



BRAIDEN ACOUSTICS LTD

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NOISE IMPACT ASSESSMENT

Prepared For : Deighton Carwash Ltd

Date : 9 Oct 2025

Site : Deighton Carwash, 70-84 Sheepridge Rd, Huddersfield

Report No. : 11144

1 INTRODUCTION

Braiden Acoustics has been commissioned by Deighton Carwash Ltd to undertake an acoustic survey at Deighton Carwash, 70-84 Sheepridge Rd, Huddersfield to support a retroactive planning application for a change of use to a car wash with tyre changing facilities.

1.1 AIM

This report will show that the site should be suitable for its intended use, regarding noise, pending any potential mitigation measures.

2 DESCRIPTION OF SITE

Deighton Car Wash is a former car park on the outskirts of Huddersfield, in Deighton.



Figure 1
Street view of site

2.1 SITE AND SURROUNDING USES

The site is bounded by Sheepridge Road to the north. To the east of the site is a convenience store with further commercial units to the west.

To the rear of the site (south) are residential dwellings, with more residential dwellings to the north, on the opposite side of Sheepridge Road. The wider area is predominantly residential.



Figure 2
Plan view of site (shown in red) and the surrounding residential dwellings

2.2 EXISTING / PROPOSED USE

The site is currently operating as a car wash and the planning application seeks retrospective permission with the addition of a tyre changing facility. The main washing area is towards the western flank of the site with one jet washer and one Hoover. Other cleaning activities are done by hand.

The tyre changing facility will be located in the south eastern corner of the site. Within the tyre changing workshop will be tyre changer and a wheel balancer.

The wheels will be removed / replaced using an impact drill within the tyre changing parking bays, next to the tyre changing workshop.

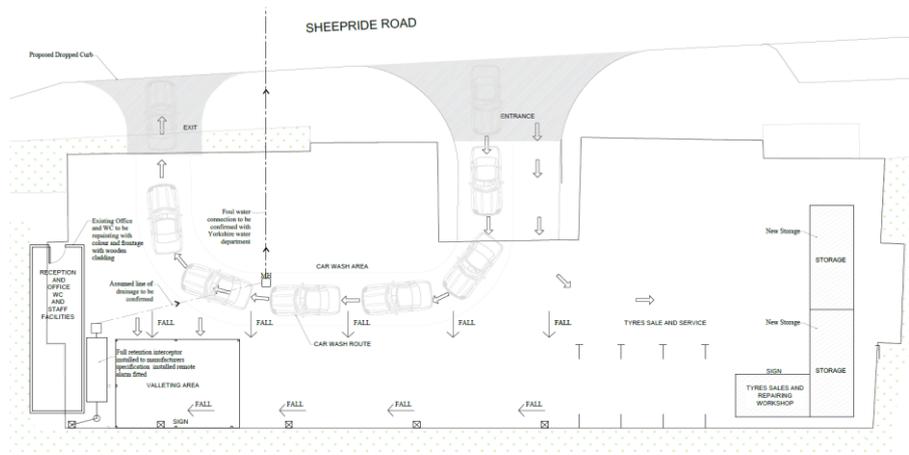
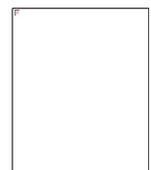


Figure 3
Proposed site layout

2.2.1 Opening hours

The site wishes to continue to operate during daytime hours:

08:00 – 18:00	Monday - Friday
09:00 – 17:00	Saturday
10:00 – 17:00	Sunday



3 ACOUSTIC CRITERIA AND METHODOLOGY

'Industrial' noise affecting residential dwellings is dealt with in the British Standard BS 4142

3.1 BS 4142

BS 4142:1999 "Method for rating industrial noise affecting mixed residential and industrial areas" [1] assesses industrial noise with regards to nearby residential dwellings. The guidance is commonly used to compare the equivalent noise from an industrial source only (specific noise level), L_{Aeq} , to the background noise level, L_{A90} , at the nearest sensitive receptor (NSR).

When measuring the Background Noise Level, the Standard states:

Choose outdoor measurement locations that will give results that are representative of the ambient sound and residual sound at the assessment location(s). Make the measurement of the ambient sound level, the residual sound level and the background sound level at a height of 1.2 m to 1.5 m above the ground, unless there is a specific reason to use an alternative height (which should be justified), and under similar conditions, e.g. similar influence of reflections and measurement height above the ground. Where practical, minimize the influence of reflections by making the measurements at least 3.5 m from any reflecting surface other than the ground.

Where it is necessary to undertake measurements above ground floor level, choose a location which is approximately 1 m from the facade on the relevant floor of the building if it is not practical to make the measurements at least 3.5 m from the facade at this elevation. NOTE When measurements for distant sources are made at 1 m from a facade, the measured level can be adjusted to an equivalent free-field level by subtracting a 3 dB correction factor. For sources that are relatively close or not perpendicular to the facade the correction may be 1 dB or 2 dB, in which case the reasons for not using a correction of 3 dB ought to be explained.

Essentially, background noise measurement should be made free field. If measurements are made at the façade, then a correction should be made in order to represent the free field.

This Standard has been recently updated, BS 4142:2014 "Methods for rating and assessing industrial and commercial sound" [2]. Whereas the old standard added 5dB 'penalty' to the Specific Noise Level (SNL) if the noise source has a 'character' that can draw attention that may be described as tonal, intermittent or impulsive, the new standard gives clearer guidance on noise 'character'. Furthermore, the previous Standard gave only one 5 dB penalty whereas the new Standard may not. When added to the specific noise level it forms the rating level. The new Standard gives the guidance for the following types of noise character:

Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

Correct the specific sound level if a tone, impulse or other characteristic occurs, or is expected to be present, for new or modified sound sources.

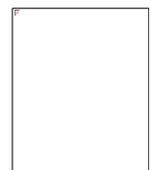
NOTE 1 The prominence of tonal or impulsive sound from a source can be masked by residual sound. In many cases the amount of masking varies as the residual sound changes in level and possibly character. The source's tonal and/or impulsive characteristics could also vary with time.

Consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention.

Tonality

For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

Impulsivity



A correction of up to +9 dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.

Other sound characteristics

Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Intermittency

When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3 dB can be applied.

Once a penalty for noise character is added to the Specific Noise Level then this is termed the Rating Level.

The background level is then compared to the rating level. It is usual that the rating level due to the source should be below the background noise level at the nearest sensitive receptor; indeed BS 4142 states:

“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.”

4 NOISE MONITORING

Measurements were made in and around the current car wash facility as well as local tyre fitting facility.

4.1 MONITORING DETAILS

Personnel: John Braiden, BSc & MSc Acoustics, MIOA.

Weather: 18°C temperature; <5ms⁻¹ wind; ~60% cloud.

Date and time: Thursday 2nd October between approximately 1400 – 1500 hrs.

Equipment: NTi XL2 integrated real time analyser & B&K 4231 calibrator

The sound level meter was calibrated before after the measurements with no drift reported.

4.2 MEASUREMENT LOCATION

Short term Background Noise measurements were taken at the edge of Sheepridge Road, to represent the noise level at the houses on the other side of the road, and to the rear of the site to represent the houses to the rear.

Noise measurements of the various noise sources were taken at suitable distances.

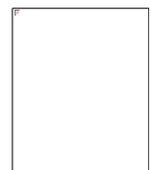




Figure 4
Site showing BNL Monitoring Locations

4.3 MONITORING RESULTS

Noise measurements of the various noise sources were made ‘ad hoc’ when they were in use. The measurement durations were typical of how long the noise sources were in use.

Background noise measurements were then made when the various noise sources were not in use as is in line with Section 7.3 of BS 4142, which states:

Measure the background noise level in the absence of the specific noise on days and at times when the specific noise source would normally be operating, either:

- a) during a temporary shutdown of the specific noise source; or*
- b) during a period immediately before or after the specific noise source operates.*

Although the background noise and noise source measurements were short, they were found to be representative and typical. Longer noise measurement, if possible, were unlikely to give significantly different results.

Noise Source	Distance	Internal / External	Time Start	Time Finish	Duration	Noise Level	LAeq / LA90	Intermittent	Impulsive	Tonal
Hoover	2m	External	14:06:54	14:08:24	00:01:30	68.1	LAeq	yes	no	no
Jet Wash	3m	External	14:10:30	14:11:56	00:01:26	72.9	LAeq	yes	no	no
Tyre Changer	1m	Internal	14:28:50	14:29:00	00:00:10	60.4	LAeq	yes	yes	no
Tyre Changer	1m	Internal	14:31:28	14:31:57	00:00:29	75.1	LAeq	yes	yes	no
Tyre Changer	1m	Internal	14:32:24	14:32:52	14:32:52	86.5	LAeq	yes	yes	no
Impact Gun	2m	External	14:38:32	14:39:10	00:00:38	78.8	LAeq	yes	yes	no
Background - Front	n/a	External	14:47:53	14:52:27	00:04:34	56.0	LA90	n/a	n/a	n/a
Background - Rear	n/a	External	14:52:57	15:02:55	00:09:58	45.4	LA90	n/a	n/a	n/a

Table 1
Measured noise levels

The pertinent measurements are shown in the above Table.

The relevant BS 4142 ‘penalties’ are also noted in the above Table.

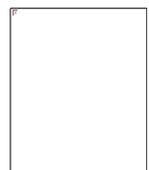
5 ACOUSTIC ASSESSMENT

Each of the relevant noises will be assessed, specifically:

- Jet washer
- Hoover

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- Impact gun (for removing/replacing wheel nuts)
- Tyre changer

5.1 HOOVER

The hoovering takes place at the north west corner of the site.

The nearest sensitive receptor (NSR) is across Sheepridge Road, some 25 m.



Figure 5
Distance from hoovering location to NSR

5.1.1 BS 4142 Assessment

As the nearest receptor is across the road, then the Background Noise Level for the front of the site is used.

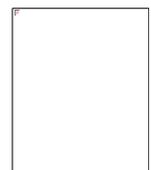
BS 4142 Noise Assessment		
Hoover	Value	dB
Measured Noise Level	2	68
Distance to NSR	25	-22
Total Specific Noise Level @ NSR		46
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	0
Intermittency	0/3	3
Rating Noise Level		49
Background Noise Level	front	56
Rating minus Background		-7

Table 2
BS4142 Assessment - Hoover

The above Table shows that the Rating Level from the hoover is 7dB less than the Background Noise Level and, therefore, of 'low – no impact'. No mitigation is required.

5.2 JET WASHER

The cars are jet-washed in the south-western corner of the site.



The nearest sensitive receptor is 35m to the south east.



Figure 6
Distance from jet washer to NSR

5.2.1 BS 4142 Assessment

As the nearest receptor is to the south-east, then the Background Noise Level for the rear of the site is used.

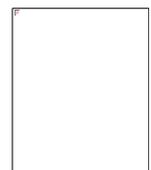
BS 4142 Noise Assessment Jet Washer	Value	dB
Measured Noise Level	3	68
Barrier	10kg/m ²	-10
Distance to NSR	35	-21
Total Specific Noise Level @ NSR		37
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	3
Intermittency	0/3	3
Rating Noise Level		43
Background Noise Level	rear	45
Rating minus Background		-2

Table 3
BS4142 Assessment – Jet Washer

The above Table shows that the Rating Level from the hoover is 2dB less than the Background Noise Level and, therefore, of 'low – no impact'. However, mitigation is required.

The southern boundary must have sufficient barrier, of surface density and height, to reduce noise levels on site by 10dB. Therefore, the following is recommended:

NB The rear boundary must have surface density of at least 10kg/m², without any gaps, and of a sufficient height to block all noise sources. An estimate, at this time is 2 – 2.5m but this must be checked on site.**



5.3 TYRE SERVICING AREA

The proposed location for the Tyre Servicing Area is only 15m or so to the nearest residential dwelling to the south.

In order to mitigate noise affecting the houses to the south of the Tyre Servicing Area, the whole area needs to be moved to the northern boundary, as shown in the Figure below.

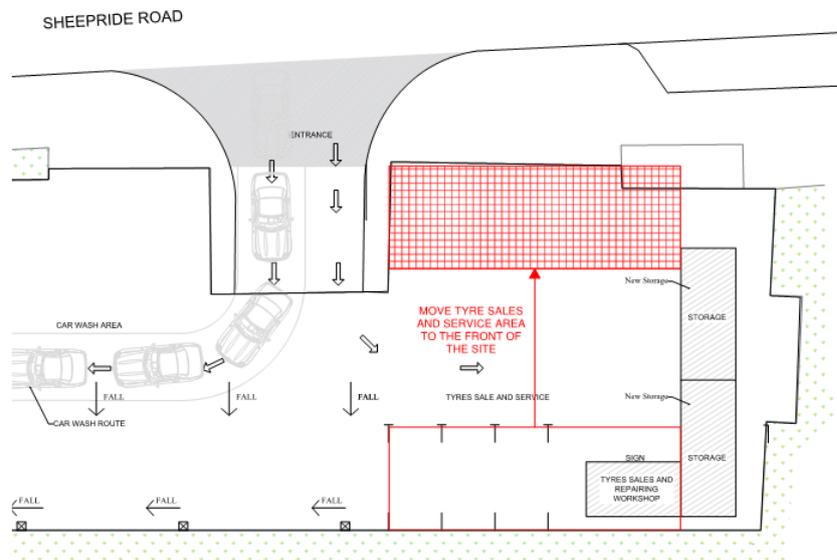


Figure 7
Tyre Servicing Area relocated

Given the new location of the Tyre Servicing Area, the relevant noise sources shall be assessed to both, the houses to the north and the houses to the south.

5.3.1 Impact Gun

The distances to the northern and southern properties are shown in the Figure below.

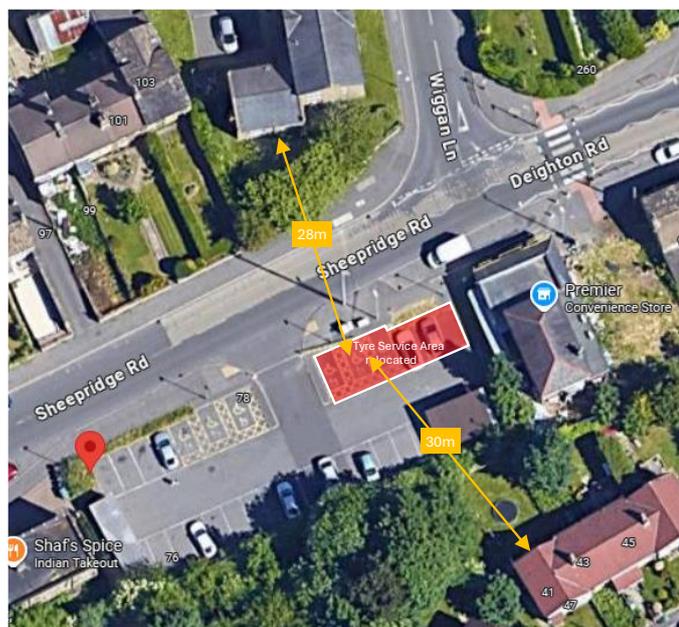
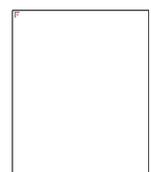


Figure 8
Distance from impact Gun to NSRs



The assessment of noise from the Impact Gun will be done separately for the northern and southern properties.

5.3.1.1 BS 4142 Assessment - SOUTH

For the southern properties, the Background Noise Level for the rear of the site is used.

BS 4142 Noise Assessment Impact Gun	Value	dB
Measured Noise Level	1	78.8
Barrier	10kg/m ²	-10
Distance to NSR	30	-30
Total Specific Noise Level @ NSR		39
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	3
Intermittency	0/3	3
Rating Noise Level		45
Background Noise Level	rear	45
Rating minus Background		+0

Table 4
BS4142 assessment for Impact Gun- SOUTH

The BS 4142 assessment of the Rating Level from the Impact Gun on the southern dwellings is 0dB below the Background Noise Level and therefore of 'low impact'.

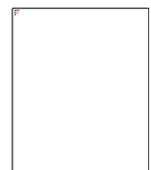
NB The rear boundary must have surface density of at least 10kg/m², without any gaps, and of a sufficient height to block all noise sources. An estimate, at this time is 2 – 2.5m but this must be checked on site.**

5.3.1.2 BS 4142 – NORTH

For noise propagating northwards, the Background Noise Level at the front of site is used.

BS 4142 Noise Assessment Impact Gun - NORTH	Value	dB
Measured Noise Level	1	78.8
Barrier	10kg/m ²	0
Distance to NSR	28	-29
Total Specific Noise Level @ NSR		50
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	3
Intermittency	0/3	3
Rating Noise Level		56
Background Noise Level	front	56
Rating minus Background		-0

Table 5 – BS 4142 Assessment for Impact Gun – NORTH



The BS 4142 assessment for noise going north also has a Rating Level of odB below the Background noise level and, therefore, also of 'low impact'. No further mitigation is required.

5.3.2 Tyre Changer

The tyre changer will be located within the Tyre Servicing unit. There will be a door on the southern elevation of the unit.

As the tyre changer is indoors, then a noise break out calculation is used.

$$SPL_{int,rev} = SPL_{ext} + SRI - 10 \log S + A_{dist} + 14 \quad (1)$$

where SPL_{ext} = external open air sound pressure level (SPL), dB

$SPL_{int,rev}$ = internal reverberant SPL, dB

SRI = sound reduction index of building element, dB

S = area of building element, m²

A_{dist} = attenuation due to distance, dB

Equation (1) is taken from Fläkt Woods Practical Guide to Noise Control.

For noise propagating northwards, the sound will travel through the rear wall of the unit.

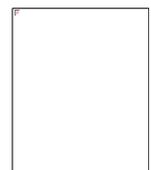
For noise propagating southwards, the sound will travel through open doors.



Figure 9
Distances from Tyre Servicing unit to NSRs

5.3.2.1 BS 4142 - SOUTH

For the southern properties, the Background Noise Level for the rear of the site is used.



BS 4142 Noise Assessment Tyre Changer - SOUTH	Value	dB
Measured Noise Level	1	83.16
SRI of open door		0
Area of open door	4	6
Distance to NSR	25	-28
Inside to outside correction		-14
Barrier	10kg/m2	-10
Total Specific Noise Level @ NSR		37
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	3
Intermittency	0/3	3
Rating Noise Level		43
Background Noise Level	rear	45
Rating minus Background		-2

Table 6
BS4142 assessment for tyre changer- SOUTH

The BS 4142 assessment of the Rating Level from the Tyre Changer on the southern dwellings is 2dB below the Background Noise Level and therefore of 'low impact'.

NB The rear boundary must have surface density of at least 10kg/m², without any gaps, and of a sufficient height to block all noise sources. An estimate, at this time is 2 – 2.5m but this must be checked on site.**

5.3.2.2 BS 4142 – NORTH

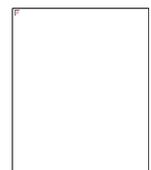
For noise propagating northwards, the Background Noise Level at the front of site is used.

BS 4142 Noise Assessment Tyre Changer - NORTH	Value	dB
Measured Noise Level	1	83.16
SRI of container walls		-10
Area of rear wall of container	4	6
Distance to NSR	25	-28
Inside to outside correction		-14
Barrier	10kg/m2	0
Total Specific Noise Level @ NSR		37
BS 4141		
Tonality	0/2/4/6	0
Impulsivity	0/3/6/9	3
Intermittency	0/3	3
Rating Noise Level		43
Background Noise Level	front	56
Rating minus Background		-13

Table 7 – BS 4142 Assessment for Tyre Changer – NORTH

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The BS 4142 assessment for noise going north has a Rating Level of 13dB below the Background noise level and, therefore, of 'low-no impact'. No further mitigation is required.

5.4 BARRIER DETAILS

The barrier must extend the full length of the southern boundary, as show in Figure 10.

The barrier must **not contain any gaps**.

The height of the barrier should be at least 2m (this is to be checked on site). There should be no direct line of sight from any noise source to any dwelling.

The surface density should be at least 10 kg/m².

Ideally the barrier should be timber and so look like a residential boundary fence.

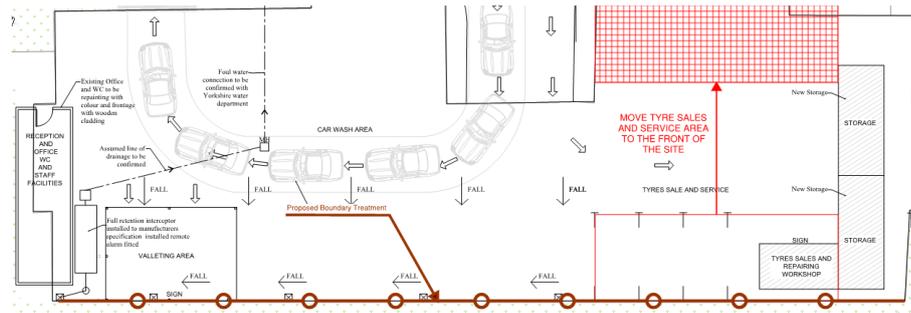


Figure 10
Site layout showing proposed boundary treatment

6 CONCLUSION

An acoustic survey has taken place at Deighton Carwash, 70-84 Sheepridge Rd, Huddersfield to support a retrospective planning application for a Car Wash and Tyre Service.

All the relevant noise sources have been assessed and the following has been recommended.

- **Move the tyre servicing area to the northern boundary of the site**
- **A boundary treatment should be installed on the southern boundary of the site, of suitable surface density and height.**

Details of the above recommendations are given in the body of the report. For any clarification, contact Braiden Acoustics.

Pending the above recommendations, noise from the various industrial sources will be of 'low impact'.

7 REFERENCES

[1] BS 4142: 1997
Method for Rating industrial noise affecting mixed residential and industrial areas
British Standards Institute, 1997.

[2] BS 4142: 2014
Methods for rating and assessing industrial and commercial sound
British Standards Institute, 2014.

