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SGN Openshaw Service Station

A noise impact assessment of service station forecourt changes

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1.0 Introduction

1.1 Sharps Acoustics LLP (SAL) have been instructed by Frowsbury Projects to undertake a noise assessment to support a planning application for service station forecourt amendments including 2no. enclosed jet wash/service bays with associated plant room. The proposed site plan has been provided in Figure A4 in Appendix A.

1.2 Details of the assessment methodology employed, together with the results of the baseline survey, assessment and conclusions are presented within this report.

Site Description

1.3 The site is located at Openshaw Service Station, 1555-1571 Ashton Old Road, Openshaw, Manchester, M11 1GR (hereinafter, "The Site"). The Site is bounded to the south by Ashton Old Road (A635).

1.4 The surrounding area has been noted to be mixed commercial and residential in nature with the nearest residential receptors identified as 1548 Ashton Old Road (to the south) and 1/3 Fairfield Avenue (to the northeast), as highlighted in Figure A1 in Appendix A.

2.0 Assessment Methodology and Criteria

National Planning Policy Framework (NPPF)

2.1 Government planning policy in relation to noise is contained in the National Planning Policy Framework (NPPF). The relevant national decision-making policy is Policy P3, "Living conditions and pollution".

2.2 Policy P3 requires development proposals to be appropriate for their location, taking into account the likely effects, including cumulative effects, of pollution on health, living conditions and the natural environment. This includes effects arising from the development itself and those resulting from pre-existing conditions in its vicinity. The policy requires that impact assessments take account of the sensitivity of the site and its intended occupiers and users, together with that of the surrounding environment and population.

2.3 In relation specifically to noise, Policy P3 states that development proposals should:

> *"Mitigate and reduce to a minimum potential adverse impacts resulting from noise, not result in levels of noise exposure which would have a significant observed adverse effect, and maintain the character of tranquil areas (those areas that have remained relatively undisturbed by noise from human sources and are prized for their recreational and amenity value for this reason)."*

2.4 Policy P3 also requires development not to give rise to or contribute to unacceptable levels of noise affecting neighbouring residents and occupiers. Adverse impacts should be avoided where possible or otherwise mitigated to an acceptable degree.

2.5 The NPPF defines the Significant Observed Adverse Effect Level (SOAEL) as the level of noise exposure above which significant adverse effects on health and quality of life occur.

Noise Policy Statement for England (NPSE)

2.6 The 2010 DEFRA publication "Noise Policy Statement for England" (NPSE) provides further policy context for the assessment and management of noise, including environmental noise. The NPSE sets out three policy aims:

- "avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life."

2.7 The NPPF does not prescribe numerical noise levels corresponding to an unacceptable adverse effect or to SOAEL. It is therefore necessary to consider the advice contained in other relevant guidance and standards when assessing the significance and acceptability of noise arising from the proposed development. This advice is discussed below.

2.8 All three aims are to be considered in the context of Government policy on sustainable development.

2.9 The NPSE introduced the concepts of the "Lowest Observed Adverse Effect Level" (LOAEL) and the "Significant Observed Adverse Effect Level" (SOAEL). Where noise effects fall between LOAEL and SOAEL, the NPSE states:

> *"… all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."*

2.10 The NPSE also notes that:

> *"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times."*

2.11 Noise effects therefore need to be considered in context. An adverse noise effect does not necessarily mean that a development is unacceptable. The degree of effect, the scope for mitigation and the wider benefits and impacts of the development should also be taken into account.

Planning Practice Guidance on Noise (PPG: Noise)

2.12 The Government first published their Planning Practice Guidance on noise (PPG) in March 2014, with the most recent version issued in July 2019. The PPG provides guidance on the interpretation and implementation of planning policy, as contained in the NPPF and the NPSE.

2.13 The use of the lowest observed adverse effect level (LOAEL) and significant observed adverse effect level (SOAEL) for the assessment of noise impacts is reinforced in the PPG, which seeks to define human perception at these effect levels.

2.14 The PPG describes the LOAEL as the level at which *"noise can be heard and causes small changes in behaviour, attitude or other physiological response"* and it is *"present and intrusive"*. Below this level, the PPG describes the NOAEL, or No Observed Adverse Effect Level, which it notes *"can be heard but does not cause any change in behaviour, attitude or other physiological response"* as the noise is *"present but not intrusive"*. The NOAEL is not included in the NPSE and is introduced in the PPG. Below the NOAEL, the PPG describes the NOEL, or No Observed Effect Level, where noise is *"not present"* and has *"no effect"*.

2.15 The PPG describes the LOAEL as the:

> *"… boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise)."*

2.16 Significant observable adverse effects, i.e. those occurring at or above the SOAEL, are described as *"present and disruptive"* and the PPG states that above the SOAEL:

> *"… the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused."*

British Standard BS 4142: 2014 + A1:2019

2.17 British Standard (BS) 4142: 2014+A1: 2019 *'Methods for rating and assessing industrial and commercial sound'* (BS 4142) describes a method for rating and assessing sound of an industrial or commercial nature, which includes, in Section 1.1 of the standard:

> *"sound from industrial and manufacturing processes;*
>
> *sound from fixed installations which comprise mechanical and electrical plant and equipment;*
>
> *sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and*
>
> *sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site."*

2.18 The industrial or commercial sound is assessed outside an existing or proposed dwelling or premises used for residential purposes. BS 4142 does not consider internal spaces in terms of its numerical assessment.

2.19 The procedure contained in BS 4142 begins by quantifying the "specific sound level", which is the measured or predicted level of sound from the source in question over a one-hour period for the daytime or a 15-minute period for the nighttime. Daytime and nighttime are not defined in BS 4142, but the standard notes that they are typically taken to be 0700 to 2300 hours for daytime, and 2300 to 0700 hours for nighttime.

2.20 BS 4142 sets out a number of methods of determining the specific sound level including, for situations where the specific sound source does not yet exist, the ability to estimate it, stating, at Section 7.3.6:

> *"Determine the specific sound level by calculation alone if measurement is not practicable, for example if the source is not yet in operation. In such cases, report the method of calculation in detail and give the reason for using it."*

2.21 The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for potentially tonal, impulsive or intermittent elements. The standard sets out subjective and objective methods for determining the presence of tones or impulsive elements but notes that the objective methods should be used where the subjective method is not sufficient. For situations where the specific sound source does not yet exist, the objective methods cannot be used.

2.22 The assessment outcome results from a comparison of the rating level with the background sound level (which is determined by the assessment of typical background noise levels by survey). The standard states, in Section 11:

> *"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.*
>
> *NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*

2.23 Finally, BS 4142 requires that the level difference is considered in the context in which it is found. Contextual considerations include:

- Absolute level of sound. If the existing level is particularly high or low, then this can affect the significance of a particular difference (assessed as described in 2.26 above).

- The character and level of the residual sound compared to the character and level of the specific sound.

- Sensitivity of receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions such as:

  i. facade insulation treatment;

  ii. ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

  iii. acoustic screening.

3.0 Noise Survey

3.1 An unattended noise survey was undertaken between 1st to 2nd October 2026.

3.2 Measurement positions were selected along the southern site boundary (MP1) and northeast site boundary (MP2). These locations were chosen to be representative of the nearest noise-sensitive receptors (NSRs), shown in Figure A1 in Appendix A.

3.3 The microphones were set at approximately 2.0 - 3.0m above ground level in free field conditions in the location shown in, Figure A1 in Appendix A.

3.4 The recording equipment used for the survey was a Norsonic 140 and Larson Davis LxT sound level meter unit. The equipment was calibrated before and after the survey with no significant drift. The noise monitoring equipment used during the survey is shown in Table 3.1, and was set to record a number of parameters, including the $L_{Aeq,T}$, L_{A90}, L_{A10} and L_{AFmax}.

Table 3.1: Survey Equipment

Equipment Description	Serial Number	Calibrator Reference Level
Norsonic 140 sound level meter	1402899	-
Norsonic 1225 microphone	91754	-
Norsonic 1209 Preamplifier	13228	-
Norsonic 1251 calibrator	29149	114
Larson Davis LxT1 sound level meter	3934	-
Larson Davis preamplifier	29332	-
Larson Davis microphone	146990	-
Larson Davis CAL200 calibrator	13691	114

3.5 Measurements were taken over continuous 15-minute periods throughout the survey.

Survey Results

3.6 The average daytime and night-time L_{Aeq} and L_{A90} results from the survey are summarised in Table 3.2 and provided in full graphically in Figure B1 in Appendix B.

Table 3.2: Summary of noise survey results

Position	Period	Sound Pressure Level dB	
		$L_{Aeq,T}$	Typical $L_{A90,15min}$
MP1	Daytime (07:00 to 23:00 hours)	69	61
	Night-time (23:00 to 07:00 hours)	63	45
MP2	Daytime (07:00 to 23:00 hours)	59	56
	Night-time (23:00 to 07:00 hours)	54	40

3.7 For information purposes it can be noted:

- Measurements of sound level were all made with the A-weighting, which is a filter applied to the sound level meter to simulate the frequency response of the human ear, which is more sensitive to high frequency sound than low.
- L_{Aeq} is the equivalent continuous noise level which is a method of averaging the varying noise level over the measurement period into a single figure value. The L_{Aeq} has the same sound energy as the fluctuating level over that period. The L_{Aeq} is also known as the "ambient level" and in BS 4142 the L_{Aeq} in the absence of the proposed development sound is known as the "residual level".
- L_{A90} is the noise level exceeded for 90% of the time and is referred to as the background noise level.

Weather

3.8 The weather forecast throughout the survey was for dry conditions with a slight breeze and suitable for measurements of noise.

Description of Noise Climate

3.9 During the attended aspects of the survey the noise climate was predominantly controlled by road traffic along Ashton Old Road and the intermittent operations of the automated car wash, with contributions from other existing service station activities.

3.10 Reference to Figure B1 in Appendix B shows that during the unattended aspects of the survey the noise levels follow a diurnal pattern, typical of road traffic noise in an urban environment, with a reduction in the evening and the lowest levels measured at night.

4.0 Noise Assessment

4.1 This section of the report outlines the prediction and assessment of noise generated by the proposed activities and items of mechanical plant.

4.2 The recognised methodology for assessment has been taken from BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* which includes consideration of sound from fixed plant installations. The numerical assessment has been provided below for relevant periods of proposed operation, following the definition of specific sound levels.

4.3 Development proposals have been illustrated in Figure A4 in Appendix A.

4.4 It has been determined that the key sources of sound relating to the development proposals would be:

- Jet wash activities
- Associated plant room
- Air/water/vacuum combi units

4.5 Noise data used in the assessment is detailed below. Reference measurement/source data for the proposed items/operations have been provided in Appendix B for reference.

Proposed Mechanical Plant

4.6 Noise source data for each of the proposed activities/mechanical plant have been presented in Table 4.1 below based on information provided by the client and SAL library data.

Table 4.1: Proposed Mechanical Plant Noise Levels

Plant/Activities	Number of Units	Sound Pressure Level at 1m $L_{Aeq,T}$ (dB)
Jet Wash Bays	2	76*
Plant Room	1	85**
Combi Unit	2	66

**Based on in-situ source measurements, an additional correction of +6 dB has been applied to the noise data provided by Istobal to account for noise generated by jet wash water impinging on vehicle chassis.*

***Internal reverberant sound level of 85 dB SPL_{INT} with one pump operating.*

4.7 A conservative 20 dB R_W has been assumed for the proposed plant room, in lieu of a more rigorous calculation of plant room enclosure break-out.

Specific Sound Level Prediction

4.8 To understand a specific sound level for the purposes of assessment, it has been necessary to make some level of assumption to the proposed usage times.

4.9 It is assumed that the jetwash bays would typically be used for 50% of a daytime reference period, allowing for inherent periods of off time for set up/change over. It is assumed the associated plant

room may run with both pumps operating for 100% of this period. However, it is not expected that the jetwash bays or plant room will operate over night-time hours (23:00 – 07:00).

4.10 The service bays would be served by 1no. air/water/screenwash, 1no. vacuum unit and 1no. combi unit. It is assumed that service bay equipment may operate in any period of the day or night, with a 50% on-time during the daytime reference period (1-hour) and 50% on-time during the night-time reference period, where it is highly unlikely all 3no. units would be used within the same 15-minute period.

4.11 The cumulative daytime and night-time noise levels generated by the proposed replacement mechanical plant has been predicted to the closest noise sensitive receptors identified in Figure A2 in Appendix A. The results are presented in Table 4.2 below.

Table 4.2: Predicted Specific Sound Levels

Receptor Reference	Location	Period	Specific Sound Level, dB $L_{Aeq,T}$
NSR1	North-facing windows of 1548 Ashton Old Road	Daytime	41
		Night-time	30
NSR2	Southwest facing windows of 1/3 Fairfield Avenue	Daytime	40
		Night-time	35

Sound Rating Level

4.12 In accordance with the guidance contained in BS 4142 the specific sound level has been corrected for tonal, impulsive, intermittent or other acoustic characteristics which may be present at the receptor to determine the sound rating level.

4.13 A character correction of + 3 - 6 dB is generally applied for a jet wash plant, where intermittent and impulsive nature may be just perceptible at the nearest receptors; however, where the existing site already comprises automated car wash activities, no character correction has been applied in this instance.

4.14 A character correction of + 2 dB might be applied for service bay equipment, where tonality could be just perceptible at the nearest receptors (if discernible above the residual environment). However, it is acknowledged that the site already comprises air/water units, and therefore this informs a worst-case, where any character associated with the items would be of a similar character to existing service station plant.

4.15 The daytime and night-time sound rating levels are therefore presented in Table 4.3 below.

Table 4.3: Predicted Rating Sound Levels

Receptor Reference	Location	Period	Rating Sound Level, dB $L_{Ar,T}$
NSR1	North-facing windows of 1548 Ashton Old Road	Daytime	41
		Night-time	32
NSR2	Southwest facing windows of 1/3 Fairfield Avenue	Daytime	40
		Night-time	37

BS 4142 Initial Estimate of Impact

4.16 The predicted daytime and night-time sound rating levels at the closest noise-sensitive receptors have been compared to the BS 4142 background levels and are presented in the table below.

Table 4.4: Initial Estimate of Impact

Location	Period	Sound Rating Level (dB $L_{Ar,T}$)	BS 4142 Background Level (dB $L_{A90,T}$)	Level Exceeding Background (dB)
NSR 1	Daytime	41	61	-20
	Night-time	32	45	-13
NSR 2	Daytime	40	59	-19
	Night-time	37	40	-3

4.17 Table 4.4 shows that the sound rating level of the proposed plant would be below the representative background sound level during the day and night.

4.18 As discussed in 2.22, in general, 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.

4.19 Based on the above, the initial assessment suggests that noise from the proposed mechanical plant and operations would have a low impact on surrounding receptors during the day (depending on context).

Context

4.20 BS 4142 states that where the initial estimate of impact needs to be modified due to the context, all pertinent factors should be taken into consideration, including the following:

<u>The Absolute Level of Sound</u>

4.21 The specific sound levels are predicted to fall significantly below the existing residual sound levels in the day and night (presented in Table 3.2 above). Predicted specific sound levels lie below the daytime residual sound levels by 26-27 dB and 10-15 dB during the night-time period.

4.22 Where there are large differences between the residual sound level over the specific sound level, of > 10 dB(A), then it has been realised in context that the ambient sound level should not change by any perceptible degree due to the instatement of the development.

<u>The Character and Level of the Residual Sound</u>

4.23 The assessment has shown that the existing noise climate is predominantly controlled by road traffic noise and existing commercial plant and forecourt operations, including automated car wash activities in the daytime. These are similar in character to the proposed development activities/plant.

4.24 Furthermore, plant character correction applied in 4.14 should be viewed as an absolute worst-case assumption, where residual noise from the existing sound climate would likely mask any distinguishing features.

The Sensitivity of the Receptor

4.25 It has been established that the noise emanating from the proposal would not increase noise levels at the existing residential premises and the proposed changes would be in keeping with the service station use class.

Context Summary

4.26 When accounting for context, noise emanating from the proposed mechanical plant and new operations would have a low impact during the daytime and night-time when assessed in accordance with BS 4142:2014.

5.0 Conclusions

5.1 SAL have been instructed to undertake a noise survey to support a planning application for proposed forecourt alterations at Openshaw Service Station. Details of the assessment methodology employed, together with the results of the baseline survey, assessment and conclusions are presented within this report.

5.2 The assessment has shown that noise emanating from the proposed development would have a low impact during proposed daytime periods of operation when assessed in accordance with BS 4142:2014+A1:2019.

Appendix A: Drawings and Figures

Figure A1: Existing site, surrounding area and measurement positions and nearest sensitive receptors annotated



Figure A2: Red line plan



Figure A3: Existing site layout



Figure A4: Proposed site layout



Figure A5: Technical specifications of proposed valeting equipment

Technical Specification -

Istobal Valeting Equipment

ISTOBAL
Vehicle Wash & Care

4CA2000 Jet Wash

Water consumption	12 Litres per minute on highest the function
Operating Pressure	65 Bar
Sound level	70 db
Electrical supply requirement	Single phase 40 amp or 3 phase N + E 20 amp
Water supply requirement	Recommended 20mm MDPE with isolation valve or a suitable pipe capable of delivering a minimum of 12 litres per minute.

4KA0000 Combo Unit

Water consumption	4 Litres per minute
Sound level	65.6 db
Electrical supply requirement	Single phase 16 amp
Water supply requirement	Recommended 20mm MDPE with isolation valve or a suitable pipe capable of delivering a minimum of 4 litres per minute.

4AA1000 Vacuum

Sound level	65.6 db
Electrical supply requirement	Single phase 16 amp
Water supply requirement	N/A

4VA1100 Air / Water / Screenwash

Water consumption	4 Litres per minute (If an Air only is being installed this is N/A)
Sound level	70 db
Electrical supply requirement	Single phase 16 amp
Water supply requirement	Recommended 20mm MDPE with isolation valve or a suitable pipe capable of delivering a minimum of 4 litres per minute. (If an Air only is being in-

Appendix B: Measured Data

Figure B1: MP1 measured noise levels

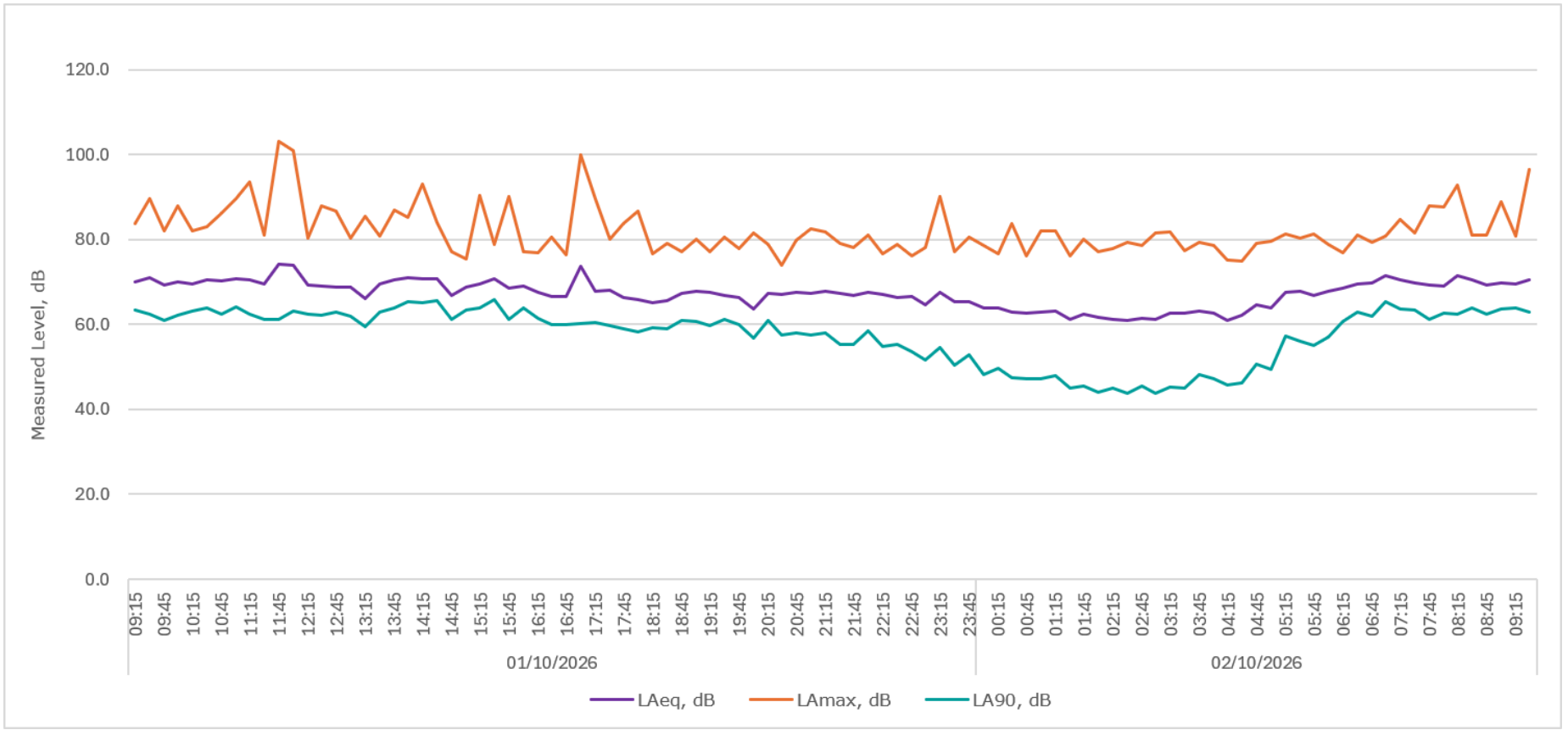


Figure B2: MP2 measured noise levels

