



29 Castle Street

Reading

Noise Impact Assessment Report

22 May 2026

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SUMMARY

New items of roof plant and an external terrace are proposed at roof level as part of the refurbishment of 29 Castle Street in Reading.

auricl has been undertaken an assessment of noise emissions associated with the proposed plant and terrace.

A background noise survey has been undertaken to determine background noise levels at the nearest noise sensitive properties, against which the potential noise emissions can be compared.

The results of the assessment show that noise emissions associated with the relocated plant are not predicted to exceed the proposed noise limits at the nearest noise sensitive properties and therefore achieve the Reading Borough Council requirement.

Noise emissions associated with the proposed terrace are predicted to correlate with a negligible noise impact, when compared with the IEMA noise impact assessment guidelines.

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1.0 Introduction

It is proposed to relocate existing plant items and create a new roof terrace at 29 Castle Street in Reading.

auricl has been appointed to carry out an assessment of noise emissions associated with the relocated plant and proposed terrace.

The following report presents the methodology and results of the survey, and an assessment of noise emissions associated with the proposals.

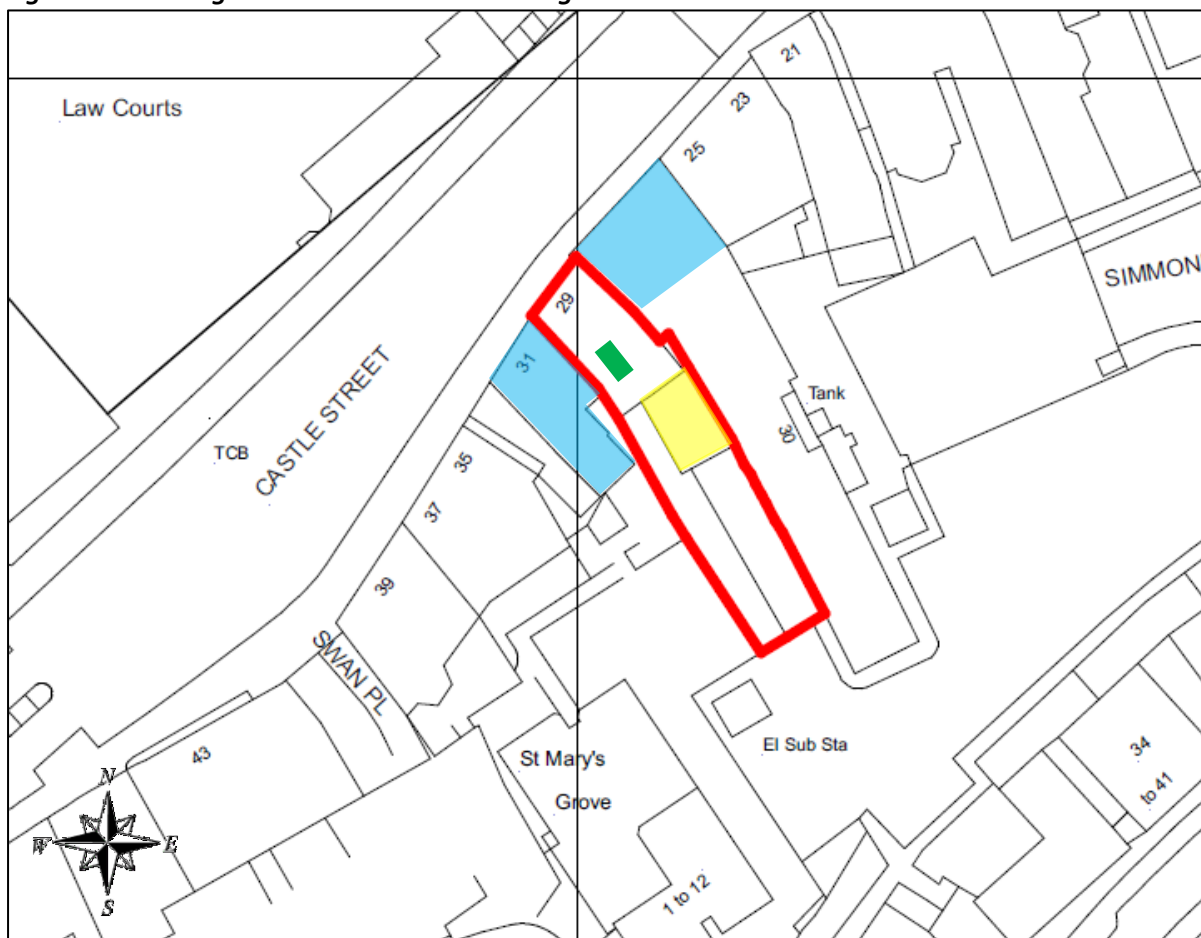
The report is technical in nature, and such, a summary of noise units and acoustic terminology are included in Appendix A for reference.

2.0 Description of Site and Proposals

The site is occupied by a commercial office building on the south-eastern side of Castle Street in central Reading and is bounded by commercial/residential buildings to the north-east and south-west, with external car parking and further residential properties to the south-east.

Figure 2.1 shows the approximate existing site extent in **red** in relation to the surrounding area, with the approximate proposed plant location indicated in **green**, the proposed terrace location indicated in **yellow** and the nearest noise sensitive properties indicated in **blue**.

Figure 2.1 Existing Site Extent and Surroundings



The maximum occupancy of the terrace area would be 20 people, with the proposed usage hours being 09:00 – 19:00 hours, Monday to Friday.

3.0 Noise Impact Assessment Criteria

A noise survey and noise assessments have been undertaken to address the following.

3.1 Plant Noise

Reading Borough Council's typical requirements relating to external building services plant noise emissions are as follows:

"No mechanical plant shall be installed until a noise assessment of the proposed mechanical plant has been submitted and approved by this Council. The assessment shall be carried out in accordance with the relevant recommendations of appropriate British Standards or other recognised Codes of Good Practice. The predicted rating level, $L_{A,r,T}$ (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to sensitive facades shall be at least 10dB below the existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation. The plant shall only be installed in accordance with the assessment and shall thereafter be maintained so that it operates to the same standard."

3.2 Terrace Noise

We are not aware of any British Standards, legislation or codes of practice which provide methodologies or criteria for assessing the noise impact of external terraces.

As such, we have considered the criteria shown in Table 3.1, which are based on the IEMA document "Guidelines for Environmental Noise Impact Assessment" (November 2014).

Table 3.1 Noise Impact Assessment Criteria

Noise Level Change (dB, L_{Aeq})	Noise Impact
< 3	Negligible
3 – 5	Moderate
5 – 10	Substantial
> 10	Very Substantial

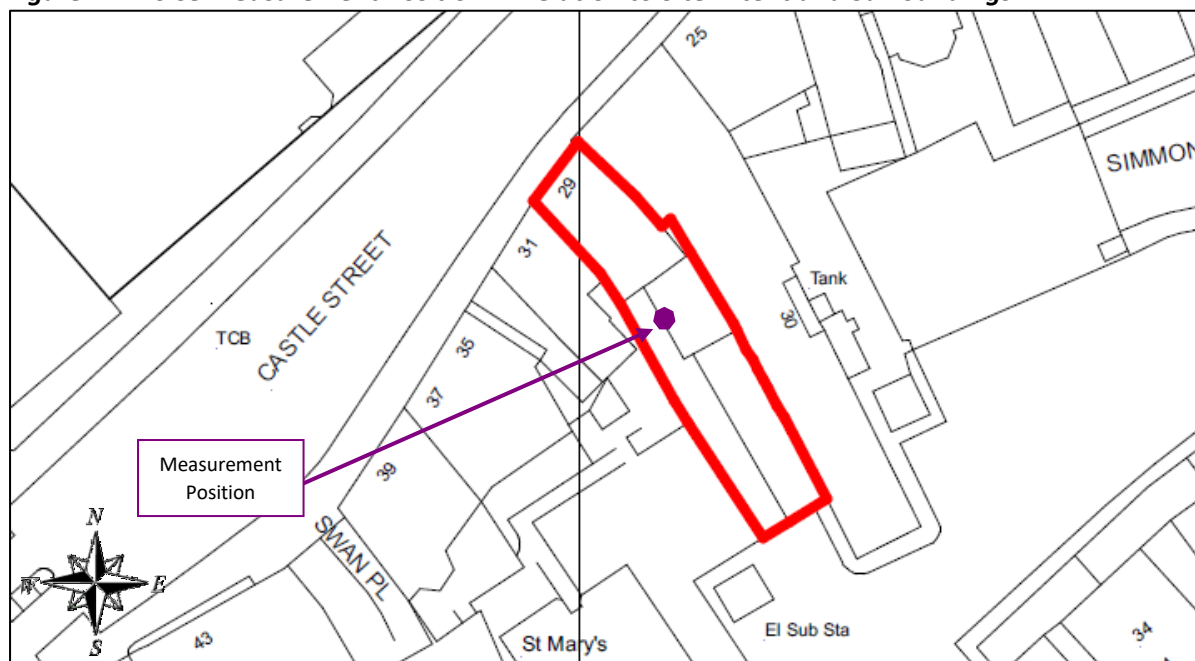
4.0 Noise Survey Methodology and Results

4.1 Methodology

An unmanned environmental noise survey was undertaken between Monday 18 May 2026 and Wednesday 20 May 2026. The noise survey period was selected to assess existing ambient and background noise levels at the nearest noise sensitive properties during the proposed operating periods.

The measurement microphone was attached to a railing on the south-western side of the roof in free-field, as indicated in **purple** on Figure 4.1.

Figure 4.1 Noise Measurement Position in Relation to Site Extent and Surroundings



The measurement position was selected as being representative of ambient and background noise levels at the nearest noise sensitive properties.

The existing plant items (to be relocated as part of the proposals) were not operational during the noise survey period.

The equipment used for the noise survey is summarised in Table 4.1.

Table 4.1 Description of Equipment used for Noise Survey

Item	Make & Model	Serial Number
Type 1 automated logging sound level meter	Norsonic 140	1406015
Type 1 ½" microphone	Norsonic 1225	168230
Calibrator	01dB CAL21	34375252

L_{Aeq} and L_{A90} sound pressure levels were measured throughout the noise survey over contiguous 15-minute periods.

Due to the nature of the noise survey, i.e. unmanned, we are unable to comment on the weather conditions throughout the entire noise survey period. However, at the beginning and end of the survey period, there was a clear sky, low wind speeds and generally sunny conditions. Weather conditions are not expected to have had any effect on measured noise levels and are considered appropriate for undertaking environmental noise measurements.

The noise monitoring equipment was calibrated before and after the noise survey period. No significant change was found. Laboratory equipment calibration certificates can be provided upon request.

4.2 Noise Survey Results & Observations

Appendix B presents a time history graph showing the measured L_{Aeq} and L_{A90} sound pressure levels measured throughout the noise survey (shown as 15-minute periods).

Table 4.2 presents the typical measured ambient and background noise levels for the periods when the plant and terrace are proposed to be operational (09:00 – 19:00 hours).

Table 4.2 Typical Measured Ambient and Background Noise Levels – Daytime (09:00 – 19:00 hours)

Typical Ambient Noise Level L_{Aeq} (1 hour) (dB)	Typical Background Noise Level L_{A90} (1 hour) (dB)
55	52

The daytime noise climate at the site was noted to be affected by distant road traffic and typical urban ambient noise.

We would consider the levels measured to be reasonable, taking into account the location of the measurement position and the dominant noise sources.

5.0 Plant Noise Assessment

5.1 Nearest Noise Sensitive Properties

The nearest noise sensitive properties to the relocated plant are noted to be the top floor residential apartments in the buildings to the north-east and south-west of the site at 27 and 31 Castle Street respectively, as indicated on Figure 2.1 above.

5.2 Plant Noise Limit

Based on the typical measured background noise level presented in Section 4.2 and the Reading Borough Council standard requirements outlined in Section 3.1, the noise limit for plant noise emissions when measured 1m from the façades of the nearest noise sensitive property is 42 dB (09:00 – 19:00 hours).

5.3 Relocated Plant

Five condenser units are currently located on the existing second floor level roof and are proposed to be relocated to a plant area on the main roof, in the location indicated on Figure 2.1.

The existing units and manufacturer's noise data are as follows:

Fujitsu AOY14AZAL	70 dB L_{WA} sound power level (estimated)*
Daikin RZQSG100L8Y1B	70 dB L_{WA} sound power level
Daikin RY100AY1	70 dB L_{WA} sound power level (estimated)*
Daikin RXS50E3V1B (2No)	48 dB L_{pA} at 1m sound pressure level (each)

* Where manufacturer's noise data is not available, conservative estimates have been made

A plant screen is to be constructed around the plant items, up to a height at least 500mm taller than the tallest plant item.

Examination of the manufacturer's octave band noise data (in accordance with the methodology described in Annex C of BS 4142: 2014) confirmed that the noise is not tonal. The plant will not operate intermittently and is not expected to be impulsive in nature.

The condenser units are proposed to operate from 09:00 – 19:00 hours on weekdays.

5.4 Plant Noise Assessment

We have undertaken calculations to predict noise emissions associated with the relocated plant at the nearest noise sensitive properties.

The plant noise calculations at the nearest noise sensitive properties are presented in Tables 5.1 and 5.2 below.

Table 5.1 Plant Noise Calculations – 27 Castle Street

Element	Level (dB)			
	Fujitsu AOY14AZAL	Daikin RZQSG100L8Y 1B	Daikin RY100AY	Daikin RXS50E3V1B
Source Sound Level	70	70	70	48
Quantity Correction	0	0	0	+3
Screening Attenuation	-14	-14	-14	-14
Distance Attenuation	-22	-22	-22	-17
Plant Noise Level at Noise Sensitive Property	31	31	31	20
TOTAL Plant Noise Level at Noise Sensitive Property	36			
Noise Limit	42			

Table 5.2 Plant Noise Calculations – 31 Castle Street

Element	Level (dB)			
	Fujitsu AOY14AZAL	Daikin RZQSG100L8Y 1B	Daikin RY100AY	Daikin RXS50E3V1B
Source Sound Level	70	70	70	48
Quantity Correction	0	0	0	+3
Screening Attenuation	-15	-15	-15	-15
Distance Attenuation	-18	-18	-18	-10
Plant Noise Level at Noise Sensitive Property	37	37	37	26
TOTAL Plant Noise Level at Noise Sensitive Property	42			
Noise Limit	42			

The results show that noise emissions associated with the proposed plant are not predicted to exceed the proposed noise limits at the nearest noise sensitive properties and therefore achieve the Reading Borough Council requirement.

6.0 Terrace Noise Assessment

6.1 Basis of Assessment

As described above, the maximum occupancy of the roof terrace area would be 20 people, with the proposed usage hours being 09:00 – 19:00 hours, Monday to Friday. Likely activities on the terrace would be conversations, telephone calls, etc. with no amplified music proposed.

Our assessment has assumed a worst-case maximum occupancy of 20 people during a typical daytime hour, with half of the occupants (10) talking at normal vocal effort.

Our calculations have taken into account an approximate distance of 5m from the terrace to the nearest noise sensitive properties.

A sound power level for speech at normal level of 68 dB L_{WA} (per person) has been used as the basis of the assessment, taken from “*Acoustic Design of Schools: A Design Guide*” (November 2015).

In our assessment of noise due to users of the terrace, we have considered the typical existing daytime ambient noise level presented in Table 4.2.

6.2 Predictions

Our noise impact calculations are shown in Table 6.1.

Table 6.1 Terrace Noise Calculations

Element	Level (dB)	
	27 Castle Street	31 Castle Street
Sound Power Level	68	68
Quantity Correction	+10	+10
Distance Attenuation	-25	-25
Predicted Noise Level at Receptor	53	53
Existing Ambient Noise Level	55	55
Total Future Noise Level	57.1	57.1
Predicted Noise Level Difference	+2.1	+2.1

It can be seen that the predicted noise level difference due to guests on the external terrace correlates with a negligible noise impact, when compared with the IEMA criteria described in Section 3.2 above.

Appendix A – Acoustic Terminology

Parameter	Description
Decibel (dB)	A logarithmic scale representing the sound pressure or power level relative to the threshold of hearing (20×10^{-6} Pascals).
Sound Pressure Level (L_p)	The sound pressure level is the sound pressure fluctuation caused by vibrating objects relative to the threshold of hearing.
A-weighting (L_A or dBA)	The sound level in dB with a filter applied to increase certain frequencies and decrease others to correspond with the average human response to sound.
L_{Amax}	The A-weighted maximum noise level measured during the measurement period.
$L_{Aeq,T}$	The A-weighted equivalent continuous noise level over the time period T (typically T= 16 hours for daytime periods, T = 8 hours for night-time periods). This is the sound level that is equivalent to the average energy of noise recorded over a given period.
L_{A90} (15 min)	The noise level exceeded for 90% of the time (also referred to as the background noise level), measured over a 15-minute period

Appendix B – Time History Graph

