



Park Lane Service Station, Bedhampton

RO Car Wash Noise Impact Assessment

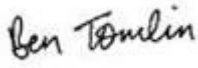
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REVISION HISTORY

Revision	Date	Revision Details	Author	Checked
R01	30/05/2025	Original Issue	 Susan Witterick BSc MIOA	 Ben Tomlin BSc MIOA

1 INTRODUCTION

- 1.1 dBx Acoustics has been appointed by Ironmoor Ltd to provide a noise impact assessment for the proposed replacement of the existing roll-over (RO) car wash on site with two new units and an associated extension to the existing structure at the Park Lane Service Station, Bedhampton, Havant PO9 3HQ.
- 1.2 Accordingly, this report presents the results of a noise survey conducted at the site, and an assessment of the noise impact arising from the proposed changes at the surrounding noise sensitive receptors.
- 1.3 A glossary of acoustic terminology is presented in Appendix A.

2 ACOUSTIC DESIGN CRITERIA

Havant Borough Council

- 2.1 The Havant Borough Local Plan (Core Strategy) (2011) policies CS16 and DM10 requires that the amenity of local residents shall be protected.
- 2.2 Havant Borough Council requires that noise resulting from the use of plant and machinery shall be of a No Observable Adverse Effect Level (NOAEL) at the boundary of the nearest noise sensitive receptor.

IEMA Guidelines for Environmental Noise Impact Assessment (2014)

- 2.3 These guidelines provide a framework for assessing the effect of a change in noise levels on a receptor.
- 2.4 Table 7-10 of the guidelines, reproduced as Table 1, below, considers the sensitivity of a receptor to noise level exposure.

Table 1: Sensitivity of Receptor to Noise Level Exposure

Effect Descriptors	Relative Change (dBL _{Aeq, T})
Negligible	2.9dBA or less change in sound level
Small	3 to 4.9dBA change in sound level
Medium	5 to 9.9dBA change in sound level
Large	Greater than 10dBA change in sound level

- 2.5 Table 7-11 of the guidelines then allows a degree of effect to be assigned based on the sensitivity of the receptor, as shown in Table 2, below.

Table 2: Degree of Effect Matrix

		Importance / Sensitivity of Receptor			
		High	Medium	Low	Negligible
Magnitude of Change	Large	Very Substantial	Substantial	Moderate	None
	Medium	Substantial	Substantial	Moderate	None
	Small	Moderate	Moderate	Slight	None
	Negligible	None	None	None	None

- 2.6 Residential receptors are considered of 'medium' sensitivity ('high' sensitivity is typically reserved e.g. for hospitals and laboratories). Commercial receptors are considered of 'low' sensitivity.
- 2.7 Finally, Table 7-7 is used to evaluate the effect significance, as reproduced in Table 3, below.

Table 3: Degree of Effect Matrix

Magnitude (Nature of Impact)		Description of Effect (on a specific sensitive receptor)
Substantial	Beneficial	Marked change. Causes a material change in behaviour and/or attitude e.g. individuals begin to engage in activities previously avoided due to preceding environmental noise conditions. Quality of life enhanced due to change in character of the area.
Moderate		Noticeable improvement. Improved noise climate resulting in small changes in behaviour and/or attitude e.g. turning down volume of television; speaking more quietly; opening windows. Affects the character of the area such that there is a perceived change in the quality of life.
Slight		Just noticeable improvement. Noise impact can be heard but does not result in any change in behaviour or attitude. Can slightly affect the character of the area not such that there is a perceived change in the quality of life.
Negligible	N/A No discernible effect on receptor	Negligible
Slight	Adverse	Non intrusive. Noise impact can be heard but does not cause any change in behaviour or attitude e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly affect the character of the area but not such that there is a perceived change in the quality of life.
Moderate		Intrusive. Noise impact can be heard and causes small changes in behaviour and/or attitude e.g. turning up volume of television; speaking more loudly; closing windows. Potential for non-awakening sleep disturbance. Affects the character of the area such that there is a perceived change in the quality of life.
Substantial		Disruptive. Causes a material change in behaviour and/or attitude e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in character of the area.
Severe		Physically harmful. Significant changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physical effects e.g. regular sleep deprivation/awakening, loss of appetite, significant medically definable harm, e.g. auditory and non auditory.

3 ASSESSMENT CONSIDERATIONS

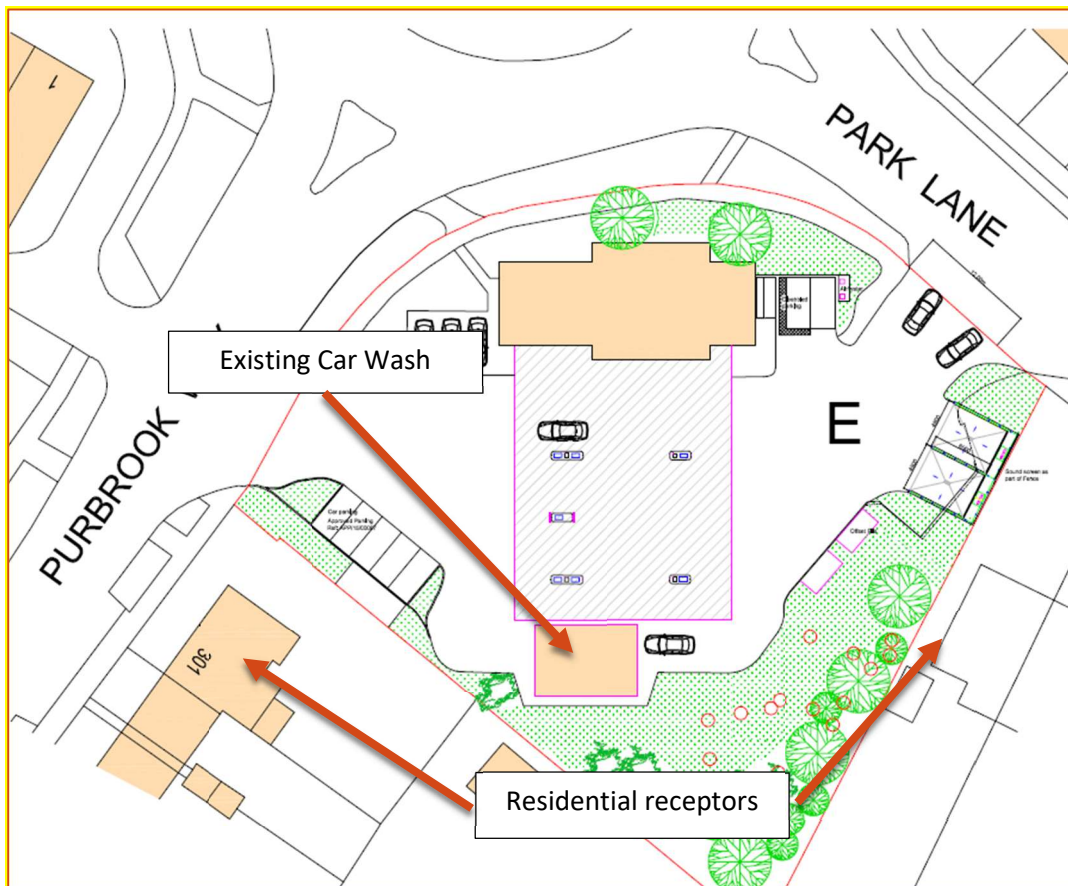
Existing Noise Climate

- 3.1 To support a previous application for the replacement of jet wash bays at the site (APP/24/00162), a noise survey was carried out in February 2024. Full details of the noise survey are reproduced in Appendix B.
- 3.2 The typical ambient noise level at the receptors is $62\text{dBL}_{\text{Aeq,T}}$ in the daytime period (08:00h-19:00h), and $59\text{dBL}_{\text{Aeq,T}}$ during the evening (19:00h-23:00h).

Noise Sensitive Receptors

- 3.3 The nearby noise receptors (NSRs) used in the assessment have been identified on Figure 1. The nearest receptors to the proposed RO car wash are 301 Purbrook Way approximately 30m from the car wash exit, and 95 Park Lane, approximately 30m from the car wash entrance.
- 3.4 95 Park Lane is owned by Ironmoor and occupied by the site operator.

Figure 1: Noise Sensitive Receptors



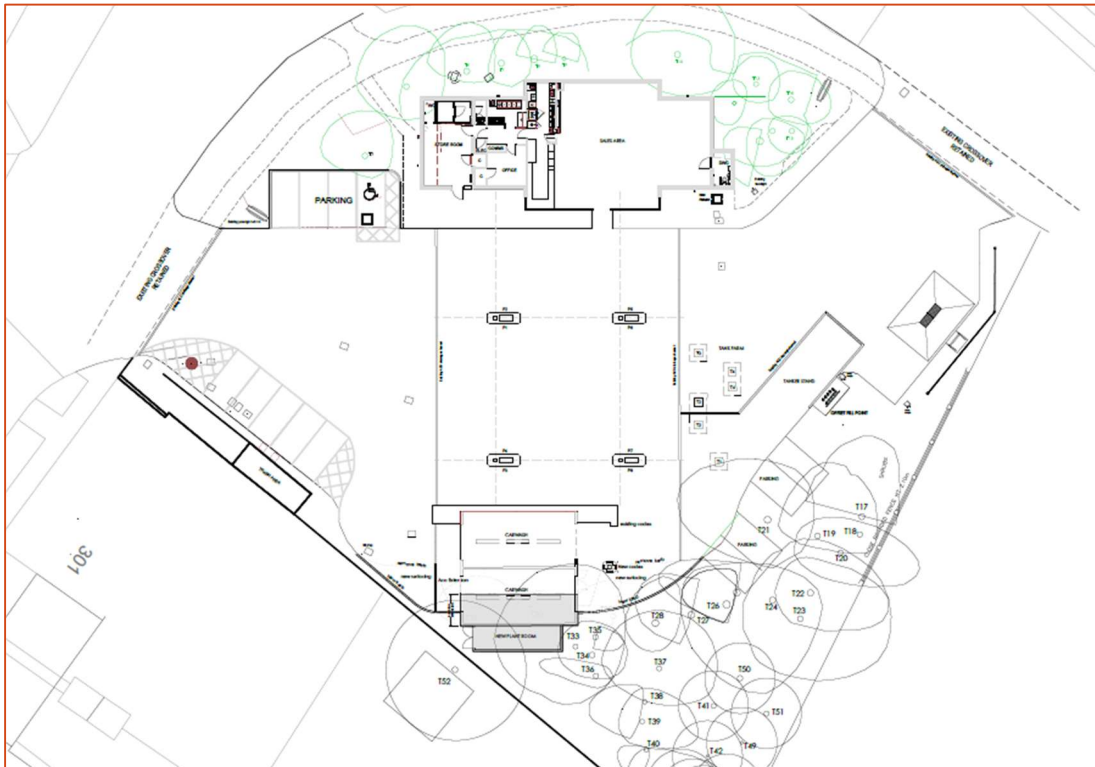
Existing Car Wash Noise Levels

- 3.5 Measurements were made of the existing RO car wash in operation on Wednesday 5th February 2025.
- 3.6 Measurements were made at 5m from the entrance and exit openings of the car wash during a typical 6-minute wash program. At both locations, the measured noise level across the full wash cycle was 76dBL_{Aeq,T}.
- 3.7 The existing RO unit is an Istobal Restyle. It is located in an open-ended enclosure.

Proposed Equipment

- 3.8 The proposed roll-over car wash model is the Istobal M'WASH3 Model 4PE3000.
- 3.9 Istobal publishes noise data for this unit on the basis of measurements made in accordance with EN ISO 3744 for a wash-dry cycle, quoting a sound power level of 100dBL_{WA}.
- 3.10 The proposed site layout is shown as Figure 2, below.

Figure 2: Proposed Site Layout



- 3.11 The proposed hours of operation are as for the recently consented jet wash units on site, namely 08:00h-22:00h Monday to Saturday, and 08:30h-21:00h on Sunday and Bank Holidays.

4 SITE NOISE MODEL

- 4.1 A computer noise model of the site has been produced using the Soundplan 9.0 software package. OS Mastermap data has been used to model the site terrain and building footprints, as well as solid timber fencing to the surrounding residential properties where this was observed to exist during the site visit.
- 4.2 The existing single RO car wash has been modelled, calibrated against the measured sound pressure level of $76\text{dB}_{\text{LAeq,T}}$ at 5m from the entrance / exit openings, to assess the existing specific noise level arising at the noise sensitive receptors.
- 4.3 Following this, the replacement 2-unit car wash has been modelled based on the manufacturer's noise data.
- 4.4 In both cases, the enclosure is modelled with a height of 4m and a roof. The opening areas to each bay are approximately 3m x 3m.
- 4.5 Noise from the wash units is represented as a point source located centrally within the enclosure at a height of 2m.
- 4.6 A screenshot from the post-development model showing the noise sensitive receptors (green dots) and RO noise sources (blue dots) is presented as Figure 3. A 3D view is presented as Figure 4.

Figure 3: Noise Model, 2D

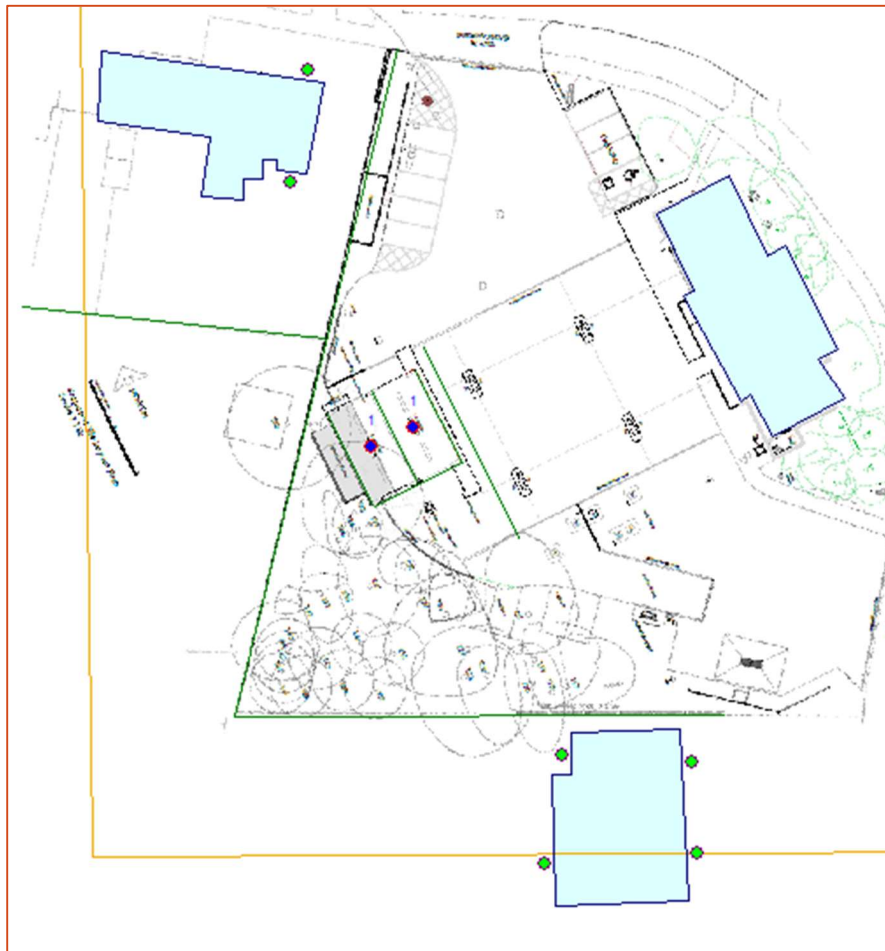
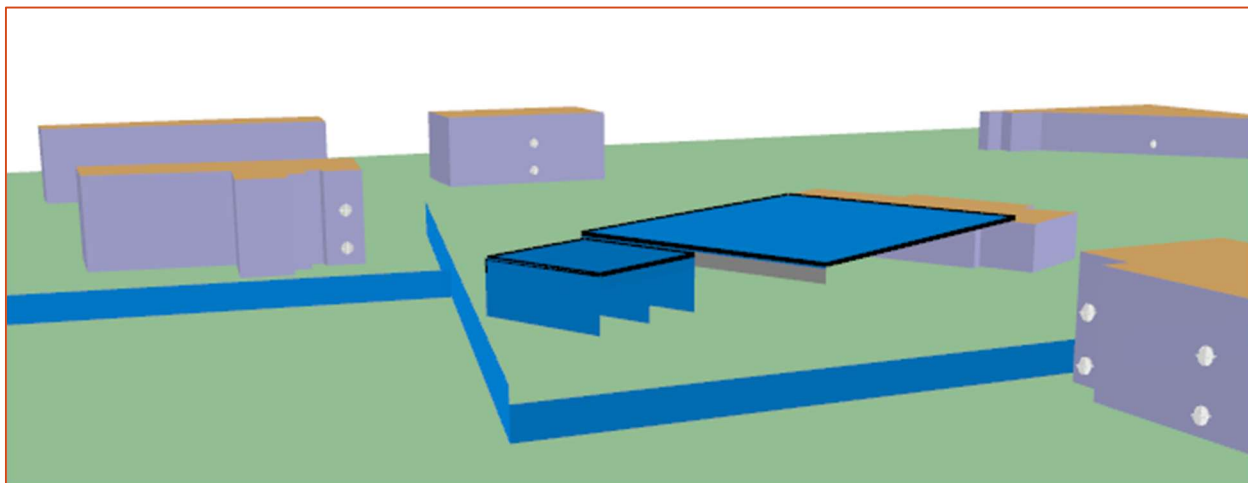


Figure 4: 3D View from Noise Model



5 ASSESSMENT

- 5.1 The model for the existing situation (single Istobal Restyle RO wash) has been calibrated to the measured sound pressure level of 76dBL_{Aeq,T} at 5m during a typical wash cycle. This is achieved by modelling the car wash with a sound power level of 102dBL_{WA}.
- 5.2 The model has then been updated to include the two proposed Istobal M'WASH3 Model 4PE3000 units (sound power 100dBL_{WA}), as indicated in Figures 4 and 5, above.
- 5.3 The model has then been used to predict the specific noise level arising at the residential receptors due to the existing and proposed situations.
- 5.4 The results are summarised in Table 4, below. All results are at first floor level (4.5m above ground) to represent a worst-case for noise impact.

Table 4: Specific Noise Level at Receptors, Existing

Receptor	Existing Specific Noise Level, dBL _{Aeq,T}	Predicted Specific Noise Level, dBL _{Aeq,T}
301 Purbrook Way	59	60
95 Park Lane	60	61

- 5.5 The predicted increase in specific noise level at the residential receptors is 1dB. This would not be considered a perceptible change.
- 5.6 Further, the predicted specific noise level presented in Table 4, above, assumes that both RO units would be in continuous operation throughout opening hours. Whilst this represents typical usage during peak periods, it is conservative to assume that usage post 19:00h would be no more than 50%, occasioning a 3dB correction to the predicted specific noise level.
- 5.7 With reference to the noise survey carried out at the site (Appendix B), the typical ambient noise level at the receptors is 62dBL_{Aeq,T} in the daytime period (08:00h-19:00h), and 59dBL_{Aeq,T} during the evening (19:00h-22:00h).
- 5.8 The cumulative noise level (ambient + car wash) at the receptors and the change in noise level associated with the proposed RO car wash units, is summarised in Table 5, below.

Table 5: Resultant Change in Noise Level

Receptor	Period	Predicted Specific Noise Level, dBL _{Aeq,T}	Ambient Noise Level, dBL _{Aeq,T}	Cumulative Noise Level, dBL _{Aeq,T}	Change, dB
301 Purbrook Way	Day (08:00h-19:00h)	60	62	64.1	+2.1
	Evening (19:00h-22:00h)	57	59	61.1	+2.1
95 Park Lane	Day (08:00h-19:00h)	61	62	64.5	+2.5
	Evening (19:00h-22:00h)	58	59	61.5	+2.5

- 5.9 The greatest change in noise level arising due to the proposed replacement RO car wash is 2.5dB at 95 Park Lane. With reference to the IEMA *Guidelines for Environmental Noise Impact Assessment* table 7-10, reproduced as Table 1, above, this would be considered to have a 'negligible' impact.
- 5.10 With reference to the matrix in Table 7-7 of the IEMA guidelines, this therefore is considered to have no discernible effect on the receptor.
- 5.11 *On this basis, taking into account the context of the existing noise climate at the receptors which already includes noise from car wash activity, it is considered that no adverse impact on residential amenity would occur as a result of the proposals.*

6 CONCLUSION

- 6.1 A noise impact assessment has been carried out for the proposed replacement of the existing Roll-Over Car Wash at Park Lane Service Station, Bedhampton, Havant PO9 3HQ, with a two-bay unit.
- 6.2 The proposed hours of operation are as for the recently consented jet wash units on site, namely 08:00h-22:00h Monday to Saturday, and 08:30h-21:00h on Sunday and Bank Holidays.
- 6.3 A noise model of the noise impact from the existing RO car wash has been created and calibrated against measurements made on site with the unit in operation. The model has then been updated to reflect the proposed equipment and enclosure, based on the manufacturer's data.
- 6.4 With reference to the site noise survey undertaken in February 2024, which included noise from the existing RO unit in operation, the resultant change in noise level at the most affected receptors has been calculated and assessed with reference to the IEMA *Guidelines for Environmental Noise Impact Assessment*.
- 6.5 The noise impact is considered 'negligible' and as such the proposals are considered to have no adverse impact on residential amenity.
- 6.6 On this basis, noise should not be a limiting factor in the planning application submitted to Havant Borough Council.

APPENDIX A – GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel, dB	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. For sound pressure level (L_p) the reference quantity is 2×10^{-5} N/m ² . The sound pressure level existing when microphone measured pressure is 2×10^{-5} N/m ² is 0 dB, the threshold of hearing.
L	Instantaneous value of Sound Pressure Level (L_p) or Sound Power Level (L_w).
Frequency	Number of cycles per second, measured in hertz (Hz), related to sound pitch.
A-weighting	Arithmetic corrections applied to values of L_p according to frequency. When logarithmically summed for all frequencies, the resulting single "A weighted value" becomes comparable with other such values from which a comparative loudness judgement can be made, then, without knowledge of frequency content of the source.
$L_{eq,T}$	Equivalent continuous level of sound pressure which, if it actually existed for the integration time period T of the measurement, would possess the same energy as the constantly varying values of L_p actually measured.
$L_{Aeq,T}$	Equivalent continuous level of A weighted sound pressure which, if it actually existed for the integration time period, T, of the measurement would possess the same energy as the constantly varying values of L_p actually measured.
$L_{n,T}$	L_p which was exceeded for n% of time, T.
$L_{An,T}$	Level in dBA which was exceeded for n% of time, T.
L_{Fmax}	The instantaneous maximum sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
L_{AFmax}	The instantaneous maximum A weighted sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
$L_{Ar,Tr}$	The rating level: the equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise.
Reverberation Time, T	The time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped. The descriptor T, often includes other nomenclature to describe the type of reverberation time measurement or if the reverberation time is an average taken for specific frequencies. For example, a T_{mf} is the mid-frequency reverberation time.
Absorption Coefficient, α	The fraction of reverberant sound energy absorbed by a material. It is expressed as a value between 1.0 which equates to perfect absorption and 0 which equates to zero absorption.
Acoustic Class, A - E	Classification of sound absorbers into Sound Absorption Classes A-E, according to BS EN ISO 11654, including frequencies 200-5000 Hz
NRC	A single-number rating system used to compare the sound-absorbing characteristics of building materials. A measurement of the acoustical absorption performance of a material, calculated by averaging its Sound Absorption Coefficients at 250, 500, 1000 and 2000 Hz
STI	Speech Transmission Index , Metric ranging between 0 and 1 representing the transmission quality of speech with respect to intelligibility by a speech transmission channel
R	Sound Reduction Index , the laboratory measured sound insulation properties of a material or building element in octave or third octave bands.
R_w	Weighted Sound Reduction Index , a single number which represents the sound reduction of a material. It is derived by plotting the sound reduction index against a set of reference curves. The curves are shifted until a best-fit is established and the curve which best fits the sound reduction spectrum is used to represent the single figure value.
D_w	Weighted Level Difference , the weighted level difference between a pair of rooms, stated as a single figure.

D_{nT}	Standardised Level Difference, a frequency-dependent measurement of airborne sound insulation, calculated using the following formula: $D_{nT} = L_1 - L_2 + 10\log(T/T_0)$ dB Where: L_1 is the energy-averaged sound pressure level due to the pink noise source measured in the source room using a sweep technique. L_2 is the energy-averaged sound pressure level measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (= 0.5s for dwellings).
$D_{nT,w}$	Weighted Standardised Level Difference, a single-figure value of airborne sound insulation performance, derived according to procedures in BS EN ISO 717-1, based on the D_{nT} values at different frequencies (100-3150 Hz third octave bands).
$D_{n,F,w}$	Weighted, Normalised Flanking Level Difference, the normalised, weighted difference in sound level between a pair of rooms via a flanking element, such as mullion or ceiling detail. The level difference in octave bands is first normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
D_{ne}	Normalised Element Level Difference. The normalised difference in sound level between a pair of rooms via a small element such as a trickle ventilator. The level difference in octave bands is normalized to a reference amount of absorption.
$D_{n,e,w}$	Weighted, Normalised Element Level Difference. The normalised, weighted difference in sound level between a pair of rooms via a small element such as a trickle ventilator, stated as a single figure. The level difference in octave bands is normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
C_{tr}	Spectrum Adaptation Term, a correction term applied to the sound insulation single-number values (R_w, D_w, and $D_{nT,w}$) in accordance with BS EN ISO 717-1. Applying the C_{tr} penalises a construction's performance if its low frequency performance is poor in relation its performance at higher frequencies.
Impact Sound	The noise generated by an impact on a structure. This is normally used to describe the noise created by people walking or moving furniture on a floor structure.
L_{nT}	Standardised Impact Sound Pressure Level, a frequency dependent measurement of impact sound insulation, calculated using the following formula: $L_{nT} = L_1 + 10\log(T/T_0)$ dB Where: L_1 is the mean sound pressure level due to the tapping machine measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (0.5s for dwellings)
$L'_{nT,w}$	Weighted Standardised Impact Sound Pressure Level, a single-figure value (@ 500 Hz) of impact sound insulation, performance, derived according to BS EN ISO 717-2, based on the L_{nT} values at different frequencies (100Hz- 3150 Hz third octave bands).
Insertion Loss, IL	The reduction of noise level due to the presence of a noise control device such as an attenuator, excluding any regeneration noise created by its presence.
NR	The Noise Rating level. This is a single figure value derived by plotting a noise spectrum against a set of curves. The curve under which the spectrum fits is the resulting NR level.

APPENDIX B – ENVIRONMENTAL NOISE SURVEY

An environmental noise survey was carried out between 08:00h on Tuesday 27th February 2024 and 10:15h on Thursday 29th February 2024.

Weather Conditions

The temperature during the noise survey varied between 7°C-10°C. There were scattered showers on Wednesday 28th February, but analysis of the survey data indicates that this did not have any effect on the measured noise levels. Wind speeds during the survey averaged 4m/s.

Equipment Used

The equipment used during the noise survey is presented in Table B1, below.

Table B6: Equipment Used

Equipment	Manufacturer & Part No.	Serial Number	Calibration Date
Meter	Casella C633C	1716934	21/09/2023
Pre-Amp	CEL 495	001773	
Microphone	CEL 251	000847	
Calibrator	CEL 120/1	1530668	29/01/24

The sound level meter was calibrated before and after measurements, with no significant drift recorded. An accredited laboratory calibrated the equipment not more than two years prior to the measurements being made, with the exception of the calibrator, which had been calibrated not more than one year prior to the survey.

Measurement Location and Noise Climate

Noise levels were measured continuously at the southern boundary of the Service Station site, adjacent to 95 Park Lane, as shown in Figure B1, below.

This measurement location was selected as representing the noise sensitive receptor with the least exposure to road traffic noise and potentially greatest exposure to noise from the proposed car wash.

A summary of the noise levels measured is presented in Table B2, below.

It can be seen that the measurements are consistent across the measurement periods, which is a good indication that the data gathered is representative of the noise climate at the surrounding residential receptors.

Figure B1: Noise Monitoring Location

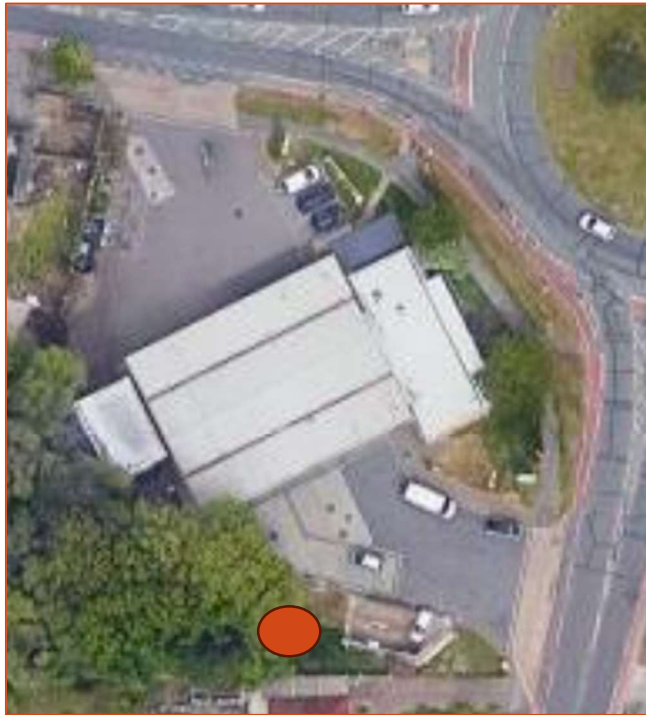


Table B2: Measured Noise Levels

Date	Period	Ambient Noise Level, $\text{dBL}_{\text{Aeq,T}}$	Background Noise Level, $\text{dBL}_{\text{A90,T}}$
Tuesday 27 th February	Daytime 08:00h-19:00h	63	57
	Evening 19:00h-23:00h	59	56
	Night 23:00h-07:00h	55	40
Wednesday 28 th February	Daytime 07:00h-19:00h	62	57
	Evening 19:00h-23:00h	59	51
	Night 23:00h-07:00h	56	38
Thursday 29 th February	Daytime 07:00h-10:15h	63	58

This report (including any enclosures and attachments) has been prepared by dBx Acoustics with reasonable skill and care in accordance with generally accepted acoustic principles and the terms agreed between dBx Acoustics and our Client. Any information provided by third parties and referred to herein may not have been checked or verified by dBx Acoustics unless expressly stated otherwise. This document contains confidential information, and no part of this report should be reproduced, distributed or communicated to any third party without express prior written consent from dBx Acoustics. We do not accept any liability if this report is used for an alternative purpose from that for which it is intended, nor to any third party in respect of this report. Where a noise survey has been undertaken, this report is based on the noise climate at the site at the time of the survey and no warranty is given as to the possibility of changes at differing times.

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