



ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 3676

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MORLAND WAY, HARPUR HILL
ENVIRONMENTAL NOISE IMPACT ASSESSMENT
ACOUSTIC CONSULTANCY REPORT ADT 3676/ENIA

Revision	Date	Prepared by	Checked by	Revision Notes
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1.0 SUMMARY

Planning permission HPK/2021/0020 has been granted for a new 3760 m² portal framed building with ancillary office accommodation over two floors.

Planning condition 8 requires an acoustic survey of night time and day time background noise levels at the boundary, which has now been undertaken as described in this report.

Planning condition 9 relates to noise from industrial activities, fixed plant and machinery, with a requirement to achieve BS 4142:2014+A1:2019 rating levels not exceeding the otherwise prevailing background sound levels at surrounding noise sensitive properties by more than 5 dB during the day. During the night, the rating level is not to exceed the background level at the same assessment location.

The nearest noise sensitive properties are houses on Morland Road, around 150 metres away to the north, and Rock Bank, some 200 metres away to the north-east.

Noise from future fixed plant selections, servicing operations and noise breakout from internal activities has been assessed individually and cumulatively at the identified noise sensitive locations.

The assessment shows that compliance with the technical requirements of planning condition 9 would be achieved, except in respect of HGV operations during the middle of the night, which are unlikely to occur for a unit of this type and size, and the initial tenant takes HGV deliveries not more than 2 or 3 times a week, during the day only. If a future operator needed to service HGVs throughout the night then additional acoustic screening would be required.

2.0 BASIS OF ASSESSMENT

2.1 Site Location

The site is located off Morland Way, Buxton, and is currently an agricultural field.

The immediate surrounding area is also agricultural, with the remains of former quarrying operations. The Harpur Hill business park is about 100 metres away to the south-west.

There is a small cluster of houses about 150 metres away on Morland Way to the north, which are the closest noise sensitive properties. There are more houses on Rock Bank, around 200 metres away to the north-east.

Morland Way joins Grin Low road a short distance away to the north, which then runs towards Harpur Hill to the east and connects with the A53 about 2km away to the north-west. The A515 is the nearest main road, just over 1km away to the north-east.

2.2 Development Details

Planning permission HPK/2021/0020 has been granted for a new 3760 m² portal framed building with ancillary office accommodation over two floors. The service yard is to the north of the building, with a landscaped bund just beyond, and the access road runs north towards Morland Way.

The landscaped bund provides a reasonable degree of acoustic screening between the service yard and the nearest dwellings on Morland Way to the north.

The initial tenant intends to operate the facility during the day, although the potential for night time operations by future operators has also been assessed.

2.3 Planning Requirements

Planning condition 8 reads as follows:

No development shall take place until a full acoustic survey has been undertaken to determine both nighttime and daytime background noise levels at the site and the survey shall be submitted to the Local Planning Authority and approved in writing.

Planning condition 9 reads as follows:

The rating level of sound emitted from industrial activities, fixed plant and/or machinery at the use hereby approved shall not exceed background sound levels (as determined in condition 9 above) by more than 5dB(A) between the hours of 0700-2300 (taken as a 15 minute LA90 at the nearest sound sensitive premises) and shall not exceed the background sound level between 2300-0700 (taken as a 15 minute LA90 at the nearest/any sound sensitive premises). All measurements shall be made in accordance with the methodology of BS4142: 2019 Methods for rating and assessing industrial and commercial sound and/or its subsequent amendments. Where access to the nearest sound sensitive property is not possible, measurements shall be undertaken at an appropriate location and corrected to establish the noise levels at the nearest sound sensitive property. Any deviations from the LA90 time interval stipulated above shall be agreed in writing with the local planning authority.

In relation to the content of planning condition 9, the background sound levels have been measured over 15 minute periods as prescribed, while the rating levels have been determined using a 1 hour assessment period during the day and a 15 minute period during the night, in accordance with BS 4142:2014+A1:2019.

2.4 Nearest Noise Sensitive Properties

The noise sensitive properties in the surrounding area have been grouped into two noise sensitive areas as described below and indicated on the attached site plan 3676/SP1:

NSA	Location	Direction	Approximate distance from proposed building (metres)
1	Houses on Morland Way	north	150
2	House on Rock Bank	north-east	200

The above noise sensitive areas represent the closest noise sensitive properties, with others located further from the site and in some cases screened by the intervening buildings. A satisfactory noise impact at the defined noise sensitive areas should therefore ensure a satisfactory noise impact at other noise sensitive locations.

2.5 Strategy for Noise Impact Assessment

Based on the information in Sections 2.1 to 2.4 above, the strategy for the noise impact assessment has been broken down into the following stages:

- i. undertake an environmental noise survey to obtain baseline noise data, as described in Section 3.0 below

- ii. assess the impact of noise emissions from new fixed plant installations as described in Section 4.0 below. At this stage the specific plant selections have not been made, and future users may install different plant. The strategy is therefore to set environmental noise limits in accordance with the requirements of planning condition 9.
- iii. assess the impact of noise from outdoor servicing operations, as described in Section 5.0 below
- iv. assess the impact of noise breakout from the building, as described in Section 6.0 below.
- v. assess cumulative noise from fixed plant, outdoor servicing and noise breakout, as described in Section 7.0 below.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Purpose

The purpose of the survey was to determine the existing ambient noise levels at locations representative of the identified noise sensitive areas, over samples of the day time and night time period.

3.2 Scope of Survey

The nature of the site and the surrounding area precluded the use of long term automatic noise monitoring. A fully attended environmental noise survey was therefore undertaken over the most sensitive periods of the day time and night time periods, the first between 06:00 hours and 10:00 hours on Monday 08 April 2024, and the second between 02:00 hours and 06:00 hours on Wednesday 10 April 2024.

3.3 Instrumentation

The instrumentation used, and the field calibration values before and after each survey period are detailed in Appendix A of this report.

3.4 Procedure

Two measurement positions were selected as described below and indicated on the attached site plan 3676/SP1:

- i. on the existing site access road, at approximately the same distance from Morland Way as the nearest houses (to represent noise sensitive area NSA1).
- ii. on the eastern site boundary, to represent noise sensitive area NSA2, the houses on Rock Bank. This was further from Grin Low Road, but higher in elevation and therefore with a clearer view of more distant noise sources.

At both positions the microphone was mounted on a tripod approximately 1.2 metres above the ground and least 3.5 metres from any other acoustically reflective surface.

Measurements were taken at each position using the 01dB Fusion sound level meter (during the day survey) and the Blue Solo sound level meter (during the night survey), each set to store the octave band and A-weighted 100ms short-term L_{eq} levels over a 15 minute sample of each hour for subsequent post processing.

3.5 Results

The logged data has been post processed to determine $L_{Aeq,T}$, $L_{A90,T}$ and L_{Amax} levels for each 15 minute period, and these are listed in the attached tables 3676/T1 and 3676/T2 for the day and night periods respectively.

The minimum background sound levels representative of each noise sensitive area are as follows:

Noise sensitive area	Representative measurement position	Day time 07:00 – 23:00 <i>$L_{A90, 1 \text{ hour}}$</i>	Night time 23:00 – 07:00 <i>$L_{A90, 15 \text{ mins}}$</i>
NSA1 – Houses on Morland Way	Position 1	44	28
NSA2 – Houses on Rock Bank	Position 2	44	29

Please refer to Appendix B for explanation of the noise units and the A-weighting term used in this report.

3.6 Weather Conditions

The weather conditions throughout the day survey period were overcast with occasional very light drizzle, and with average wind speeds remaining below 5 m/s. Occasional strong gusts of winds were observed, but these are not considered to have had a significant effect on the measured noise levels.

Weather conditions throughout the night survey period were dry and overcast with wind speeds generally at or around 5 m/s. Occasional strong gusts of winds were observed, but did not significantly affect the measured background sound levels.

3.7 Description of Existing Acoustic Environment

At the beginning of the day time period the noise levels at both positions were largely controlled by the sound of birdsong, sheep bleating, distant roads and occasional vehicles on Grin Low Road.

From around 07:00 hours an increase in traffic on Grin Low Road and noise from the industrial units to the south-west was observed at both positions, which abated slightly towards the end of the survey period.

During the night time period the background sound levels were controlled by distant traffic in Buxton and from the direction of the A53, this dropped over the course of the survey before increasing again from 05:00 hours as traffic flows increased and birdsong commenced. There was sporadic noise from reversing alarms, vehicle movements and engines from the industrial units to the south-west throughout the night.

4.0 NOISE IMPACT ASSESSMENT (NEW FIXED PLANT)

4.1 Basis of Assessment

At this stage none of the major fixed plant installations have been selected, so it is not possible to undertake a noise impact assessment of specific equipment.

Environmental noise limits have therefore been proposed, which can then be used in the future selection of plant and any associated attenuation.

4.2 Noise Limits

As described in Section 2.3 above, it is a requirement of planning condition 9 that the BS 4142 rating level of industrial noise emissions from the site does not exceed the otherwise prevailing background sound level by more than 5 dB during the day, and with no excess during the night, at the noise sensitive locations.

As there are several potential noise sources to take into account, to ensure that the cumulative noise levels comply with that condition the proposal is to control noise from fixed plant to BS 4142 rating levels not exceeding the background level during the day, and to a level 5 dB below the background level during the night.

Proposed noise limits for fixed plant are therefore as follows:

Recommended BS 4142:2014+A1:2019 rating level limits for fixed plant		
Location	Day (07:00 - 23:00)	Night (23:00 - 07:00)
	<i>L_{Ar, 1 hour} dB</i>	<i>L_{Ar, 15 mins} dB</i>
NSA1 – Houses on Morland Way	44	23
NSA2 – Houses on Rock Bank	44	24

The permissible noise from individual items of plant will depend on their location and screening from the houses, but as a general guide, plant situated on the north-west or north-east elevations of the building should be limited to a cumulative sound power level of $L_{w(A)}$ 86 dB during the day and 69 dB during the night.

5.0 **NOISE IMPACT ASSESMENT (SERVICING OPERATIONS)**

5.1 **Source Data**

The initial tenant has provided information on their expected external operations, which include 2 or 3 HGV arrivals over the course of a week, and more regular loading and unloading of small vans using electric fork trucks. These activities will all take place during the day.

Noise from night time operations is possible in the future with the current or a subsequent tenant.

The source noise data for these operations is set out in Appendix C.

Noise from waste collections has not been specifically included in the assessment as it occurs relatively infrequently and the noise varies considerably according to the type of waste collected. For most industrial premises it would be normal to schedule waste collection for non-sensitive day-time hours only.

5.2 Initial Assessment of Impact

Based on the information set out in Section 5.1 above, specific sound levels have been calculated at the surrounding noise sensitive areas using Cadna/A 2023 environmental noise mapping software, with first order reflections and ground absorption applied where appropriate.

The HGV manoeuvres have been modelled as moving point sources with a speed of 5 km/h for the forward components and 3 km/h for the reverse component. The vehicle engine has been assumed to be running with the vehicle stationary for 30 seconds before departing.

The servicing noise is not normally tonal or intermittent, although there is an impulsive character. A correction of + 3 dB has been applied to the specific sound levels to account for the perceptible impulsivity of the sound, on the basis that it would be just perceptible at the relatively distant noise sensitive areas.

Predicted specific sound levels at the identified noise sensitive areas for the day time period with a HGV arrival, unload (30 minutes), engine idle and set off, together with unloading of vans for the whole of the 1 hour assessment period are set out in the following table, along with the background sound levels and the resulting differences:

BS 4142 assessment - day time period		
	NSA1 Morland View Road	NSA2 Rock Bank
Specific Sound Level L _{Aeq, 1 hour} (dB)	32	35
Character correction (dB)	+ 3	+ 3
Predicted Rating Level L _{Ar, 1 hour} (dB)	35	38
Background level L _{A90, 1 hour} (dB)	44	44
Excess of rating level over background sound level (dB)	- 9	-- 6

The noise from day time servicing operations should therefore be well within the requirements of planning condition 9, in and of itself.

At night, the position is slightly different as the BS 4142 rating level of the transient HGV manoeuvres are averaged over a 15 minute assessment period, rather than a 1 hour period. The specific sound levels, rating levels, background levels and the resulting differences for the night time period are set out in the following table:

BS 4142 assessment - night time period		
	NSA1 Morland View Road	NSA2 Rock Bank
Specific Sound Level L _{Aeq, 15 mins} (dB)	35	38
Character correction (dB)	+ 3	+ 3
Predicted Rating Level L _{Ar, 15 mins} (dB)	38	41
Background level L _{A90, 15 mins} (dB)	28 - 40	29 – 42
Excess of rating level over background sound level (dB)	-2 to +10	-1 to +12

Compliance with planning condition 9 clearly depends on whether the activities and in particular the HGV servicing are taking place during the middle of the night when background levels are at their lowest, or during the 06:00 to 07:00 hours period when background levels are similar to day time conditions.

In reality, it is unlikely that there would be HGV servicing during the night, as the initial tenant does not operate in that way, and night deliveries would tend to be associated with a major logistics warehouse for a food chain operator or parcels delivery company, rather than a unit on this relatively small scale.

The noise from the unloading of vans using electric fork trucks alone would be relatively insignificant, with specific sound levels of $\leq 20 \text{ dB } L_{Aeq,T}$ at the identified noise sensitive areas. This would yield rating levels below the background levels even during the middle of the night.

It would therefore be reasonable to conclude that the noise from outdoor servicing operations would be compliant with planning condition 9, with the proviso that there are no HGV deliveries during the night (23:00 to 07:00), notionally, vehicles with a gross weight of over 3.5 tonnes.

6.0 NOISE BREAKOUT FROM BUILDING

Measurements have been taken of the noise levels at the existing premises used by the initial tenant. They currently operate out of two different units in Chapel en le Frith and Whaley Bridge, and one objective of the move to the new Buxton premises is to consolidate those operations onto one site. The reverberant sound pressure levels measured in each unit under normal operations are provided in Appendix C, and are fairly similar to the levels measured by ADT in modern industrial premises of a similar size.

The building will be constructed using typical insulated metal cladding, and the sound reduction indices for a typical example (Kingspan AWP/60) are as follows:

Octave band centre frequency (Hz)	63	125	250	500	1k	2k	4k	8k
Sound reduction index (R)	15	16	19	23	26	22	39	39

These figures equate to a weighted sound reduction index of R_w 25.

The cladding is likely to be supplemented by blockwork up to around 3000mm, but the upper section and roof would not be lined. The roller shutter doors are assumed to be closed during normal operations.

Cadna/A 2023 environmental noise mapping software has been used to model environmental noise breakout from the walls and roof of the proposed building, based on the information described above. The resultant noise levels at the identified noise sensitive properties are as follows:

	$L_{eq,T}$ (dB) at octave band centre frequency (Hz)								A-wt
	63	125	250	500	1k	2k	4k	8k	
NSA1 Morland Way	30	29	29	22	16	17	-6	-24	25
NSA2 Rock Bank	26	25	24	18	11	12	-13	-38	20

The noise levels provided above do not exhibit clear tonality, nor would the noise be intermittent as the same activities take place throughout the working day. It is possible that there could be impulsivity which may potentially be noticeable at one or other assessment location, but only during the night when the background levels are lower.

The BS 4142 assessment of day time operations is therefore as follows:-

BS 4142 assessment - day time period		
	NSA1 Morland View Road	NSA2 Rock Bank
Specific Sound Level $L_{Aeq, 1 \text{ hour}}$ (dB)	25	20
Character correction (dB)	0	0
Predicted Rating Level $L_{Ar, 1 \text{ hour}}$ (dB)	25	20
Background level $L_{A90, 1 \text{ hour}}$ (dB)	44	44
Excess of rating level over background sound level (dB)	- 19	- 24

During the night, the assessment would be as follows:

BS 4142 assessment - night time period		
	NSA1 Morland View Road	NSA2 Rock Bank
Specific Sound Level $L_{Aeq, 15 \text{ mins}}$ (dB)	25	20
Character correction (dB)	+ 3	+ 3
Predicted Rating Level $L_{Ar, 15 \text{ mins}}$ (dB)	28	23
Background level $L_{A90, 15 \text{ mins}}$ (dB)	28 - 40	29 – 42
Excess of rating level over background sound level (dB)	-12 to 0	-19 to -6

Noise breakout from buildings would therefore be compliant with the requirements of planning condition 9 during the day or the night, in and of itself.

7.0 CUMULATIVE IMPACTS

It is necessary to consider the worst case scenario with fixed plant noise, servicing activity and noise breakout from the building occurring at the same time.

The cumulative specific sound levels at the identified noise sensitive areas for the fixed plant noise, servicing noise and noise breakout from the building have been calculated as follows:-

Assessment of cumulative noise - day		
	NSA1 Morland View Road	NSA2 Rock Bank
Fixed plant noise (from Section 4.2)	44	44
Servicing noise (from Section 5.2)	32	35
Noise breakout from buildings (Section 6.0)	25	20
Cumulative $L_{Aeq, 1 \text{ hour}}$ dB	44	45
Character correction (dB)	+ 3	+ 3
Predicted Rating Level $L_{Ar, 1 \text{ hour}}$ (dB)	47	48
Background level L_{A90} (dB)	44	44
Excess of rating level over background sound level (dB)	+ 3	+ 4

For this worst case scenario, the BS 4142 rating levels would be not more than 5 dB above the background sound levels, as required by planning condition 9.

The same assessment of cumulative noise for the night time period is as follows:

Assessment of cumulative noise - night		
	NSA1 Morland View Road	NSA2 Rock Bank
Fixed plant noise (from Section 4.2)	23	24
Servicing noise (from Section 5.2)	35	38
Noise breakout from buildings (Section 6.0)	25	20
Cumulative $L_{Aeq, 15 \text{ mins}}$ dB	36	38
Character correction (dB)	+ 3	+ 3
Predicted Rating Level $L_{Ar, 15 \text{ mins}}$ (dB)	39	41
Background level L_{A90} (dB)	28 - 40	29 – 42
Excess of rating level over background sound level (dB)	-1 to +11	-1 to +12

The night time cumulative impacts are entirely controlled by the noise from servicing activities, and as described in Section 5.2 above, but this would not generally occur during the middle of the night when the background levels are at their lowest.

The requirement in planning condition 9 to achieve rating levels not exceeding the otherwise prevailing sound levels should therefore be achieved during normal operations.

FOR ACOUSTIC DESIGN TECHNOLOGY

Measurement
Position 1



Measurement
Position 2

Notes

Description

Site Plan Showing Noise Monitoring Locations and Noise Sensitive Areas

Project

Morland Way, Harpur Hill

Survey Dates

08 April 2024 and 10 April 2024

Drawing No.

3676/SP1



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EARLY MORNING / DAY SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Position	Period	L _{Aeq, 15mins} dB	L _{Amax} dB	L _{A90} dB
1	06:02 – 06:17	56	78	40
	07:00 – 07:15	59	83	46
	08:00 – 08:15	57	78	45
	09:01 – 09:16	57	78	44
2	06:18 – 06:33	51	66	43
	07:17 – 07:32	53	68	48
	08:17 – 08:32	52	64	45
	09:17 – 09:32	51	68	44

TABLE 3676/T1

NIGHT SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Position	Period	L _{Aeq, 15mins} dB	L _{Amax} dB	L _{A90} dB
1	02:05 – 02:20	41	67	37
	03:05 – 03:20	45	69	34
	04:05 – 04:20	47	65	28
	05:05 – 05:20	53	75	38
2	02:25 – 02:40	46	65	39
	03:25 – 03:40	42	62	31
	04:25 – 04:40	43	62	29
	05:25 – 05:40	45	57	35

TABLE 3676/T2

APPENDIX A - INSTRUMENTATION

Manufacturer	Type and / or Model	Serial Number	Last Laboratory Calibration	Calibrator Output (dB)	Free Field Correction (dB)	Initial reading (dB)	Final reading (dB)
01dB	Fusion 1 Class 1 Sound Level Meter (SLM11)	15131	April 2023		-0.30	113.7	113.69
01dB	Fusion MCE3 Microphone	14038	April 2023				
01dB	(Blue) Solo Class 1 Sound Level Meter	60320					
01dB	PRE 21 S Pre-Amplifier	16866	March 2023		-0.10	113.9	114.1
01dB	MCE 212 ½ inch Microphone	90549					
Norsonic	Nor1251 Calibrator (Cal 4)	33453	March 2024	113.98			
Norsonic	Nor1251 Calibrator (Cal 5)	34220	February 2024	114.02			

APPENDIX B

Acoustic Terminology

The annoyance produced by noise is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and any variations in its level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

A-weighting The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the A-weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average person. It is also possible to calculate the A-weighted noise level by applying certain corrections to an un-weighted spectrum.

When the noise being measured has variable amplitude, such as traffic noise, it is necessary to qualify the basic dB unit. This may be done using a statistical index L_n dB, where n is any value between 0 and 100, and is the percentage of the sample time for which the stated level is exceeded. In defining the use of the index, both the value of n and the length of the sample period must be stated.

L_{10} L_{10} , being the level exceeded for 10% of the time, has been shown to be a good indicator for traffic noise intrusion, and is used in assessing the effect of traffic noise on residential or commercial premises.

L_{90} L_{90} is the level exceeded for 90% of the time, and is used as a measure of background noise level, as it excludes the effects of occasional transient levels, such as individual passing cars or aircraft.

In addition to the statistical noise indices defined above, the following noise units are also used to define variable amplitude noise sources:

$L_{eq,T}$ $L_{eq,T}$ is defined as the notional steady sound pressure level which, over a stated period of time, would contain the same amount of acoustical energy as the actual fluctuating sound measured over the same period. In other words, it is a measure of the "average" noise level

L_{max} L_{max} is the maximum time-weighted sound pressure level recorded over the stated time period

APPENDIX C

Noise Source Data

Noise data: $L_{eq,T}$ at 5m except where indicated									
	63	125	250	500	1k	2k	4k	8k	A-wt
Library data for generic operations									
Unloading HGV with gas turbine heavy duty fork truck	82	73	72	69	68	66	56	51	73
HGV manoeuvring (source at 1.25m height)	80	71	66	69	70	69	62	53	74
HGV start and idle (source at 1.25m height)	82	72	69	69	69	70	66	64	75
Data for the initial tenant operations									
Unloading van using lightweight electric fork truck	55	59	56	57	53	50	49	37	59
Production noise inside Whaley Bridge unit (reverberant L_p)	60	59	64	63	65	65	60	58	70
Production noise inside Chapel en le Frith unit (reverberant L_p)	69	70	73	71	68	66	65	62	74