



Environmental Associates

Noise Assessment

Lakeside School, Liverpool

April 2021

Witherslack Group



Noise Assessment

Lakeside School, Liverpool

Client: Witherslack Group

Report reference: NJD19-0143-001R

Report Version	Issue Date	Issued By
Final	April 2021	Nichola J Dixon-Boak CSci MIAQM MIEEnvSc MIOA

NJD Environmental Associates LTD

www.njdenvironmental.co.uk

Company Registration No 10956987

CONTENTS

1	INTRODUCTION	1
2	PLANNING POLICY AND GUIDANCE.....	2
3	NOISE SURVEY	7
4	SITE SUITABILITY.....	9
5	PEAK HOUR TRAFFIC	10
6	CONCLUSION.....	11

APPENDICES

1	Proposed layout
2	Noise measurements

1 INTRODUCTION

1.1 Background

- 1.1.1 NJD Environmental Associates LTD was instructed by Witherslack Group to undertake a noise assessment for the proposed refurbishment of an existing primary school and the construction of a proposed secondary school at Lakeside School, located off Naylor's Road in Liverpool. The site location is shown at Drawing 1, with the proposed layout provided at Appendix 1.



Drawing 1: Site Location

- 1.1.2 This noise assessment considers the site suitability for the proposed secondary school, also taking into account the refurbishments to the existing primary school, as well as the potential noise impact associated with additional vehicle movements.

2 PLANNING POLICY AND GUIDANCE

2.1 National Planning Policy Framework (NPPF)

- 2.1.1 The revised NPPF published in February 2019 provides the following with regards to noise, set out at paragraph 180:

“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.”*

- 2.1.2 It is clear that the NPPF seeks to limit the exposure of new development to unacceptable levels of noise, although the policy does not seek to prescribe what constitutes an unacceptable level of noise.

2.2 Noise Policy Statement for England (NPSE)

- 2.2.1 The Department for Environment, Food and Rural Affairs (DEFRA) published the NPSE in March 2010.

- 2.2.2 The explanatory note of NPSE defines the terms used in the NPPF:

“2.19 There are several key phrases within the NPSE aims and these are discussed below.

‘Significant adverse’ and ‘adverse;

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

NOEL – 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.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effect on health and quality of life can be detected.

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

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.”

2.2.3 The NPSE does not define the SOAEL numerically, stating at paragraph 2.22:

“2.22 It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.”

2.2.4 There is no local or national guidance on how the three terms should be defined numerically, it is for the assessor to collate and interpret appropriate guidance on noise, such as may be found in British Standards, and correlate the guidance with the concepts of NOEL, LOAEL and SOAEL.

2.3 Planning Practice Guidance: Noise (PPGN)

2.3.1 In March 2014, the Government released the PPG on noise, revised in July 2019. This document sets out a number of principles and reinforces the guidance set out in the NPPF and NPSE.

2.3.2 Paragraph 001 of PPGN notes that:

“Noise needs to be considered when new development may create additional noise and when new developments would be sensitive to the prevailing acoustic environment.”

2.3.3 It goes on to note in paragraph 003 that:

“Local planning authorities’ plan-making and decision taking should take account of the acoustic environment and in doing so 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.”*

2.3.4 The PPGN broadly repeats the NPSE definitions of the NOEL, LOAEL AND SOAEL and it provides a summary table to explain how the terms relate to each other and to typical human response to sound. The table is replicated below in Table 1.

Table 1: PPGN Noise Exposure Hierarchy			
Perception	Examples of Outcome	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 small changes in behaviour and/or attitude, e.g., turning up volume of televisions; 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 areas 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 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 or non-auditory	Unacceptable Adverse Effect	Prevent

2.3.5 The PPGN provides advice on how to mitigate the effects of noise, noting that there are options to reduce noise at source, to optimise site layouts and to use planning conditions.

2.4 BB93: Acoustic Design of Schools - Performance Standards

- 2.4.1 Building Bulletin 93 (BB93) explains minimum performance standards for the acoustics of school buildings and describes the normal means of demonstrating compliance with the Building Regulations.
- 2.4.2 The standard sets out recommended design limits for a variety of rooms and teaching spaces, which are dependent on the sensitivity of the location and the requirements for specific acoustic conditions within these spaces.
- 2.4.3 The objective is to provide suitable indoor ambient noise levels (IANL) for:
- (a) clear communication of speech between teacher and student
 - (b) clear communication between students
 - (c) learning and study activities.
- 2.4.4 The indoor ambient noise level includes noise contributions from:
- external sources outside the school premises (including, but not limited to, noise from road, rail and air traffic, industrial and commercial premises)
 - building services (e.g., ventilation system, plant, etc.). If a room is naturally ventilated, the IANL is calculated and measured with ventilators or windows open as required to provide ventilation. If a room is mechanically ventilated or cooled, the plant should be assumed to be running at its normal operating duty.
 - actuator and damper noise

2.5 Institute of Acoustics (IOA) and the Association of Noise Consultants (ANC). 'Acoustics of Schools: A Design Guide' 2015

- 2.5.1 The document provides supporting guidance and recommendations on the acoustic design of new and refurbished schools, stating performance criteria that represent minimum standards which must be achieved to provide a suitable acoustic environment for teaching and learning.

2.6 Design Manual for Roads and Bridges (DMRB)

- 2.6.1 The assessment of operational phase road traffic noise impacts is assessed in general accordance with the guidance presented in the recently published "LA111 - Noise and Vibration" document of DMRB (hereafter referred to as "DMRB LA111").

- 2.6.2 When assessing the potential for operational phase impacts, DMRB LA111 requires a scoping assessment to be initially conducted.
- 2.6.3 The scoping assessment reports on the following scoping assessment questions to gain an understanding of the need to undertake a further noise assessment:
1. Is the project likely to cause a change in the BNL of 1dB LA10,18hr in the do-minimum opening year (DMOY) compared to the do-something opening year (DSOY)?
 2. Is the project likely to cause a change in the BNL of 3dB LA10,18hr in the do-something future year (DSFY) compared to the DMOY?;
 3. Does the project involve the construction of new road links within 600m of noise sensitive receptors?;
 4. Would there be a reasonable stakeholder expectation that an assessment would be undertaken?
- 2.6.4 Where the response to one or more of the scoping assessment questions is 'yes', the scoping assessment shall make a recommendation on the scope of further assessment.

3 NOISE SURVEY

3.1 Baseline Noise Levels

- 3.1.1 Between the 22nd to 23rd October 2019, noise measurements were undertaken in order to quantify noise from the adjacent road, to the south of the site, this being the dominant noise source. Measurements were taken using an Acoem 01dB Fusion sound level meter. The Class 1 instrument logged 1/3 octave levels throughout the measurement. The instrument was calibrated before and after the measurements to a reference level of 94dB, with no notable drift observed.

Monitoring Location

- 3.1.2 Measurements were taken at the location shown in Drawing 2 below.



Drawing 2: Noise Monitoring Location

3.1.3 The monitoring location was as follows:

- ML1: On the southern site boundary, adjacent to the road, with the microphone located 2m above the ground, i.e., above the existing close boarded fence that is to be retained.
 - The measurement took place during the following dates and times:
 - 1308h on the 22nd October, to 0926h on the 23rd October 2019.

Existing Baseline Noise Levels

3.1.4 The noise levels are summarised in Table 2 below. The data has been analysed and the measured daytime level determined, representative of that experienced during school hours.

Table 2: Summary of measured daytime noise level (dBA)		
Location	Daytime LAeq	Daytime LAmax
ML1	70.7	96.5

3.1.5 Full details of the measurements are presented in Appendix 2.

4 SITE SUITABILITY

4.1 External Areas

- 4.1.1 The IOA and ANC (2015) recommends that playgrounds, outdoor recreation areas and playing fields are generally considered to be of relatively low sensitivity to noise.
- 4.1.2 The documents further recommend that for new schools, 60 dB LAeq,30min should be regarded as an upper limit for external noise at the boundary of external areas used for recreation.
- 4.1.3 The results from Figure 1 demonstrate that the required criterion is achieved within the proposed play areas, with noise levels of approximately 50dB LAeq,30T and less calculated within the green spaces in the northern part of the site.

4.2 Internal Areas

- 4.2.1 The IOA and ANC (2015) recommends that for new schools, 60 dB LAeq,30min should be regarded as an upper limit for external noise at the boundary of external areas used for formal and informal outdoor teaching and recreation.
- 4.2.2 The document goes on to state that it may be possible to meet the specified indoor ambient noise levels on sites where external noise levels are as high as 70dB LAeq,30min but this will require considerable building envelope sound insulation, or screening.
- 4.2.3 BB93 further discusses internal target levels for noise, depending on the teaching space or room use. The most onerous BB93 target for the proposed secondary school new build is considered to be 40 dB(A) LAeq,30min for classrooms, with natural ventilation, i.e., an open window. This equates to a façade noise level of 55dB(A) LAeq,30min, assuming approximately 15dB of attenuation for a partially opened window.
- 4.2.4 The guidance recommends that for refurbished areas, such as those associated with the existing primary school, the recommended internal noise level within teaching spaces is 45dB LAeq,30min, with natural ventilation. This equates to a façade noise level of 60dB(A) LAeq,30min, assuming approximately 15dB of attenuation for a partially opened window.

- 4.2.5 Based on the modelled façade noise levels at the proposed development site, provided at Figures 1 to 3, alongside the proposed layout at Appendix 1, the BB93 requirements would be met at both the refurbished primary school and the proposed secondary school, assuming approximately 15dB of attenuation for a partially opened window providing natural ventilation.
- 4.2.6 Façade levels of >55dB(A) are predicted on the ground floor of the proposed secondary school at the southern section of the eastern façade and on the southern façade. However, with reference to the proposed layout, the windows present at these facades are associated with meeting rooms, offices and the kitchen. The recommended internal noise level within these spaces is 45dBLAeq,30min, with natural ventilation, i.e., a façade noise level of 60dB(A) LAeq,30min, assuming approximately 15dB of attenuation for a partially opened window.
- 4.2.7 Figure 1 demonstrates that the façade noise levels are below 60dB(A) and therefore the recommended internal noise level is also achieved within these additional spaces.

5 PEAK HOUR TRAFFIC

- 5.1.1 Information regarding peak hour traffic flows has been provided by the project team's transport consultant, Optima Highways and Transportation.
- 5.1.2 The peak hour, associated with vehicle movements, is considered to be 0800h to 0900h. Currently, at the existing access off Naylor's Road, there are a total of 54 vehicle movements during the peak hour.
- 5.1.3 With the proposed secondary school, the total vehicle movements at the proposed access during the peak hour is predicted to be 168, i.e., an increase of 114 movements.
- 5.1.4 The measured LAeq adjacent to Naylor's Road during the peak hour 0800 to 0900h is 73dB. Due to the prevailing road traffic noise level experienced at existing dwellings adjacent to Naylor's Road, noise associated with this small increase in vehicle movements will not be perceptible and therefore noise from vehicle movements during the peak hour is considered to be **not significant**.
- 5.1.5 With reference to the PPGN noise hierarchy, noise associated with the additional vehicle movement is unlikely to be noticeable and there will be no observed effect.

6 CONCLUSION

6.1 Introduction

- 6.1.1 NJD Environmental Associates has undertaken a noise assessment for the proposed refurbishment of an existing primary school and the construction of a proposed secondary school at Lakeside School, located off Naylor's Road in Liverpool.

6.2 Site Suitability

- 6.2.1 The assessment has found that noise guidance levels for external areas are achieved across the site.
- 6.2.2 Internal guidance levels will also be achieved with open windows providing natural ventilation.

6.3 Peak Hour Traffic

- 6.3.1 Noise associated with additional vehicle movements during the peak hour is considered to be not significant, when taking into consideration the high level of prevailing road traffic noise already experienced at existing dwellings adjacent to Naylor's Road.
- 6.3.2 It is concluded that noise should not be a prohibitive factor in the determination of this planning application.



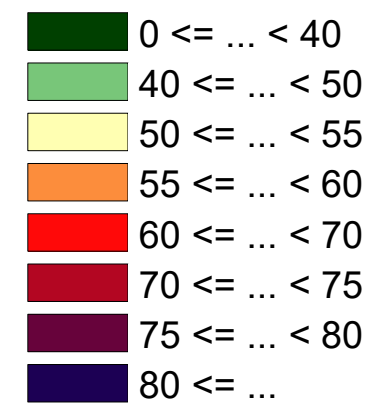
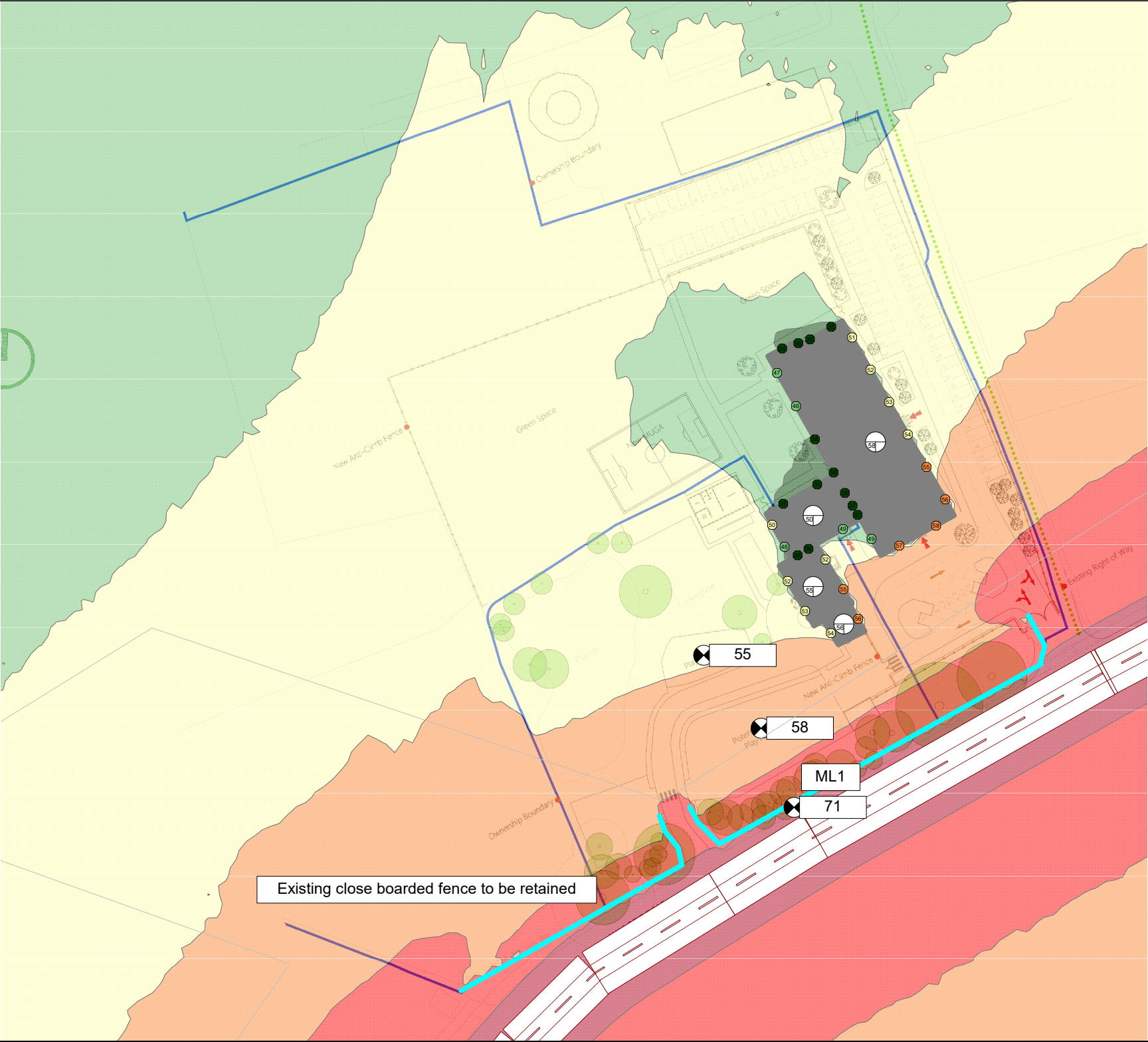
Environmental Associates

NJD Environmental Associates LTD

www.njdenvironmental.co.uk

Company Registration No 10956987





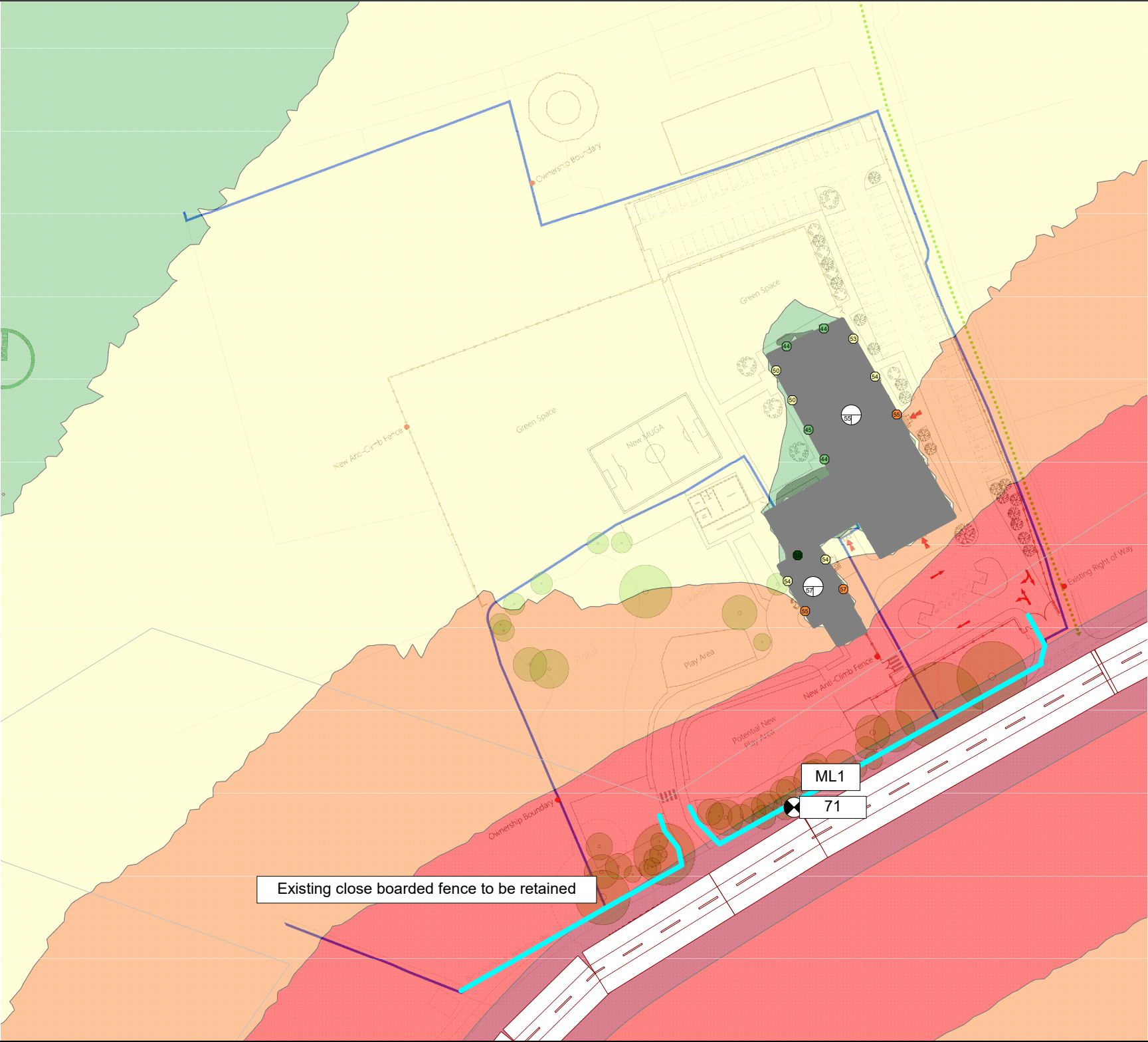
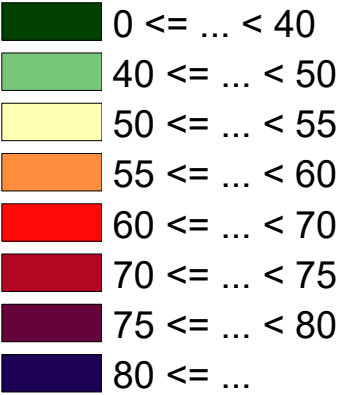
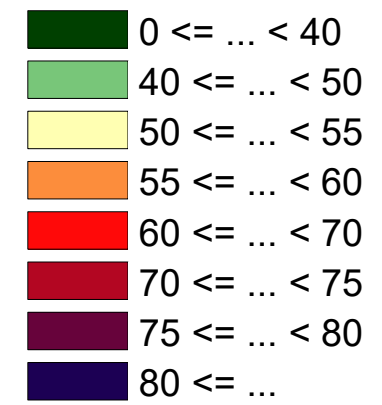
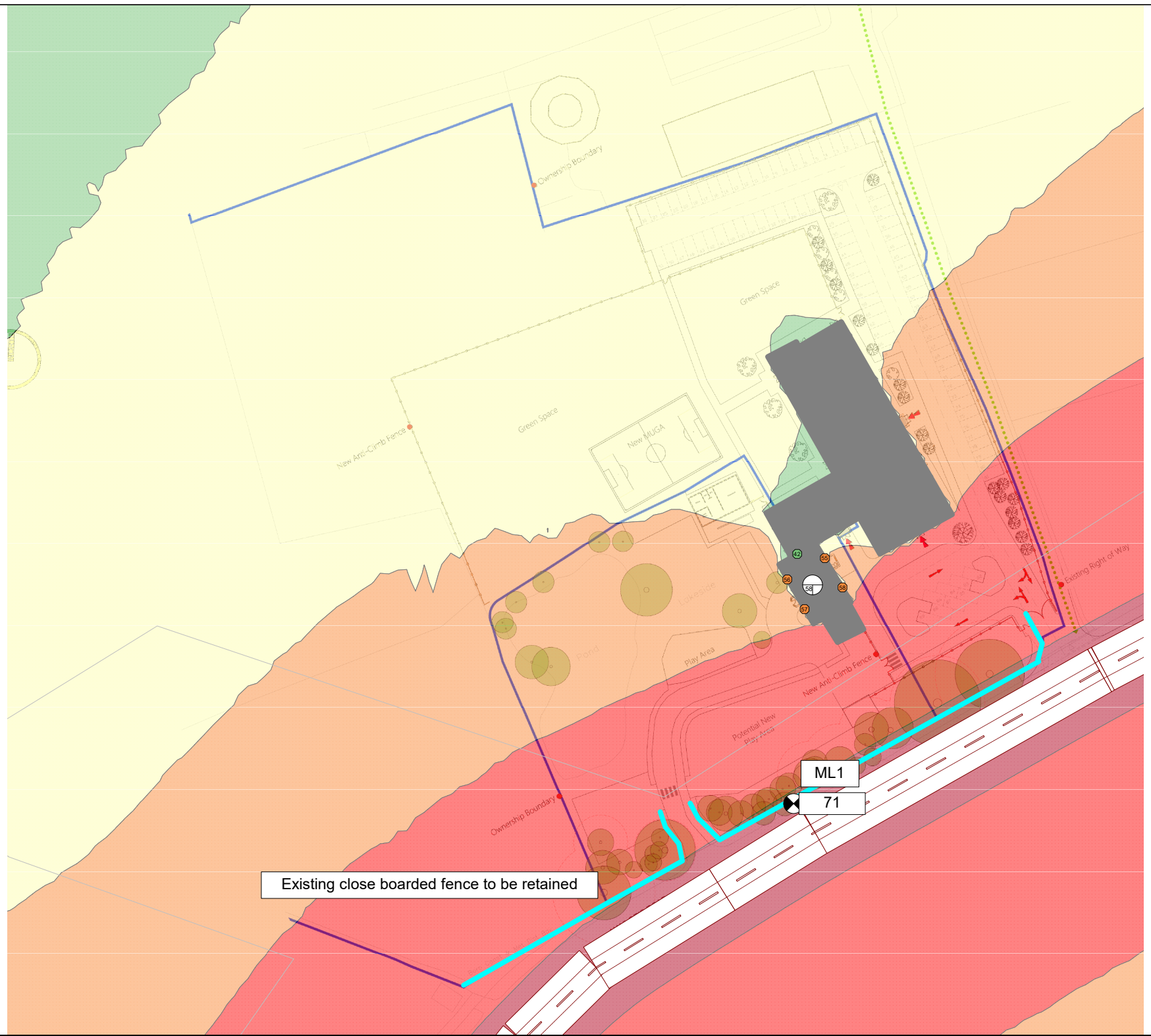


Figure 2:
Daytime LAeq,30min
(First Floor)

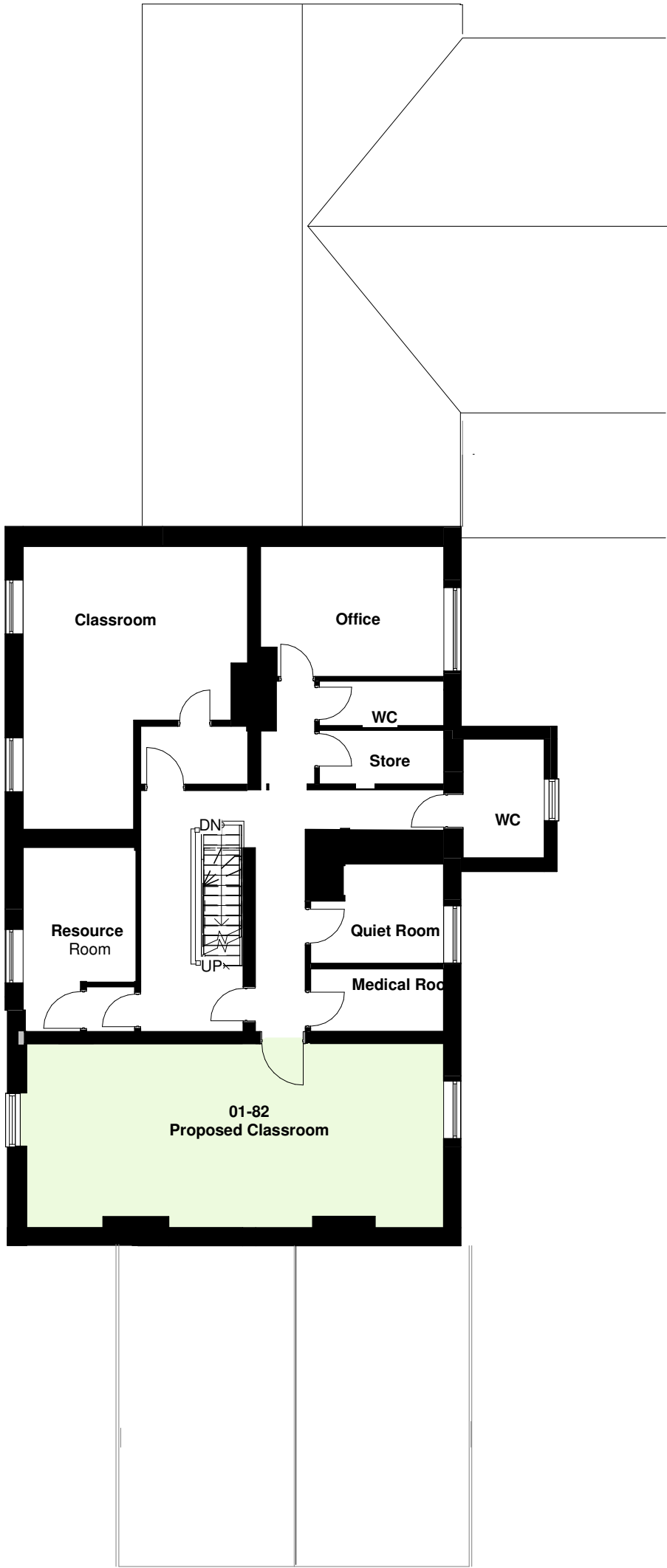
Drawn By:
NJ Dixon-Boak



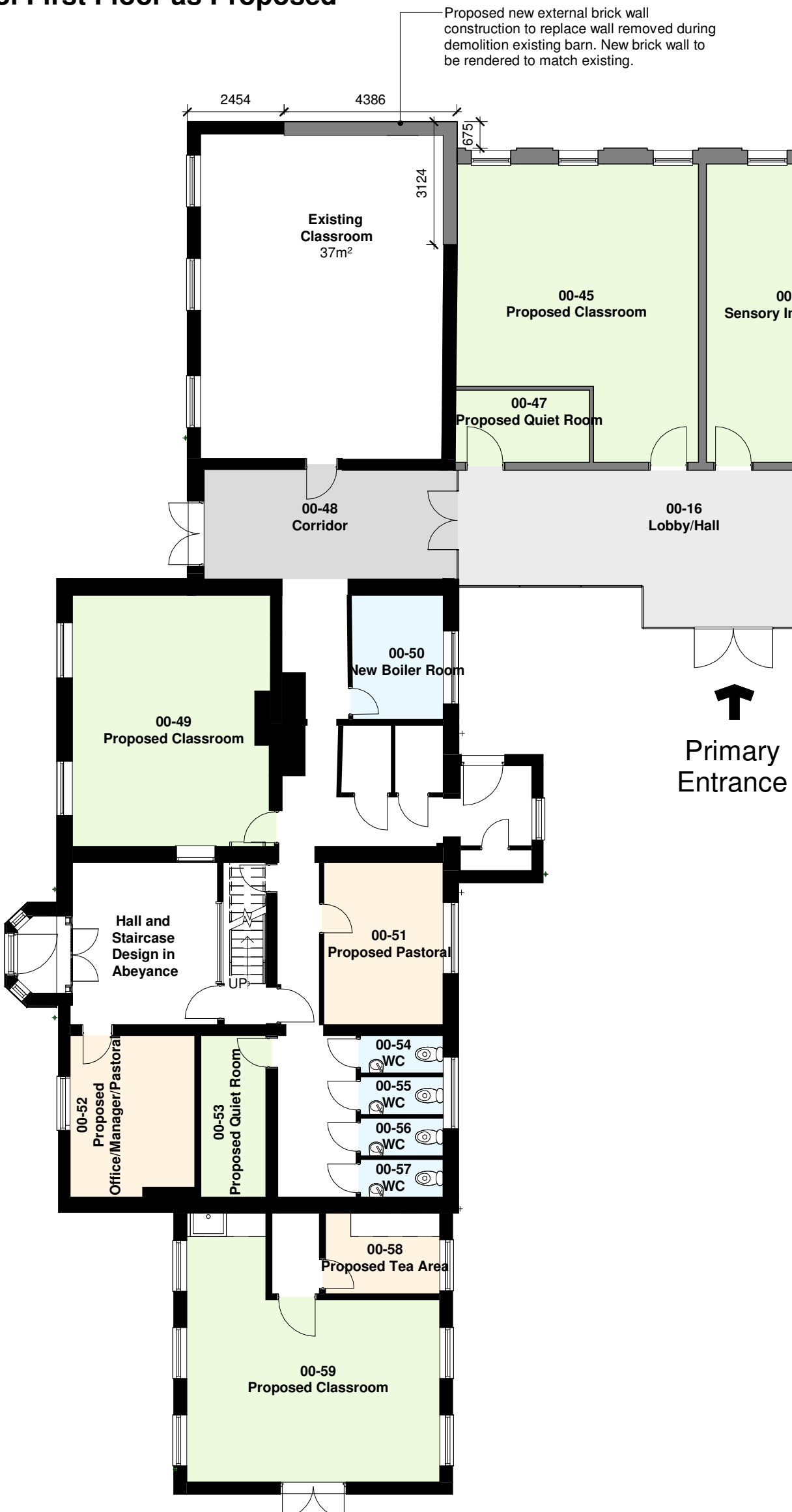
Date:
April 2021



Primary School First Floor as Proposed



Primary School Ground Floor as Proposed



Secondary School First Floor as Proposed



Secondary School Ground Floor as Proposed



0m 2m 4m 6m 8m
VISUAL SCALE 1:100 @ A1

By Department Legend

- Admin Base
- Ancillary
- Circulation/Lobby/Stairwells
- Dining
- New Build Classrooms - Pupil Area

Primary School Rooms Schedule				
Number	Name	Areas		
		Metric	Imperial	
Ground Floor Level				
00-48	Corridor	17.93 m²	193 ft²	
00-49	Proposed Classroom	31.62 m²	340 ft²	
00-50	New Boiler Room	7.32 m²	79 ft²	
00-51	Proposed Pastoral	12.50 m²	135 ft²	
00-52	Proposed Office-Manager/Pastoral	12.69 m²	137 ft²	
00-53	Proposed Quiet Room	6.79 m²	73 ft²	
00-54	WC	2.01 m²	22 ft²	
00-55	WC	2.01 m²	22 ft²	
00-56	WC	2.01 m²	22 ft²	
00-57	WC	2.01 m²	22 ft²	
00-58	Proposed Tea Area	5.97 m²	64 ft²	
00-59	Proposed Classroom	34.16 m²	368 ft²	
First Floor Level				
01-82	Proposed Classroom	37.76 m²	407 ft²	
Grand total		174.81 m²	1,882 ft²	

Secondary School Rooms Schedule				
Number	Name	Areas		
		Metric	Imperial	
Ground Floor Level				
00-01	Lobby	8.43 m²	91 ft²	
00-02	Waiting Area	24.59 m²	265 ft²	
00-03	WC	3.38 m²	36 ft²	
00-04	Reception	25.51 m²	275 ft²	
00-05	Meeting Room 1	23.30 m²	251 ft²	
00-06	Meeting Room 2	15.30 m²	165 ft²	
00-07	Staff Change 1	6.90 m²	74 ft²	
00-08	Staff Change 2	6.44 m²	69 ft²	
00-09	Office	15.23 m²	164 ft²	
00-10	Head Teacher	21.40 m²	230 ft²	
00-11	Exams Room	4.25 m²	46 ft²	
00-12	WC Staff	2.52 m²	27 ft²	
00-13	WC	2.73 m²	29 ft²	
00-14	WC	2.73 m²	29 ft²	
00-15	Plant Room	19.89 m²	212 ft²	
00-16	Lobby/Hall	32.43 m²	349 ft²	
00-17	Hall	94.12 m²	1,013 ft²	
00-18	Dining Store	7.89 m²	85 ft²	
00-19	Kitchen Store	7.89 m²	85 ft²	
00-20	WC Change	4.28 m²	46 ft²	
00-21	Kitchen	35.42 m²	381 ft²	
00-22	Pastoral Manager	15.97 m²	172 ft²	
00-23	Cleaner/Store	7.33 m²	79 ft²	
00-24	Comms	4.41 m²	47 ft²	
00-25	Sensory Light	15.40 m²	166 ft²	
00-26	Medical Wet Room	16.27 m²	175 ft²	
00-27	IT/Media	43.39 m²	467 ft²	
00-28	DT Room	43.39 m²	467 ft²	
00-29	1:1 Pastoral	11.07 m²	119 ft²	
00-30	WC	2.61 m²	28 ft²	
00-31	WC	2.61 m²	28 ft²	
00-32	WC	2.61 m²	28 ft²	
00-33	WC	2.61 m²	28 ft²	
00-34	Classroom	33.11 m²	356 ft²	
00-35	Classroom	33.11 m²	356 ft²	
00-36	Staff Room	26.03 m²	280 ft²	
00-37	Food Tech Classroom	36.13 m²	389 ft²	
00-38	Therapy	10.85 m²	117 ft²	
00-39	Showers Changing	14.26 m²	153 ft²	
00-40	Showers Changing	14.32 m²	154 ft²	
00-41	Maintenance	8.02 m²	86 ft²	
00-42	Stairs	22.44 m²	242 ft²	
00-43	Corridor	179.59 m²	1,933 ft²	
00-44	Stairs	31.24 m²	336 ft²	
00-45	Proposed Classroom	39.98 m²	430 ft²	
00-46	Sensory Integrations	37.82 m²	407 ft²	
00-47	Proposed Quiet Room	6.29 m²	68 ft²	
First Floor Level				
01-60	Classroom	35.26 m²	380 ft²	
01-61	Classroom	35.30 m²	380 ft²	
01-62	WC	2.48 m²	27 ft²	
01-63	WC	2.52 m²	27 ft²	
01-64	WC	2.48 m²	27 ft²	
01-65	WC	2.48 m²	27 ft²	
01-66	Large Classroom	39.84 m²	429 ft²	
01-67	Classroom	45.89 m²	494 ft²	
01-68	1:1 Pastoral	16.28 m²	175 ft²	
01-69	Science	45.99 m²	495 ft²	
01-70	Science	10.07 m²	108 ft²	
01-71	1:1 Pastoral	12.16 m²	131 ft²	
01-72	Stairs	20.53 m²	221 ft²	
01-73	Comms	5.01 m²	54 ft²	
01-74	Art Store	8.00 m²	86 ft²	
01-75	Corridor	50.61 m²	545 ft²	
01-76	Sensory Dark	13.15 m²	142 ft²	
01-77	Art Room	45.89 m²	494 ft²	
01-78	Stairs	22.39 m²	241 ft²	
01-79	Therapy	10.63 m²	114 ft²	
01-80	Deputy Head	16.96 m²	183 ft²	
01-81	Cleaner	5.00 m²	54 ft²	
Loft Level				
00-83	Loft	214.88 m²	2,313 ft²	
Grand total		1,689.11 m²	18,181 ft²	

Drawing Status
PLANNING

This drawing is © C4 Projects and is not to be copied, reproduced or re-distributed either in whole or in part without the prior written permission of the originator.

The originator shall have no responsibility for any liability, loss, cost, damage or expense arising from or relating to any use of this document other than for its intended purpose on this project.

This drawing shall be read in conjunction with all other relevant drawings, specifications and associated documentation. Any discrepancies, errors or omissions are to be reported to the originator before proceeding with work.

All dimensions are to be checked on site by the contractor prior to proceeding with any work. This drawing shall not be scaled to ascertain any dimensions, work to figured dimensions only.

DISCLAIMER
When this drawing is issued in CAD, it is an uncontrolled version issued for information only, to enable the recipient to prepare their own documents/drawings for which they are solely responsible.

SOFTWARE INTEROPERABILITY
C4 Projects prepared this drawing using Autodesk REVIT Architecture.

C4 Projects does not accept liability for any loss or degradation of any information held in the drawing resulting from the translation from the original file format to any other file format or from the recipients reading of it in any other programme.

Hazard Identification		
ref	hazard	date

Primary School GIA		
Name	Metric	Imperial
First Floor Level		
Primary School	148.97 m²	1,603 ft²
Ground Floor Level		
Primary School	269.01 m²	2,896 ft²
Second Floor Level		
Primary School	103.58 m²	1,115 ft²
Grand total	521.56 m²	5,614 ft²

Secondary School GIA		
Name	Metric	Imperial
First Floor Level		
Secondary School	476.57 m²	5,130 ft²
Ground Floor Level		
Secondary School	1,094.33 m²	11,779 ft²
Grand total	1,570.90 m²	16,909 ft²

P4	Reception Area Layout Amended, Stairs Added	AW	08.04.21	JP
P3	Plant Room Area Amended	AW	26.03.21	JP
P2	Updated Following Comments	AW	24.03.21	JP
P1	First Issue of Drawing	AW	17.03.21	JP
Rev	Revision Details	Drawn	Date	Checked

C4 Projects
Quayside, Widnespool Business Park, Stockton Heath, W44 6HL
t: 01855 751 852
e: info@c4projects.co.uk
www.c4projects.co.uk

Project Management • Architecture • Building Surveying • Cost Consultancy

Client
Witherslack Group
W

Project
Lakeside School
Liverpool

Drawing Title
Plans as Proposed - Primary School B1 and Secondary School B3

Status Purpose of Issue
S2 SUITABLE FOR INFORMATION

Drawn by AW Created 17.03.21
C4 Job no. 20034 Scale 1 : 125 @ A1

Drg no. 20034-C4P-BB-ZZ-DR-A-2001 Rev P4

Appendix 2 – Noise Measurements

File	20191022_130852_000000_1.CMG				
Location	ML1				
Data type	Leq				
Weighting	A				
Start	10/22/2019 1:00:00 PM				
End	10/23/2019 5:00:00 PM				
	Leq specific dB	Lmin dB	Lmax dB	L90 dB	Duration cumulated h:min:s
Source					
Daytime LAeq	70.7	45.0	96.5	55.2	03:51:08

LAeq – Peak Hour 0800-0900h

File	20191022_130852_000000_1.CMG				
Location	ML1				
Data type	Leq				
Weighting	A				
Start	10/22/2019 1:08:52 PM				
End	10/23/2019 9:26:28 AM				
	Leq specific dB	Lmin dB	Lmax dB		Duration cumulated h:min:s
Source					
Peak Hour 0800-0900	72.5	51.7	85.0		01:00:00