



Premier Inn Salisbury North Bishopdown

Whitbread plc

Noise Impact Assessment

Revision 01

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Project Particulars

Client Name: Whitbread plc

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1 Introduction

- 1.1 Proposals are in place to develop an extension to the existing Premier Inn Salisbury North Bishopdown hotel located at Pearce Way, Salisbury SP1 3GU. The extension will be towards the northern area of the site, adjoined to the existing north building. This report presents an assessment of the noise emission from new building services plant associated with the extension. Noise intrusion into the newly formed hotel bedrooms has also been assessed within this report.
- 1.2 An external noise survey has been conducted at the site, and the measurement data have been used to establish the prevailing ambient and background noise levels affecting the site and neighbouring noise-sensitive properties. This data has then been used to assess the noise impact in accordance with Wiltshire Council's anticipated requirements.
- 1.3 Chapter 2 of this report presents the acoustic requirements, Chapter 3 describes the external noise survey, and the assessment of plant noise emission to neighbouring properties plant noise intrusion into guestrooms is presented in Chapter 4. An assessment of external noise intrusion into guestrooms is assessed in Chapter 5. Conclusions have been provided in Chapter 6.
- 1.4 The full measurement data are available on request. Definitions of some of the terminology used throughout the report have been included in Appendix A.

2 Criteria

2.1 Overview

- 2.1.1 When assessing the impact of noise emission from new building services plant associated with the proposed development, and noise intrusion into the proposed development, consideration has been given to local planning policy, available good practice guidance, and the hotel operator's brand standards. Existing outline planning conditions for the wider site have also been considered. A list of the documents that have been consulted is provided below:

Local Policy

- Wiltshire Council, *Wiltshire Core Strategy* (adopted 2015)
- Laverstock and Ford Communities Neighbourhood Plan (adopted 2022)
- Reg 19 Draft Wiltshire Local Plan (2023)
- Draft Salisbury Neighbourhood Plan (2023)

Good Practice Guidance

- British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*

Hotel Operator's Brand Standards

- Premier Inn Generic Specification for a Turnkey Development (January 2024 – Edition Rev N)

- 2.1.2 Summaries of the guidance considered relevant to the proposals are presented within this Chapter.

2.2 Local Policy

- 2.2.1 Wiltshire Council's *Wiltshire Core Strategy* (adopted 2015) includes a policy concerning guidance for new developments that contains the following passage related to noise:

"Core Policy 57

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)."

- 2.2.2 It is noted the Council have produced a Regulation 19 Draft Local Plan and have recently undertaken a consultation which closed in November 2023. The Council are currently considering the consultation response before submitting the draft plan for Examination which is anticipated in quarter 4 of 2024. Based on the current stage of the draft plan and continued conformity of the adopted Plan, it is considered only limited weight can be given to the emerging policies and the current adopted Plan remains the primary document to assess the proposal. Consequently, it is considered the requirements of these draft policies cannot be applied to the proposed development as they are still draft and potentially subject to change following the Reg 19 consultation and upcoming examination.
- 2.2.3 In any case draft Policy 98 *Ensuring high quality design and place shaping* is similar in scope to the current adopted policy under Policy 57. Additionally, draft Policy 69 *Tourism and related development* notes that all proposals for tourism development must demonstrate that they will "not lead to adverse impacts such as light, noise and odour impacts, particularly in rural or isolated locations. Assessments may be required to address the potential for adverse associated with the new development".
- 2.2.4 It is believed that Wiltshire Council do not specify any objective criteria, therefore the assessment of noise emission will be undertaken in accordance with good practice guidance and Premier Inn's own requirements.

2.3 British Standard 4142

- 2.3.1 British Standard 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* presents a method for predicting noise impact on noise-sensitive neighbours. This is done by comparing the noise level of a source (the *specific* sound level) with the existing background noise level in the area, in the absence of the source (the *background* sound level).
- 2.3.2 The methodology requires consideration be given to all aspects of the assessment process and it must also account for any unusual acoustic features, such as tonal, impulsive, and intermittency characteristics. These are accounted for by the addition of various decibel corrections to the specific sound level. This corrected level is the *rating* level.
- 2.3.3 The greater the positive difference between the rating level and the background level, the greater the magnitude of the impact. BS 4142 gives the following descriptions with regards to the potential impact:
- A difference of around +10dB or more is likely to be an indication of a *significant adverse impact*, depending upon the context.
 - A difference of around +5dB or more is likely to be an indication of an *adverse impact*, depending upon the context.
 - Where the rating level does not exceed the background sound level, this is an indication of a *low impact*, depending upon the context.

2.4 Premier Inn Generic Specification for a Turnkey Development

- 2.4.1 The Premier Inn Generic Specification for a Turnkey Development (January 2024 – Edition Rev N) provides objective criteria for external noise ingress into hotel bedrooms; these criteria are presented in Table 2-1.

Period	Noise level
Daytime (07:00-23:00)	$\leq 35 \text{ dB } L_{Aeq,1\text{hour}}$
Night-time (23:00-07:00)	$\leq 30 \text{ dB } L_{Aeq,1\text{hour}}$ $\leq 42 \text{ dB } L_{AFmax}^*$

**The maximum criterion applies to all vehicle and railway train passbys and all aircraft flyovers. It also applies to the noise from all street activities including those associated with patrons attending and leaving adjacent, neighbouring or connected entertainment venues; noise associated with commercial and industrial neighbouring premises including delivery activities and process equipment; seagulls and church bells. Genuinely infrequent and unpredictable sources of noise such as car alarms occurring no more than twice a night are excluded.*

Table 2-1: Internal background noise level requirements (Premier Inn brand standards)

- 2.4.2 These limits apply to all external noise sources, including road, rail and air traffic, and noise from activities outside the hotel and any adjacent premises, when measured in any hotel bedroom with windows closed.
- 2.4.3 The document also provides objective criteria for background noise levels that should be achieved in guestrooms as a result of building services plant; the relevant criterion is as follows:

“The background noise level in any hotel bedroom as a result of any other building services systems serving the bedroom, neighbouring bedrooms or any other parts of the hotel or development, shall not exceed NR20 L_{eq} within the bedroom. Particular attention is drawn to noise intrusion from roof top plant above or adjacent to bedrooms.”

- 2.4.4 The Premier Inn Specification also requires that noise emission from all plant associated with the hotel be designed to be at least 5dB below the lowest measured background sound level at night with all plant operating simultaneously, when assessed at the boundary (assumed to be any normally occupied position) of the nearest noise sensitive property.

3 External noise survey

3.1 Site description

- 3.1.1 The site is a hotel located on Pearce Way, Salisbury SP1 3GU, just emerging from Hampton Park Roundabout. The roundabout connects Pearce Way with London Road (A30) which is located south of the site. There is also a railway that runs east to south of the site. The surrounding area consists primarily of residences located north-west and west of the site, as well as some commercial properties.
- 3.1.2 The main source of noise affecting the site and neighbouring properties was observed to be road traffic noise from Pearce Way. Aircraft noise was also observed on-site from what is believed to be low-flying aircraft.
- 3.1.3 The immediate neighbours surrounding the site are residential properties north-west of the site and a restaurant ("Hampton Inn Table Table") south of the site.

3.2 Measurement methodology

- 3.2.1 Continuous, unattended noise level measurements were conducted at a single position within the car park of the site. The microphone is considered to have been placed in a reasonable approximation of free-field conditions, extended about 1m above the local ground level.
- 3.2.2 The measurement position along with the locations of sound sources and receptors can be seen on the satellite image in Figure 3-1 (overleaf).
- 3.2.3 Statistical and spectral octave-band data were recorded in 15-minute samples between 18:15 on Thursday 18th April and 12:45 on Wednesday 24th April 2024. The "fast" (125ms) time constant was used.
- 3.2.4 The data measured at this location are considered representative of the typical and lowest background sound levels experienced at nearby neighbouring properties, as well as noise levels incident to the facades of the proposed development.
- 3.2.5 Measurements were undertaken generally in accordance with the procedures advised within British Standard 4142 and British Standard 7445-1: 2003 *Description and measurement of environmental noise*.
- 3.2.6 The following equipment were used to carry out the measurements:

Type	Model	Serial no.
Class 1 sound level meter	Norsonic 131	1312766
Environmental microphone	Norsonic 1218	12182517
Portable calibrator	Norsonic 1251	34926

Table 3-1: Noise survey equipment

- 3.2.7 The calibration of the sound level meter and associated microphone were checked prior to and on completion of the survey in accordance with recommended practice. No significant drift in calibration occurred during the survey. The accuracy of the calibrator can be traced to National Physical Laboratory Standards.



Figure 3-1 Satellite image showing measurement position, noise sources and nearby noise-sensitive receivers.

3.3 Weather

- 3.3.1 Weather conditions throughout the survey are believed to have been mostly calm and dry, with the exception of Friday 19 April 06:00-18:00 where high wind speeds were recorded (according to data sourced from a nearby weather station at Boscombe Down, Salisbury). It should be noted that wind speeds at this level can affect measurements of the background sound level; data measured on this day have therefore been discounted, as the measured sound levels are not considered representative of the typical ambient sound climate. Measurement data outside of this time however are not believed to have been adversely affected by the weather, in the context of this assessment.

3.4 Results & commentary

- 3.4.1 Full measurement data are available on request. A summary of the key data is presented in this report.

- 3.4.2 A graph showing the noise level history is presented in Figure 3-2 (overleaf).
- 3.4.3 Based on the measured data, the lowest typical background sound levels expected to occur during the daytime and night-time at the nearest noise-sensitive properties are presented in Table 3-2.

Time	Lowest typical background sound levels
Daytime (07:00-23:00)	30 dB $L_{A90,15min}$
Night-time (23:00-07:00)	23 dB $L_{A90,15min}$

Table 3-2: Typical background sound levels obtained during the survey

- 3.4.4 Noise levels can be seen to have generally followed a diurnal pattern, falling to the lowest levels overnight and rising to the highest levels in the morning, as typical for sites that are exposed to road traffic noise.

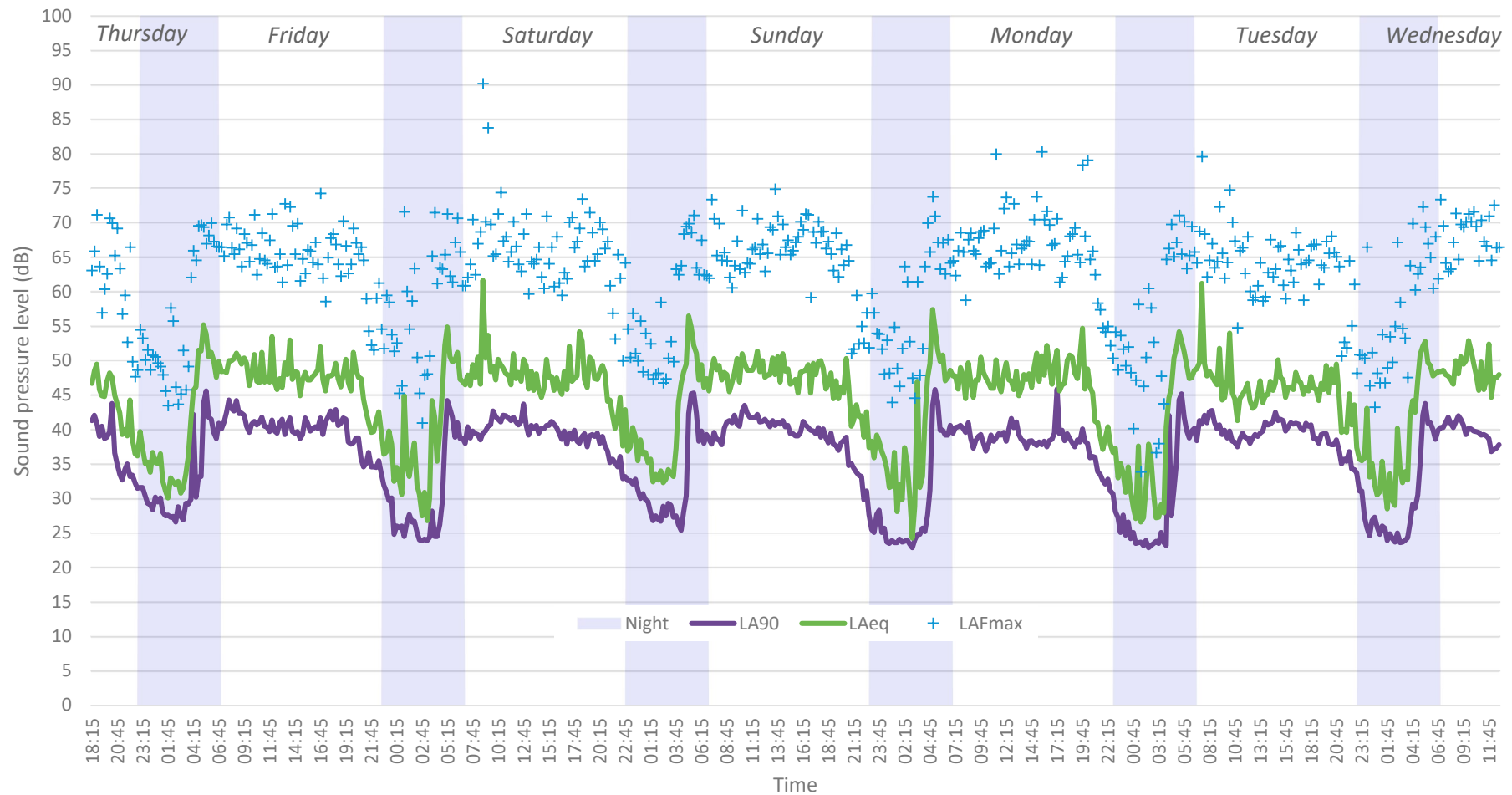


Figure 3-2 Measurement noise level history

4 Plant noise emission assessment

4.1 Plant noise emission limits

- 4.1.1 In order to achieve a “low impact” according to a BS 4142 assessment, the rating level of the proposed building services plant needs to be no greater than the background sound level at the existing neighbouring properties. The background sound level used should reflect the level that is typically expected to occur at different times during the day.
- 4.1.2 In order to represent a worst-case scenario, the lowest typical background sound levels obtained during the survey have been used to define the plant noise emission limits at the nearest noise-sensitive receivers (NNSRs). The following limits are based on the results of the noise survey, and are expected to satisfy the requirements of the Local Authority:

Time	Plant noise emission limits at NNSR
Day (07:00-23:00)	30 dB L_{Ar}
Night (23:00-07:00)	23 dB L_{Ar}

Table 4-1: Plant noise emission limits at nearest noise-sensitive receivers, based on measurement data

4.2 Plant proposals

- 4.2.1 Two outdoor condenser units (Mitsubishi PURY-EP200YNW-A2) and one heat pump unit (Mitsubishi Qton ESA30EH-25) are proposed to be installed at ground level at the south facing façade of the proposed extension. As these units will be located externally, they have been included within the noise emission assessment.
- 4.2.2 Additionally, new kitchen ventilation is proposed to be installed internally to serve a new breakfast room within the existing hotel. As this equipment is located internally, and ducted externally, noise is more readily controlled by the use of in-duct silencers / attenuators, and so has not been included within the noise emission assessment. It has been assumed that the ventilation equipment and associated silencers / attenuators will be selected so that the specific sound level at 1m from any atmosphere side termination is controlled to not exceed 50 dB L_{pA} externally. The kitchen ventilation system, and associated silencers / attenuators, can be reviewed in more depth during the detailed design stage, if necessary.
- 4.2.3 There is also a proposed internal plant room. However, noise from this plant room is expected to be sufficiently screened by the walls of the building itself. Hence the internal plant within this room have not been included in the noise emission assessment.
- 4.2.4 A drawing showing the location of the proposed external plant is shown in Figure 4-1.

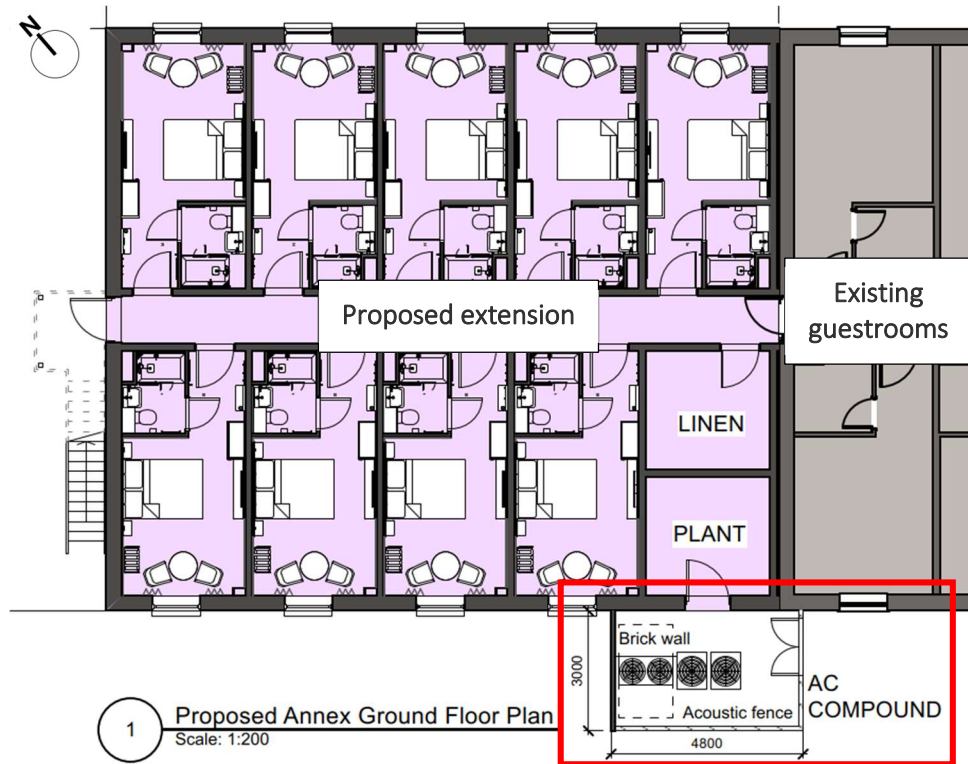


Figure 4-1: Site plan showing location of proposed plant (red box)

- 4.2.5 The air-conditioning equipment (2 No. Mitsubishi PURY-EP200 units) are able to be controlled to 70% duty during daytime (07:00 – 23:00) and to 50% duty overnight (23:00 – 07:00). The water heater (Mitsubishi Q-ton ESA30EH) is expected to be required to operate at normal duty anytime during a 24-hour period.
- 4.2.6 The sound power levels for the air-conditioning equipment and water heater have been provided by the manufacturer and are presented in Table 4-3. The equipment is noisier when operating in heating mode, so only the data for heating mode has been used in the assessment.

Unit	Highest noise levels in octave-band centre frequencies (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
PURY-EP200 70% duty	79	74	69	67	65	62	64	60	72
PURY-EP200 50% duty	75	68	60	59	56	53	57	55	63
Qton ESA30EH-25	42	47	48	54	60	56	52	44	63

Table 4-2 Manufacturer provided linear sound power levels (dB ref: 10^{-12} W)

- 4.2.7 The external units are to be placed within an enclosure. The north-west facing side of the enclosure is to be an imperforate brick wall, of at least 2.1m in height, to acoustically screen the NNSRs to the north-west of the plant. All other sides and lid of the enclosure are to be formed using a 150mm acoustic louvre. The sound reduction indices (SRI) of an example suitable louvre, in octave-band frequencies, are provided in Table 4-3.

Product	Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
CAICE SS150	4	4	6	8	11	11	11	10

Table 4-3 Sound reduction indices (SRI), in dB, of an example suitable product, measured in accordance with BS EN ISO 10140-2

- 4.2.8 Alternative louvre specifications / products are expected to be suitable, and should be subject to detailed design.

4.3 Nearest noise-sensitive receivers

- 4.3.1 The nearest noise-sensitive receivers (NNSRs) to the external plant area are considered to be the residential properties located on Bundy Lane and Cook Court. The nearest and most affected properties are highlighted in Figure 4-2 (overleaf).
- 4.3.2 The approximate distances between the plant and the assessment locations are presented in Table 4-4.

Plant	Assessment location	Approximate distance
External plant area	Bundy Lane residence	37m
	Cook Court residence	41m

Table 4-4: Approximate distance between plant area and assessment locations

- 4.3.3 The line-of-sight between the ground-floor external plant and all assessment locations will be obscured by the brick wall of the plant enclosure. Hence corrections owing to screening have been applied.
- 4.3.4 The noise impact to other neighbouring properties not identified in this report is expected to be less than that presented, due to the increased propagation distances. The assessment is therefore considered to be representative of a worst-case scenario.

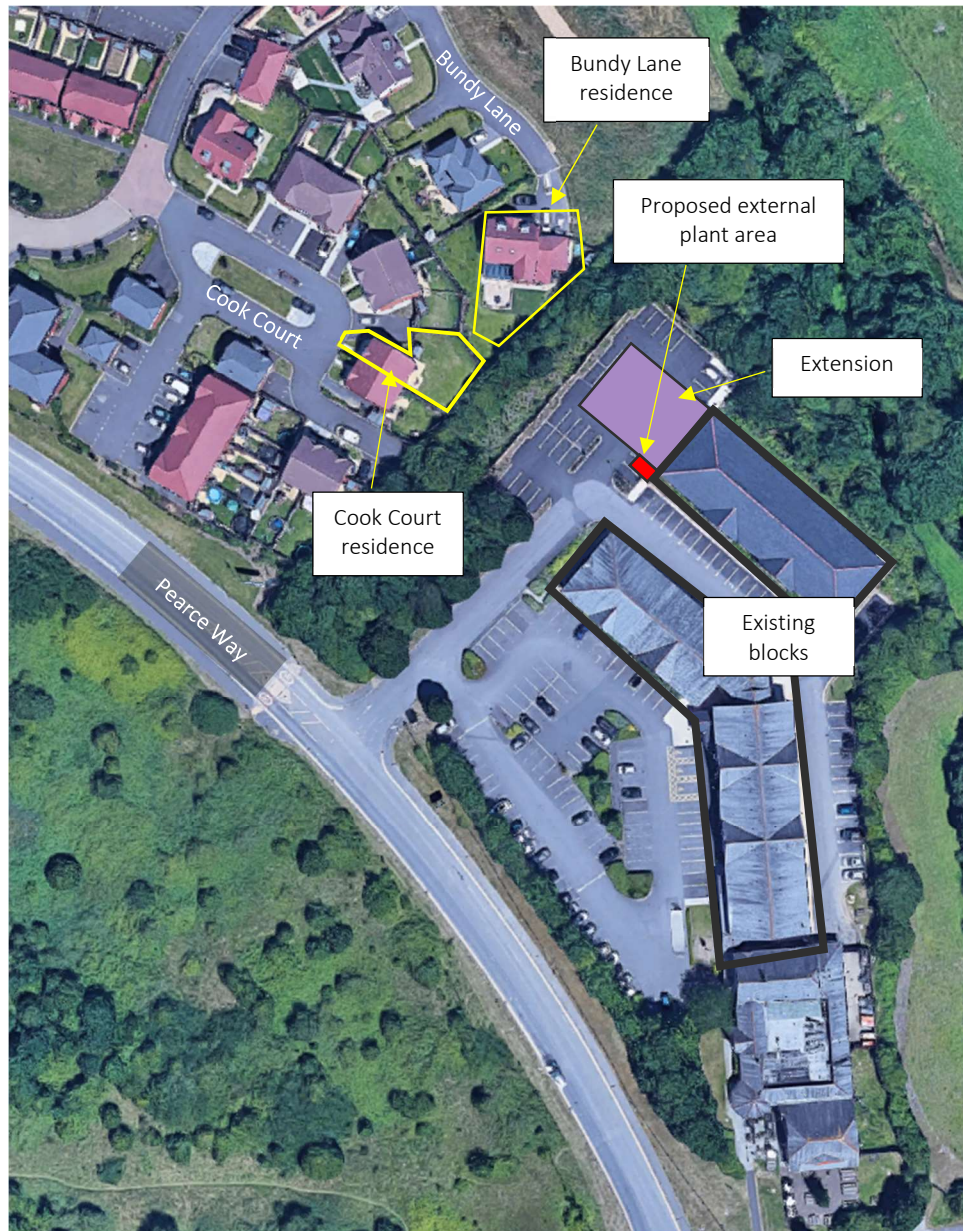


Figure 4-2 Satellite image showing proposed location of extension, external plant area, and nearest noise-sensitive receivers

4.4 Background sound levels

- 4.4.1 The noise levels at the measurement position are considered to be representative of the background sound levels experienced at all assessment locations.

4.5 Calculation methodology

- 4.5.1 The calculation of the specific sound level for each noise-sensitive receiver has been carried out in accordance with the general calculation methodology outlined in ISO 9613-2:2024, as per typical industry practice. Calculations have been made for each of the following means of attenuation, where considered to be relevant:

- **Geometric divergence** – which describes the reduction in sound pressure level as the distance from the source increases.
- **Screening** – which describes the attenuation provided when the line-of-sight between source and receiver is obscured by an impermeable object with a surface mass of at least 10 kg/m².
- **Specific attenuation measures** – such as acoustic louvres and attenuators.

4.5.2 The proposed plant enclosure has been included in the calculations, along with the proposed limited operating duties for the PURY air-conditioning units.

4.5.3 The guidance in BS 4142 requires that appropriate corrections be added to the *specific sound level* to account for certain acoustic characteristics that may indicate that the plant noise is more discernible. The corrected sound level is defined as the *rating level*. The following characteristics have been considered:

- **Tonality** – Noise from the proposed air-conditioning units will typically be airflow noise at maximum duty, which is broadband in character, and therefore not expected to contain tonal qualities. However, a precautionary +2 dB correction has been applied.
- **Impulsivity** – When properly maintained, noise from the proposed units is not expected to exhibit impulsive characteristics, therefore this correction has not been applied.
- **Intermittency** – The duty of each individual air-conditioning unit will adjust depending on the cooling/heating duty requested by the occupants. The equipment is, however, expected to operate with gradual stop/starts, so it is not expected that an intermittent characteristic would be experienced at the neighbouring properties. Despite this, a +3 dB correction has been applied to the specific sound level, as a precaution.
- **Other** – The units are not expected to emit any other characteristics that would be readily distinctive against the existing acoustic environment, therefore no correction has been applied.

4.5.4 The BS 4142 rating level will therefore be 5 dB higher than the specific sound level at the nearest noise-sensitive receivers.

4.6 Predicted noise levels at neighbouring properties

4.6.1 The specific sound level of the proposed plant at each assessment location is presented in Table 4-5 below, along with BS 4142 assessed impact.

Time	Noise limit	Receiver	Specific sound level	Rating level	BS 4142 assessment of impact
Daytime (07:00-23:00)	30 dB L_{Ar}	Bundy Lane residence	25 dB L_{pA}	30 dB L_{Ar}	Low
		Cook Court residence	24 dB L_{pA}	29 dB L_{Ar}	Low
Night-time (23:00-07:00)	23 dB L_{Ar}	Bundy Lane residence	18 dB L_{pA}	23 dB L_{Ar}	Low
		Cook Court residence	17 dB L_{pA}	22 dB L_{Ar}	Low

Table 4-5: Predicted plant noise levels at each assessment location

- 4.6.2 Noise emission from the proposed plant is hence expected to have a “low” impact on the neighbouring properties, based on the guidance presented in BS 4142. In addition, the limits stated in the Premier Inn Specification (regarding plant noise emission to neighbouring properties) are expected to be met based on the predicted noise levels calculated. This is consequently expected to comply with Wiltshire Council’s anticipated requirements.

4.7 Plant noise intrusion into hotel guestrooms

- 4.7.1 Given that the external plant is to be placed in an enclosure comprising a north-west facing 2.1m brick wall with all other sides and lid of the enclosure to be formed using a 150mm acoustic louvre of the specification in Table 4-3, it is expected that the Premier Inn criterion of NR20 L_{eq} (regarding plant noise intrusion into hotel guestrooms) will be met for all existing and proposed guestrooms.

5 External noise intrusion into hotel guestrooms

5.1 Reference noise levels

- 5.1.1 The highest noise levels obtained during the survey at each individual octave-band centre frequency are provided in Table 5-1 below, alongside the highest A-weighted values obtained during the survey. These can be used for calculating external noise ingress into the new hotel bedrooms. These levels are considered representative of a reasonable worst-case scenario.

Time	Highest noise levels in octave-band centre frequencies (Hz)								
	63 Hz	125	250	500	1k	2k	4k	8k	dB(A)
Daytime L_{eq} (07:00-23:00)	58	52	45	41	40	36	53	53	57
Night-time L_{eq} (07:00-23:00)	52	42	39	37	36	47	51	46	54
Night-time L_{Fmax} (23:00-07:00)	82	71	61	60	55	54	65	59	74

Table 5-1: Highest noise levels obtained during the survey (dB ref: 2×10^{-5} Pa)

- 5.1.2 Noise intrusion into the new guestrooms has been assessed using all of the measured data obtained during the external noise survey.
- 5.1.3 The level of noise intrusion into a space is a function of the volume and surface finishes of the space, and the sound insulation performance provided by the façade.

5.2 Recommended façade constructions

- 5.2.1 The recommended sound insulation performance of façade elements to achieve the criteria presented in Table 2-1 have been determined based on the ratio of glazing to solid façade, and the room sizes shown in the architectural drawings.

In order for the worst-case rooms to meet the requirements, the following specification for the opaque façade elements is recommended:

Façade element	Frequency (Hz)					
	125	250	500	1000	2000	4000
External walls	40	46	51	53	50	50
Bedroom windows	21	28	38	43	41	49

Table 5-2: Recommended opaque façade specification for worst-case rooms. All values are sound reduction indices in dB, measured in accordance with BS EN ISO 10140-2

- 5.2.2 The sound insulation performance for external walls is expected to be achieved with typical solid masonry constructions supplemented with internal plasterboard linings, and insulation in the cavity.

- 5.2.3 A suitable glazing configuration for the bedroom windows would be a double-glazed unit such as Abbey Glass' "LITE", comprising; 8.8mm acoustically laminated outer pane, 20mm airgap, 6mm laminated inner pane. Alternatively, their "URBAN" triple-glazed window would also be suitable, which comprises; 4mm outer pane, 16mm airgap, 8.8mm acoustically laminated central pane, 14mm airgap, 4mm inner pane.
- 5.2.4 Alternative façade constructions and glazing configurations may be suitable, so long as they achieve the internal noise level criteria in Table 2-1. it is also worth noting that glazing selections should account for framing losses.
- 5.2.5 Noise ingress via the ventilation openings to bedrooms is expected to be adequately controlled using the standard Premier Inn detail, which incorporates a 1m length of acoustically treated flexi-duct located internally on the atmosphere side terminations.

6 Conclusions

- 6.1 An external noise survey has been conducted at the site, and the measurement data have been used in conjunction with planning guidance from Wiltshire Council, industry standards (BS 4142) and Premier Inn's own criteria (Premier Inn Generic Specification for a Turnkey Development) to establish noise emission limits at nearby neighbouring properties.
- 6.2 A noise emission assessment has been undertaken of proposed new building services plant associated with the proposed extension, based on the manufacturer's data and the findings of the noise survey.
- 6.3 The proposed air conditioning equipment will be controlled so that the duties are restricted, to assist with satisfying the noise emission limits.
- 6.4 Noise emission from the proposed plant is expected to have a "low impact" on the neighbouring residential properties, based on the guidance presented in BS 4142. Predicted noise levels at the neighbouring properties due to the proposed plant are also below the limits established by the Premier Inn Specification. Noise from the proposed building services plant is therefore expected to satisfy Wiltshire Council's anticipated requirements.
- 6.5 Plant noise intrusion into hotel guestrooms has been assessed and the requirements stated in the Premier Inn Specification are expected to be met for all existing and proposed guestrooms.
- 6.6 External noise intrusion into hotel guestrooms bedrooms of the proposed new extension has also been assessed, and indicative façade specifications expected to meet the Premier Inn requirements have been provided.

Appendix A - Terminology

This appendix provides an explanation of some of the terms used in this report.

A-weighting L_A or L_{pA} , L_{WA}	Within its operating limits a precision measurement microphone measures all frequencies the same so the output it produces does not reflect what we would actually hear. The A-weighting is an electronic filter that matches the response of a sound level meter to that of the human ear. When A-weighted the Sound Pressure Level L_p becomes L_{pA} (or L_A) and the Sound Power Level L_W becomes L_{WA}.
L_p	<i>The instantaneous sound pressure level (L_p)</i>
L_{pA} (or L_A)	<i>The A-weighted instantaneous sound pressure level (L_{pA} or L_A). This is the root mean square size of the pressure fluctuations in the air. This level can fluctuate wildly even for seemingly steady sounds. To make sound level meters easier to read the values on the display are smoothed or damped out. This is effectively done by taking a rolling average of the previous 0.125s (FAST time constant) or the previous 1s (SLOW time constant).</i>
L_{AF} , L_{AS}	The letters F or S are added to the subscripts in the notation to indicate when the FAST or SLOW time constant has been used. These are often omitted but it is good practice to include them.
L_{max}	<i>The maximum instantaneous sound pressure level (L_{max}),</i>
L_{Amax}	<i>The A-weighted maximum instantaneous sound pressure level (L_{Amax})</i>
L_{AFmax}	<i>The A-weighted maximum instantaneous sound pressure level with a FAST time constant (L_{AFmax}).</i>
$L_{N,T}$	<i>The percentage exceedance sound pressure level ($L_{N,T}$),</i>
$L_{AN,T}$, $L_{AFN,T}$ N = %age value, 0-100 T = measurement time eg. L_{A90} , L_{A10} , L_{AF90} , 5 min	<i>The A-weighted percentage exceedance sound pressure level ($L_{AN,T}$), the A-weighted percentage exceedance sound pressure level with a FAST time constant ($L_{AFN,T}$). This is the sound pressure level exceeded for $N\%$ of time period T. e.g. If an A-weighted level of x dB is exceeded for a total of 6 minutes within one hour, the level will have been above x dB for 10% of the measurement period. This is written as $L_{A10,1hr} = x$ dB. L_{A0} (the level exceeded for 0 % of the time) is equivalent to the L_{Amax} and L_{A100} (the level exceeded for 100 % of the time) is equivalent to the L_{Amin}. It is good practice to include the letter which identifies the time constant used as this can make a significant difference to the value.</i>
$L_{eq,T}$	<i>The equivalent continuous sound pressure level over period T ($L_{eq,T}$),</i>
$L_{Aeq,T}$ T = measurement time eg. $L_{Aeq,5min}$	<i>The A-weighted equivalent continuous sound pressure level over period T ($L_{Aeq,T}$). This is effectively the average sound pressure level over a given period. As the decibel is a logarithmic quantity the L_{eq} is not a simple arithmetic mean value. The L_{eq} is calculated from the raw sound pressure data. It is not appropriate to include a reference to the FAST and SLOW time constants in the notation.</i>

