ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 3107

19 November 2020

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MOT STATION, LONGSIGHT

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

ACOUSTIC CONSULTANCY REPORT ADT 3107/ENIA

Revision	Date	Issued By	Checked by	Revision Notes
-	19 November 2020	Rob Ashby	Andrew Lockwood	first issue

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1.0 SUMMARY

Acoustic Design Technology Limited have been appointed to undertake an environmental noise impact assessment for a proposed new MOT test centre on land to the east of New Bank Street, Manchester. The proposal is to redevelop the site to construct a single storey test centre with associated offices and surface car parking as indicated on the application drawings.

An environmental noise survey was undertaken to assess ambient noise levels representative of surrounding noise sensitive areas during the proposed opening hours.

BS 4142:2014 rating level limits have been proposed for the cumulative noise level from all plant and commercial activities, set on a par with the otherwise prevailing background noise levels.

A BS 4142 assessment of the noise from all operations has been undertaken, with an initial assessment of 'low impact'. Consideration of the noise in the context of the existing noise climate indicates noise levels would result in 'no observed adverse effect' using the Planning Practice Guidance.

2.0 BASIS OF ASSESSMENT

2.1 Site Location

The site is located in Longsight, approximately 3.5km south east of Manchester city centre. The existing site is currently in use as a HGV storage yard.

The site is bounded to the north by the CAF Rail Longsight depot, and by railways and sidings to the north and east. To the south, the site adjoins a number of existing residential properties on Chalcombe Grange. To the west, the site is bounded by New Bank Street, with residential properties approximately 40m beyond.

To the south west lie a number of commercial units which are part of the nearby Longsight Trading Estate, the boundary of which lies approximately 20m to the south west.

2.2 Proposed Development

The proposal is to redevelop the site to create a single storey MOT testing centre with associated offices plus parking provision for up to seven cars.

Proposed opening and delivery hours are as follows.

Period	Hours
Opening hours Monday to Saturday	08:00 – 17:00
Opening hours Sunday	08:00 – 12:00

Access to the development is via New Bank Street at the western site boundary.

2.3 Planning Policy

The National Planning Policy Framework (NPPF) sets out the general terms of reference for sustainable development, including noise. Section 180 states that:

> *Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
>
> *c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

However, neither the NPPF nor the supplementary guidance Noise Policy Statement for England (NPSE) contain any fixed noise criteria, assessment methods or references to established standards such as BS 4142 or BS 8233.

For this development the key principle to be applied from the NPPF is to protect existing residents from noise generated by the development.

The Planning Practice Guidance (Noise) defines the action to be taken for various effect levels, based on perception of noise and typical outcomes. These are provided in the attached table 3107/T1.

2.4 Assessment Criteria

The assessment of noise from on-site activities has been undertaken having regard to the guidance presented in BS 4142: 2014 +A1: 2019 '*Methods for rating and assessing industrial and commercial sound*'.

BS 4142 describes an assessment methodology for determining a 'rating level' for the items of plant being assessed, typically expressed in terms of dB $L_{Ar,Tr}$. BS 4142 also notes that certain acoustic features can increase the significance of the impact over that expected from a basic comparison between the specific sound level and the background sound level. In such instances, a character correction may be applied to obtain the rating level.

The rating level is compared to the background noise level (typically measured in terms of dB $L_{A90,T}$) in the absence of noise from the item or items of plant being assessed:

- A difference of +10 dB is likely to be an indication of a significant adverse impact depending on the context.

- A difference of +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level is relative to the measured background 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 that plant noise would have a 'low impact' depending on the context of the prevailing noise climate.

2.5 Nearest Noise Sensitive Properties

The noise sensitive properties in the surrounding area have been grouped into noise sensitive areas (NSA), as described below and as indicated on the attached site plan 3107/SP1.

NSA	Location	Direction	Approximate distance from site boundary (metres)
1	Dwellings on Chalcombe Grange	South	<5
2	Dwellings on Lamb Close	West	40

The above NSA 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 NSA should therefore ensure a satisfactory noise impact at other noise sensitive areas.

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 surrounding noise sensitive areas during the proposed opening hours.

3.2 Scope of Survey

A fully attended environmental noise survey was undertaken between 13:00-15:30 on Monday 16 November 2020. The survey period was selected to avoid rush hour periods at the beginning and end of the day, when background noise levels would be increased by commuter traffic on the roads and a higher number of train journeys.

3.3 Instrumentation

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

3.4 Procedure

A single measurement position was selected as described below and indicated on the attached site plan 3107/SP1.

Monitoring position 1 was chosen as representative of the level at the quieter of the two identified noise sensitive receptor locations, and thus provides a more onerous assessment.

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, at the boundary of NSA 2.

The noise levels were logged continuously for the duration of the survey period using a series of consecutive 5 minute periods with the sound level meter set to store the summary results for each period

3.5 Results

The logged $L_{Aeq,T}$ $L_{A90,T}$ and L_{Amax} levels for each 5 minute period are summarised in the table below, with detailed results presented in 3107/T2.

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

3.6 Weather Conditions

Weather conditions throughout the survey period were generally favourable, with light winds, dry ground and a lack of precipitation. Some rainfall did occur around 15:30, after which the survey was terminated.

3.7 Description of Existing Acoustic Environment

The existing noise climate is controlled by a combination of distant road traffic, and noise from trains. Noise from the trains was generally a mixture of general railway noise such as rail squeal and shunting, however there was also a significant distant low frequency component which was discernible for the majority of the survey period at the monitoring location. This is assumed to be from idling diesel tractor units.

Local road traffic was intermittent and local industrial and commercial activity noise could be discerned occasionally at the monitoring location. Based on site observations, noise levels at NSA 1 were significantly more affected by noise from surrounding commercial uses than NSA 2, with nearby noise generating activities including the existing HGV yard on the development site, as well as the Best Tyres garage to the south of the site.

4.0 NOISE IMPACT ASSESSMENT (NEW FIXED PLANT)

4.1 Basis of Assessment

No fixed external plant such as condensers is proposed for the development, with all testing activities and equipment located internally within the testing centre. Therefore, the assessment will consider noise emission from the open roller shutter doors of the MOT centre, plus movements of vehicles into and out of the test centre.

4.2 Noise Limits

As described in Section 2.4 above, noise from plant and commercial activities at the proposed MOT centre have been assessed based on the BS 4142 methodology, where a rating level on a par with the typically prevailing background level is defined as a 'low impact'.

Please refer to Appendix C for definitions of the relevant terms from BS 4142:2014.

Proposed noise limits are therefore as follows:

Recommend BS 4142:2014 rating level limits for fixed plant L_{Ar} dB	
Location	Daytime (08:00-17:00)
All NSA	46

4.3 Predicted Noise Levels

To assess noise levels at the façade of the identified NSA, a three dimensional Cadna-A noise model has been developed. Noise model geometry is based on drawings and information supplied by the client, as well as ordnance survey mapping and digital terrain data. Noise levels have been predicted at a height of 4.5m above ground at the most noise affected façade of each NSA having windows to habitable rooms.

Based on the plans provided, there are four customer parking spaces, plus three staff spaces. The noise model therefore includes up to 7 car parking movements for the worst case 1 hour period.

Noise levels within the testing centre are based on library data recorded by ADT at similar vehicle testing and maintenance operations, with appropriate corrections for the number and duration of each activity during a typical 1 hour period. Source noise data for the principal noise sources associated with the MOT centre are set out in Appendix D.

Based on the information set out above, predicted rating levels, typical background levels and initial assessments of impacts are presented in the following table:

	NSA1	NSA2
Specific Noise Level $L_{Aeq,\ 1hour}$ (dB)	45	40
Acoustic feature correction* (dB)	+ 3	+ 3
Predicted Rating Level $L_{Ar,1\ hour}$ (dB)	48	43
Background level $L_{A90,1\ hour}$ (dB)	46	46
Excess of rating over background (dB)	+2	-3

*Note:- correction for 'just perceptible impulsivity' applied

4.4 Noise Impact Assessment

The results of the BS 4142 assessment presented in Section 4.3 indicate that the cumulative rating noise level from the proposed MOT centre would be ≤ 2dB above the measured prevailing background noise level, inclusive of rating corrections, and is therefore considered to represent a 'low impact'.

When taking into account the context of the existing noise climate, which is currently subject to noise from similar activities as a result of the nearby Best Tyres Fit as well as the railway to the west, noise from the MOT centre would be in-keeping with the character and magnitude of the existing noise climate.

Further, the cessation of HGV activities on the site following completion of the development would be expected to reduce noise levels at NSA, as the proposed site activities are expected to be less intensive and of a lower overall noise level.

Thus, according to the Planning Practice Guidance although the noise may be audible at the closest NSA, it is unlikely to have any effect on behaviour or attitude, equating to 'no observed adverse effect'.



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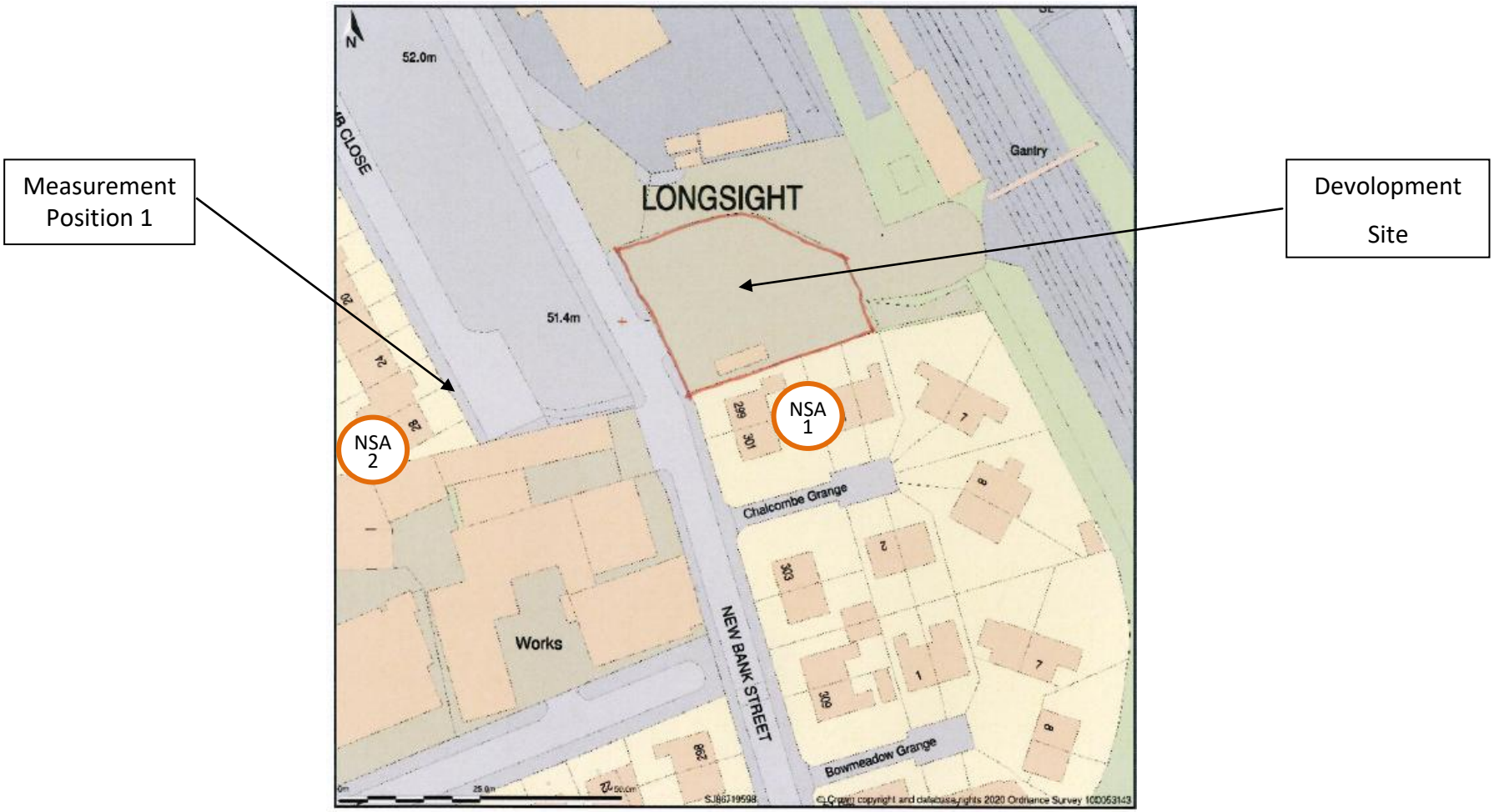
Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 3107/T1



Notes	**Description** Site Plan Showing Noise Monitoring Locations	
	Project MOT Station, Longsight	
	Date 19 November 2020	**Drawing No.** 3107/SP1

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POSITION 1 SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Period	$L_{Aeq, 15mins}$ dB	L_{Amax} dB	L_{A90} dB
16/11/2020 13:05	54	74	46
16/11/2020 13:10	52	74	46
16/11/2020 13:15	52	67	46
16/11/2020 13:20	50	59	46
16/11/2020 13:25	48	57	45
16/11/2020 13:30	49	68	46
16/11/2020 13:35	52	62	47
16/11/2020 13:40	52	68	45
16/11/2020 13:45	49	58	46
16/11/2020 13:50	49	59	46
16/11/2020 13:55	49	59	46
16/11/2020 14:00	50	64	46
16/11/2020 14:05	50	61	46
16/11/2020 14:10	51	64	47
16/11/2020 14:15	48	57	46
16/11/2020 14:20	50	72	46
16/11/2020 14:25	51	74	45
16/11/2020 14:30	52	80	45
16/11/2020 14:35	50	64	47
16/11/2020 14:40	51	66	46
16/11/2020 14:45	51	72	45
16/11/2020 14:50	48	57	45
16/11/2020 14:55	50	69	45
16/11/2020 15:00	47	58	45
16/11/2020 15:05	49	62	44
16/11/2020 15:10	49	66	44
16/11/2020 15:15	48	58	44
16/11/2020 15:20	49	60	46
16/11/2020 15:25	50	67	45
16/11/2020 15:30	48	60	45

TABLE 3107/T2

Summary of Noise Data for Internal Test Centre Activities

Noise Source	Octave Band Centre Frequency Sound Power Level–(dB L_w)								On Time (mins)	$L_{Aeq,1hour}$
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz		
Hydraulic ramp	70	61	58	64	56	57	58	57	5	58
Compressors (x2) in enclosure	70	61	58	64	56	57	58	57	10	72
Car start and idle	80	86	74	71	69	72	68	62	5	66
Car engine rev to 3k RPM	75	84	77	73	72	73	66	58	1	66

TABLE 2790/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)
Rion	NL-31 Class 1 Sound Level Meter	110057					
Rion	UC-53 ½ inch Microphone	01306	May 2019		0.0	114.0	114.0
	NH-21 Preamplifier	00159					
Norsonic	Nor1251 Calibrator (Cal 5)	34220	February 2020	114.01			

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

Definitions from BS 4142 : 2014

reference time interval, T_r

specified interval over which the specific sound level is determined (1 h during the day, and 15 min during the night)

specific sound level, $L_{Aeq,Tr}$

equivalent continuous A-weighted sound pressure level produced by the specific source at the assessment position produced over a given reference time interval, T_r

rating level, $L_{At,Tr}$

specific sound level plus any adjustment for the characteristic features of the sound

background noise level, $L_{A90,T}$

see Appendix A