



**Proposed mixed use development,
82-84 Westbourne Road, Huddersfield**

Noise Assessment Report

Document ref. 03918-120100

27/04/2026

On behalf of
Mailingg Ltd

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1.0 INTRODUCTION

- 1.1 Blue Tree Acoustics has been appointed by Mailingg Ltd to carry out an assessment of existing noise levels at the site of a proposed mixed use development at 82-84 Westbourne Road, Huddersfield.
- 1.2 The development site is situated in Huddersfield on Westbourne Road, and currently comprises a disused carpet shop.
- 1.3 The proposal is to refurbish the ground floor shop area and create 2no dwellings above the retail use.
- 1.4 The character of the surrounding area is a mixture of existing commercial and residential uses.
- 1.5 The noise impact assessment has included:
 - a) Inspection of the site and surroundings.
 - b) Review of outline drawings of the proposed development provided by the Client's architect.
 - c) Noise monitoring surveys undertaken on the site during daytime and nighttime.
 - d) Evaluation of the site in accordance with relevant planning policy guidance.
 - e) Consideration of noise control measures required to maintain acceptable noise levels within the proposed bedrooms and living rooms in accordance with *British Standard 8233: 2014*, 'Guidance on sound insulation and noise reduction for buildings' (BS8233).
- 1.6 A glossary of technical terminology and parameters used in this report is provided in Appendix 1.

2.0 EXISTING NOISE SOURCES

Road traffic

- 2.1 Westbourne Road is the main noise source in the area, and it is situated approximately 5m away from the development site.
- 2.2 Westbourne Road is busy during daytime hours, and continues to be used frequently into the night. Westbourne Road has a bus stop on each side of the road in close proximity to the site, with buses running multiple times per hour throughout the day until around midnight, and starting again at around 0520 hours.
- 2.3 Noise from road traffic movements dominates the sound level measurements made at Location 1, but any externally made noise associated with commercial operations are also included in the measurements.

Commercial

- 2.4 As Westbourne Road is a commercial hub, there are various cafes, shops, takeaways, etc. in the vicinity. Noise from these locations is not dominant at the site, but any noise generated is included in the Location 1 measurements.
- 2.5 The site is proposed to accommodate 2no shops at ground floor level. There is a possibility for the noise from the shops to be audible in the flats above.
- 2.6 The proposed ground floor level shop units are unlikely to have significant noise levels within them. The residential part of the development would be subject to Building Regulations, which would require a minimum sound insulation performance across the separating structures. We understand that the Client's architect has taken responsibility for designing sound insulation from the commercial units and between the dwellings, so this is not considered within our report.

3.0 NOISE SURVEY

- 3.1 Noise monitoring has been undertaken by Blue Tree Acoustics in order to determine the existing ambient noise climate at the site. Measurements were taken during representative daytime and nighttime survey periods.
- 3.2 Largely unattended logging noise measurements were taken at Location 1 within the development site building, between Monday 13/04/2026 and Wednesday 15/04/2026.
- 3.3 Figure 1 marks the measurement location. Figure 2 shows the site location plan. Figure 3 reproduces the proposed floor layouts.
- 3.4 The instrument used for the noise survey was 1no Rion NL-52 Type 1/Class 1 integrating sound level meter. The meter was within a valid period of laboratory calibration. A proprietary environmental windshield was fitted to the microphone, which was positioned through a 1st floor level window facing Westbourne Road. The microphone of the instrument was located at 1st floor level, at 1m distance from the building façade facing Westbourne Road. Calibration checks were carried out both before and after the measurements, with minimal variance observed and all values being within 0.1dB of the stated value.
- 3.5 The noise measurement results are detailed in Appendix 2 and summarised in the following table. Road traffic was the dominant noise source witnessed at the development site.

Table 1: Measured free-field external noise levels at Location 1, based on 1-minute measurements

Period	dB L _{Aeq}	dB L _{Amax}	dB L _{A10}	dB L _{A90}
Daytime	56 - 81	65 - 103	60 - 82	39 - 71
Nighttime	29 - 75	34 - 86	30 - 78	26 - 68

- 3.6 The L_{A10} and L_{A90} values are provided for the sake of completeness, but they are meaningless given the 1-minute logging measurement periods; 1-minute logging was selected as L_{Aeq} values can be calculated, and L_{Amax} values at night can be established.
- 3.7 The average daytime ambient noise level is 68dB L_{Aeq} free-field. The average ambient nighttime noise level is 65dB L_{Aeq} free-field.

- 3.8 No noise survey periods have been deleted excluded from the dataset for adverse weather conditions. There are 3no short rainfall events visible in the weather data, but these have not significantly affected noise levels. Weather conditions throughout the survey periods were generally dry and calm, with wind speeds <5m/s. Archival weather data from a nearby weather station is presented in Appendix 3.

4.0 NOISE ASSESSMENT

- 4.1 The proposed development has planning permission under the decision notice for application ref. 2024/62/92848/W dated 13/02/2026. This permission has 2no noise conditions relating to the design of the development.

“3. Before construction work commences, a noise assessment report by a suitably competent person shall be submitted to and approved in writing by the Local Planning Authority. The report shall include:

- a) an assessment of all noise emissions from the proposed development*
- b) details of existing background and predicted future noise levels at the boundary of the nearest noise sensitive premises*
- c) a written scheme of how the occupants of the above-mentioned noise sensitive premises will be protected from noise from the proposed development including details of all necessary noise attenuation*

The development shall not be brought into use until all works comprised within the measures specified in the approved report have been carried out in full and such measures shall be thereafter retained.

Reason: To ensure the proposed development does not cause harmful noise pollution within neighbouring noise sensitive locations, in the interest of amenity, to comply with the aims and objectives of Policies LP24 and LP52 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning Policy Framework.

4. *Before the development is brought into use written evidence to demonstrate that the airborne sound insulation performance of the party floors/walls/ceiling of the development is of a minimum of 55dB DnTw + Ctr shall be submitted to and approved in writing by the Local Planning Authority. If it cannot be demonstrated that the aforementioned airborne sound insulation performance has been achieved, a scheme incorporating further measures to achieve the sound insulation performance shall be submitted to and approved in writing by the Local Planning Authority. All works comprised within those further measures shall be completed and further written evidence to demonstrate that the aforementioned sound insulation performance level has been achieved shall be submitted to and approved in writing by the Local Planning Authority before the development is first brought into use.*

Reason: To protect the amenity of occupiers of the proposed development from noise or disturbance from nearby noise generating premises to accord with the aims of Policies LP24 and LP52 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning Policy”

- 4.2 The ground floor unit is currently a shop, and the proposal is for the ground floor space to become 2no shops of Use Class E(a) and for the 1st floor level areas to become dwellings. As such, there is no noise emission assessment required here. The assessment is that there will be no

high levels of noise, that noise-sensitive areas will not be affected, and that no noise mitigation measures are required. For the sake of completeness, it is prudent to ensure that the shops do not play foreground music and that any music playing in the shops is limited to 60dB(A). The shops should have no external mechanical services plant or extracts. This will ensure that there is no noise impact, thus satisfying Condition 3.

- 4.3 Condition 4 requires a minimum sound insulation performance of $55\text{dB } D_{nT,w} + C_{tr}$, which is presumed to relate to the separating floor between the new dwellings and the shops. A performance of $55\text{dB } D_{nT,w} + C_{tr}$ represents a high level of sound insulation, and it is 12dB higher than the minimum Building Regulations requirements. BS8233 proposed $55\text{dB } D_{nT,w}$ between sensitive rooms and very high activity source levels. Firstly, this is not $D_{nT,w} + C_{tr}$; secondly, a shop is not a very high activity source level. As such, this level of protection is very high and may be difficult to achieve. However, Condition 4 is not the subject of this report, as it is understood to be dealt with by the Client's architect.
- 4.4 Kirklees Council (and all other Local Authorities) would usually apply planning conditions to protect future residents from road traffic noise, etc. in the local noise climate surrounding the development. That type of condition has not been applied here, but perhaps Condition 3 should relate to the potential impact on the residents from road traffic noise, etc., rather than the requirement to assess noise egress from 2no shops and 2no dwellings. The present report considers noise ingress and the protection of the dwellings, as this is the primary issue at this site.
- 4.5 *British Standard 8233: 2014, 'Guidance on sound insulation and noise reduction for buildings'* (BS8233:2014) provides information on the design of internal acoustics in buildings. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations.
- 4.6 BS8233:2014 provides guidance regarding indoor ambient noise criteria for residential accommodation, as presented in the following table.

Table 2: BS8233:2014 guidance criteria for indoor ambient noise levels

Activity	Location	0700-2300 hours	2300-0700 hours
Resting	Living rooms	35 dB L_{Aeq} (16 hour)	-
Dining	Dining room/area	40 dB L_{Aeq} (16 hour)	-
Sleeping (daytime resting)	Bedroom	35 dB L_{Aeq} (16 hour)	30 dB L_{Aeq} (8 hour)

- 4.7 BS8233:2014 does not stipulate any criteria for maximum noise levels within rooms in terms of dB L_{Amax} , but does state that, “*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values.*”
- 4.8 Other published guidance on implementing limiting L_{Amax} criteria in bedrooms (e.g. *ProPG: Planning and Noise*, and *WHO Community Noise Guidelines*) advises that individual noise events should not normally exceed 45dB L_{Amax} more than 10no times per night, as this represents a threshold below which the effects of individual noise events on sleep can be regarded as negligible. ProPG also refers to the BS8233:2014 L_{Aeq} criteria set out above.
- 4.9 It is noted that BS8233:2014 also states that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved.
- 4.10 In addition, the BS8233:2014 guidance relating to gardens makes reference to external noise levels in gardens and balconies, etc., as follows:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be

warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”

- 4.11 Noise mitigation advice given in Section 5.0 of this report is based on achieving the BS8233:2014 indoor noise level criteria to ensure a suitable level of protection for the future occupants of the development. Noise ingress calculations have been carried out in accordance with BS8233:2014. Calculations have been undertaken to limit noise ingress to 45dB L_{Amax} within bedrooms, as this is understood to be required in Kirklees Council. Calculations are based on the typical noise events occurring at the site, but it must be acknowledged that there will always remain potential for atypical events that could result in L_{Amax} noise levels exceeding 45dB within bedrooms.

Guidance documents on ventilation and overheating

- 4.12 *Approved Document O ‘Overheating’* does not apply to buildings undergoing a change of use and so does not apply to this site, but the information is nonetheless given here.
- 4.13 Recent amendments to Building Regulations now include some consideration of environmental noise in dwellings. *Approved Document O ‘Overheating’* relates to mitigating overheating in new residential buildings by designing and constructing the buildings to limit unwanted solar gains in summer and to provide an adequate means of removing excess heat from the indoor environment. The document states that compliance can be demonstrated by following either a simplified method based on maximum glazing areas and minimum opening areas, or a dynamic thermal modelling method that requires a CIBSE TM59 overheating assessment.

- 4.14 Section 3 of Approved Document O considers conditions to ensure that the overheating strategy is usable, and states:

“3.1 The standards in this section may mean that the standards of the simplified method cannot be met. For example, if external noise is an issue, it is unlikely that windows would be opened by an occupant and therefore the minimum free areas of the simplified method cannot be met. In such cases, dynamic thermal modelling should be used.

3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).*
- b. 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).*

3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use. NOTE: Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020)”

- 4.15 Paragraph 2.11 of Approved Document O also states, “NOTE: Any method to reduce overheating risk in residential buildings must comply with all other parts of the Building Regulations. Particular attention should be paid to the requirements of Part F and the guidance in Approved Document F, Volume 1: Dwellings on noise and maintenance.”
- 4.16 Approved Document O also makes reference to the ANC publication ‘Acoustics Ventilation and Overheating Residential Design Guide Version 1.1 January 2020’ (AVOG). This document

provides an approach to managing the competing aspects of thermal and acoustic comfort, and has been written to reflect the requirements of ProPG and overarching planning requirements.

4.17 Approved Document F considers ventilation, and states the following in relation to noise:

“1.7 Account should be taken of outside noise when considering whether openable windows are appropriate for purge ventilation.

NOTE: Although there is no requirement to undertake noise testing, achieving the levels in the following guidance would ensure good acoustic conditions. The average A-weighted sound pressure level for a ventilator operating under normal conditions and not at boost rates should not exceed both of the following.

- a. 30dB $L_{Aeq,T}$ * for noise-sensitive rooms (e.g. bedrooms and living rooms) when a continuous mechanical ventilation system is running on its minimum low rate.*
- b. 45dB $L_{Aeq,T}$ * in less noise-sensitive rooms (e.g. kitchens and bathrooms) when a continuous operation system is running at the minimum high rate or an intermittent operation system is running.*

** The noise index $L_{Aeq,T}$ is used in BS 8233, where T is the duration of the measurement. If the noise from the sound source is steady (i.e. fluctuating by up to 3dB), a measuring time of 1 minute will be adequate and the $L_{Aeq, 1 \text{ min}}$ level will be similar to the dB(A) level used elsewhere. If the noise from the sound source fluctuates more than this, a longer measuring time (T) may be required, but the higher portion of the fluctuating level should be considered, and the sound may attract more attention due to the changes in level.*

NOTE: Methods for measuring the sound power level produced by the fan unit of decentralised extract ventilation, centralised extract ventilation and balanced mechanical ventilation with heat recovery systems are described in BS EN 13141.”

4.18 Although not applicable to change of use scenarios, noise mitigation advice given in Section 5.0 of this report also considers the Approved Document O indoor sound level criteria to afford a suitable level of protection for the future occupants of the proposed development.

5.0 NOISE MITIGATION MEASURES

5.1 There are a variety of proportionate and reasonable techniques that could be introduced to mitigate the effects of noise, such as:

- a) **Engineering:** reduction of noise at source (e.g. use of quiet machinery and working methods), containment of generated noise, and protection of noise-sensitive buildings (e.g. by sound insulation and/or screening them by purpose-built barriers);
- b) **Layout:** adequate distance between source and noise-sensitive building; screening by natural barriers, other buildings or non-critical rooms in a building;
- c) **Administrative:** limiting operating time of source, restricting activities on site, specifying an acceptable noise limit.

Dwelling protection

5.2 The design of the building envelope of the new dwellings can incorporate suitable sound insulation to satisfy the internal noise criteria set out above. Indicative noise ingress calculations have been carried out in accordance with BS8233:2014 in order to determine appropriate sound insulation measures to satisfy the acoustic criteria set out above. Based on the noise ingress calculations, the following sound insulation measures are recommended.

5.3 Ceilings in living rooms, dining rooms, and bedrooms should comprise minimum 2no layers solid gypsum-based board (total minimum mass per unit area 20kg/m^2), overlaid with mineral fibre insulation of minimum 100mm thickness.

5.4 External walls (whether existing or proposed) are of masonry construction, and are sufficient in terms of acoustic performance.

5.5 Our calculations indicate that the following glazing and ventilation specifications will be required in order that BS8233 internal noise levels can be met.

Table 3: Glazing minimum octave band sound reduction

Glazing configuration	Octave band minimum sound reduction indices (dB)						
	63	125	250	500	1k	2k	4k
<u>All living rooms and all dining rooms, as well as all bedrooms entirely shielded from Westbourne Road:</u> 4mm glass / 12mm airgap / 10mm glass (nominal R_w 36dB)	20	25	22	33	40	43	44
<u>Bedrooms facing Westbourne Road:</u> 10mm glass / 12mm airgap / 6.4mm laminated glass (nominal R_w 39dB)	22	27	29	36	41	42	52

- 5.6 All bedrooms should be fitted with a ventilation system that provides an acoustic performance of at least 55dB $D_{ne,w}$, such as the Greenwood MA3051 wall vent. Where possible, ventilation should be sought from the rear of the building away from Westbourne Road; where this has been possible, the ventilation performance required in each case can be reduced by 15dB. Living rooms and dining rooms should be fitted with a ventilation system that provides an acoustic performance of at least 44dB $D_{ne,w}$, such as the Greenwood EHA574 acoustic vent.
- 5.7 It is the 45dB L_{Amax} criterion at night that dictates higher glazing and ventilation specifications for bedrooms exposed to Westbourne Road. The following charts show the nighttime noise level data of interest.

Chart 1: Calculated dB L_{Amax} noise ingress levels – Bedroom at night across 2no nights

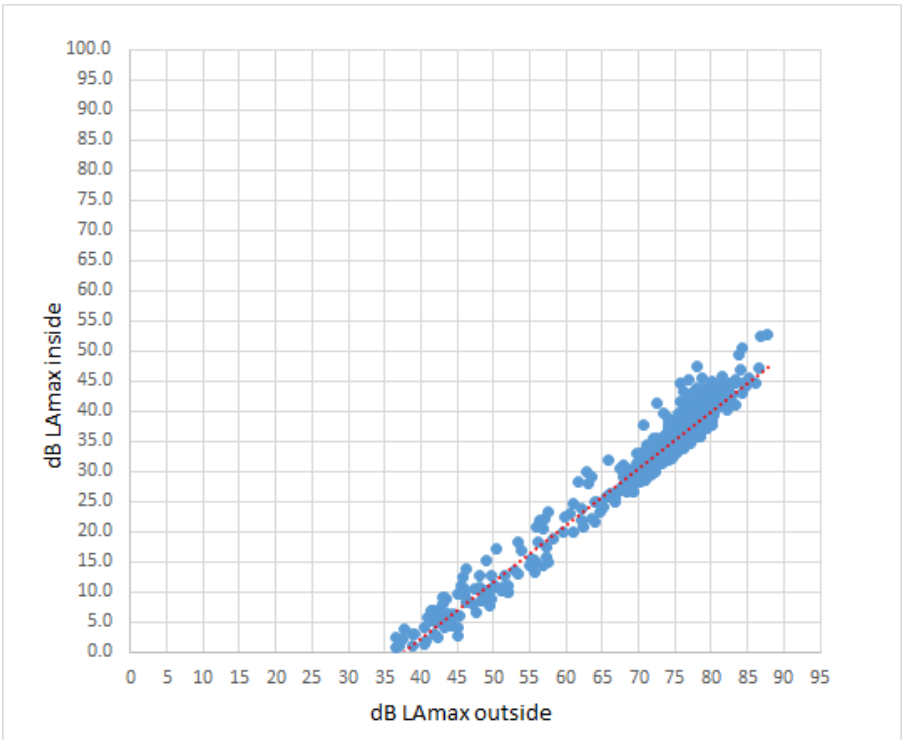
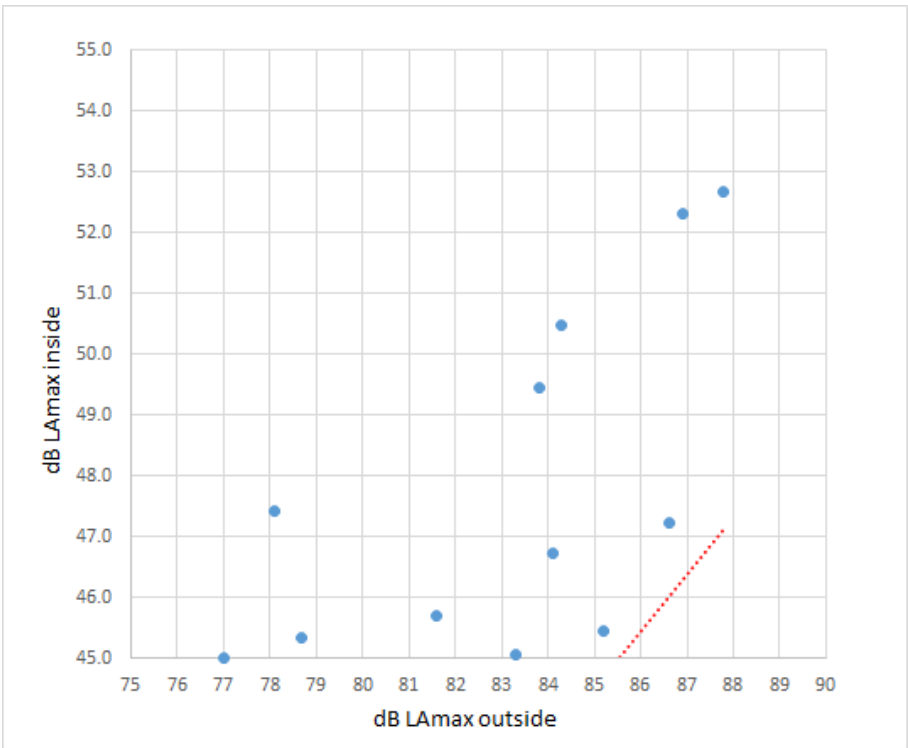


Chart 2: Calculated dB L_{Amax} noise ingress levels – Bedroom at night across 2no nights (zoomed-in view)



- 5.8 As can be seen above, the proposed specification generates 8no exceedances over 45dB L_{Amax} across 2no nights (i.e. 4no exceedances per night on average), thus falling within the '10no exceedances' typical interpretation, with the highest expected internal noise level being under 53dB L_{Amax} based on the data collected over 2no nights.
- 5.9 Glazing and ventilators to non-habitable rooms or spaces do not require special acoustic measures, and these spaces may have standard trickle ventilation and standard double-glazing. (For the purposes of noise assessment, separate kitchens, bathrooms, WCs, etc., are considered to be non-habitable spaces.)
- 5.10 Approved Document O does not apply to this change of use proposal, but the following overheating comments are nonetheless made. Considering the magnitude of the measured nighttime L_{Amax} sound levels at this development site, it is not expected that the Approved Document O criteria with open windows for use with the simplified assessment method will be met for bedrooms most exposed to road traffic noise. The highest maximum noise level expected at night in a bedroom with an open window is 72dB L_{Amax} , and over 400no exceedances are expected to occur per night. Any overheating assessment should therefore consider closed bedroom windows for all plots with a view of Westbourne Road.

6.0 SUMMARY AND CONCLUSIONS

- 6.1 A noise assessment has been carried out on behalf of Mailingg Ltd for a proposed mixed use development at 82-84 Westbourne Road, Huddersfield.
- 6.2 The assessment has included measurements of the prevailing ambient noise levels at the site every 1-minute for 2no days. Road traffic noise from Westbourne Road was found to be the dominant noise source at the site.
- 6.3 Calculations indicate that the stated BS8233 noise criteria (with additional 45dB L_{Amax} nighttime criteria) can be met.
- 6.4 The ground floor retail part of the development proposal is unlikely to generate significant noise levels. Furthermore, the surrounding noise sources such as Westbourne Road are high, and as such Condition 3 would naturally be satisfied in that low shop source sound levels will not impact on existing noise-sensitive uses in the area. As Condition 4 will be dealt with by others, it is not considered in this report, other than to say that the requirement is very high and does not flow from a normal standard.
- 6.5 The site may be considered suitable for residential development in planning and noise terms, as acceptable noise levels in accordance with BS8233:2014 can be achieved following the design and implementation of suitable noise mitigation measures.

7.0 DISCLAIMER

- 7.1 This document is limited to addressing the specific acoustic issues contained herein, and its content is based on drawings and information provided to date by our Client/their Design Team.
- 7.2 All findings, comments, recommendations, etc., in this document are for acoustic purposes only; any and all other considerations and requirements, e.g. structural, airflow, thermal, fire safety, CDM compliance, determination of whether materials are dangerous, hazardous, deleterious, etc. (non-exhaustively), are the responsibility of other such suitably qualified specialists to check and advise on.
- 7.3 All findings, comments, recommendations, etc., in this document have been prepared with reasonable skill and care by BTA, within the scope of our Client's brief and timescales. Calculations and estimates upon which BTA's findings are elaborated are based on reasonable assumptions and industry practice that, by their nature, involve uncertainties that could cause future onsite results to differ materially from those predicted. BTA does not guarantee or warrant any calculation or estimate made, especially those based on data measured by third parties or information provided by third parties to BTA or otherwise relied upon by third parties. Any third-party information required and/or provided for the purpose of completing this document should not be considered as verified by BTA.
- 7.4 BTA's work may occasionally involve provision of acoustic performance advice and acoustic design recommendations that others may choose to regard as a "specification" under CDM 2015 (and thus others may occasionally choose to regard BTA to be a "Designer" under CDM 2015). Notwithstanding this, it is always the responsibility of others (Principal Designer) to approve/incorporate into their final design – or not – their final specification selections; although these may be based on BTA's acoustic performance advice, as BTA neither has control over how or whether BTA's acoustic advice is incorporated into the final design by others, nor any power to enforce that any such final specification selections made by others based on BTA's advice are appropriate in any regard beyond their acoustic performance qualities, it also remains the responsibility of others under CDM 2015 to ensure that any ancillary (non-acoustic) considerations in the course of selection, installation, maintenance, etc. of final specifications are advised upon by such relevantly qualified specialists (non-acoustic, and therefore non-BTA), and that any safety precautions identified in the course of their consideration by others are taken by others (the Principal Designer, Designers, Contractors, Client, etc.).

- 7.5 Products and materials that perform well acoustically tend to be heavier than standard products. Use of these products and materials may increase the weight of the element, and the CDM Principal Designer, Client, etc. must take care to ensure that this risk is mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe lifting and installation techniques, maintenance, etc. are used to reduce any remaining risk. Wherever BTA advises that works such as acoustic barriers are desirable to attenuate noise, care must be taken by the CDM Principal Designer, Client, etc. to ensure that the risks associated with constructing and maintaining bunds, walls, fences, etc. are mitigated as far as possible with appropriate changes to their design, and the Client, Principal Contractor, Contractor, Installer, Fitter, etc. must ensure that appropriate and safe construction and installation techniques, maintenance, etc. are used to reduce any remaining risk.
- 7.6 This document has been prepared for the sole use, benefit, and information of our direct Client for the purposes agreed at the time of their formal instruction, and the information contained herein is the sole property of, and confidential to, our direct Client. The liability of BTA in respect of the information contained herein will not extend to any third party.

FIGURE 1 – SITE AERIAL VIEW AND APPROXIMATE MEASUREMENT LOCATION



FIGURE 2 – LOCATION PLAN

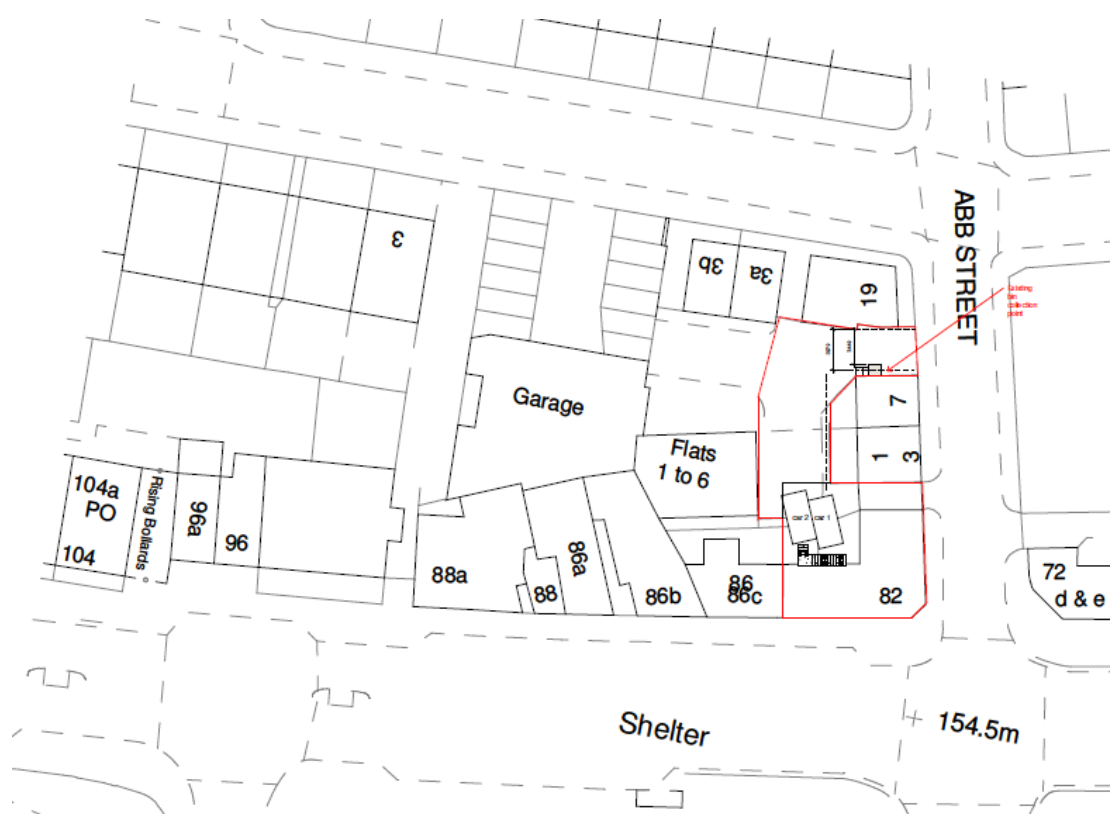
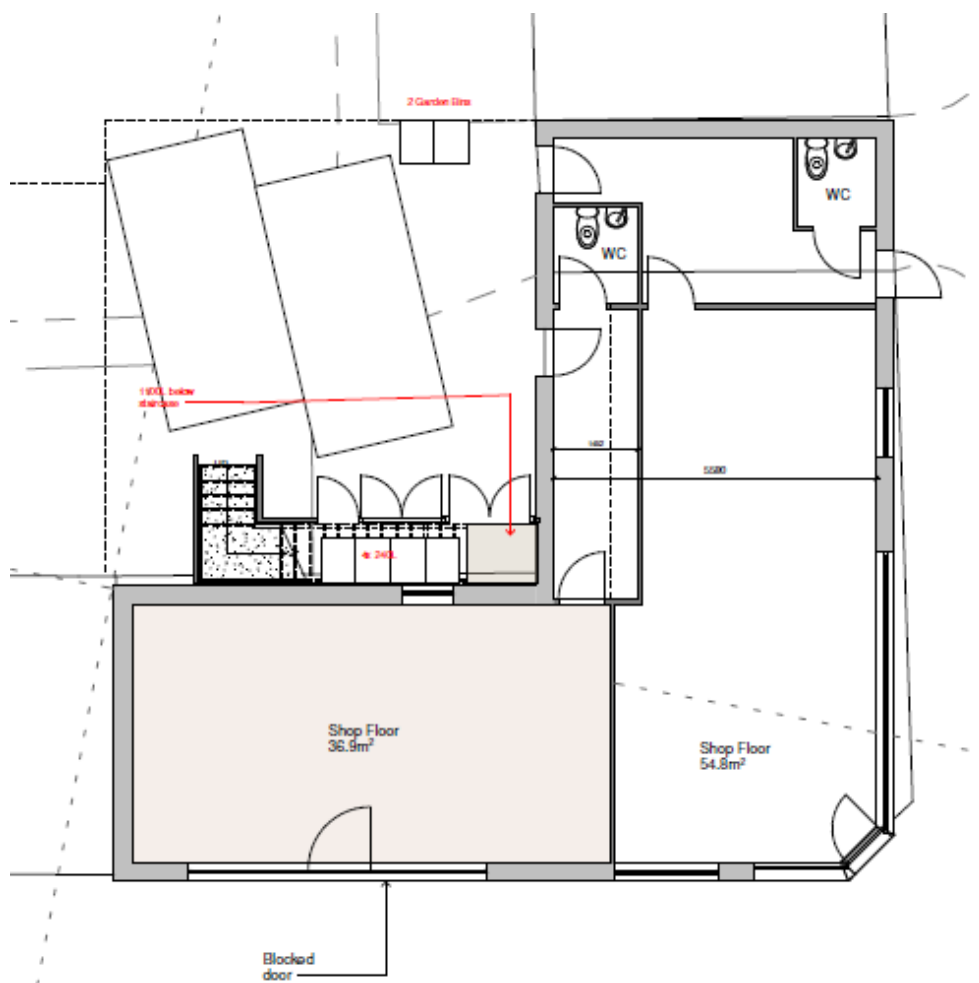
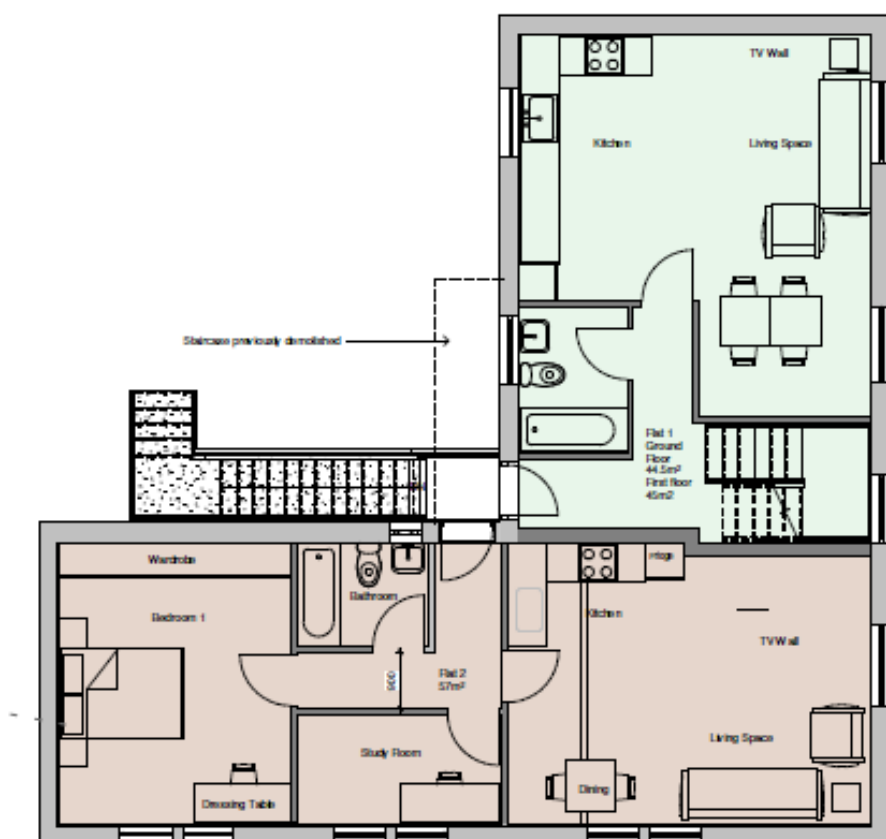


FIGURE 3 – INDICATIVE PROPOSED LAYOUT PLANSGround floor level

1st floor level

APPENDIX 1 – TECHNICAL UNITS AND INDICES

a) Sound Pressure Level and the decibel (dB)

A sound wave is a small fluctuation of pressure in air. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. Due to the wide range of pressure variations detectable by the ear, a logarithmic scale is used to convert the values into manageable numbers. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

b) Frequency and Hertz (Hz)

Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or Hertz (Hz). Sometimes large frequencies are often written as kilohertz (kHz), where 1kHz = 1000Hz.

Young people with normal hearing can hear frequencies in the range 20Hz to 20kHz. However, the upper frequency limit gradually reduces as a person gets older.

As the ear hears some frequencies better than others, the A-weighting scale is used to mimic human hearing. A-weighting applies a correction to the sound level at a given frequency depending on how well the ear hears that frequency.

c) Glossary of Terms

In order to describe noise where the level is continuously varying, a number of other indices, including statistical parameters, are used. The indices used in this report are described below.

L_{Aeq} This is the A-weighted equivalent continuous sound level which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period.

L_{Amax} This is the maximum A-weighted sound level that was recorded during the monitoring period.

L_{A90} This is the A-weighted sound level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise.

L_{A10} This is the A-weighted sound level exceeded for 10% of the time period and is often used in the assessment of road traffic noise.

SEL This is the Single Event Level or Sound Exposure Level. The SEL is the total energy measured over the event, compressed into 1 second. $SEL = L_{Aeq} + 10\log(t)$, where t is time in seconds. Also $L_{Aeq} = SEL - 10\log(t) + 10\log(n)$ where t is time in seconds and n is the number of events in the time period.

R_w A measure of the airborne sound insulation performance of a separating element, when tested in laboratory conditions.

APPENDIX 2 – NOISE SURVEY DATA

No noise survey periods have been excluded for poor weather conditions; 3no short rainfall events are visible in the weather data (Appendix 3), but these have not significantly affected noise levels.

Location 1 – Westbourne Road elevation

Rion NL-52 sound level meter, all values dB(A), 1-minute duration, façade

Chart AC1: Primary measurement data – Daytime and nighttime

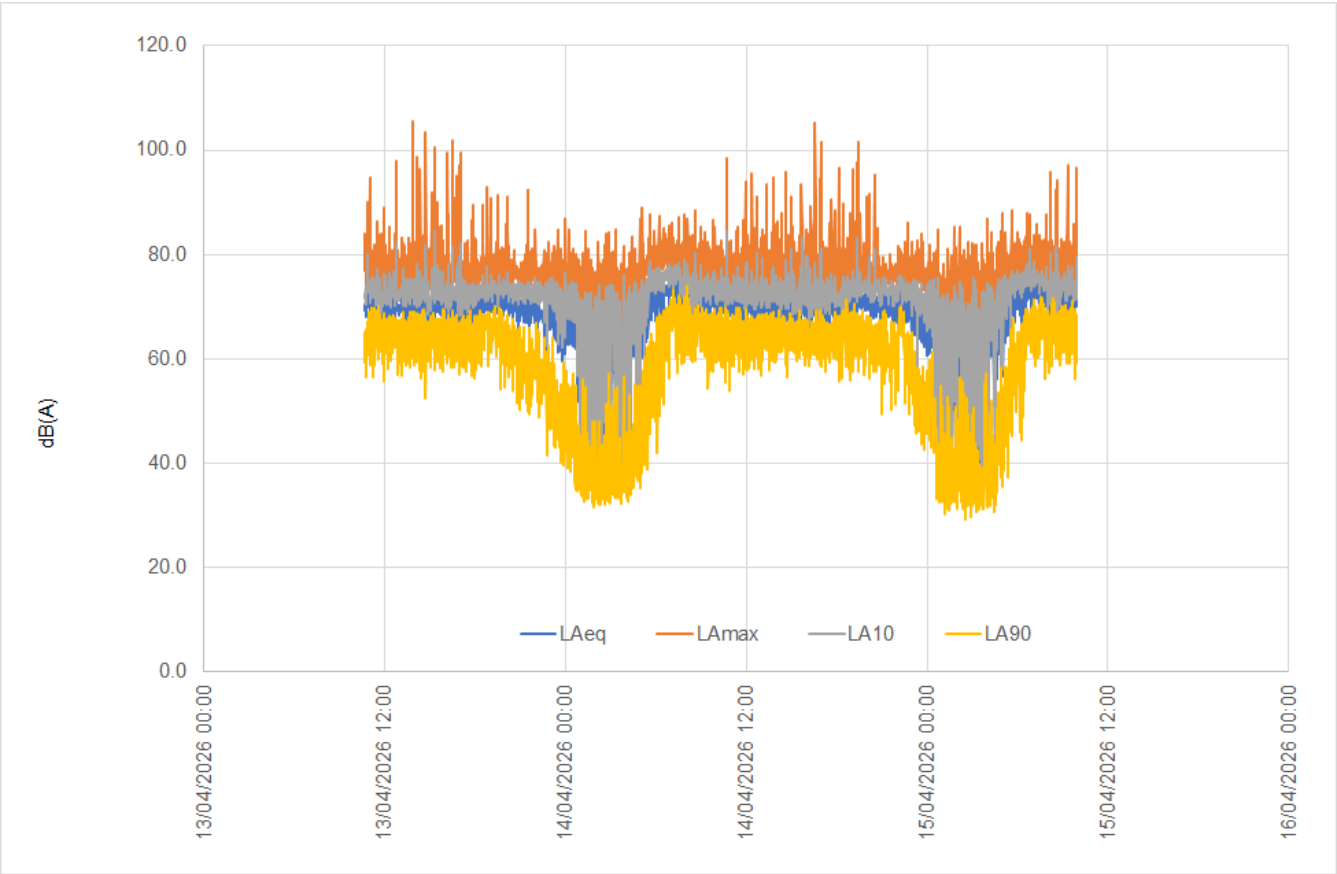


Chart AC2: dB LAeq daytime values – 1-minute duration, façade

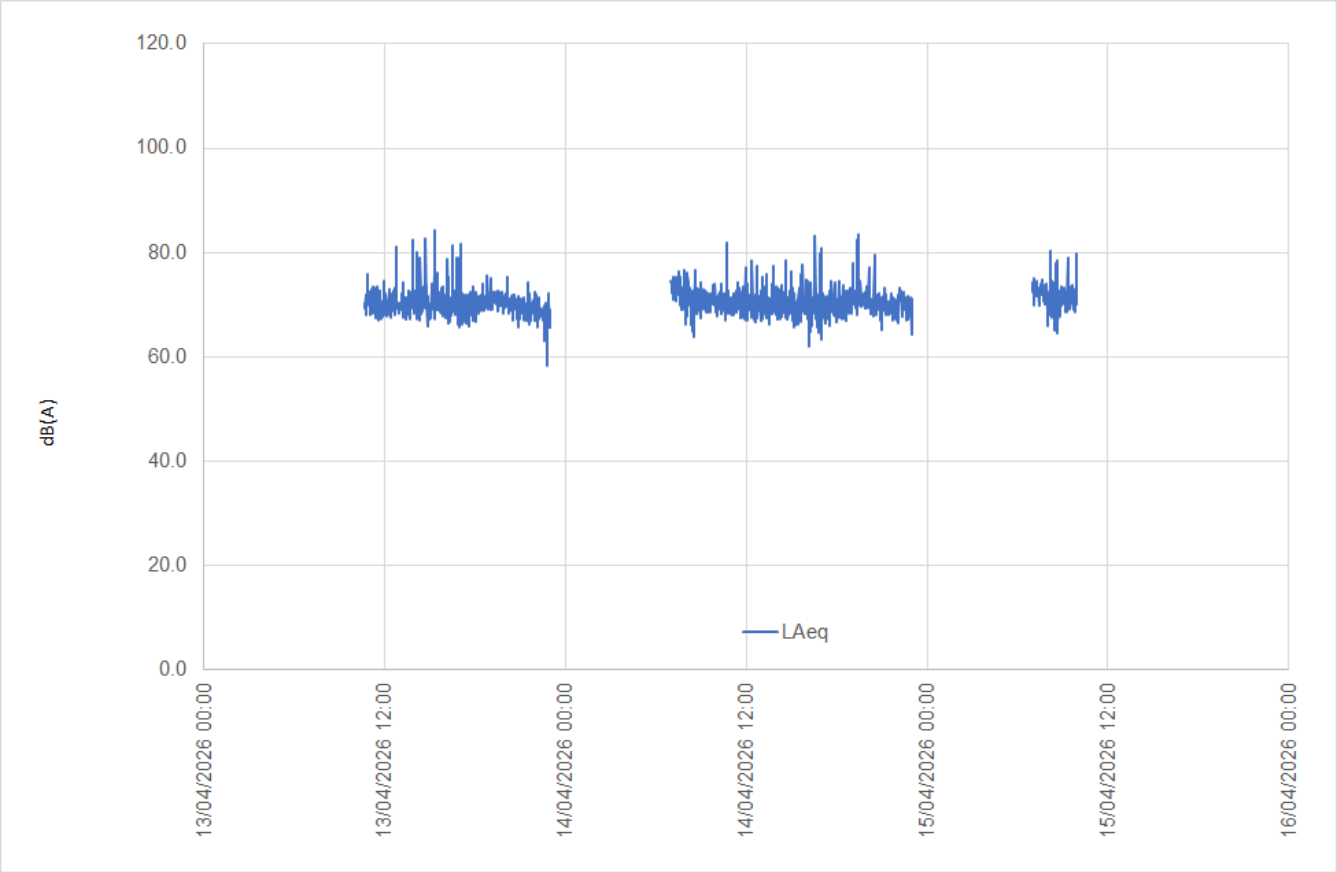
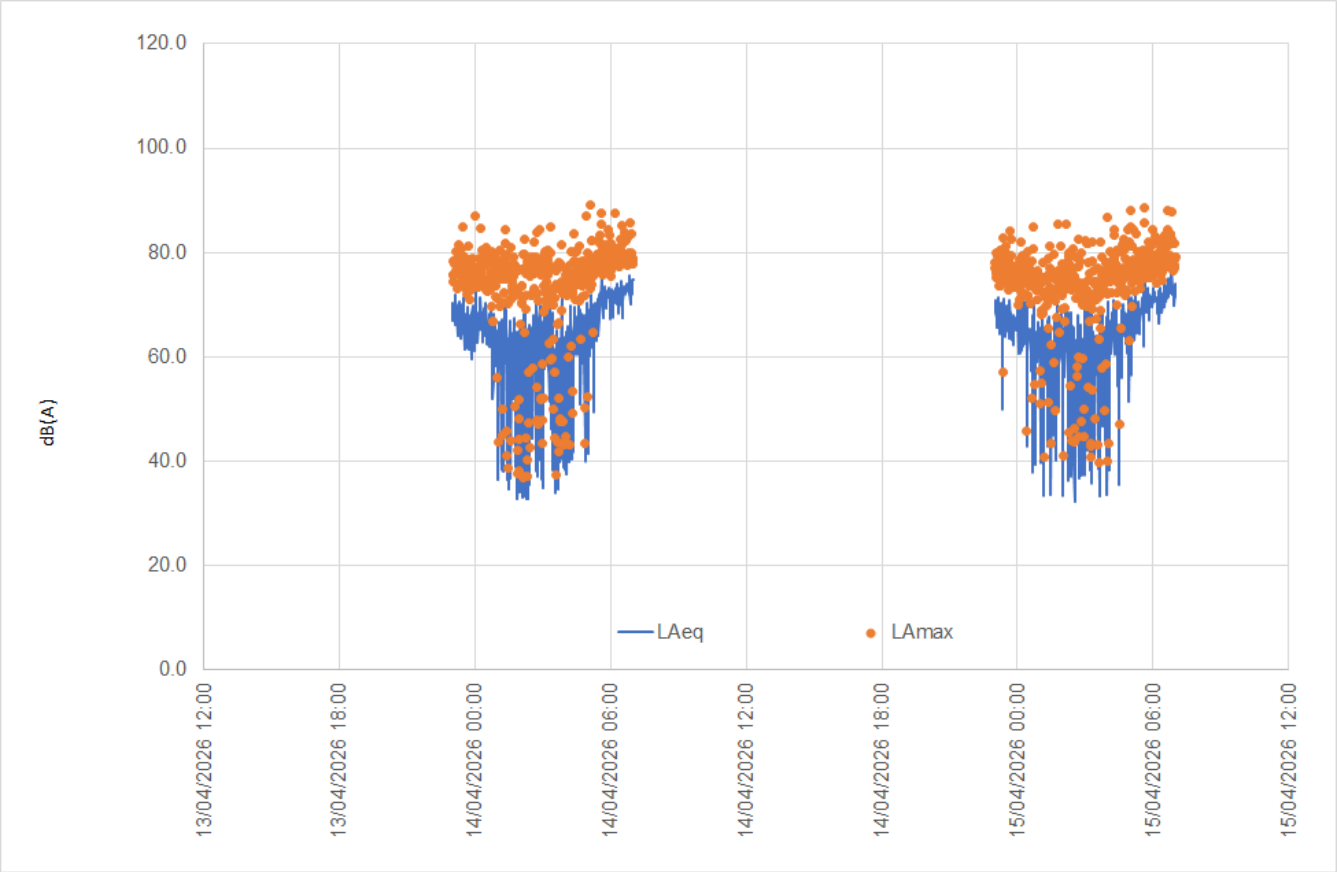
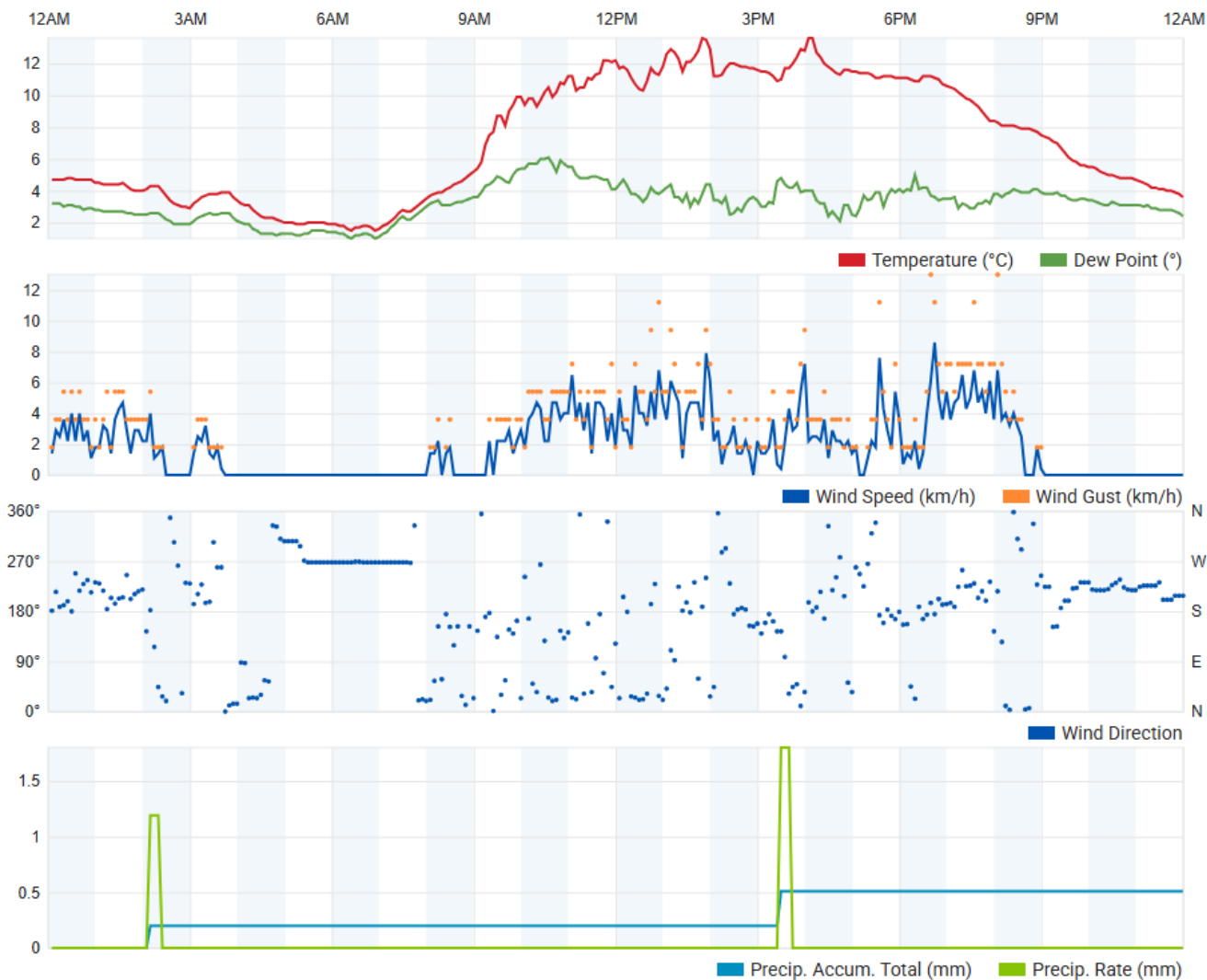


Chart AC3: dB LAeq and dB LAmax nighttime values – 1-minute duration, façade

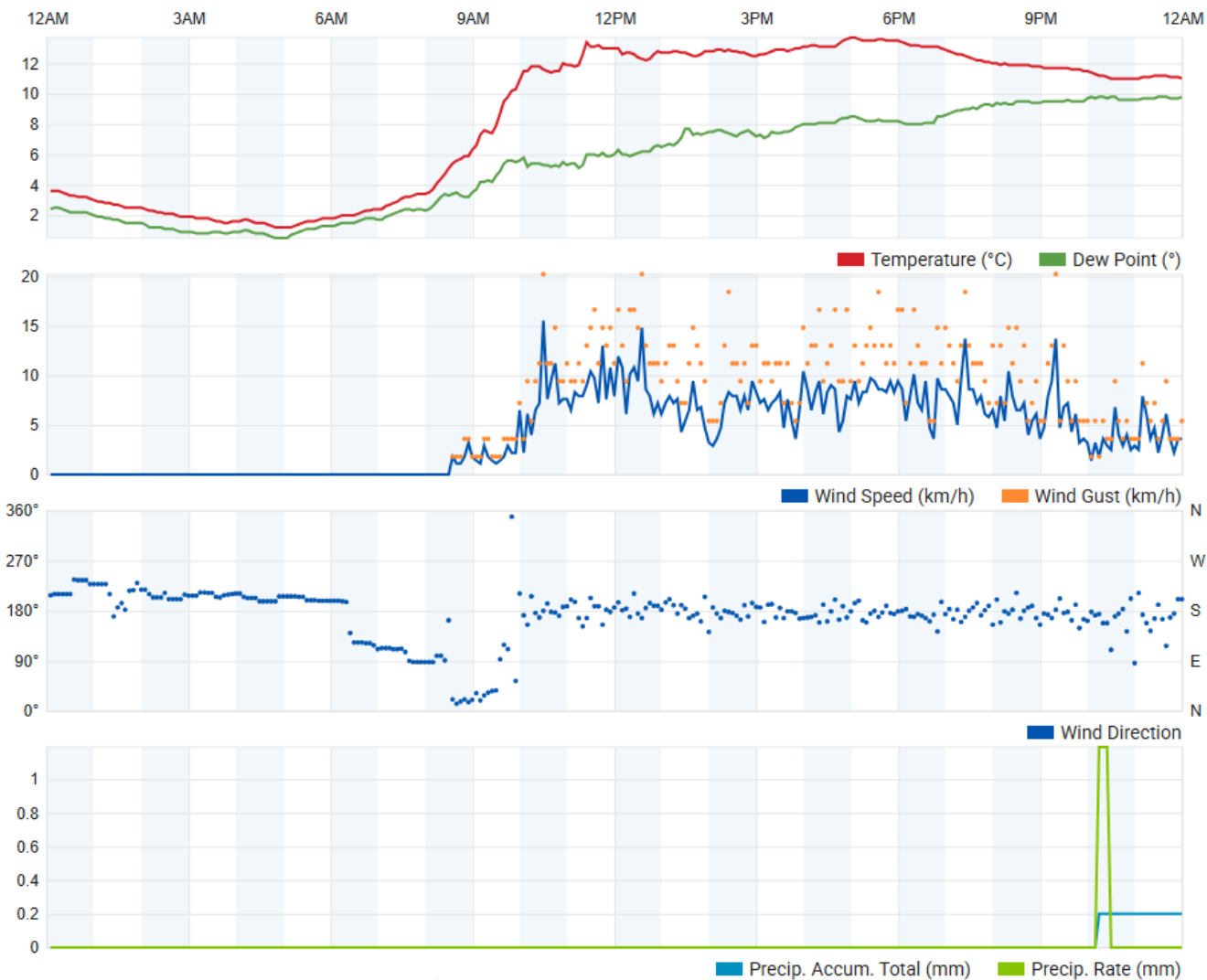


APPENDIX 3 – WEATHER DATA

Monday 13/04/2026



Tuesday 14/04/2026



Wednesday 15/04/2026

