CHALLENGER HOMES (MOSTON) LTD

PROPOSED RESIDENTIAL DEVELOPMENT

SULBY STREET, MOSTON, MANCHESTER

ENVIRONMENTAL NOISE ASSESSMENT

R2025-REP01A-PC

15 MARCH 2022

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REPORT DETAILS

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SUMMARY

Red Acoustics Ltd has been commissioned by Challenger Homes (Moston) Ltd to provide an assessment of the impact of environmental noise on the proposed development site at land off Sulby Street, Moston, Manchester.

Environmental noise surveys have been carried out to determine the existing noise climate affecting the site. The measured noise levels were then used to determine facade noise mitigation across the proposed site based on the current proposed layout plans provided by Challenger Homes (Moston) Ltd.

Noise break-in calculations have been undertaken based on typical house types for the site layout provided. The break-in calculations have been used to determine the acoustic strategy in relation to facade mitigation. The aim of the strategy is to achieve the following internal and external noise levels:

- Living Rooms, Dining Rooms and Kitchens 35dB $L_{Aeq,t}$
- Bedrooms 30dB $L_{Aeq,t}$ and 45dB L_{Amax}
- Garden and Patios - up to 55dB $L_{Aeq,t}$

The results of the environmental noise survey and subsequent noise break-in calculations conclude that the above targets can be achieved using a standard glazing configuration and non-acoustic trickle window ventilators as a standard feature for the whole development.

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APPENDIX A: NOISE SURVEY DETAILS

1.0 INTRODUCTION

Red Acoustics Ltd has been commissioned by Challenger Homes (Moston) Ltd to provide an assessment of the impact of environmental noise on the proposed development site at land off Sulby Street, Moston, Manchester.

Environmental noise surveys have been undertaken to determine the prevailing noise climate and perform noise break-in calculations based on the measured data.

The report outlines the measured data and the results of noise break-in calculations to determine the glazing strategy in relation to facade noise mitigation.

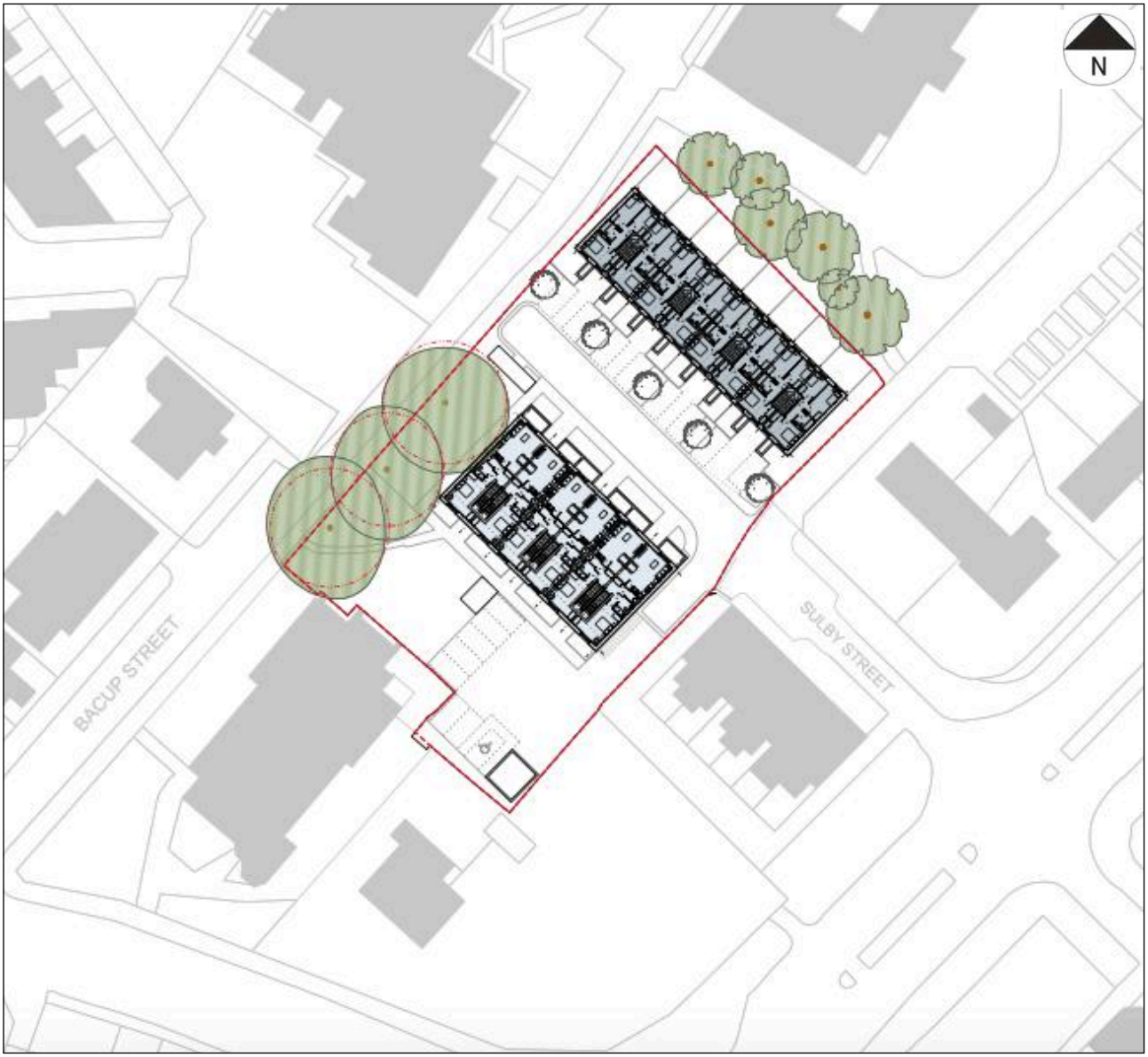
2.0 SITE DESCRIPTION & PROPOSED DEVELOPMENT

The proposed residential development is located on land off Sulby Street, Moston, Manchester. Figure 2.1 below shows the proposed site location outlined in red. The site currently consists of the former social club building with associated car parking hardstanding and open land. The site is bordered to the Northern side by the St Dunstan's RC Primary School site. Immediately adjoining the South-Eastern side of the proposed site is St Luke C of E church and grounds. Adjoining the site to the South and Western sides are existing residential properties which line Sulby Street and Lightbowne Road respectively. From initial site inspections it is apparent that there are no significant sources of noise affecting the site with local traffic noise and arrival/departure of pupils from the adjacent school being the main sources of environmental noise.

Figure 2.1: Proposed Site Location

Full planning application for demolition of existing structures and construction of 8 townhouses and 12 apartments (Use Class C3) with associated car parking, amenity space and access. The proposed site layout provided by the client is shown in Figure 2.2 below.

Figure 2.2: Proposed Site Layout



3.0 ENVIRONMENTAL NOISE SURVEYS

An attended environmental noise survey has been carried out at measurement positions 1 (MP1) & 2 (MP2) on 17th December 2021 to determine the existing noise climate at the proposed development site. Figure 3.1 below shows the location of the monitoring positions.

Figure 3.1: Environmental Noise Survey Monitoring Positions

Measurements at MP1 were taken with a telescopic pole at a height of 4m above ground level in free field conditions. This position was selected to have clear line of sight over Lightbowne Road and Kenyon Lane road pass-by events. Measurements at MP2 were taken at a tripod height of 1.5m above ground level in free field conditions. MP2 was positioned to have clear line of along Bacup Street and over the adjacent primary school, car park and pupil entrance. Figures 3.2 & 3.3 below detail the results of the survey measurements undertaken at MP1 & MP2 respectively. For a worst case assessment the highest 5 minute measured noise data period has been used to determine the day and night-time L_{Aeq} noise levels, which have been used in the noise break-in calculations. L_{AFmax} levels have also been determined from the night time measured noise data with the highest measured maximum event noise L_{AFmax} level (excluding a nearby police incident) used for the purpose of the noise break-in calculation.

Figure 3.2: Survey Results MP1

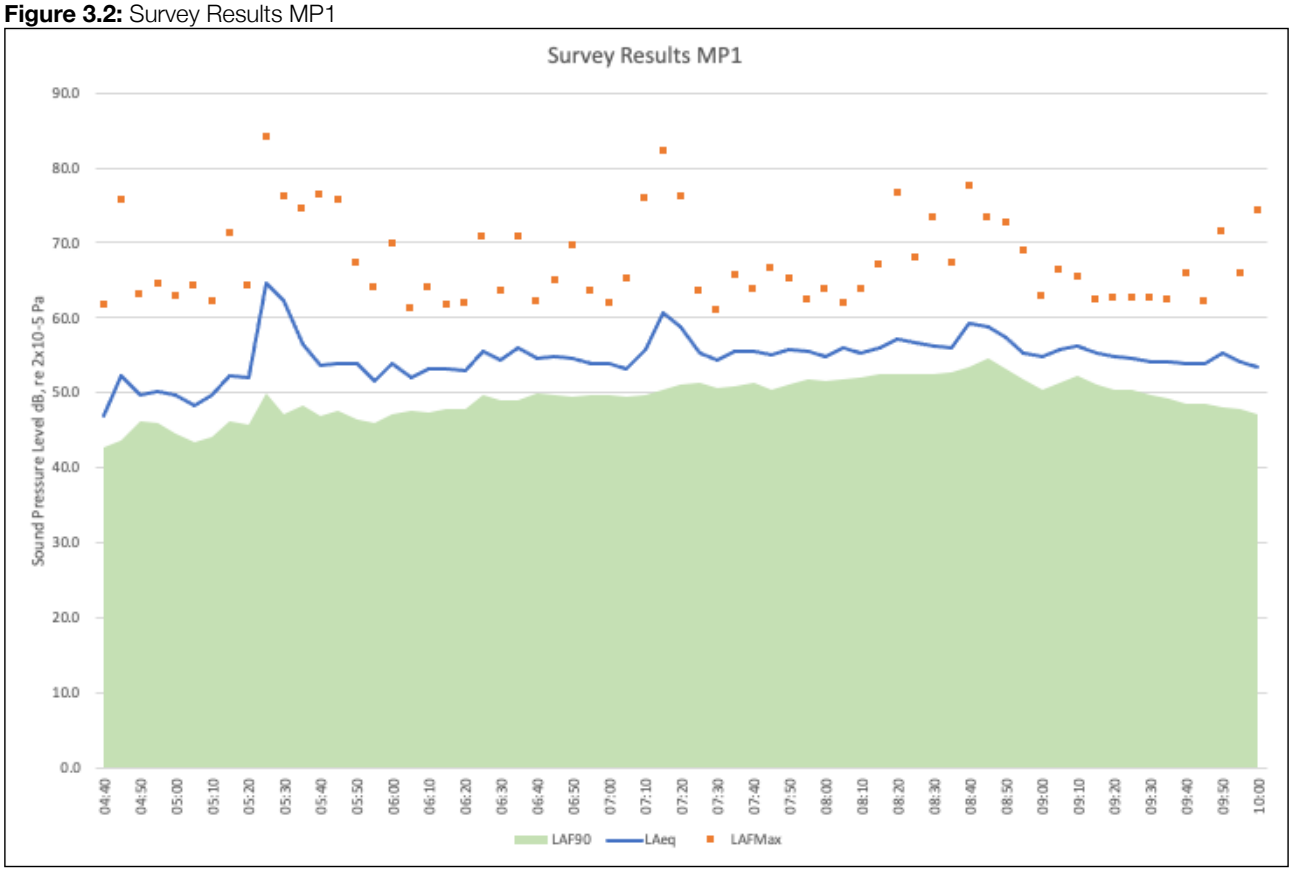


Figure 3.3: Survey Results MP2

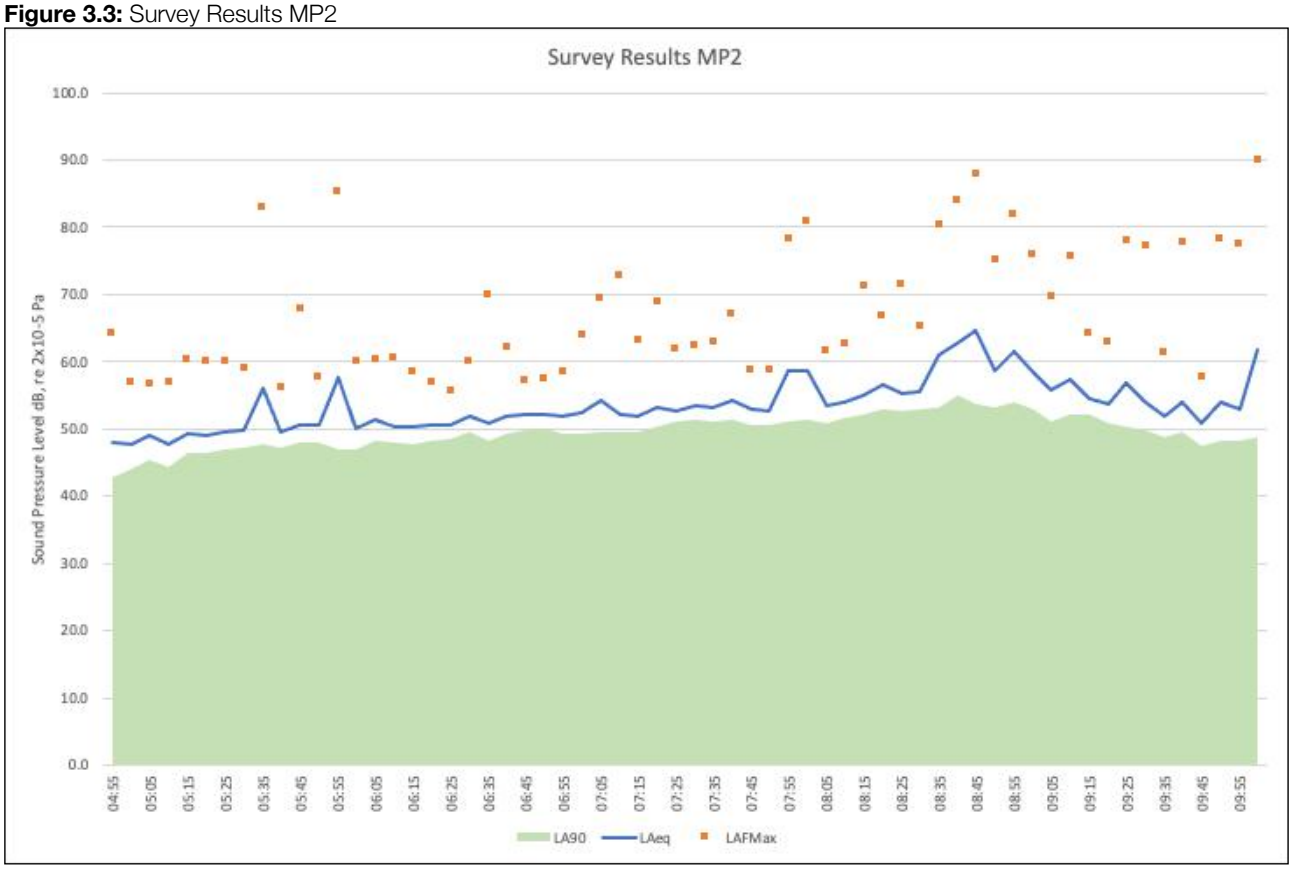


Table 3.1 summarises the measured noise levels at the site.

Table 3.1: Summary of Measured Environmental Noise Levels

	Measured Sound Pressure Level, dB (re: 2x10-5 Pa)					
	Daytime			Night Time		
Measurement Location	L_{Aeq}	L_{Amax}	L_{A90}	L_{Aeq}	L_{Amax}	L_{A90}
MP1	53 - 61 (typically 56)	61 - 82	47 - 55 (typically 51)	47 - 65 (typically 53)	61 - 84	43 - 50 (typically 47)
MP2	51 - 65 (typically 56)	58 - 90	47 - 55 (typically 51)	48 - 58 (typically 51)	56 - 85	43 - 50 (typically 47)

Table 3.2 below presents the octave band and broadband measured levels for the daytime and night-time periods used for noise break-in calculations.

Table 3.2: Measured Noise Break-in Levels

Period	Spectrum Type	Octave Band Centre Frequency Hz / dB					Measured Broadband (dBA)
		125	250	500	1000	2000	
Daytime	L_{Aeq}	53.4	49.1	49.0	52.6	47.2	60.7
Night-time	L_{Aeq}	48.3	44.8	45.5	49.4	44.4	64.6
	L_{AFmax}	59.3	59.3	61.2	60.3	64.1	75.7

4.0 NOISE BREAK-IN CALCULATIONS

BS8233:2014 Break-in Calculation

The methodology described in BS8233:2014[1] for break-in calculations has been used to determine a suitable glazing and ventilation strategy.

The variables required to determine suitable glazing and ventilation requirements are as follows:

- Room volume in m^3
- Facade element surface areas m^2
- Facade element sound reduction indexes in each octave band (125Hz - 2kHz).
- Room reverberation time in seconds to determine affective absorption area in m^2 in the receiving room.

The room volume and facade element surface areas have been taken from the drawing information provided by the client. The sound reduction index levels for glazing and ventilation elements are held on file and taken from manufacturers' published data. The room reverberation time is assumed to be 0.4s, 0.6s and 0.7s in each octave band for bedrooms, living rooms and kitchens respectively. For bedroom spaces the roof/ceiling pathway is taken into consideration with the typical sound insulation performance taken from BS8233.

In line with standard building practices it is understood that all plots are to be ventilated using trickle ventilators to window units. Noise break-in calculations have been undertaken on this basis.

[1] British Standards Institute 8233:2014 *Guidance on sound insulation and noise reduction for buildings*

5.0 PLANNING POLICY & DESIGN TARGETS

Planning Policy

National Planning Practice is guided by the National Planning Policy Framework. With regard to Noise the Framework states the following:

Planning policies and decisions should take account of the acoustic environment and consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur and;*
- *whether or not a good standard of amenity can be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

The terms 'significant adverse impact' and 'other adverse impacts' are defined in the explanatory notes of the 'Noise Policy Statement for England (NPSE) which states:

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

No Observed Effect Level : This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

Lowest Observed Adverse Effect Level : This is the level above which adverse effects on health and quality of life can be detected.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

Significant Observed Adverse Effect Level : This is the level above which significant adverse effects on health and quality of life occur.

These are summarised in Table 5.1 below.

Table 5.1: Explanation of Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Levels	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; closing windows for some of the time because of the noise. Potential for non-awakening 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. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. 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

It should be noted that no specific noise limits for NPPG have been defined in Table 5.1 above, however, guidance from other acoustic standards may be employed to determine suitable levels within the overall principal of the National Planning Policy Framework.

Design Targets

The noise design targets for internal habitable spaces and gardens are detailed in Table 5.2. The targets are based on the advice provided in BS8233:2014.

Table 5.2: BS8223:2014 Design Targets

Space	$L_{Aeq,16hr}$ (07:00 - 23:00)	$L_{Aeq,8hr}$ (23:00 - 07:00)	L_{Amax} (23:00 - 07:00)
Living Room & Kitchen	35dB	-	-
Dining Room & Study	40dB	-	-
Bedroom	35dB	30dB	≤45dB

For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$, with an upper guideline value of 55dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited. In the case of this development all plots are expected to achieve guideline target values based on the measured data.

6.0 RECOMMENDATIONS

Based on the measured data and the noise break in calculations, the target noise levels within the relevant spaces can be achieved with a standard glazing specification and a non-acoustic window trickle vents to be installed as standard across the development.

Target noise levels can be achieved across the development with installation of the following glazing specification:

- 4mm /16mm/ 4mm Standard Glazing

Table 6.1 presents the octave band Sound Reduction Index (SRI) values for the various facade elements used in the noise break-in calculations and subsequent recommendation. Alternative proposals may be used provided that the minimum octave band acoustic performance specifications are met, and that once specific design details and contractor glazing proposals are developed for the external building envelope, the noise break-in calculations be re-checked by Red Acoustics to ensure that the target noise criteria will be met. Compliance with Approved Document F and thermal comfort requirements should be confirmed by others. External wall sound insulation performances are taken from the data in BS8233:2014 for typical cavity masonry wall constructions.

Table 6.1: Minimum Facade Element Performance Requirements

Facade Element	Octave Band Performance Data dB				
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz
4/16/4 Glazing (SRI) including frame	21	17	25	35	37
External Wall (R)	40	44	45	51	56

Based on the proposed layout, garden noise levels are predicted to be between 50dBA or below for all plots. No additional mitigation is therefore proposed.

7.0 CONCLUSIONS

An assessment of noise levels impacting on the residential facades of the proposed development has been carried out in order to determine a facade mitigation strategy to achieve indoor target noise levels.

By implementing the recommended facade mitigation strategy, the internal noise levels will achieve the target criteria.

Noise impact on garden spaces has been assessed and the target noise levels are predicted to be achieved for all plots.

No additional mitigation is proposed.

APPENDIX A: NOISE SURVEY DETAILS

Location

Land off Sulby Street, Moston, Manchester.

Survey Dates

17th December 2021 attended measurements.

Weather

Dry with full cloud and wind speeds <5m/s, Temperature 3ºC - 5ºC.

Personnel Present During Measurements

Paul Clark Dip IOA MIOA

Associate Members of the Association of Noise Consultants

Accredited Test Organisation Number 180

Instrumentation

Kit No	Equipment Description	Type Number	Manufacturer	Serial Number	Date of Last Calibration	Calibration Certificate Number
RED04 MP1	Sound Level Meter	CR:171B Type 1	Cirrus	G056973	25-Jun-20	35032
	Microphone	MK:224	Cirrus	606043B	25-Jun-20	35031
	Preamplifier	CRL:MV200F	Cirrus	0805F	25-Jun-20	35032
RED05 MP2	Sound Level Meter	CR:171B Type 1	Cirrus	G081108	21-Aug-20	145222
	Microphone	MK:224	Cirrus	211432D	21-Aug-20	145223
	Preamplifier	CRL:MV200F	Cirrus	8499F	21-Aug-20	145222
MP1 & MP2	Sound Calibrator	CR:515 Type 1	Cirrus	59150	12-Aug-21	38703

Methodology & Calibration

Before and after the measurements, the sound level meters were check calibrated to an accuracy of ±0.3dB using their associated Class 1 Calibrators. No drift in the instruments' sensitivities were noted across any of the survey periods. Copies of all calibration certificates are kept on file by Red Acoustics Ltd and can be supplied if requested.