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5 Broadwater West Worthing, BN14 9AA

Post Construction Testing

March 2025

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ii. Document History

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AC20094.02.00	0	Noise Impact Assessment	03/03/25	BG	DG
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iii. Credentials

Acoustic survey and assessments were undertaken by Ben Groves BSc (Hons) MSc MIOA. Ben has been involved with acoustic consultancy for over ten years and has a Masters degree in environmental acoustics and is a corporate member of the Institute of Acoustics (MIOA).

The report was authorised by David Gnanaseharam BSc (Hons) MSc MIOA. David has been involved with acoustic consultancy (including sound insulation testing and noise impact assessments) for over fifteen years and has a Masters degree in Acoustics from the University of Surrey and is a corporate member of the Institute of Acoustics (MIOA).

In addition, they are both is fully accredited under the Sound Insulation Testing and Measurement Association (SITMA) scheme. SITMA is a professional association for the Acoustic Consultancy industry and operates a registered testers scheme providing 3rd party accreditation to testing companies, ensuring that all companies operate to a high standard.

SITMA also holds UKAS Accreditation to ISO 17024:2012.

1. Introduction

Trace has been appointed by Ganco Assets to provide acoustic consultancy services to assist in discharging planning condition associated with residential development at 5 Broadwater Road, West Worthing (The Property).

An assessment is required at The Property to establish that suitable façade elements have been installed to protect residents form external noise break-in.

NOTICE/0022/23 issued by Worthing Borough Council provides the following stipulation:

> "The assessment shall include a scheme for protecting the proposed noise sensitive development from external commercial noise. The scheme shall achieve the indoor ambient noise levels for dwellings specified in BS:8233:2014. Following approval of the scheme and prior to first occupation of any dwelling unit, a test shall be undertaken and the results submitted to the local planning authority to demonstrate that the attenuation measures proposed in the scheme are effective and protect the residential unit from noise"

An initial site survey was conducted in order to specify facad elements. These details can be found in Trace Report Document reference: AC20095.01.01. This initial survey measured worstcase façade noise level on Broadwater Road. These levels were used to specify façade elements for the whole development.

The focus of this assessment will be to discharge the above condition. While no sensitive spaces within the deveopent directly overlook Broadwater Road, the most noise effected room within The Property was used as the internal assessment location.

2. Relevant Standards and Guidance

The primary standards used in the preparation of this document are as follows:

- British Standard (BS) 7445: 2003 *Part 1 Description and measurement of environmental noise. Guide to quantities and procedures*
- British Standard (BS) 8233:2014 *Guidance on sound insulation and noise reduction for buildings*
- Noise Policy Statement for England (NPSE)
- Professional Practice Guidance on Planning & Noise (ProPG)

3. Site Description

3.1. Site Description

The Property is in the administrative region of Worthing Borough Council. The area immediately around The Property is predominantly commercial with local shops bars, and restaurants along Broadwater Road. The local noise climate is dominated by noise from traffic on Broadwater Road.

To assess the impact of external noise, a unit was housed externally, and sample measurements were completed within the bedroom of the flat overlooking the adjacent commercial property. No areas within the first floor dwellings overlook Broadwater Road.

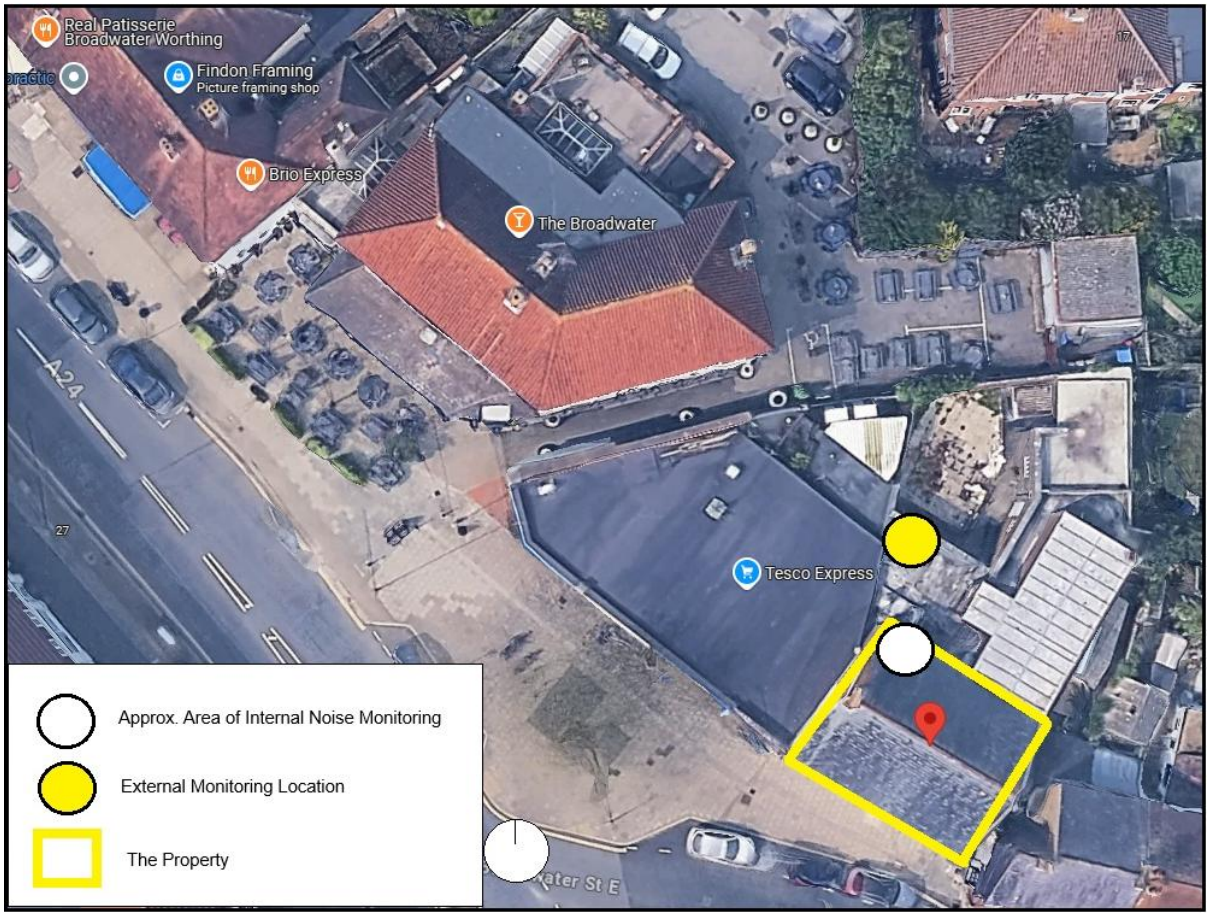

Figure 3.1: Site location

4. Project criteria

4.1. External Façade Requirements

British Standard 8233:2014 *Guidance on sound insulation and noise reduction for buildings* (BS8233:2014) provides guidance on the acceptable levels of noise within buildings of different types, these levels are based on World Health Organisation (WHO) guidelines.

In the case of residential developments, BS 8233:2014 recommends ambient noise levels in living accommodations. The document states that "*in general, for steady external noise sources, the internal ambient noise level shouldn't exceed the guideline values…"* recommendations from BS8233 are reproduced in Table 4.1 below.

Activity	Location	Day-time 07:00-23:00	Night-time 23:00-07:00
Resting	Living room	35 dB $L_{Aeq, 16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq, 16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16hour}$	30 dB $L_{Aeq, 8hour}$

Table 4.1 Indoor ambient noise levels for dwellings

A specific maximum L_{AFmax} value is not given by BS 8233:2014. Based on commonly applied criteria, we propose that for bedrooms at night, individual noise events should not normally exceed 45 dB L_{AFmax}.

5. Environmental Noise Survey

5.1. Survey Details

An unattended external acoustic survey was carried out by Trace between 14:00 on Tuesday, 11 February, and 14:00 on Wednesday, 10 February 2025. The external microphone was located on the façade of a property overlooking the commercial parts of the neighbouring area. However, this area was still dominated by road traffic. Internal measurements were taken in the bedroom overlooking this part of The Property. The bedroom windows were closed, with trickle vents open.

The sound level meters were set to concurrently log and store consecutive 15-minute L_{Aeq}, L_{Amax}, and L_{A90} sound levels. The internal levels captured over the first 1 hour period were compared to the external levels to establish the mitigation provided by the glazing and ventilation systems.

The level difference (DnT) was determined using a one-hour internal measurement period while external levels were continuously recorded over 24 hours. This approach is justified as the acoustic insulation provided by the building envelope remains consistent over time, meaning the measured level difference is representative of the building's overall performance. Since both internal and

external locations were exposed to the same road traffic noise source, any variations in external levels would result in proportional changes to internal levels, ensuring the validity of the calculation.

During the noise survey, the external microphone was protected with a windshield and positioned at first-floor level overlooking The Broadwater PH. Measurements were undertaken in general accordance with BS 7445-2:2003 '*Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*. Levels have been measured in free-field conditions and are expected to be representative of the worst affected façades.

Weather conditions during the day survey were generally cold and overcast; however, there was no precipitation for the 24-hour duration of the survey. The wind speeds varied but were less than 5m/s. Weather is not expected to have had a detrimental effect on the collection of acoustical data.

The sound level meter had calibration checks before and after the measurement surveys to generate a calibration level of 94 dB at 1 kHz. The equipment calibration was verified before and after the survey and no significant calibration drift was observed (<0.5dB). The microphone was fitted with a windshield. The sound level meter used during the survey was compliant with the Class 1 standard as required by BS EN 61672-1:2013 *Electroacoustics. Sound level meters. Specifications*. This is the most scientifically accurate form of sound level meter that is available.

The equipment used is shown in Table 5.2 and 4.2 for the external and interal measurement units, respectively.

Description	Name	Serial Number	Calibration Due
Sound Level Meter	Svantek 971	154221	06/01/2026
Calibrator	Rion NC-75	34935217	01/12/2025

Table 5.1 – Equipment Details External Measurements

Description	Name	Serial Number	Calibration Due
Sound Level Meter	Norsonic 131	1312729	18/11/2026
Calibrator	Rion NC-75	34935217	01/12/2025

Table 5.2 – Equipment Details Internal Measurements

All noise equipment has been calibrated to traceable standards within the preceding two years and the acoustic calibrator within the preceding 12 months. Calibration certificates for all equipment used in the survey are available upon request.

5.2. Survey Results

The first 1 hour of internal and external measurements were compared, which is presented in Table 4.2. Both internal and external measurements were driven by the same external noise sources.

Measurement period	External Level (dB$L_{Aeq,1hour}$)	Internal Level (dB $L_{Aeq,1hour}$)	Level Difference
$L_{Aeq,1hour}$	53	26	-27 dB

Table 5.3 Summary of internal and external measurement comparison

This correction can be applied to the recorded external noise level measurements to determine the internal ambient noise levels resulting from the installed glazing and ventilation systems. These figures are presented in Table 5.4, below.

	Measured Noise Levels (dB re 2.0 x 10^{-5} Pa)			
Measurement period	**L_{Aeq}**	**L_{Afmax}**	**L_{A10}**	**L_{A90}**
Daytime (07:00 - 23:00)	28	53	29	22
Night-time (23:00 - 07:00)	24	44	25	15

Table 5.4 Summary of extrapolated internal noise level measurement results

As shown in Table 4.4 the prevailing daytime $L_{Aeq,16hour}$ within The Property is expected to be 28 dB. The nighttime sound level within the Property is expected to be 24 dB $L_{Aeq,8hr}$ with typical maximum sound levels below 45 dB $L_{Amax,15min.}$

It is therefore expected, based on measurement, that the internal ambient noise levels within The Property will be within the levels prescribed by BS8233:2014.

These levels demonstrate compliance with the requirements of BS8233:2014.

6. Conclusions

Trace has been appointed by Ganco Assets to provide acoustic consultancy services to assist in discharging planning condition associated with residential development at 5 Broadwater Road, West Worthing (The Property).

An assessment is required at The Property to establish that suitable façade elements have been installed to protect residents form external noise break-in.

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The sound level meters were set to concurrently log and store consecutive 15-minute L_{Aeq}, L_{Amax}, and L_{A90} sound levels, and the internal levels captured over the first 1 hour period were compared to the external levels to establish the mitigation provided by the glazing and ventilation systems.

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Appendix A Figures

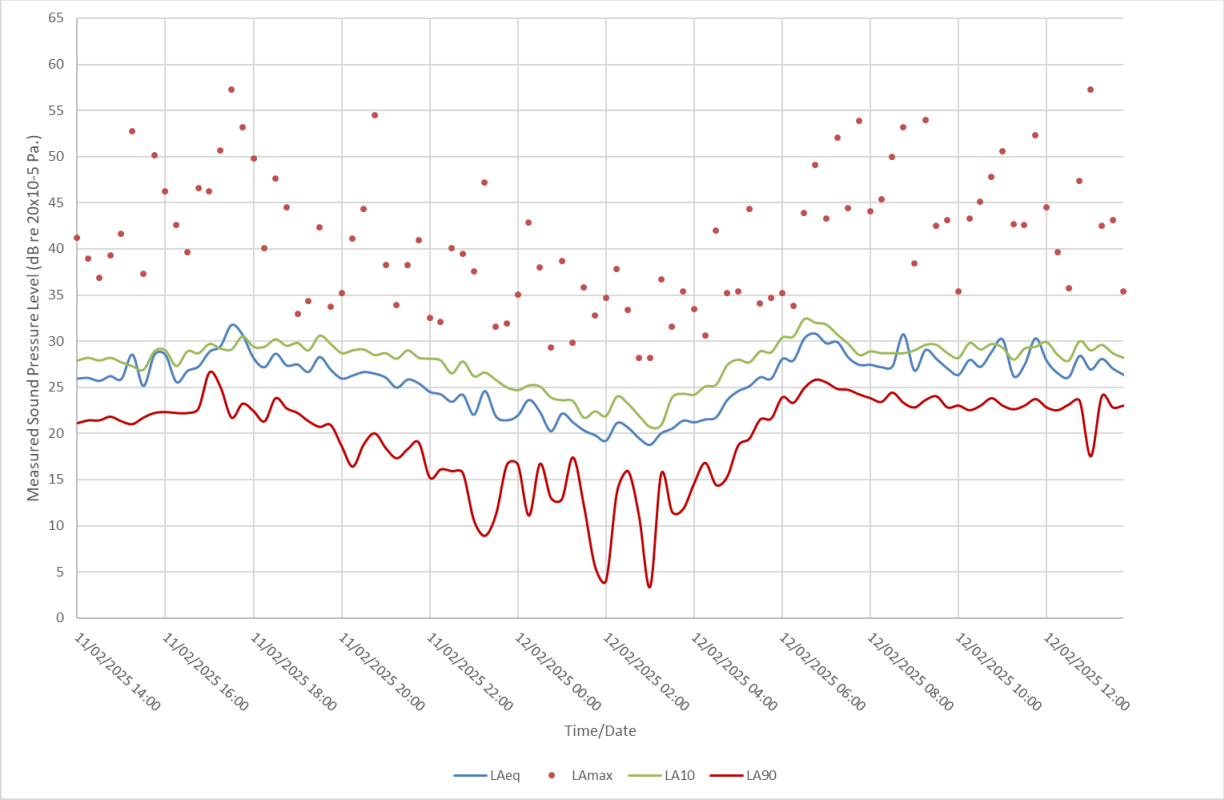

Figure A.1 Extected internal ambient noise levels resulting from external sources



Figure A.2 External monitoring position



Figure A.3 Area of Internal monitoring position



Figure A.4 Trickle Vents open