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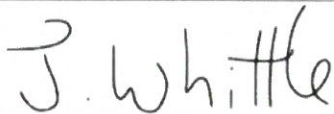
UNITY COMMUNITY PRIMARY SCHOOL - NURSERY & ADMIN
BLOCK EXTENSION

ENVIRONMENTAL NOISE STUDY

R1949-REP01-PB

23 MARCH 2021

REPORT DETAILS

Project	Unity Community Primary School - Nursery & Admin Block Extension		
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Document Reference	R1949-REP01-PB		
Revision	A		
Date Issued	23 March 2021		
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Signed			

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SUMMARY

An assessment of the impact of the approved admin, nursery school extension and nursery playground at Unity Community Primary School has been undertaken.

The approved consent for the scheme includes Condition 13 which requires the premises to be acoustically insulated and treated to limit the break-out of noise in accordance with a noise study. The scheme of acoustic treatment shall then be submitted and approved by the Local Planning Authority.

The report presents the results of acoustic break-out testing of the as-built nursery school extension, measurements of typical nursery class sound (internally and externally) levels and modelling to predict the sound at the nearest noise sensitive properties from break-out from the building and from the new nursery playground.

The results of the study show that the impact from the nursery playground and break-out from the nursery room with the windows open is no greater than the No Effect Level and therefore no specific mitigation measures are required.

No works have been undertaken to assess the admin block as it is considered that the impact will not be at the Significant Adverse Effect Level due to the nature of the development.

Based on this conclusion planning condition 13 can be discharged and no further works are necessary.

UNITY COMMUNITY PRIMARY SCHOOL

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1.0 INTRODUCTION

Red Acoustics has been commissioned by Contor Ltd to provide an assessment of the impact of the approved nursery school extension and nursery playground at Unity Community Primary School.

The information in this report has been prepared with the aim of accompanying an application to discharge Planning Condition 13 of the approved planning consent. The planning consent condition states:

13) Before first use of the development nearby approved, the premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority.

This report presents the details of a prediction of sound level break-out with windows open from the nursery classroom and from the nursery playground. The prediction is based on measured sound levels from the existing nursery school class and playground at Unity Community Primary School.

The predicted sound level are then assessed against an impact matrix to determine if additional mitigation is needed. If required, measures to limit the impact are proposed.

No works have been carried out on the new admin block as it is considered noise breaking out from this area of the development is not likely to cause a Significant Observed Adverse Effect upon nearby noise sensitive properties.

2.0 SITE DESCRIPTION & PROPOSED DEVELOPMENT

The site is located off Allesley Drive, Cheetham Hill and contains the existing Unity Primary School. The approved consent allows for the construction of a two storey admin block at ground and first floor level and a single storey nursery classroom at ground floor level plus an outside nursery playground.

The construction of the extension is in keeping with the existing building and is a cavity block/brick construction which has an internal lining of plasterboard on adhesive dabs. Thermal double glazing is also fitted to all doors and windows. In the nursery there is a vaulted ceiling with a void with the roof being concrete tile, batten and waterproof roofing membrane.

From our site inspection the weak points in the facade of the nursery will be the new and existing windows and doors. The nursery playground is small area to the South West corner of the new nursery classroom. This area faces directly onto the properties on Allesley Drive and the plans do not show and solid fencing screening this area. The nearest noise sensitive properties to the nursery classroom and playground are approximately 23m away to the South West, West and North West.

Figure 2.1 presents the site location plan and Figure 2.2 - 2.5 present the approved drawings.

Figure 2.1: Site Location Plan

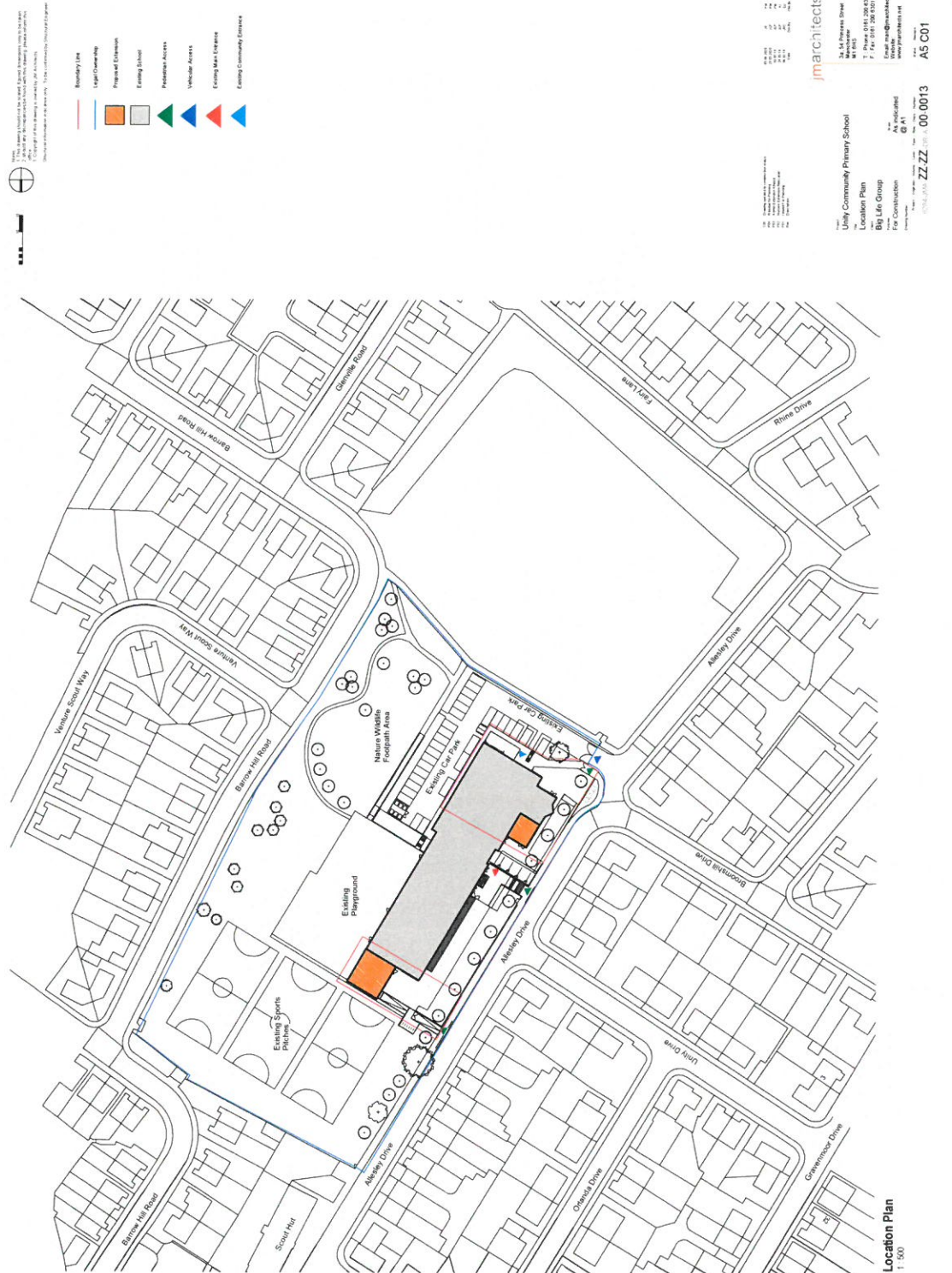


Figure 2.2: Proposed Site Layout



Figure 2.3: Admin Block Ground Floor

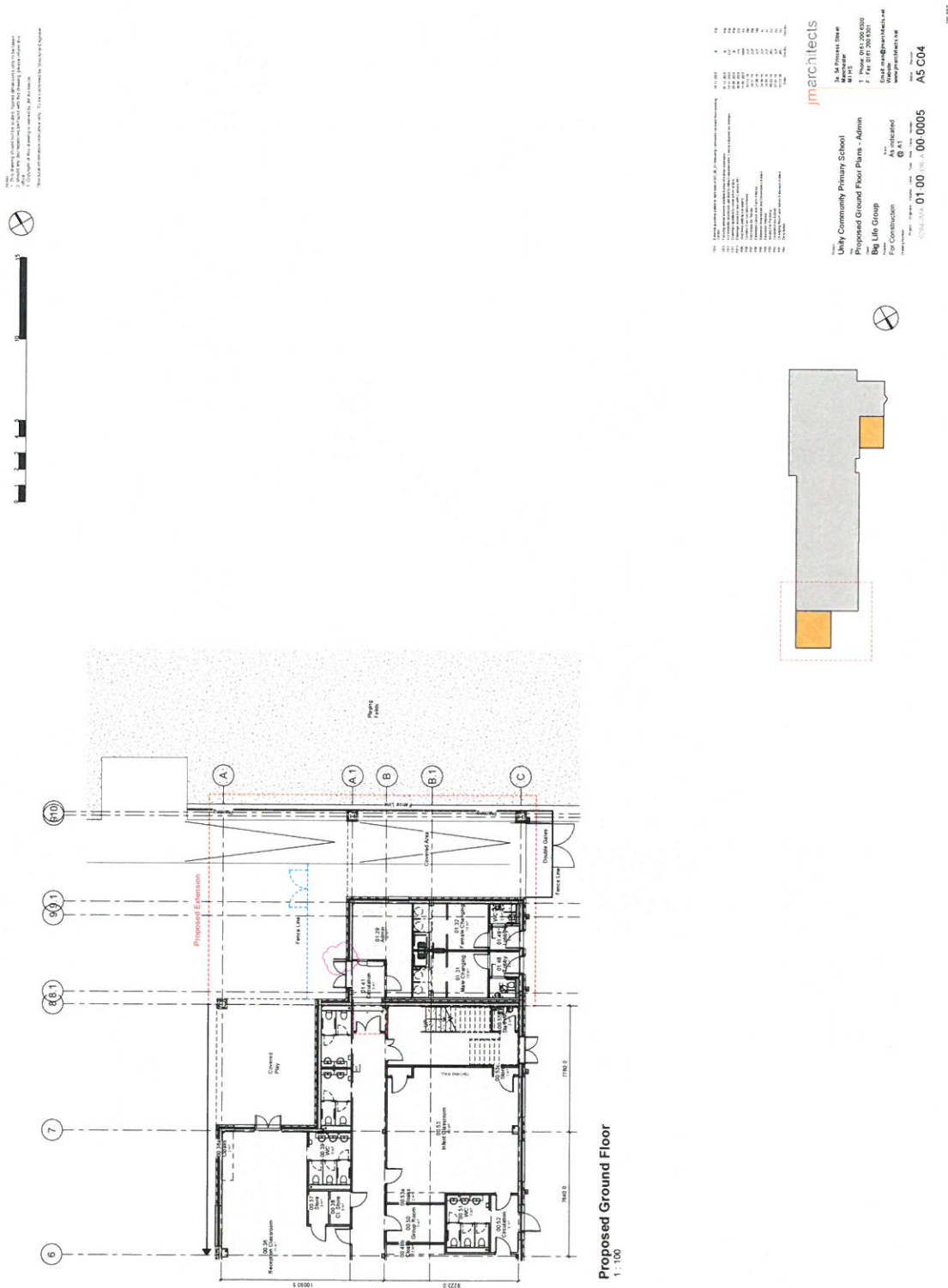


Figure 2.4: Admin Block First Floor

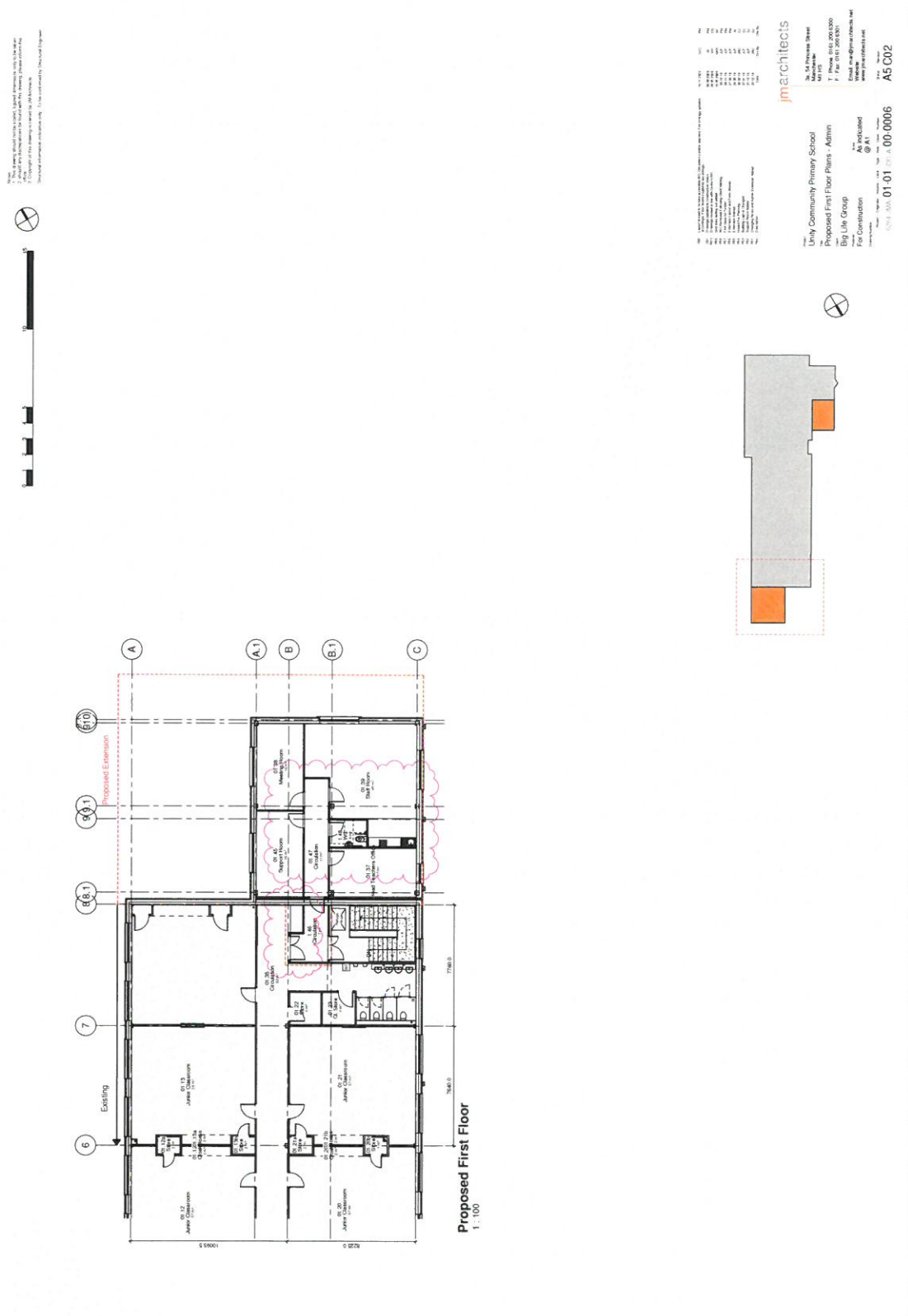
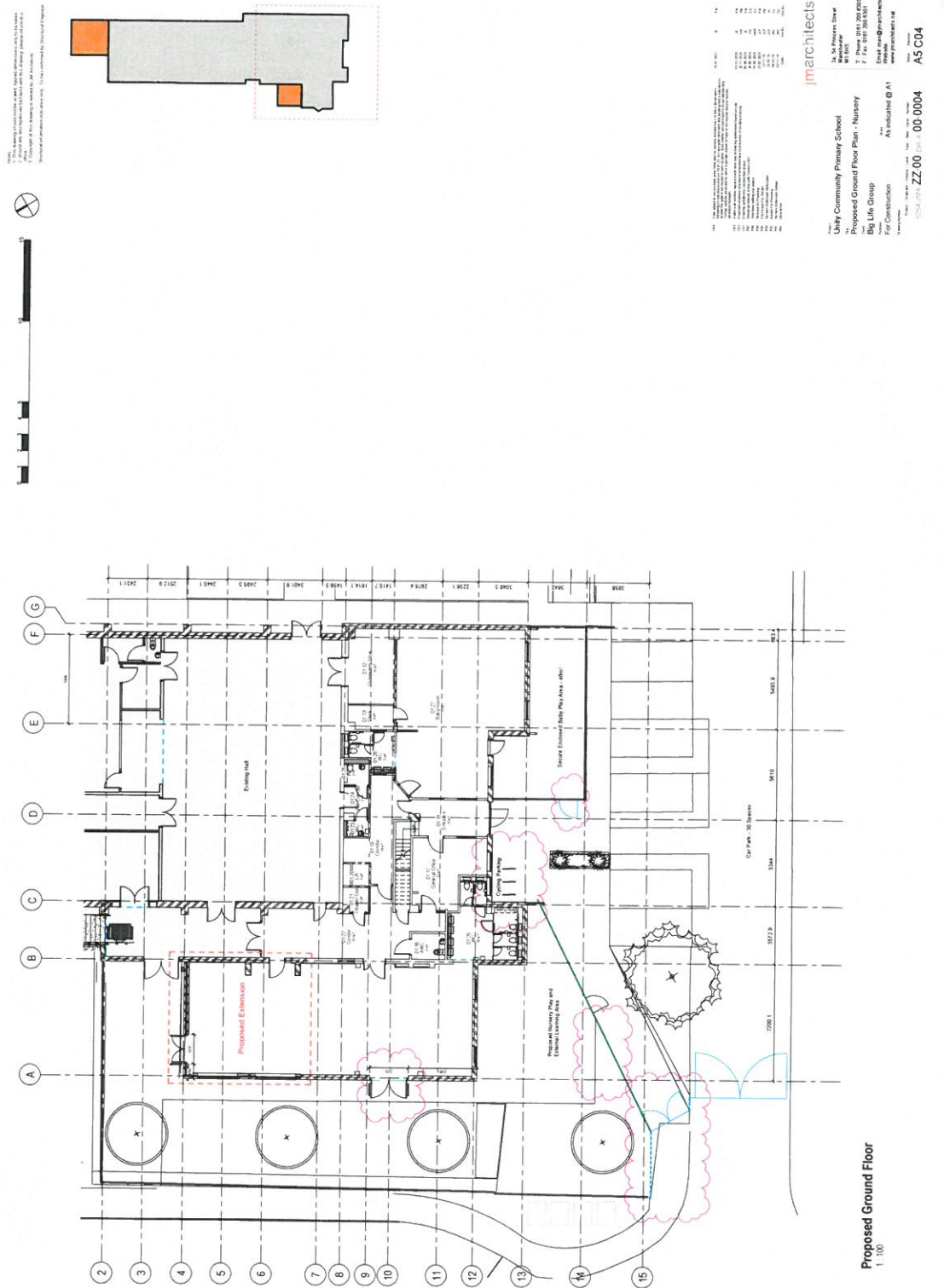


Figure 2.5: Nursery Classroom



3.0 PLANNING POLICY

National Planning Practice Guidance (NPPG) is guided by the National Planning Policy Framework (NPPF). With regard to noise the guidance 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 3.1 below.

Table 3.1: 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, idling 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 3.1 above, however, guidance from other acoustic standards may be employed to determine suitable levels within the overall principle of the National Planning Policy Framework.

There is no specific guidance with regards the impact from non-residential educational institutions for break-out sound or from playground sound. Based on the available guidance documents¹ Table 3.2 presents the recommended impact assessment matrix for the scheme.

Table 3.2: Recommended Impact Assessment Matrix

Effect Level	Difference between cumulative $L_{Aeq,t}$ sound level and existing ambient $L_{Aeq,t}$ sound level	Comment	Required Action
No Effect Level (NEL)	0-3dB	No impact	No specific measures required
No Observed Effect Level (NOEL)	4-6dB	Noise can be heard but causes no effect	No specific measures required
Lowest Observed Effect Level (LOAEL)	7-9dB	Noise can be heard and may cause small change in behaviour	Mitigate and reduce to a minimum
Significant Observed Effect Level (SOAEL)	≥ 10 dB	Noise can be heard causing material change in behaviour	Avoid or prevent

¹ BS4142:2014 - Methods for rating industrial and commercial sound; BS8233:2014 - Guidance on sound insulation and noise reduction for buildings; Association of Noise Consultants (2017) - Professional Practice Guidance Planning and Noise; Association of Noise consultants (2020) - Acoustics, Ventilation & Overheating Residential Design Guide; Manchester City Council (2015) - Planning & Noise Technical Guide

4.0 ENVIRONMENTAL NOISE SURVEY

Attended and unattended environmental noise surveys were undertaken to measure the sound reduction of the as built nursery facade, existing ambient sound levels at the nearby noise sensitive properties on Allesley Drive plus source measurements for the nursery classroom internally and the nursery playground.

Figure 4.1 presents the location plan of the measurements undertaken externally. Measurements of the source level in the nursery classroom were made in Nursery Classroom 2. Measurements for the facade break-out were made using a continuous sweep method internally as well as externally 1m from the facade. Figure 4.2 - Figure 4.4 below presents the measurement data at MP1, MP2 and internally within the nursery classroom respectively.

Figure 4.1: Survey Locations



Figure 4.2: Attended Survey Data MP1

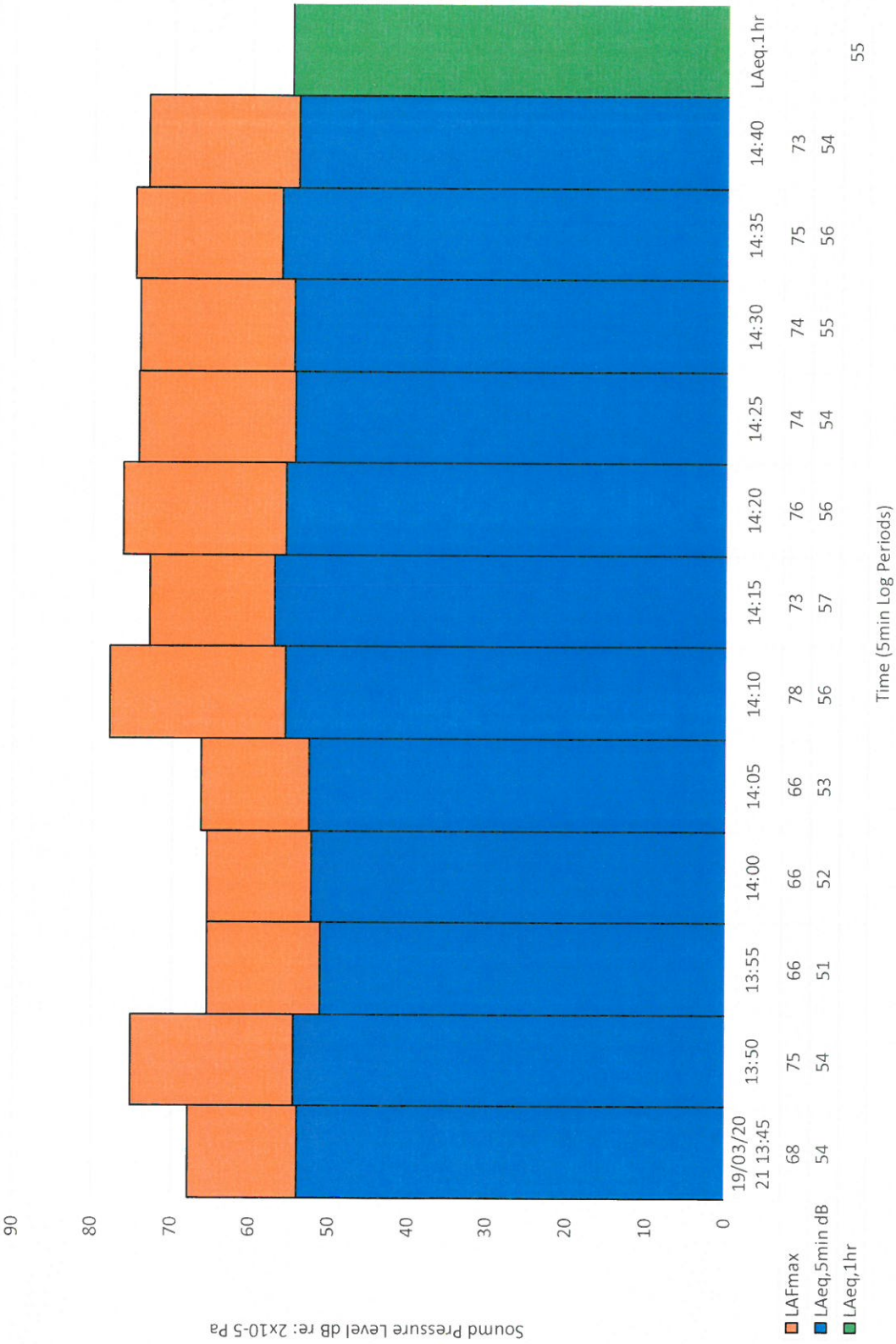


Figure 4.3: Unattended Survey Data MP2

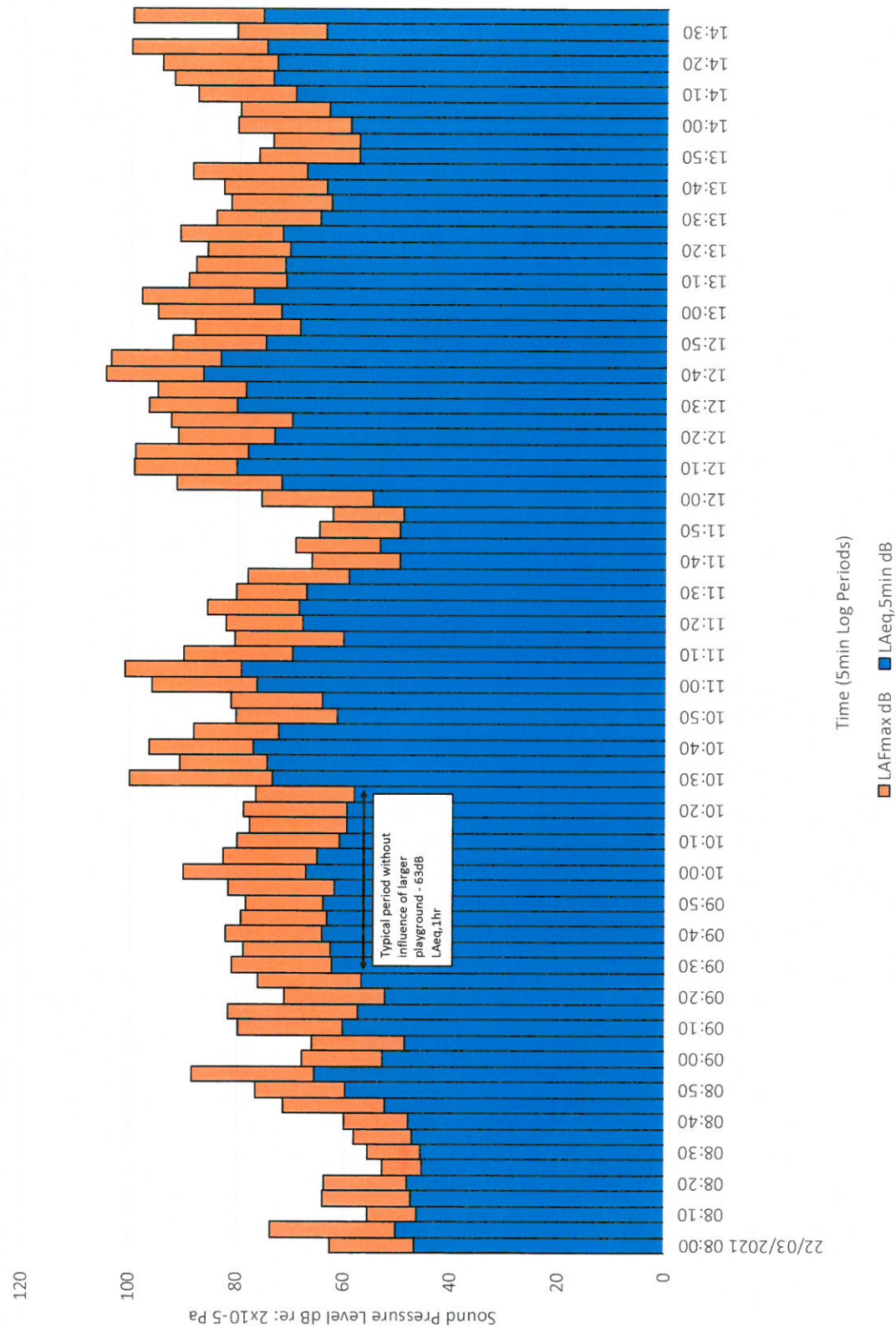
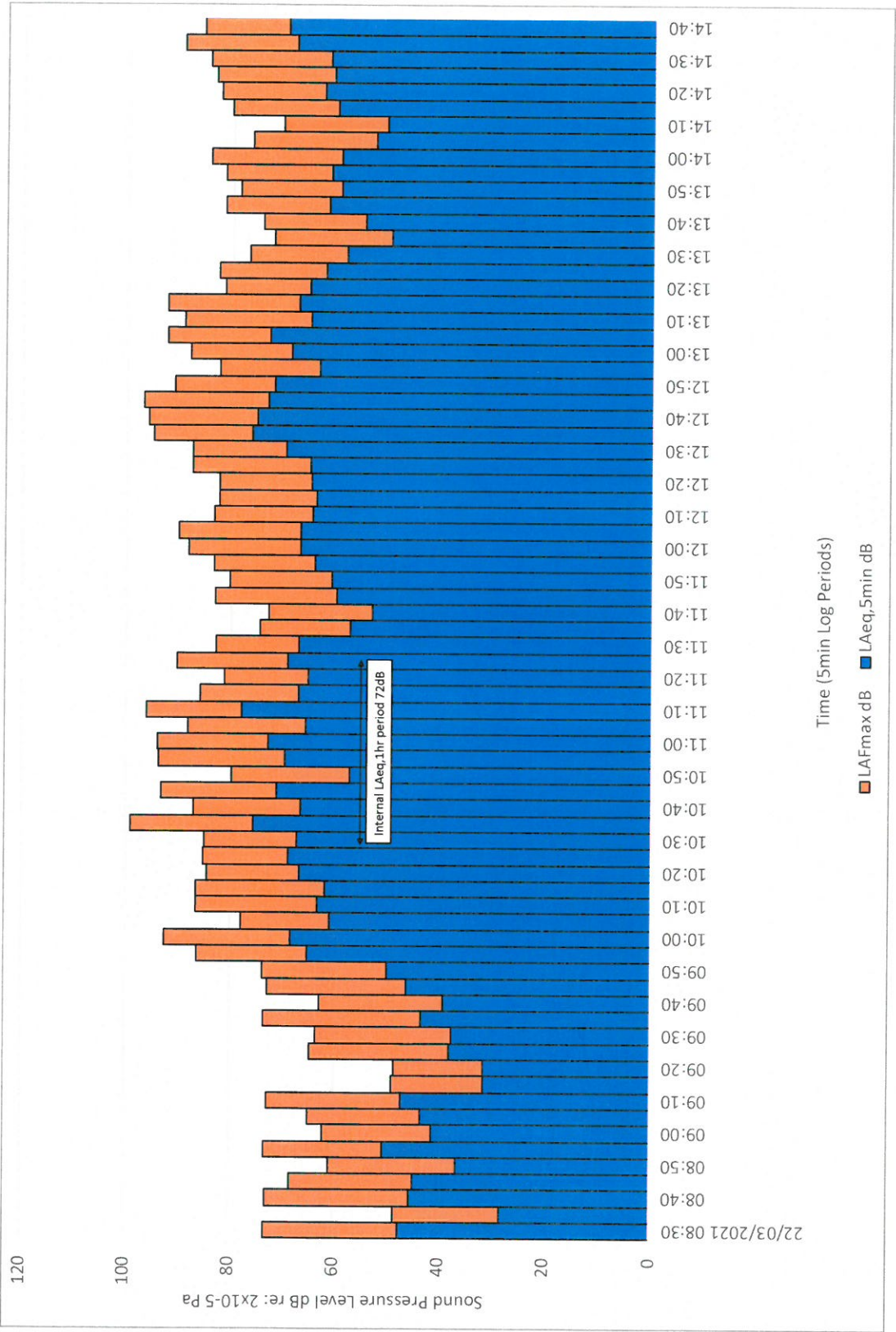


Figure 4.4: Unattended Survey Data in Nursery Classroom 2

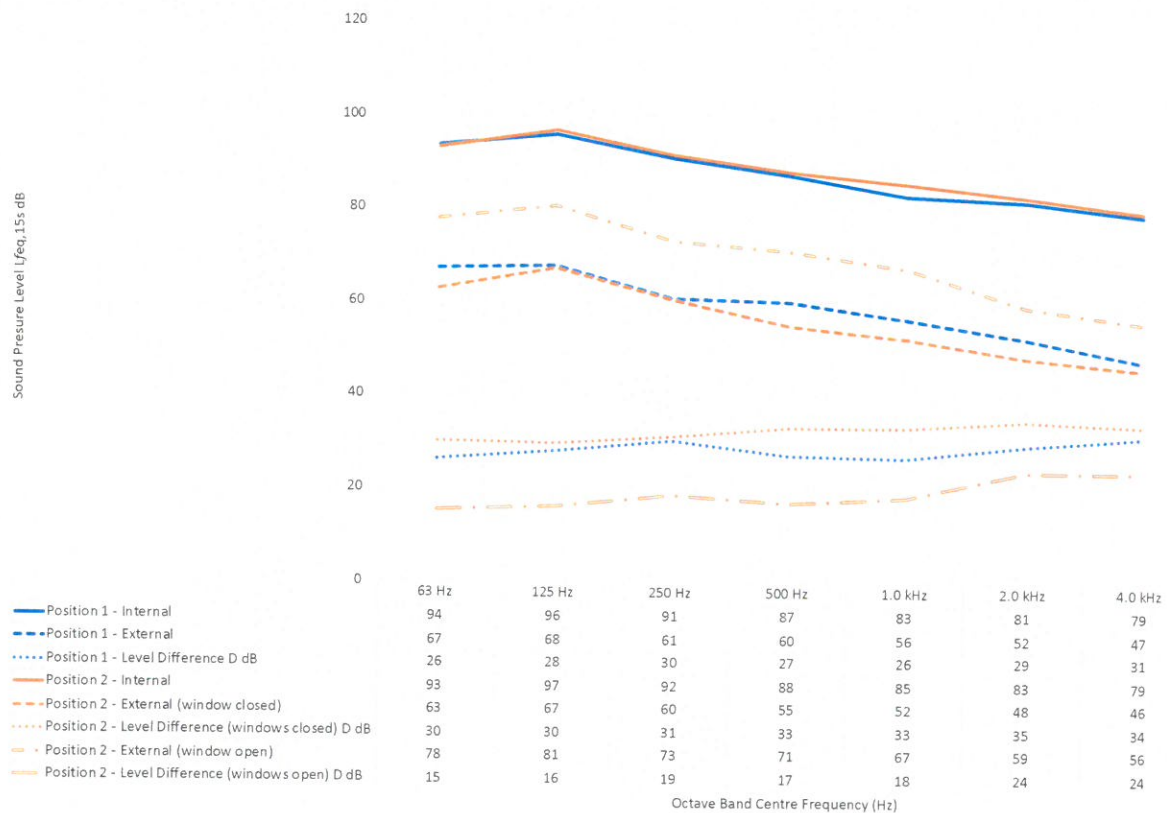


The ambient $L_{Aeq,1hr}$ experienced by the existing residential properties is 55dB and the typical playground noise level measured from the nursery was 63dB $L_{Aeq,1hr}$. Internally the loudest $L_{Aeq,1hr}$ period was between 10:30-11:30 and this was 72dB.

Measurement of the facade sound insulation were made using a loudspeaker and pink noise source internally in the new nursery classroom. Measurements were made at two positions, one directly in front of the existing exit door and one directly in front of the new windows facing Allesley Drive as these are considered the weak elements of the facade. The receiver measurements were made externally using a walking sweep method 1m from the facade at 1.2m - 2.0m from the ground with the microphone pointing towards the facade at all times.

Figure 4.5 below presents the measured results of the break-out testing. The calculated worst case level difference of the facade was 19dB which was from Position 2 facing the windows with all window lights open to the maximum amount but with the exit door closed. The measurements have not been corrected for background sound as the measured sound level exceeded the existing background sound level by greater than 10dB.

Figure 4.5: Break-out Test Measurements



5.0 NOISE MODELLING AND ASSESSMENT

Noise Modelling

Modelling has been undertaken using CadnaA. CadnaA implements the ISO 9612-2 procedures and is considered one of the leading industry standard software packages for noise modelling and prediction.

The site has been modelled in CadnaA and a vertical area source has been set for the nursery building break-out and a source area set for the nursery playground. All buildings are set to reflective and to the approximate heights. The ground is set to be an absorption co-efficient of 0.5 to mimic mixed ground.

For the nursery break-out a broadband sound level of 72dB $L_{Aeq,1hr}$ has been set as an internal level across the whole of the facade of the new nursery building. A composite worst case reduction of 19dB has been included for the facade and a calculation has been made to the residential properties on Allesley Drive.

Figure B1 presents the result of the prediction and shows that the predicted sound level from break-out at the front facade of the existing residential property is 32dB $L_{Aeq,1hr}$.

For the nursery playground the existing nursery playground has been modelled and the source sound level as a sound power per m^2 has been determined by matching the measured value of 63dB at MP2, which is considered to be the sound level from the nursery children playing out without interference from the main school playground. The calibrated source level that equates to 63dB at MP2 for the existing area of the nursery playground is 73dB L_{WA} per m^2 .

Figure B2 presents the result of the prediction and shows that the predicted sound level from nursery playground at the front facade of the existing residential property is 49dB $L_{Aeq,1hr}$.

Impact Assessment

Table 5.1 below presents the impact assessment based on the recommended assessment matrix in Section 3.0.

Table 5.1: Impact Assessment Table 4.5: Break-out Test Measurements

Scenario	Predicted Sound Pressure Level $L_{Aeq,1hr}$	Existing Ambient Background $L_{Aeq,1hr}$	Cumulative $L_{Aeq,1hr}$	Difference between Cumulative $L_{Aeq,1hr}$ and Existing Ambient $L_{Aeq,1hr}$	Expected Impact	Action Required
Nursery break-out	32	55	55	0	No Effect Level	No specific measures required
Nursery playground	49	55	56	1	No Effect Level	No specific measures required

Based on our impact assessment the impact is expected to at the No Effect Level. Therefore no specific mitigation are required.

6.0 CONCLUSION

An assessment of the potential noise impact from break-out from the nursery classroom and playground has been undertaken.

Based on our assessment the impact is expected to be at the No Observed Effect Level or less. Therefore, no specific mitigation measurement are needed.

APPENDIX A: NOISE SURVEY DETAILS

Location

Unity Community Primary School

Survey Dates

19th March 2021 and 22nd March 2021

Weather

Dry, sunny and mild. Wind speed $<5\text{ms}^{-1}$

Personnel Present During Measurements

Paul Bentley BSc MSc Pg. Dip IOA MIOA

Instrumentation

Table A1 provides details of the measurement instrumentation used during the surveys. Calibration certificates are available on request

Methodology

Before and after the measurements the sound level meters were checked calibrated to an accuracy of $\pm 0.3\text{dB}$ using their associated Class 1 Calibrators. No drift in the instruments' sensitivities were noted across any of the survey periods.

Table A1: Instrumentation

Reference	Equipment Description	Type Number	Manufacturer	Serial Number	Last Calibrated	Certificate Number
MP1 & MP2 RED04	Sound Level Meter	CR:171B Type 1	Cirrus	G056973	25-Jun-20	35032
	Outdoor Microphone	MK:224	Cirrus	210642D	16-May-18	119350
	Outdoor Preamplifier	MK:170	Cirrus	187	16-May-18	119352
	Sound Calibrator	CR:515 Type 1	Cirrus	59150	25-Jun-20	35030
Break-out and Nursery Classroom 2 RED09	Sound Level Meter	Type 140 Type 1	Norsonic	1402793	19-Jul-19	32362
	Preamplifier	Nor 1209	Norsonic	12152	19-Jul-19	32362
	Microphone Capsule	Nor 1225	Norsonic	72874	19-Jul-19	32361
	Sound Calibrator	Type 1251 Class 1	Norsonic	34390	21-Aug-20	35531

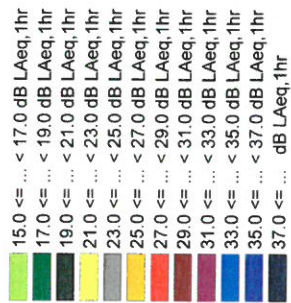
APPENDIX B: CADNA NOISE MODELLING OUTPUTS

Figure B1: Predicted break-out sound level from nursery classroom

Drawing Notes

- Internal sound level 72dB LAeq,1hr
- Facade source 3m in height and runs along SW, NW and NE Elevations
- Facade sound reduction set at 19dB

Impact Map Key



Plot Objects

- Area Source
- vert. Area Source
- Building
- Receiver
- Building Evaluation
- Calculation Area



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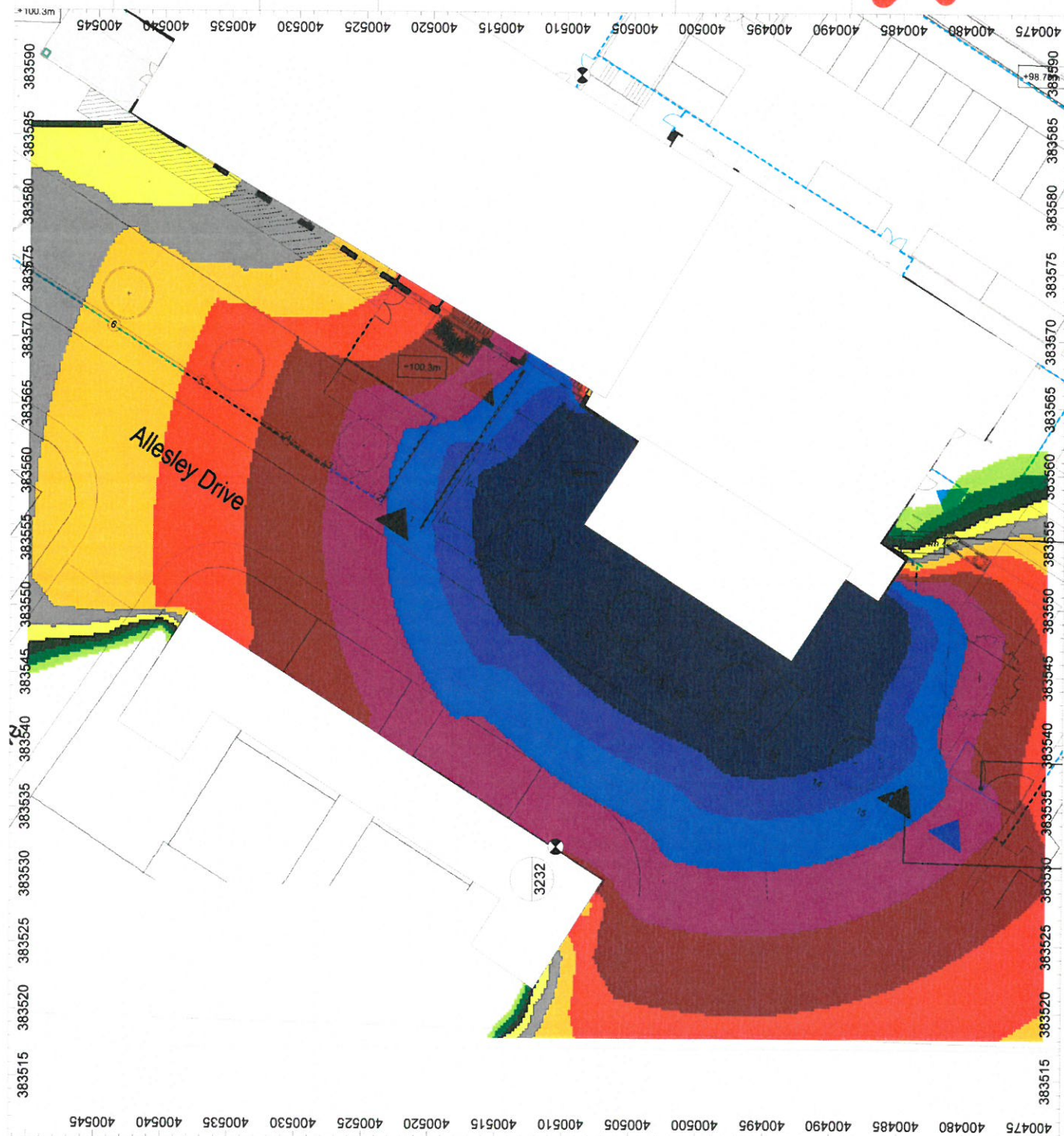
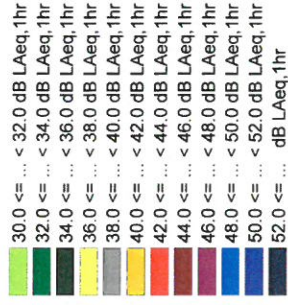


Figure B2: Predicted sound level from nursery playground

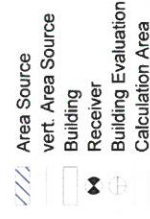
Drawing Notes

- Playground sound level set to 63dB LwA per m2

Impact Map Key



Plot Objects



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