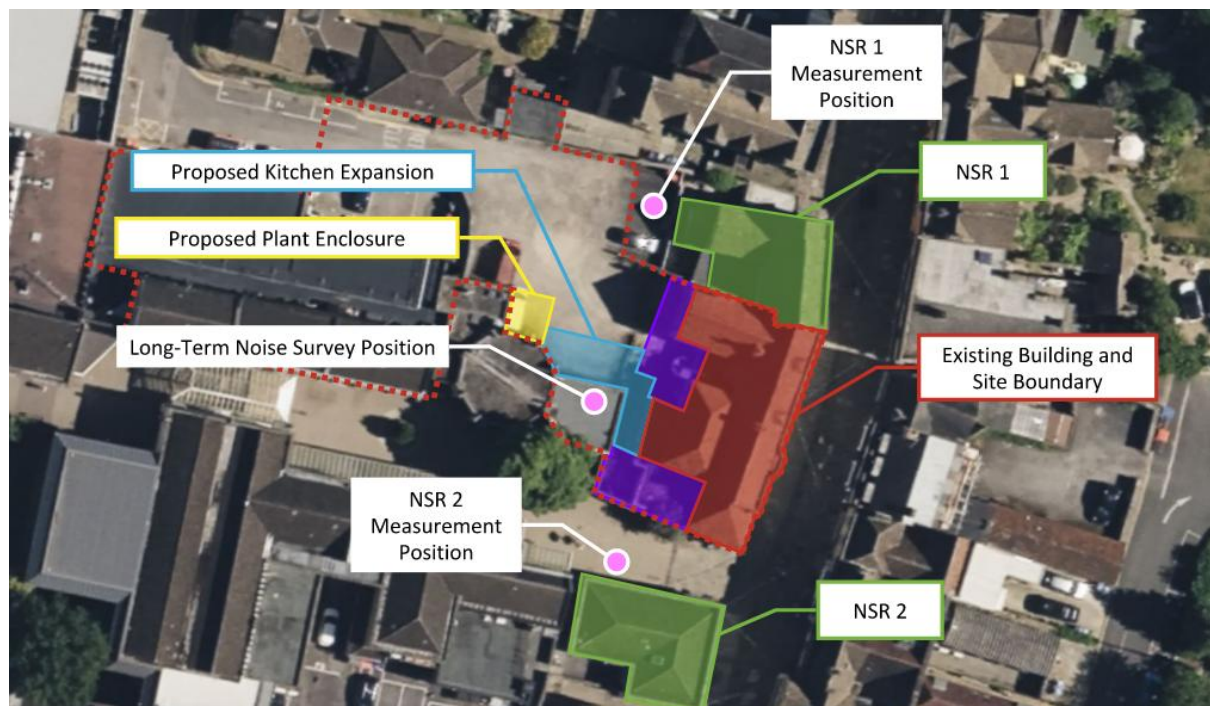


Figure 2: Long-term and short-term survey measurement locations.

Background noise is thought to be mainly due to commercial plant equipment situated primarily on the Co-Op and other smaller shops, as well as residual background noise from Newlands Road and Post Office Lane. Ambient noise is thought to be mainly due to pedestrian activity on Martingate and Corsham High Street.

To establish the noise environment, an unattended long-term (5 day) measurement was undertaken in close proximity to the existing site, as well as 30-minute “spot” measurements at the boundary of two nearby Noise Sensitive Receptors (NSRs). The long-term survey measurement was located on a nearby flat roof (at approximately first floor height to the development and NSRs). The survey position is roughly in-line with the site boundary of the proposed development. The survey and spot measurement positions are shown in Figure 2.

The long-term survey measurements were taken with a Norsonic 140 precision sound level analyser. This equipment complies with BS EN IEC 61672 Class 1. The meter used a Norsonic 1225 free-field response microphone and NOR 1209 microphone pre-amplifier.

A field calibration of the sound level meter was completed at the beginning and end of the long-term measurement with a Norsonic 1251 sound calibrator, complying with BS EN IEC 60942 Class 1. No noticeable drift was detected upon analysis of the results of the survey. Information on equipment calibration is given in Appendix B.

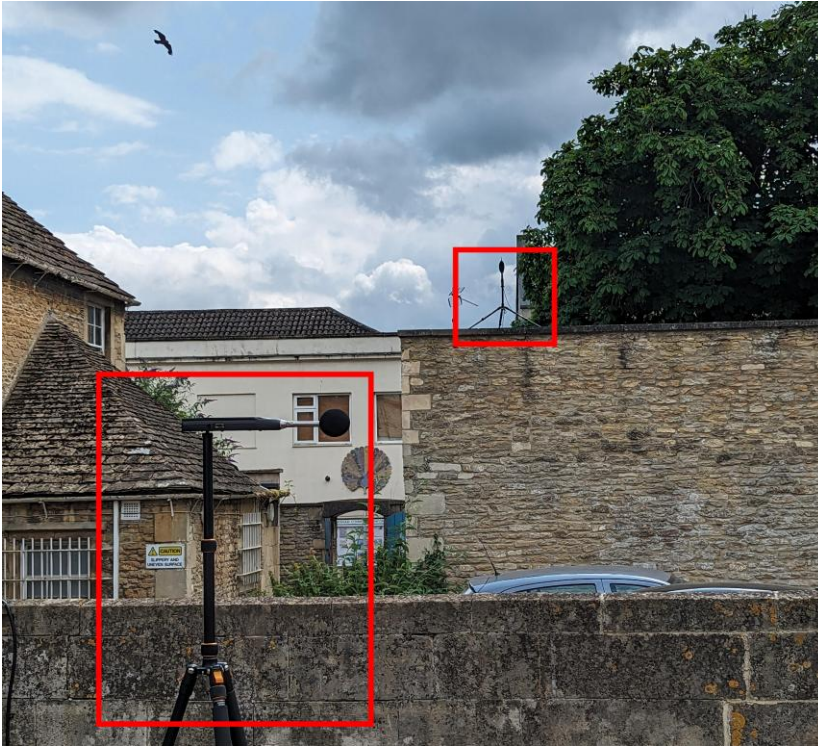


Figure 3: Survey equipment in-situ (Spot Measurement in foreground, Long-Term Survey in background).

Measurements were taken between 15:00 21st June 2023 until 15:00 27th June 2023. Measurements were taken every 15 minutes throughout the period. Weather conditions during the survey were observed to be dry and calm and thus have been determined to have had no impact on the results of the survey. Figure 4 shows graphed noise survey data, indicating maximum, ambient and background noise levels (L_{AFmax} , L_{Aeq} and L_{AF90} parameters respectively).

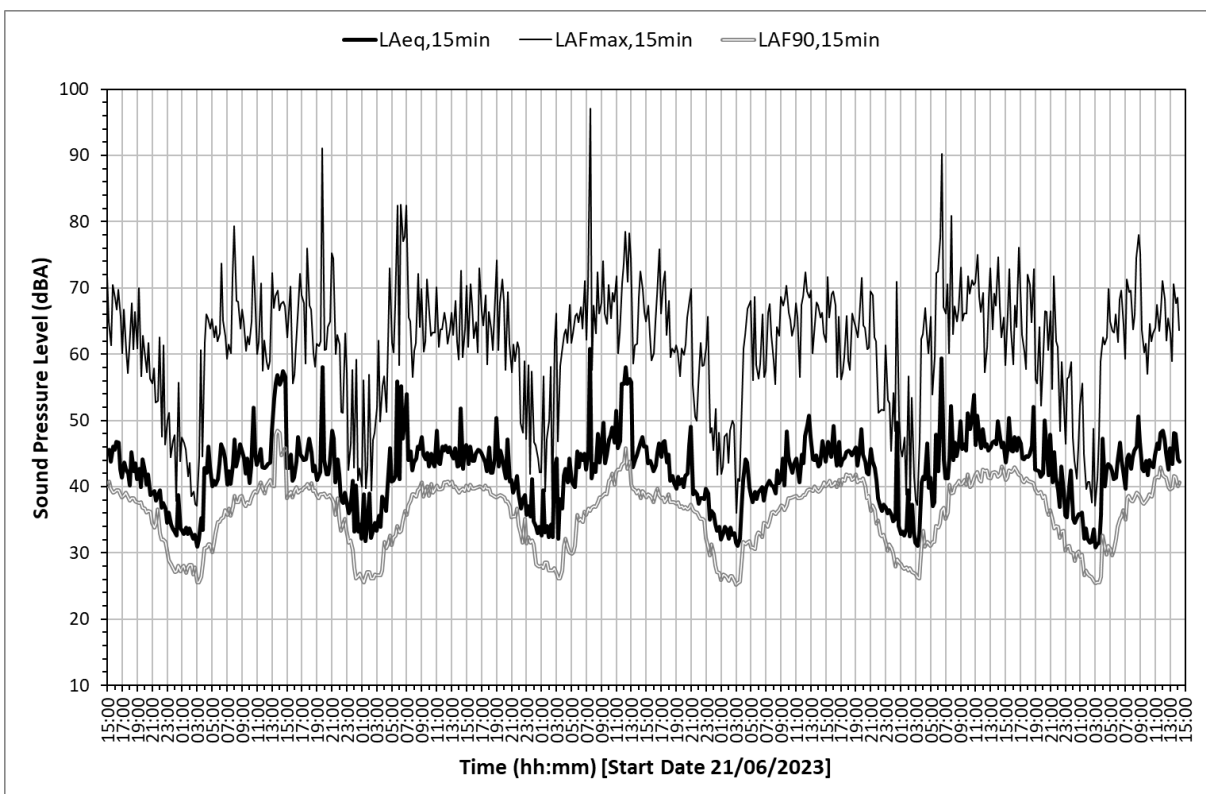


Figure 4: The noise levels measured across the long-term noise survey at location L1, showing L_{Aeq} , L_{AFmax} , L_{AF90} .

The statistical levels, shown in **Table 1** indicate the site to be very quiet. This is particularly notable for the background noise levels at night, which are notably very low compared to Max Fordham Acoustics' experience of and data on other comparable environments.

Ambient Noise Level		Representative ^[1] Background Noise Level		Maximum ^[2] Noise Level
L _{Aeq,16hr} (07:00-23:00)	L _{Aeq,8hr} (23:00-07:00)	L _{A90,15min} (07:00-23:00)	L _{A90,15min} (23:00-07:00)	L _{AFmax,15min} (23:00-07:00)
47dB	43dB	39dB	28dB	67dB

[1] 40th percentile ($P_{40\%}$) value of measurement period.

[2] Noise level not normally exceeded on more than 10 occasions per night.

Table 1: A summary of the noise levels measured during the long-term noise survey at location L1

3.1 Spot Measurements

The 30-minute spot measurements were taken close to the two nearest Noise Sensitive Receptors ("NSR"s) so as to compare the noise levels between them and the long-term survey measurement. This was to confirm the survey measurement was representative of the noise environment at the NSRs, or whether an adjustment factor between the measured noise levels and the levels at the NSRs would be necessary. Because of this, the short-term measurements were taken simultaneously with the long-term measurements.

The survey spot measurements were taken with a Norsonic 118 precision sound level analyser. This equipment complies with BS EN IEC 61672 Class 1. The meter used a Norsonic 1225 free-field response microphone and NOR 1206 microphone pre-amplifier.

A field calibration of the sound level meter was completed at the beginning and end of measurements with a Norsonic 1251 sound calibrator, complying with BS EN IEC 60942 class 1. No noticeable drift was detected between the initial and final calibration. The microphone was secured to a tripod which was set up such that the microphone would be situated approximately 1.5 m above floor level and at least 1.5 m from any façade, fence, or wall.

A graphical comparison of the survey and spot measurements is available in Appendix C.

The ambient noise level ($L_{Aeq,15min}$) recorded at NSR 1 did not have a consistent correlation with the ambient noise level at the survey location across the period of the simultaneous measurements, and the typical level difference was relatively low. Therefore, the noise levels measured over the long-term survey has therefore been assumed to be representative of the NSR 1 boundary location.

The levels of ambient noise recorded at the long-term location and at NSR 2 had a clear and consistent correlation, with the level at the spot measurement close to NSR 2 being around 6dB higher than at survey location. The existing ambient noise levels at NSR 2 are therefore taken to be 6dB higher than those measured at the survey location.

The representative LA90 background sound levels across all time periods are taken to be equivalent across the whole site and neighbouring NSRs at this proximity to each other.

Location	Noise Level L _{Aeq} dB		
	Day (07:00-19:00)	Evening (19:00-23:00)	Night (23:00-07:00)
NSR 1	48	44	43
NSR 2	54	50	49

Table 2: Assumed noise Levels at NSRs, including corrections where noted above.

4.0 PLANT NOISE

4.1 Plant Noise Assessment Methodology

All mechanical newly introduced items of plant proposed to be included within the proposed development have been assessed following the guidance of BS 4142:2014+A1:2019.

Representative Background Noise Levels

Due the absence of suitable survey locations at site boundaries, it was not possible to measure the long-term $L_{A90,15min}$ at the boundary of the NSR. Instead, a long-term survey position as close as possible to the NSR was chosen, and the L_{A90} measured here was compared to the L_{A90} measured during short-term spot measurements at NSR boundaries.

The L_{A90} measured simultaneously at each of the spot locations was, in both cases, louder than the L_{A90} measured over the course of the long-term survey. For this reason, the L_{A90} from the survey over the day and night has been taken as being the same as the spot measurements' L_{A90} , which is a conservative estimate.

Plant Noise Rating Level Targets

The plant noise rating level $L_{Ar,Tr}$ which is likely to be considered an indication of low impact, depending on the context, is defined as a 5dB below the background noise level $L_{A90,15min}$, as noted in the Planning Consultation Response, reproduced in Section 2.5.

These rating levels are considered in context to determine whether any modifications need to be included to make an effective estimate of noise impact, in line with the guidance of BS 4142:2014+A1:2019.

4.2 Plant Noise Level Targets

Defining a Plant Noise Rating target of 5dB below the existing representative background sound level at the NSRs gives the following figures.

	$L_{A90,15min}$	$L_{Ar,Tr}$
	Existing Representative Background Sound Level	Rating level 5 dB below existing background.
Day time (7am-11pm)	39 dBA	34 dBA
Night-time (11pm-7am)	28 dBA	23 dBA

Table 3: External day and night-time plant noise rating levels at the nearest Noise Sensitive Receptors (NSRs).

It is noted that the Plant Noise Rating target levels – along with the night-time background sound level – are classified as “very low”, according to guidance in BS 4142:1997, as detailed in Section 2.2.

As such, it is considered appropriate to treat this as a context in which “absolute levels might be as, or more, relevant to the assessment of noise impact than the margin by which the rating level exceeds the background”, as defined by BS 4142:2014+A1:2019.

While no guidance as to the appropriate absolute level against which to assess the plant noise is given, it is considered likely that where plant noise levels at windows of the nearest NSRs are limited to a maximum of 35dB $L_{Ar,Tr}$, there is not expected to be any significant noise impact on residents, as this is the boundary of the region considered by BS 4142:1997 to be “very low”.

It is therefore considered suitable that this is adopted as a Plant Noise Rating target in contexts where the target would otherwise be lower.

	$L_{Ar,Tr}$
	Proposed Plant Noise Rating Target
Day time (7am-11pm)	35 dBA
Night-time (11pm-7am)	35 dBA

Table 4: Proposed Plant Noise Rating Target $L_{Ar,Tr}$ at NSRs.

In “Guideline levels for Community Noise” (1999), the World Health Organisation state that a 30dBA continuous sound pressure level should not be exceeded indoors since this may have negative effects on sleep.

Field test measurements show that it is expected to be able to achieve a 10 dB outside-to-inside level difference through a slightly open window, meaning that an absolute noise rating level of 35dBA outside bedroom windows would be expected to achieve a rating of 25dBA indoors.

This is far below the onset level of health effects on sleep, and of generalised annoyance in dwellings, which supports the indication of the 35dBA rating level outdoors being of low impact on NSRs.

4.3 Plant Noise Emission

The proposed, significantly noise-producing, items of plant to be situated outdoors are to be:

- 2 Air Source Heat Pumps (ASHPs)
- 1 Chiller serving the catering chiller and freezer
- The intake and exhaust terminations of the Kitchen ventilation system,

Ground Level Plant Enclosure

The ASHPs and Chiller are proposed to be located within a plant enclosure at ground level in the carpark to the rear of the development. The Sound Pressure Level, measured at 1m from the plant, as provided by the manufacturers, are as shown in **Table 5**.

Unit	Individual Sound Pressure Level @1m from Plant ($L_{Aeq,T}$ dB)								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dBA
ASHP 1	60	64	70	62	59	54	48	44	65
ASHP 2	60	64	70	62	59	54	48	44	65
Catering Chiller	53	56	57	48	46	42	35	34	53

Table 5: A summary of the plant noise information provided by the manufacturers for the plant within the enclosure.

The enclosure is to be formed of a 2.5m high, 150mm deep acoustically attenuated louvre. The plant within the enclosure is at least 19m from façade of NSR 1 and is fully shielded from NSR 2. As noise from Heat Pumps and Chillers can sometimes have just perceptible tonality, a 2dB perceptual correction, as defined by BS 4142:2014, is added to this noise.

The insertion loss of the selected louvre, as supplied by the manufacturer, is as shown in **Table 6**.

Unit	Insertion Loss (dB)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
150mm Attenuated Louvre	4	5	7	12	16	16	16	18

Table 6: The insertion loss data provided by the manufacturer for the attenuated louvre used for the proposed enclosure.

Rooftop Plant

The kitchen ventilation plant noise sources - consisting of the intake and exhaust terminations and the breakout noise from the fans - are located on the roof of the kitchen extension.

Both the intake and exhaust terminations are fitted with in-duct attenuators in between the fans and terminations. The initial sound power level of the fans – along with the insertion loss of the proposed attenuators and the resultant termination sound power – is shown in **Table 7**.

Source	Sound Power Level (dB) / Insertion Loss (dB)								dBA
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Intake Fan (Sound Power Level)	83	89	89	88	85	84	78	72	91
Intake Attenuator (Insertion Loss)	8	16	26	42	49	49	46	32	-
Resultant Intake Termination (Resultant Sound Power Level)	75	73	63	46	36	35	33	40	59
Exhaust Fan (Sound Power Level)	83	97	89	86	85	80	77	72	90
Exhaust Attenuator (Insertion Loss)	15	30	48	50	50	50	50	50	-
Resultant Exhaust Termination (Resultant Sound Power Level)	68	67	41	36	35	30	27	22	52

Table 7: A summary of the calculation of the resultant Sound Power Levels of the Ventilation Terminations.

The breakout noise from the kitchen ventilation systems is mitigated by adding an additional 5kg/m² of mass to the outside face, along with insulation. For the exhaust fan, this is formed by a boxing-out structure, lined with an acoustic lagging material. This box shall be supported independently from the fans and ductwork to avoid structure-borne sound transmission and shall extend up to 1m along the ductwork between the fan and the attenuator in both directions. For the intake fan, this consists of a dense jacket around the fan itself.

The anticipated level of noise breakout from each fan, the insertion loss of the proposed lagging, as provided by the manufacturer, and the resultant sound power level from each fan is shown in **Table 8**.

Source	Sound Power Level (dB) / Insertion Loss (dB)								dBA
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Intake Fan Breakout (Sound Power Level, Estimated)	62	72	60	55	53	54	43	35	61
Effect of Boxing-Out (Insertion Loss)	2	2	6	14	18	20	23	23	-
Resultant Intake Fan Breakout (Resultant Sound Power Level)	60	70	54	41	35	34	20	12	55
Exhaust Fan Breakout (Sound Power Level, from Manufacturer)	62	80	60	53	53	50	42	35	65
Effect of Boxing-Out (Insertion Loss)	15	15	18	23	28	37	41	41	-
Resultant Exhaust Fan Breakout (Resultant Sound Power Level)	47	65	42	30	25	13	1	-7	49

Table 8: A summary of the calculation of the resultant Breakout Sound Power Levels of the Fans.

As noise from ventilation systems is typically relatively constant and not significantly tonal, no perceptual corrections, as defined by BS 4142:2014, are considered likely to be applicable.

Prediction of Impact

Figure 5 shows the relative positions of the introduced plant noise sources described above and the nearest NSRs.

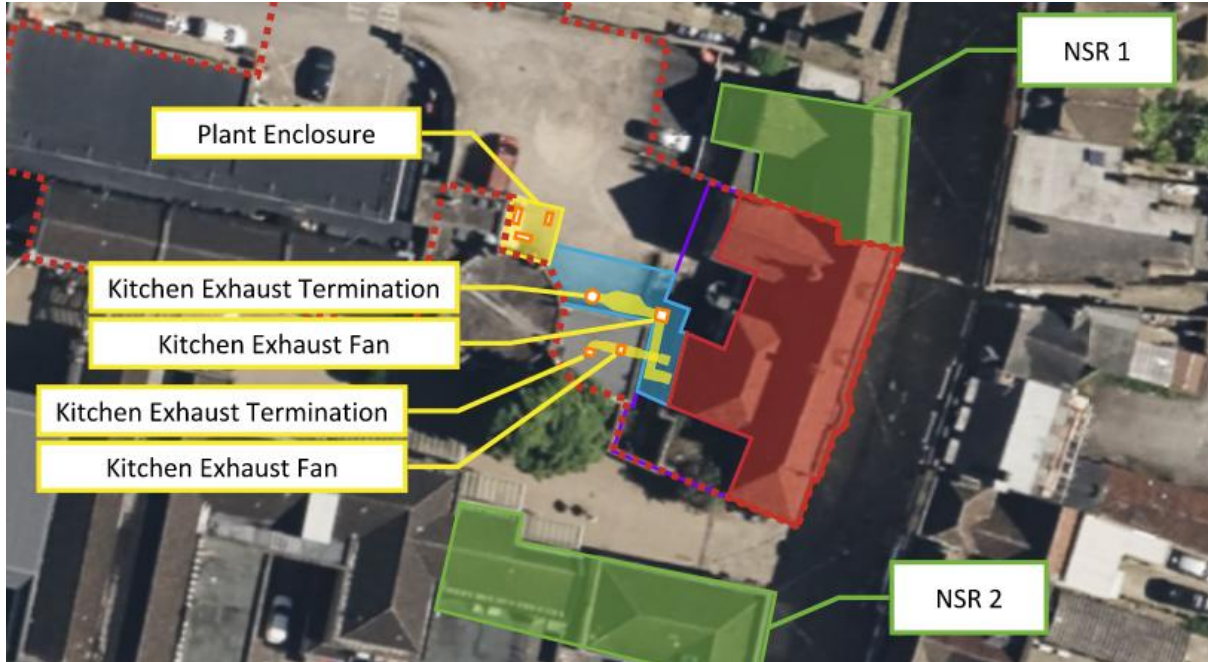


Figure 5: An aerial image showing the proposed sources of plant noise and two closest NSRs.

The distance between these sources and the closest part of the façade of each NSR is shown in **Table 9**.

Source	Distance to NSR 1	Distance to NSR 2
Plant Enclosure	18m	23m
Intake Fan	21m	17m
Intake Termination	19m	17m
Exhaust Fan	15m	20m
Exhaust Termination	17m	21m

Table 9: The distance between each proposed plant noise source and each NSR.

NSR 1 benefits from the effect of the louvred plant enclosure, which blocks line-of-sight between the interior of the enclosure and the façade of the building, and NSR 2 benefits from the shielding provided from the buildings to the south of the enclosure. Both NSRs have direct line-of-sight to all rooftop ventilation sources.

A summary of the calculations used to predict the plant noise rating level ($L_{Ar,Tr}$) at 1m from the façade of each NSR is shown in **Table 10** and **Table 11**.

Source	Sound Power Level (dB) / Plant Noise Rating Level ($L_{A,r,Tr}$ dB)								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dBA
Combined Plant Within Enclosure (Sound Power Level, incl. +2dB Correction)	70	73	79	71	68	63	57	53	74
Level at NSR 1, Path Over Enclosure ($L_{A,r,Tr}$ @18m, including barrier effect)	30	32	35	25	19	11	1	-7	29
Level at NSR 1, Path Through Louvre ($L_{A,r,Tr}$ @18m, including louvre insertion loss)	33	35	39	26	19	14	8	2	32
Level at NSR 1, Total From Enclosure ($L_{A,r,Tr}$)	34	37	40	28	22	16	9	3	33
Level at NSR 1, Intake Termination ($L_{A,r,Tr}$ @21m)	36	34	8	4	2	-3	-6	-11	19
Level at NSR 1, Intake Fan Breakout ($L_{A,r,Tr}$ @19m)	25	41	23	6	-3	-18	-32	-39	26
Level at NSR 1, Exhaust Termination ($L_{A,r,Tr}$ @17m)	41	39	29	12	2	1	-1	6	25
Level at NSR 1, Exhaust Breakout ($L_{A,r,Tr}$ @15m)	23	31	21	6	-5	-16	-33	-41	18
Level at NSR 1, Total From Roof ($L_{A,r,Tr}$)	42	44	30	14	6	2	0	6	29
Level at NSR 1, Total ($L_{A,r,Tr}$)	43	45	41	28	22	16	9	7	35

Table 10: A summary of the calculation of the total plant noise rating level at NSR 1.

Source	Sound Power Level (dB) / Plant Noise Rating Level ($L_{A,r,Tr}$ dB)								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dBA
Combined Plant Within Enclosure (Sound Power Level, incl. +2dB Correction)	70	73	79	71	68	63	57	53	74
Level at NSR 2, Total From Enclosure ($L_{A,r,Tr}$ @23m, including barrier effect from building)	19	20	21	8	2	-6	-15	-22	14
Level at NSR 2, Intake Termination ($L_{A,r,Tr}$ @17m)	34	33	6	2	1	-4	-7	-13	18
Level at NSR 2, Intake Fan Breakout ($L_{A,r,Tr}$ @17m)	23	39	21	4	-5	-20	-34	-42	23
Level at NSR 2, Exhaust Termination ($L_{A,r,Tr}$ @21m)	43	41	31	14	4	3	1	8	27
Level at NSR 2, Exhaust Breakout ($L_{A,r,Tr}$ @20m)	24	32	22	7	-4	-15	-32	-40	18
Level at NSR 2, Total From Roof ($L_{A,r,Tr}$)	43	44	32	15	6	3	1	8	29
Level at NSR 2, Total ($L_{A,r,Tr}$)	43	44	32	16	8	4	1	8	29

Table 11: A summary of the calculation of the total plant noise rating level at NSR 2.

As the total plant noise rating level at the most affected noise sensitive receptor is not higher than **35dB $L_{A,r}$** , accounting for the effect of the noise mitigation measures detailed above, it is considered that the proposed scheme satisfies the plant noise requirements given in **Section 4.2**.

As such, this plant strategy does not represent an increase in plant noise, relative to that given in the previous iteration of this Noise Impact Assessment.

5.0 ACTIVITY NOISE

5.1 Context

There are two Outdoor Areas for drinking and dining proposed as part of the development, the Quiet Garden, and the Restaurant Garden.

- The Quiet Garden will be used by hotel guests for personal relaxation. It is not a social space.
- The Quiet Garden has a capacity of 14 people.
- The Restaurant Garden is seated and will be used for upscale dining and quiet conversation.
- The Restaurant Garden has a capacity of 34 people.

The locations of the outdoor areas are shown in **Figure 6**.



Figure 6: Location of Outdoor Areas for drinking and dining, relative to the Site and nearest NSRs.

The effective centre of the Quiet Garden is approximately **11m** away from NSR 1, and the effective centre of the Restaurant Garden is approximately **11m** away from NSR 2.

Both receptors benefit from a similar degree of shielding from their closest external area, as a result of the solid boundary wall, with the effect predicted to result in a reduction of around **5dB** in both cases. Both receptors are well shielded from the other garden, and any activity noise will therefore be dominated by that from the nearest external space.

As such, only the potential impact of noise from the Restaurant Garden on NSR 2 is assessed below, as the impact of noise from the Quiet Garden on NSR 1 will be lower, due to the smaller capacity.

5.2 Management of Activity Noise

The outdoor spaces will be carefully managed by the building operator to help keep noise levels from patrons from causing noise nuisance at residential receptors. As well as limiting the impact to the neighbouring residences, the operator will also be managing noise for the protection of their own guests in the rooms overlooking the gardens.

The restaurant garden area will be closed from 22:30 at the latest, to minimise any risk of noise impact on neighbours.

The restaurant garden may also incorporate planting on the kitchen extension wall to add a degree of acoustic diffusion to the wall which will help to mitigate strong reflections of noise within the garden.

5.3 Prediction of Activity Noise

The level of activity noise at 1m from the façade of NSR 2 has been predicted using a methodology broadly in line with that given in Wiltshire Council's *Planning Consultation Guidance Note 6 – Specific Guidance for Proposed Developments*, as well as the Planning Consultation Response, reproduced in Section 2.5 of this report.

As this guidance was written with the intent of assessing nightclubs and bars, some minor variations have been made to reflect the particular nature of these spaces. These variations are as follows:

- The guidance assumes that “each person talks in raised voices”. As the proposed business is based around upscale dining and wine-tasting based, the type of noise expected would instead be from “normal” or “casual” conversation.
- The guidance assumes an average group size of 2.0 in its calculation of 50% “on time”. Instead, an “on time” of 30% is used, which is a more typical for restaurants, with a group size of 3.0.

For the purpose of this assessment, it has been assumed that the speech activity noise source is a point source at the centres of each outdoor drinking and dining area, at a height of 1.3 m above the ground (approximate head height for someone who is seated).

Table 10 includes a calculation of predicted people noise at the nearest residential receptor from normal speaking levels when the Restaurant Garden is being used at maximum capacity.

Normal Voices	
Base level at 1 metre	57 dB $L_{Aeq,1hour}$
Factor up for X patrons (10 log 34)	+15 dB
Correction for 30% “on time” (10 log 0.3)	-5 dB
Attenuation from acoustic barrier	-5 dB
Correction for distance (20 log 1/11)	-21 dB
Total sound level at the nearest residential receptor	41 dB $L_{Aeq,1hour}$
Background level at the nearest residential receptor	39 dB $L_{A90,15min}$
Difference between people noise and background (Total – Background)	+2 dB

Table 12: Calculation of predicted noise at the nearest residential receptor from normal speaking levels.

The equivalent calculation for raised and casual voices has also been undertaken (shown in Table 2).

*Noise level from raised voices shown for context, although not expected at the proposed development.

Type of Speech	Difference between People Noise and Background Noise
Casual	- 3 dB
Normal	+ 2 dB
Raised*	+ 9 dB*

Table 13: Difference between People Noise and Background Noise at nearest residential receptor.

5.4 Assessment of Activity Noise Impact

The above prediction methodology, as given by Wiltshire Planning Authority, does not include criteria for the assessment of Activity Noise Impact at a noise sensitive receptor, only for calculating the absolute noise level.

There are several commonly used ways to predict the likely impact of activity noise. One method used by planning authorities is summarised in **Table 14** below.

Noise levels from places of entertainment on adjoining residential sites at which planning permission will not be granted			
Noise description and measurement location	Period	Time	Sites adjoining places of entertainment
Noise at 1 meter external to a sensitive façade	Day and evening	0700-2300	$L_{Aeq,5min}$ shall not increase by more than 5dB*
Noise at 1 meter external to a sensitive façade	Night	2300-0700	$L_{Aeq,5min}$ shall not increase by more than 3dB*
Noise inside any living room of any noise sensitive premises, with windows open or closed	Night	2300-0700	$L_{Aeq,5min}$ (in the 63Hz Octave Band measured using the “fast” time constant) should show no increase in dB*
* As compared to the same measure, from the same position, and over a comparable period, with no entertainment taking place			

Table 14: Proposed activity noise assessment methodology.

As shown in **Table 1**, the L_{Aeq} at NSR 2 during the evening is predicted to be approximately **50dBA**. As this space will not be used past 2300, this represents the most sensitive period for this noise. A level of entertainment noise of **41dBA** – as predicted for Normal level speech from the Restaurant Garden at NSR 2 in Table 10 – would result in an increase to this level by **1dB** to **51dBA**.

As such, the predicted levels of noise from the Restaurant Garden at NSR 2 are predicted to satisfy this requirement.

6.0 SUMMARY

- Max Fordham LLP have been appointed to provide acoustics advice in relation to the proposed development of the Corsham House Hotel at 13 High St. Corsham.
- The proposed development comprises the refurbishment of the Grade II listed building into a hotel, with additional new plant rooms, a small commercial breakfast kitchen, bistro, and outdoor social areas.
- An environmental noise survey of the site was undertaken by Max Fordham engineers to measure the existing noise levels at/around the site. During the daytime, the average ambient noise level measured was **47 dB LAeq** and minimum background level recorded was **39 dB LA90,10min**, and at night the mean ambient noise level was **43 dB LAeq** and minimum background level recorded was **28 dB LA90,10min**. The site is noted to be exceedingly quiet in comparison to international guidance on noise limits.
- Due to the context of the very low noise levels at the site, the use of an absolute level as a Plant Noise Rating target, rather than a level relative to the existing background sound level, has been judged more appropriate.
- The introduced plant will be limited to a total maximum noise rating level of **35 dBA LAr,Tr** at bedroom windows for all nearby NSR premises. The predicted noise levels from the proposed plant strategy
- The two outdoor areas for drinking and dining are introduced sources of activity noise, but the expected noise levels at NSRs resulting from this new activity are not predicted to increase the current LAeq,T noise levels during the hours of operation by more than **1 dB**, which satisfies the criteria of the proposed activity noise assessment methodology.

7.0 APPENDICES

7.1 Appendix A – Glossary of Acoustic Terms

SOUND POWER LEVEL, or L_W (decibels, dB)

The total amount of sound energy per unit of time generated by a particular sound source. This corresponds to a reference sound power of 10 pW.

SOUND PRESSURE LEVEL, SPL, or L_P (decibels, dB)

A measure of the instantaneous sound pressure at a point in space. The threshold of hearing occurs at approximately $L_P=0$ dB (which corresponds to a reference sound pressure of 20 μ Pa).

A-WEIGHTED SOUND PRESSURE LEVEL, L_A (dBA)

A-weighted sound pressure level values are frequency-weighted in a way that approximates the frequency response of the human ear and allows sound levels to be expressed as a single figure value.

EQUIVALENT CONTINUOUS A-WEIGHTED SPL, $L_{Aeq,T}$ (dBA)

Energy average of the A-weighted sound pressure level over a time period, T. The level of a notional continuous sound that would deliver the same A-weighted sound energy as the actual fluctuating sound over the course of the defined time period, T.

MAXIMUM A-WEIGHTED SPL, L_{AFmax} (dBA)

Maximum A-weighted sound pressure level measured with fast time weighting.

BACKGROUND SOUND LEVEL, $L_{A90,T}$ (dBA)

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval, T, measured using time weighting, and quoted to the nearest whole number of decibels.

40th PERCENTILE OF A DATA DISTRIBUTION OF BACKGROUND SOUND LEVEL VALUES, $P_{40\%} L_{A90,T}$ (dBA)

The 40th percentile value of a data distribution of individual $L_{A90,T}$ values. NOISE RATING LEVEL, $L_{Ar,Tr}$ (dBA)

The A-weighted specific sound level plus any adjustment for characteristic features of the sound (for example if the sound features impulsive or tonal components). Used in BS 4142:2014 assessments.

SPECIFIC SOUND LEVEL, $L_s = L_{Aeq,Tr}$ (dBA)

The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .

7.2 Appendix B – Sound Level Meter Equipment

The equipment summarised in the table below has been calibrated by a UKAS accredited laboratory in accordance with the laboratory requirements of the United Kingdom Accreditation Service (UKAS) on the dates indicated. UKAS calibration data sheets and certificates are available upon request.

Item	Make	Type	Serial no.	Calibration Intervals	Last Calibrated	Next Due Calibration	Calibration Certificate Number
Class 1 sound level meter	Norsonic	140	1405942	2 years	22/02/23	22/02/25	U43414
Microphone preamplifier	Norsonic	1209	15804	2 years	22/02/23	22/02/25	U43414
Microphone	Norsonic	1225	208215	2 years	22/02/23	22/02/25	43413
Calibrator	Norsonic	1251	34059	1 year	09/01/23	09/01/24	U42886
Class 1 sound level meter	Norsonic	118	31419	2 years	16/02/22	16/02/24	U40198 U40199
Microphone preamplifier	Norsonic	1206	30457	2 years	16/02/22	16/02/24	U40198 U40199
Microphone	Norsonic	1225	271043	2 years	16/02/22	16/02/24	40197
Calibrator	Norsonic	1251	30895	1 year	22/02/23	22/02/24	U43412

7.3 Appendix C – Survey and Spot Measurement Comparison

