ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 2513

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Mosscare Housing Ltd
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DALBEATTIE STREET, MANCHESTER

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

ACOUSTIC CONSULTANCY REPORT ADT 2513/ENIA

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-	8 February 2017	Howard Masters	Chris Middleton	first issue

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1.0 SUMMARY

Planning permission is being sought for supported accommodation for adults with learning disabilities as shown on the planning application drawings.

Acoustic Design Technology Limited have undertaken an environmental noise survey to determine the typical levels of noise generated by the main sources impacting on the proposed development site.

Based on the survey data, preliminary analysis indicates that compliance with the BS 8233:2014 indoor ambient noise criteria should be achievable with standard thermal double glazing and trickle vents.

Noise levels in outdoor amenity areas should generally be within the BS 8233:2014 recommended limits.

The site should therefore be acoustically suitable for the proposed development.

2.0 BASIS OF ASSESSMENT

2.1 Site Location

The site is located on Dalbeattie Street in Harpurhey, Manchester, north-east of Cheetham Hill, and is currently an unused patch of land.

The surrounding area is mainly residential, with typical Manchester suburban housing to the east, south and west of the proposed development, as well as an urban park to the north.

Nearby non-residential buildings include a shopping centre with 2 supermarkets on Moston Lane to the south, and a primary school to the south.

The M60 is located some 1.8 km away to the north, with a railway line approximately 2 km away to the east, and Manchester Airport about 17 km away to the south-west.

2.2 Proposed Development

The proposal is to redevelop the site to create supported accommodation for adults with learning disabilities as shown on the planning application drawings.

2.3 Assessment Criteria

Suitable indoor ambient noise criteria for residential developments are provided in Section 7.7.2 of BS 8233:2014, as follows:

Activity	Location	Day (07:00 - 23:00)	Night (23:00 - 07:00)
Resting	Living room	35 dB $L_{Aeq, 16hour}$	-
Dining	Dining room / area	40 dB $L_{Aeq, 16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16hour}$	30 dB $L_{Aeq, 16hour}$

Section 7.7.3.2 of the same document recommends that the external noise levels in outdoor amenity spaces such as gardens and patios do not exceed $L_{Aeq, T}$ 50 - 55 dB, where practical.

2.4 Strategy for Noise Impact Assessment

Based on the information in Sections 2.1 to 2.3 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. provide a preliminary overview of the sound insulation requirements necessary to control noise intrusion to acceptable levels inside the proposed dwellings and in outdoor living areas, as described in Section 4.0 below.

3.0 ENVIRONMENTAL NOISE SURVEY

3.1 Introduction

An environmental noise survey was undertaken between 06:00 hours and 08:00 hours on Tuesday 24 January 2017, that being a sample of typical worst case traffic noise conditions.

3.2 Instrumentation

The survey was conducted using the instrumentation detailed in Appendix A of this report.

The sound level meter was calibrated at the beginning of the survey period, and the calibration checked at the end. No drift occurred.

3.3 Procedure

Measurement positions were selected as described below and indicated on the attached site plan 2513/SP1:

i. at the south-west corner of the proposed development, approximately 3 metres away from the nearest kerb of Dalbeattie Street

ii. at the south-east corner of the proposed development, approximately 15 metres away from the nearest kerb of Dalbeattie Street

iii. at the north-east corner of the proposed development, approximately 15 metres away from the nearest kerb of Dalbeattie Street and 10 metres away from Parkmount Road

iv. at the north-west corner of the proposed development, approximately 3 metres away from the nearest kerb of Dalbeattie Street and 10 metres away from Parkmount Road

At all 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 hourly at each position, with the sound level meter set to store the octave band and A-weighted 100ms short-term L_{eq} levels over a 10 minute sample of each hour for subsequent post processing.

3.4 Results

The logged data has been post processed to determine $L_{Aeq,T}$ $L_{A90,T}$ and L_{Amax} levels for each 10 minute period, and these are listed in the attached table 2513/T1.

Octave band $L_{eq,\ 10\ mins}$ are listed in the attached table 2513/T2.

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

3.5 Weather Conditions

For the duration of the survey the weather conditions were dry and still, and had no effect on the measured levels.

3.6 Description of Existing Acoustic Environment

The noise climate across the site was mainly controlled by the noise from traffic on Dalbeattie Street, Parkmount Road and the surrounding road network as well as a distant traffic drone from the M60 ring road.

Towards the end of the survey there was some additional noise from fairly frequent aircraft activity.

4.0 EXTERNAL NOISE INTRUSION INTO DWELLINGS

4.1 Introduction

The guidance in the following sections is intended to demonstrate how suitable noise levels could be achieved inside dwellings and in outdoor living areas, for the purposes of the planning application. It is not intended provide definitive acoustic performance specifications for the building envelope.

4.2 Site Noise Levels

When assessing external noise intrusion into new dwellings and noise levels in gardens it must be borne in mind that the noise climate may change in the future. The following discussion is by necessity based on the results of the environmental noise survey described in Section 3.0 above.

The survey data has been processed to determine the noise levels incident on the main building elevations of the currently proposed layout.

Noise levels over the surveyed portions of the day (07:00 - 23:00) and night (23:00 - 07:00) period are assumed to be typical of the full periods. The assumed incident noise levels are therefore as follows:

Position	Incident noise levels	
	Day $L_{Aeq,\ 16\ hour}$ dB	Night $L_{Aeq,\ 8\ hour}$ dB
South-west corner	54	48
South-east corner	52	48
North-east corner	54	49
North-west corner	56	52

4.3 Noise Design Criteria

BS 8233:2014 noise criteria for indoor and outdoor living areas are provided in Section 2.3 above, replicated below:

Activity	Location	Day (07:00 - 23:00)	Night (23:00 - 07:00)
Resting	Living room	35 dB $L_{Aeq,\ 16hour}$	-
Dining	Dining room / area	40 dB $L_{Aeq,\ 16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,\ 16hour}$	30 dB $L_{Aeq,\ 8hour}$
-	Outdoor living areas	50 - 55 dB $L_{Aeq,\ 16hour}$	-

4.4 Noise Levels Within Dwellings

Based on the incident noise levels set out in Section 4.2 above, noise reduction requirements for compliance with the indoor ambient noise criteria in Section 4.3 above are as follows:

Location	Reduction of traffic controlled $L_{Aeq,T}$ required (dB)	
	Day (07:00 - 23:00)	Night (23:00 - 07:00)
South-west corner	19	18
South-east corner	17	18
North-east corner	19	19
North-west corner	21	22

A typical building façade with windows open for ventilation generally provides around 12 dB noise reduction of road traffic controlled $L_{Aeq,T}$. It should be apparent from the above table that the noise reduction requirements for all elevations exceed that level, as is typical of virtually all urban locations.

With windows closed and ventilation using typical frame mounted trickle ventilators an overall noise reduction of around 30 dB is normally achievable, assuming standard thermal double glazing. This would be sufficient for all areas.

4.5 Noise Levels in Outdoor Amenity Areas

The proposed communal gardens are located to the north, east and south of the development.

Reference to Section 4.2 above reveals day time noise levels of $L_{Aeq,T}$ 56 dB at the north-west corner of the site, reducing to 52 dB at the eastern boundary. The proposed gardens run from the Dalbeattie Street boundary to the east boundary, with some also screened from the traffic by the new building.

The noise levels in the garden areas should therefore generally be within the BS 8233 recommended range of $L_{Aeq,T}$ 50 - 55 dB, in common with the gardens of other existing dwellings on Dalbeattie Street, and no additional noise control measures should be necessary.



FOR ACOUSTIC DESIGN TECHNOLOGY



Notes	**Description** Site Plan Showing Noise Monitoring Locations	
	Project Dalbeattie Street, Manchester	
	Survey Date 24 January 2017	**Drawing No.** 2513/SP1

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SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Position	Period	$L_{Aeq, 10mins}$ dB	L_{Amax} dB	L_{A90} dB
1	06:00 – 07:00	48	62	44
	07:00 – 08:00	54	68	48
2	06:00 – 07:00	48	64	46
	07:00 – 08:00	52	63	49
3	06:00 – 07:00	49	59	47
	07:00 – 08:00	54	68	49
4	06:00 – 07:00	52	69	47
	07:00 – 08:00	56	68	49

Table 2513/T1

SURVEY RESULTS (OCTAVE BAND $L_{EQ,T}$)

Position / period	$L_{eq, 10\ min}$ (dB) at octave band centre frequency (Hz)								$L_{Aeq, 10min}$ (dB)
	63	125	250	500	1k	2k	4k	8k	
Pos 1 06:00-07:00	60	54	44	44	45	38	37	27	48
Pos 2 06:00-07:00	58	50	46	45	45	40	32	22	48
Pos 3 06:00-07:00	58	51	45	45	47	40	30	21	49
Pos 4 06:00-07:00	59	51	46	47	50	44	34	25	52
Pos 1 07:00-08:00	58	51	45	45	47	40	30	21	54
Pos 2 07:00-08:00	61	54	48	47	49	48	44	42	52
Pos 3 07:00-08:00	59	51	46	47	50	44	34	25	54
Pos 4 07:00-08:00	62	55	51	50	52	49	41	32	56

Table 2513/T2

APPENDIX A - INSTRUMENTATION

Manufacturer	Type and / or Model	Serial Number	Last Calibrated
01dB Solo	01dB Solo Class 1 Sound Level Meter	65201	September 2015
	PRE 21 S Pre-Amplifier	15619	
	MCE 212 ½ inch Microphone	101204	
Norsonic	Nor1251 Microphone Calibrator	34220	January 2016

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