

PLANNING NOISE ASSESSMENT

on behalf of

WORLD MISSION AGENCY – WINNERS

CHAPEL INTERNATIONAL

for the site at

114 CHAIN ROAD, BLACKLEY

REPORT DATE: 13/11/2024

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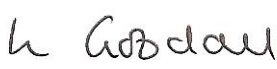


Summary

A noise impact assessment has been undertaken to predict the potential impact on and from a proposed place of worship at 114 Chain Road, Blackley. The proposal involves the demolition of the existing building on the site and construction of the new chapel and associated uses such as classrooms, gym, café, offices and other ancillary spaces.

Measurements of noise levels have been made at the site in a location representative of the new building and of the existing nearby noise sensitive receptors. This has been undertaken to identify the pre-development ambient and background noise levels. A noise model has been assembled for the proposed development site, the results from which are provided within this report. This data was subsequently used to predict the potential impact of noise from likely activities associated with the proposed development when in use on nearby receptors and the impact of noise on the proposed development.

The assessment concludes that noise from the development at the nearest and/or worst-affected receptor locations will either be controllable through design of the development, or negligible without specific acoustic consideration.

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Signed:		Signed:	
Date:	13/11/2024	Date:	13/11/2024

Version	Date	Change	Initials
1	13/11/2024	First issue	JL

Advisory Note

It is recommended that you confirm the suitability of all recommended noise mitigation measures with your architects, structural engineers, building contractors, fire consultants, material manufacturers and any other technical advisors prior to procurement and field application. When the recommended noise control measures are implemented on site they must satisfy the requirements of all disciplines, therefore, should not cause any health and safety issues.

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1 Introduction

- 1.1 Miller Goodall Ltd has on behalf of World Mission Agency – Winners Chapel International, undertaken a noise assessment in respect of the impact of noise on and from a new worship building at 114 Chain Road, Blackley. The site is former convent which has not been in use for a number of years, but the proposal is for a new, larger building to be used as a place of worship with space for classrooms, counselling rooms, multi-purpose hall, gym, bookshop, restaurant, junior and senior teens churches offices and associated ancillary spaces.

2 Site Description

- 2.1 The site is located at 114 Chain Road, Blackley. The existing site comprises disused sections of a former convent which have been used as a school and then dining area for the St. Euphrasia's Care Home to the north since the 1980's. It has been out of use for a number of years.
- 2.2 To the south and west of the site is Meade Hill School and Our Lady's Roman Catholic High School, beyond which are residential areas of Blackley. The nearest residences to the west are approximately 140 m from the development site and approximately 120 m to the east of the site. Adjoining the site at the north is the St Euphrasia's Care Home, which will be remaining in operation and will be the nearest noise-sensitive receptor to the site.
- 2.3 The M60 loops around the north of the site at approximately 250 m from the site and is the main noise source. No noise from the nearby schools or St Euphrasia's Care Home was audible when setting up or collecting the survey equipment.

3 Proposed Development

- 3.1 This development is proposed to provide a new chapel which can accommodate circa 1,500 people and various ancillary spaces including Junior and Senior Teens Churches, classrooms for toddlers to children age 12, a gym, bookshop, restaurant/café, offices/meeting rooms and associated ancillary spaces.
- 3.2 Additionally, the existing car parks at the site are proposed for expansion to accommodate the anticipated traffic associated with the development.
- 3.3 Potentially significant noise sources associated with the development include:

- Road traffic noise from attendees at the site;
- 4 No air handling units assumed (worst-case) to be operating 24/7; and
- Music and singing from services within the building.

3.4 Noise from these sources has been assessed.

4 Policy, Guidance and Assessment Methodology

4.1 National planning policy is outlined in **Appendix 1: Planning Policy**. The acoustic standards and assessment techniques referred to in this assessment are outlined in **Appendix 2: Acoustic Standards and Guidance**.

Internal noise levels within the development

4.2 As there is no specific guidance on internal ambient noise levels for worship buildings, indicative noise limits have been taken from Department for Education Building Bulletin 93 (BB93) which most closely match the selection of spaces proposed within the development.. For educational type spaces in the building, noise criteria have also come from BB93, summarised below.

Table 1: BB93 Room Criteria – Internal Ambient Noise Levels (IANLs)

Room Proposed	Room Type (BB93)	New-Build IANL (dB)
5-7 Year Old Classroom, 3-4 Year Old Classroom, Toddler Classroom, 8-10 Year Old Classroom, 11-12 Year Old Classroom	Classroom	35
Acc. WC, WC, Male WC, Female WC	Toilet	50
Community Development/CSR Office, Pastorate, Pastors Office, ARP Office, Office, Statutory Body Office, Finance Office, Assistant Youth Pastors Office, Youth Pastors Office,	Office	40
Restaurant/Café	Dining room	45
Wellness Centre/Gym	Gymnasium/Activity studio	40
Meeting Room, Board Room,	Meeting Room	40
Reception area	Atrium	45
Main Auditorium, Junior Teens Church, Senior Teens Church, Multi-Purpose Hall/Youth Dev. Centre	Lecture Room	35

Noise from Mechanical Services

4.3 Mechanical services plant noise is assessed using BS 4142 methodology, and against Manchester City Council guidance which requires the combined rating level of all mechanical services plant to not exceed a level of 5 dB below the background noise level.

Noise from Activities within The Development

4.4 Manchester City Council does not have specific noise requirements for religious buildings, the most relevant requirements are for entertainment venues. The requirements for non-structurally connected entertainment venues are that noise does not exceed a level of 5 dB below the background noise level in each octave band. Those daytime background noise levels/limits are shown in **Table 2** below:

Table 2: Octave band worship noise level spectra

Descriptor	Noise Levels , dB							
	at Octave Band Centre Frequency, Hz							
	63	125	250	500	1k	2k	4k	8k
Daytime Background Noise Level, <i>L</i> _{A90} (07:00 – 23:00)	54	48	40	44	49	40	21	16

4.5 However, as the development is not strictly an entertainment venue, these entertainment noise limits do not apply to the site. Noise limits equal to background noise in each octave band, which roughly correlates to audibility criteria, are, therefore, used within the assessment.

4.6 These noise limits apply at all noise-sensitive receptors, the worst affected of would potentially be the care home adjacent to the northern boundary of the proposed development site. All other receptors benefit from a combination of increased distance and/or screening losses from the site. We are therefore primarily assessing the Care Home, as noise levels at all other receptors would be lower.

Road Traffic Noise Associated with the Development

4.7 The assessment criteria within the IEMA guidance, “Guidelines for Environmental Noise Impact Assessment” outlined in **Appendix 2** have been applied to the modelled changes in road traffic noise. Noise levels are assessed as a change in noise level, where the change in *L*_{aeq,16hr} is considered

against the scale shown in **Table 15** below. It is proposed that the change in noise level not exceed a negligible adverse impact at any receptor, to prevent undue disturbance at any receptor.

Table 3: Magnitude of impact (07:00 – 23:00).

Change in Noise Level, x <i>L</i> _{Aeq,16h} (07:00 –23:00) (dB)	Magnitude of Impact
x ≥ 10	Major adverse
5 ≤ x < 10	Moderate adverse
3 ≤ x < 5	Minor adverse
0 ≤ x < 3	Negligible adverse
x < 0	No change

5 Consultation

- 5.1 Pre-app consultation has been undertaken and comments from the Environmental Health Office in relation to noise advised that the planning application must fully consider acoustic breakout from the building and noise from vehicle movements.
- 5.2 In addition, as mechanical services plant is proposed at the site, this has been considered independently of the above and assessed to Manchester City Council’s policy for mechanical services.

6 Noise Survey

6.1 Measurements of Existing Noise Sources

- 6.1.1 Noise measurements were undertaken at a location representative of the location of the proposed development and nearby noise sensitive receptors in accordance with BS 7445-1: 2003¹ by Jo Lacy and Steve Maslivec, being employed by Miller Goodall Ltd. Details of the equipment used are shown in **Table 4**.

¹ BS 7445-1: 2003 Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

Table 4: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1 ^{2,3} Integrating Real Time 1/3 Octave Sound Analyser	NTi XL2-TA	NTi Audio	A2A-15860-E0	27/02/2023	06143/1
Pre-amplifier	NTi MA220	NTi Audio	8102	27/02/2023	06143/1
Microphone	NTi MC230A	NTi Audio	A16445	27/02/2023	06143/1
Class 1 Calibrator ⁴	NOR 1251	Norsonic	32798	29/05/2024	U47928
Outdoor microphone housing	NTi WP30	NTi Audio	NA	NA	NA
Weather Station	Vantage Vue	Davis	MJ150128029	N/A	N/A

- 6.1.2 The calibration of the sound level meter was checked before and after measurements with negligible deviation (≤ 0.1 dB).
- 6.1.3 Background and ambient noise monitoring was undertaken at the times specified in **Table 5**, below. Measurements were made over a typical weekend period. The primary source of noise at the measurement position was distant road traffic noise from the M60, as well as some anonymous road traffic noise from local roads.
- 6.1.4 Each measurement period consisted of sequential 100 ms samples which therefore allowed the variation in noise level over time to be assessed. The 100 ms noise levels have not been presented in this report but are kept on file for future reference.
- 6.1.5 Measurements were made under free-field conditions at a height of 1.5 m above local ground level. The measurement position is shown in **Appendix 3: Monitoring Positions**.
- 6.1.6 Weather conditions were monitored throughout the survey period using a weather station adjacent to the sound level meter. In general, weather conditions were appropriate for noise monitoring – periods where wind exceeded 5 m/s or where rain was identified have been removed from the survey data. Due to Storm Ashley arriving on Sunday afternoon, the sound level meter was blown

² IEC 61672-1 (2002) Electroacoustics – Sound level meters Part 1: Specifications

³ IEC 61260 (1995) Electroacoustics – Octave-band and fractional-octave-band filters

⁴ IEC 60942 (2003) Electroacoustics – Sound calibrators

over on Sunday at approximately 14:50. The exact time has been identified and all data after this time removed from the assessment data.

7 Monitoring Results

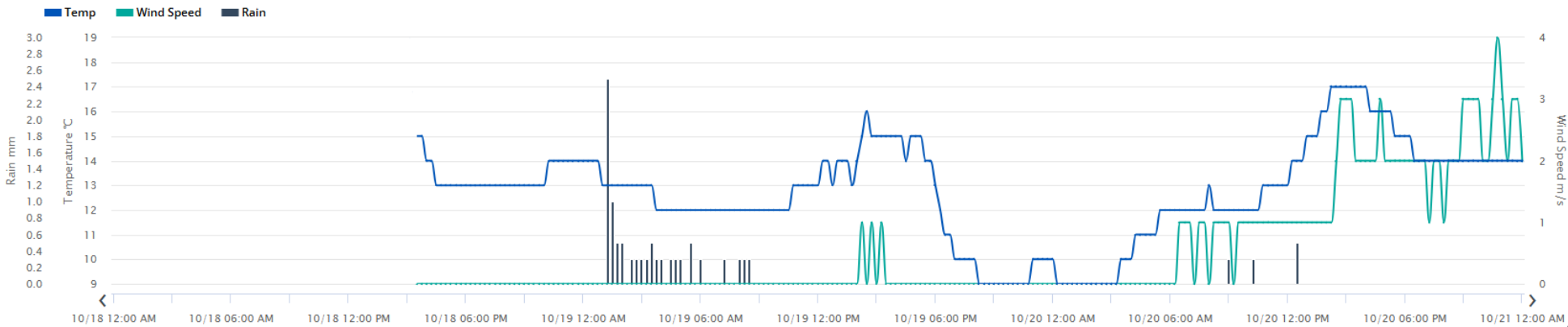
7.1 A summary of the broadband measurement data used within the assessment is provided in **Table 5** below. All data are sound pressure levels in dB re 20 µPa.

Table 5: Summary of noise measurements

Measurement Location	Start Date (dd/mm/yy)	Start Time (hh:mm)	Elapsed Time ¹	L _{Aeq,T} (dB)	Overall L _{AF,max} (dB)	L _{A90,T} (dB)
MPI	18/10/24	14:55	7h 57m 55s	53.8	83.4	50
	18/10/24	23:00	4h 00m 00s	48.1	72.6	45
	19/10/24	07:00	14h 33m 17s	53.9	78.6	50
	19/10/24	23:00	8h 00m 00s	50.4	71.9	46
	20/10/24	07:00	7h 20m 00s	53.1	72.3	53
¹ Data excluded from typical day- and night-time periods due to weather conditions						

7.2 The weather station indicated periods of weather inappropriate for noise surveys during the survey period. While the recorded noise data indicated no obvious sign of change during these periods, some data has been excluded to ensure they were not impacted by wind/rain. The weather station data collected during the noise survey is laid out in **Figure 1**.

Figure 1: Weather Station Data



- 7.3 Following review of the weather station data and exclusion of noise data due to potential negative impacts due to the weather, the data collected is considered appropriate for assessment purposes.
- 7.4 Octave band frequency data was obtained during surveying, and this was utilised within noise ingress calculations to determine suitable mitigation in terms of glazing and ventilation requirements. This source data is provided in **Table 6**, below as integer values and has been calculated based on the periods reported in **Table 5** and excludes all periods of inclement weather.

Table 6: Octave band free-field external noise level spectra

Measurement Descriptor	Sound Pressure Level, dB							
	at Octave Band Centre Frequency, Hz							
	63	125	250	500	1k	2k	4k	8k
Daytime $L_{Aeq,16hr}$	60	53	47	49	53	56	41	36
Daytime $L_{A90,16hr}$	54	48	40	44	49	40	21	16
Night-time $L_{A90,8hr}$	48	42	35	39	43	35	19	16

- 7.5 As can be seen from the levels in **Table 6** above, the background sound levels are close in level to the ambient sound levels at low frequencies, indicating that the motorway is dominating the background noise climate.

8 Noise Modelling

8.1 Computer Modelling

- 8.1.1 Predictions of existing noise levels on the site have also been undertaken using the CadnaA noise modelling package. Specific model parameters were applied as follows:
- Propagation of noise using algorithms within ISO 9613-2:2024 *Acoustics – Attenuation of sound during propagation outdoors*.
 - Roads were modelled as area sources at a height of 0.5 m above ground level and calibrated using spectral data measured during the survey.
 - Plant items modelled as area sources or vertical area sources in locations and of dimensions provided.
 - Default ground absorption $G = 0.5$ (equivalent to mixed ground cover and consistent with the dominant ground cover at the site).
 - Ground attenuation: spectral all sources

- No adverse meteorological effects
- Two orders of reflection
- Topographical data was obtained using DEFRA LIDAR contours for the site and surrounding assessment area.

8.2 Validation of the Noise Model

8.2.1 Noise level receptor points were incorporated into the CadnaA model at the noise survey measurement locations to calibrate the model using the measured octave band L_{eq} noise levels. The modelled results agreed with the measured results to within ± 1 dB L_{Aeq} .

8.3 Noise Model Predictions

8.3.1 The following scenarios have been modelled using the indicative master plan provided (excluding existing ambient noise):

- daytime L_{Aeq} noise levels across the site at a height of 1.5 m;
- daytime L_{Aeq} noise levels across the site at a height of 4 m;
- night-time L_{Aeq} noise levels across the site at a height of 4 m.

8.3.2 Screenshots from each model are provided in **Appendix 4: Noise Grid Maps**.

9 Impact of Noise on the Development

9.1 In order to assess the potential glazing requirements for spaces in the new building, noise ingress calculations were undertaken based on the methodology in BS EN 12354-3⁵. Assumptions of reverberation time and noise criteria have been taken from BB93. It is understood that ventilation will be provided by mechanical means throughout the development.

9.2 Calculations of noise break-in have been undertaken using SRI performance data typical of the anticipated construction of the building as shown in **Table 7** overleaf.

⁵ BS EN 12354-3:2017 Building acoustics – Estimation of acoustic performance of buildings from the performance of elements. Part 3: Airborne sound insulation against outdoor sound

Table 7: Sound Reduction Index of Assessed Façade Elements

Façade Element	Sound Reduction Index, SRI (dB)								R _w (dB)	C _{tr} (dB)	R _w + C _{tr} (dB)
	at Octave Band Centre Frequency, Hz										
	63	125	250	500	1k	2k	4k	8k			
Twin-Leaf Masonry Wall	32	34	34	40	56	73	76	76	45	-5	40
Roof	21	27	37	43	48	52	52	52	46	-7	39
External Door	19	25	34	41	42	46	47	49	42	-5	37
Glazing	18	24	20	25	35	38	35	35	31	-4	27

9.3 With ventilation provided by mechanical means or by façade mounted trickle vents, standard thermal double glazing would be appropriate throughout the development for the control of noise ingress into all spaces. Standard thermal double glazing is typically of a 4 / 12 / 4 configuration, i.e. 4 mm float glass pane / 12 mm air gap / 4 mm float glass pane, and would be expected to achieve the following acoustic performance:

Table 8: Sound Reduction Index of Standard Thermal Double Glazing

Façade Element	Sound Reduction Index, SRI (dB)								R _w (dB)	C _{tr} (dB)	R _w + C _{tr} (dB)
	at Octave Band Centre Frequency, Hz										
	63	125	250	500	1k	2k	4k	8k			
Standard Thermal Double Glazing	18*	24	20	25	35	38	35	35*	31	-4	27

* Data is not typically reported at these frequencies and are therefore indicative of performance only. Nevertheless, we would anticipate 4 / 12 / 4 glazing achieving them as a minimum.

10 Impact of Noise from the Proposed Development

10.1 Noise Breakout

10.1.1 Noise breakout from the site has been based on reference data from the Miller Goodall library for music in worship settings and has been assumed to be concurrent in all worship spaces. It is unlikely that this would occur in reality but is considered as part of an absolute worst-case scenario. The octave band noise data used within the noise modelling is shown in **Table 9**.

Table 9: Octave band worship noise level spectra

Measurement Descriptor	Internal Sound Level, dB								dB(A)
	at Octave Band Centre Frequency, Hz								
	63	125	250	500	1k	2k	4k	8k	
Internal worship music (live band with amplified sound) and crowd noise	91.8	91.4	91.0	87.1	83.8	76.8	75.5	69.7	89.1

10.1.2 Noise break-out from the site has been assessed using dimensions measured from drawings provided by *MOJO Architecture* and based on typical façade elements for this kind of development. The assumed sound reduction performance of elements is provided in **Table 10** below:

Table 10: Sound Reduction Index of Assessed Low-Performance Façade Elements

Façade Element	Sound Reduction Index, SRI (dB)								R_w (dB)	C_{tr} (dB)	$R_w + C_{tr}$ (dB)
	at Octave Band Centre Frequency, Hz										
	63	125	250	500	1k	2k	4k	8k			
Twin-Leaf Masonry Wall	32	34	34	40	56	73	76	76	45	−5	40
Roof	21	27	37	43	48	52	52	52	46	−7	39
External Door	19	25	34	41	42	46	47	49	42	−5	37
Glazing	18	24	20	25	35	38	35	35	31	−4	27

10.1.3 Based on these constructions, and the assumptions made above, the predicted at nearby noise sensitive receptors have been calculated with a summary of the results in **Table 11** below:

Table 11: Entertainment Noise Assessment

Description	Entertainment Noise Assessment, dB							
	at Octave Band Centre Frequency, Hz							
	63	125	250	500	1k	2k	4k	8k
Predicted Noise Level at Care Home	54.9	46.3	35.2	23.6	13.0	0.1	-3.5	-13.6
Noise Limits (Equal to background)	54	48	40	44	49	40	21	16
Difference (Compared to background)	0.9	-1.7	-4.8	-20.4	-36	-39.9	-24.5	-29.8

10.1.4 As can be seen from the results in **Table 11** above, entertainment noise will not exceed a level equivalent to background noise in any octave band except at the worst-affected noise sensitive receptors, in a worst-case scenario assuming that all large spaces are generating noise at the

same time. However, it is unlikely that all spaces would be generating such high levels of in-phase noise simultaneously, meaning noise emissions from the site are likely to be lower than those predicted above. Furthermore, an exceedance of 0.9 dB is unlikely to be detectable and would only occur at the worst affected receptor in a worst-case scenario that is unlikely to occur in reality.

- 10.1.5 Noise breakout from the site is therefore considered unlikely to have any adverse impact on any nearby noise sensitive receptors.

10.2 Mechanical Services Noise

- 10.2.1 A BS 4142 noise impact assessment has been undertaken in order to assess the potential noise impact at the most affected location due to mechanical services noise from the proposed development and is detailed in this section of the report.

- 10.2.2 Mechanical services noise levels have been provided by the client, with the data utilised with noise modelling reported below in **Table 12**:

Table 12: Sound Power Levels of Proposed Plant

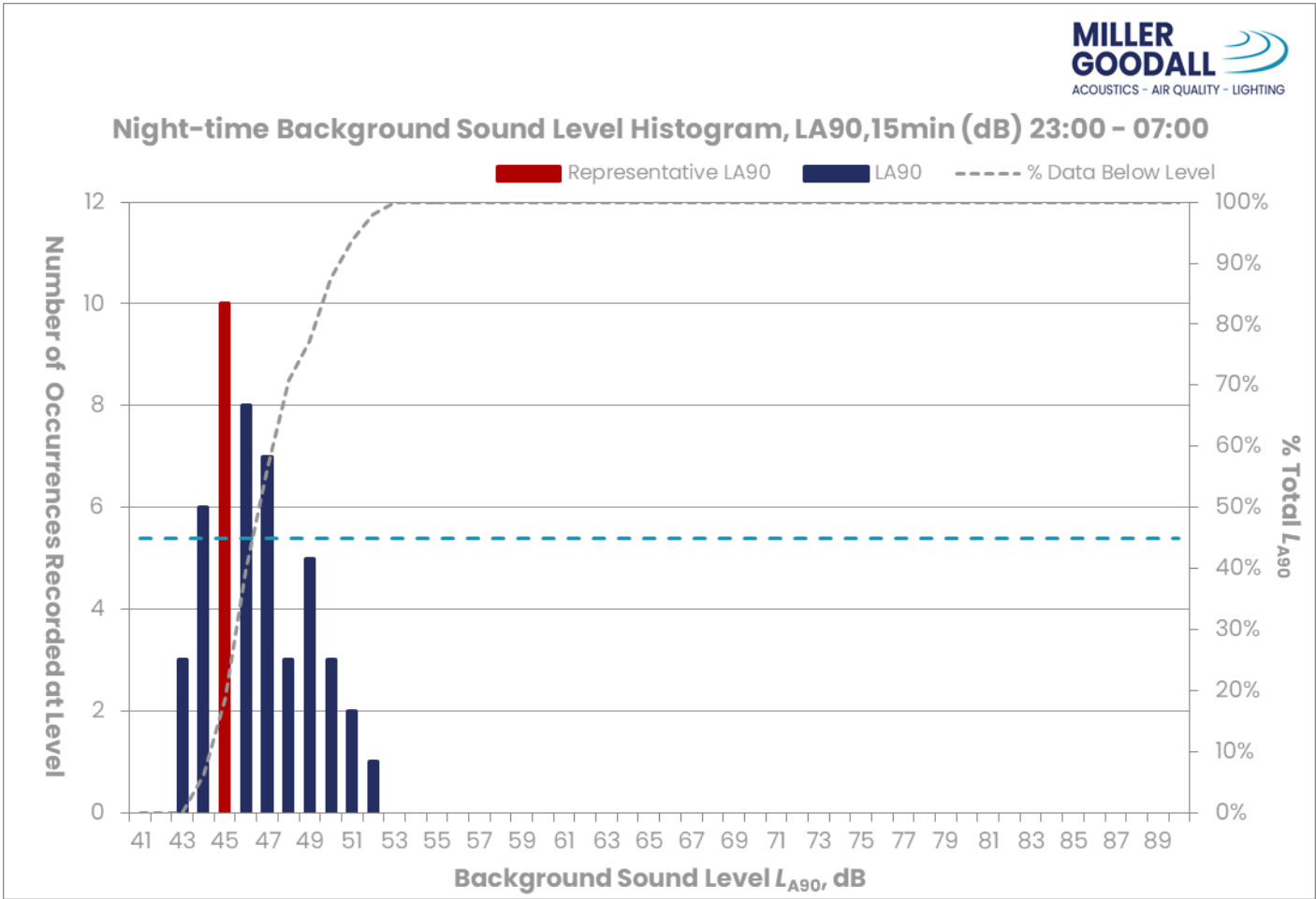
Plant Item	No. Items	Sound Power Level, SWL (dB) at Octave Band Centre Frequency (Hz)								dB(A)
		63	125	250	500	1k	2k	4k	8k	
AHU01 Intake	3	66	75	62	49	35	31	29	28	60.2
AHU01 Exhaust	3	75	82	70	61	45	44	51	54	68.0
AHU01 Breakout	3	72	78	62	61	60	56	51	35	66.1
AHU02 Intake	1	60	73	55	42	28	23	22	22	57.4
AHU02 Exhaust	1	70	79	63	56	39	37	44	46	64.0
AHU02 Breakout	1	67	76	55	56	54	50	43	29	62.1

- 10.2.3 The following BS 4142 assessment has considered the night-time period only to ensure a worst-case assessment in the event that mechanical services are running after 23:00 or before 07:00. Background noise levels were recorded at the site during the environmental noise survey and are reproduced in **Table 13** below. The representative background noise level has been determined

using the statistical method provided in *The Little Red Book of Acoustics*⁶ which is summarised in **Appendix 2: Acoustic Standards and Guidance**.

10.2.4 The histogram of night-time background sound levels is shown in **Figure 2** below, with the representative level highlighted in red. This is the night-time background noise level that will be used for mechanical services assessment at night as this is the worst-case period when the plant may be operating.

Figure 2: Background Sound Level Histogram



10.2.5 Plant noise limits are set 5 dB below the pre-development representative background noise level (shown above), as required by Manchester City Council and are shown in **Table 13**.

⁶ The Little Red Book of Acoustics: A Practical Guide (Fourth Edition). Published by Blue Tree Acoustics, 2024.

Table 13: Background Noise Levels

Assessment Period	Representative Background Noise Level ($L_{A90,15min}$), dB	Plant Noise Limits, dB
Night (15-min)	45	40

10.2.6 Based on the above assumptions, the BS 4142 assessment of noise impact at the worst affected noise sensitive receptor (care home) is shown in **Table 14**.

Table 14: BS 4142:2014 Noise Impact Assessment: Night-time

Results		Relevant Clauses of BS 4142:2014	Commentary
Measured Ambient Noise Level	$L_{Aeq,15min} = 50$ dB	7.3.1	Averaged from several 15-minute measurements during the night-time
Background Sound Level	$L_{A90,15min} = 45$ dB	8.1.2 8.3	Determined using the Little Red Book method for assessing L_{A90} noise levels
Assessment made during the night-time, so the reference interval is 15 min		7.2	
Specific Sound Level	$L_{Aeq,15min} = 36$ dB	7.3.3 eqn. (2)	
Acoustic feature correction	+ 2 dB	9.2	Noise modelling suggests there may be some perceptible tonality at the worst affected receptor. No impulsivity, intermittency or other acoustic characteristics are predicted due to the proposed mechanical services being new.
Rating Level	$(36 + 2) = 38$ dB		
Excess of Rating Level over Background Sound Level	$(38 - 45) = -7$ dB		
Assessment indicates likelihood of no adverse impact		11	Initial estimate only
Context		11 8.5	The assessment relates to an existing receptor which will be adjacent to a new building. Traffic noise is dominant across the site currently.
Uncertainty of the assessment		10	There is a degree of uncertainty due to the noise data being recorded un-attended. However, audio logging and a weather station were used to reduce the uncertainty regarding weather and local conditions.

10.2.7 It can be seen from the above table that the initial estimate of noise impact of the new building is negligible as the rating level of all mechanical services plant operating simultaneously is predicted to be more than 5 dB below the background noise level (2 dB below plant noise limits) and is therefore compliant. It should be noted that any other noise sensitive receptors will benefit from additional distance and/or screening losses.

10.3 Traffic Noise

10.3.1 Traffic noise has been assessed on the basis of traffic flow data provided to us for the baseline and proposed development. It is understood that the 2029 baseline data involves zero vehicle movements on a Sunday between 11:15 and 12:15, i.e. no noise from vehicles. As this is also the period when there is the highest predicted traffic flows directly due to the development, this is the period that is assessed.

10.3.2 The following assumptions have been made with respect to the traffic flow so that assessment of noise may be made:

- Worst case traffic peak flow of 237 total vehicle movements in a single one-hour period
- 20 % of all vehicles will be “heavy” vehicles ie coaches
- Road surface will be impervious and bituminous, with average texture depth of 5.0 mm
- Road gradient will follow the current topography
- Average travel speed of 30 km/h
- Road width 2.4 m
- Source height 0.5 m above local ground level

10.3.3 Based on these assumptions, the highest noise level at any nearby noise sensitive receptor due to traffic movements will be at 106 Chain Road. At this location, at the highest traffic flow associated with the development, noise levels are expected to be 58.9 dB $L_{Aeq,1hr}$.

10.3.4 The recorded ambient noise level during this hour was 56.4 dB $L_{Aeq,1hr}$. The predicted noise level is therefore 2.5 dB above the existing ambient noise level in the worst-case hour. Over a full daytime period, the noise levels associated with road traffic are predicted to be below the ambient and background noise levels.

10.3.5 Comparing against the “Magnitude of Impact” (**Table 15** in **Appendix 2: Acoustic Standards and Guidance**), even in the worst-case single hour when specific noise due to traffic movements is greatest, the magnitude of impact is classified as “Negligible Adverse”. Over a full 16-hour day, the change in ambient noise level ($L_{Aeq,16hr}$) is < 1 dB. While these figures are based on the $L_{Aeq,T}$, it would

be worth noting that even if an increase of 2.5 dB occurred over a full 18-hours in terms of $L_{A10,18hr}$ noise levels as well as L_{Aeq,T_r} at worst, the noise would be considered between negligible and minor when assessed against DMRB. Traffic noise is therefore considered to have a negligible impact on nearby noise sensitive receptors.

- 10.3.6 Furthermore, as the noise climate at the site is dominated by road traffic noise from the M60, the noise from the road traffic will be of the same character as the existing noise climate. This is contextual but would reduce the perceived impact due to an increase in road traffic noise due to the development.

11 Transmission of Noise within the Development

- 11.1 The nature of the development means that there is potential for noise to travel between adjacent sensitive areas, particularly where mechanical services ductwork and partition penetrations exist. Care must be taken in due course to ensure that these details are appropriately designed to control noise transmission within the development.

12 Summary and Conclusions

- 12.1 A noise assessment has been undertaken to predict the impact of noise on, and from a proposed new place of worship at 114 Chain Road, Blackley. It is proposed to demolish the existing building at the site to create a new, larger place of worship with ancillary uses including classrooms, counselling rooms, multi-purpose hall, gym, bookshop, restaurant, junior and senior teens churches offices and associated ancillary spaces.
- 12.2 As part of this development, mechanical services plant items will be installed at the site with the potential to impact nearby noise sensitive receptors, particularly the residential care home at the northern boundary of the building.
- 12.3 An environmental noise survey has been undertaken with a weather station in place to record the weather conditions throughout a weekend survey to ensure typical noise levels have been recorded at the site. This information has been used to populate an environmental noise model for the calculation of noise ingress at the new building and setting of noise limits for noise egress from the building.
- 12.4 Without additional mitigation measures, the noise due to the combined operations of mechanical services plant items is anticipated to be 7 dB below the existing background noise level at the worst-

affected noise sensitive façade at night. This is therefore unlikely to have any adverse impact at any noise sensitive receptor.

- 12.5 With assumed performances of façade elements and concurrent worship music noise in all proposed halls at the site, noise levels at the worst-affected noise sensitive receptors are anticipated to not exceed the existing background noise level in any octave band except 63 Hz octave band, and by less than 1 dB. This is unlikely to be audible and is therefore unlikely to have any adverse impact at any noise sensitive receptor.
- 12.6 With typical standard thermal double glazing in place, internal ambient noise levels in all noise-sensitive parts of the building will be compliant with noise criteria taken from BB93. As a result, specific acoustically rated façade elements are not required to control noise ingress at the site.
- 12.7 Traffic noise associated with the peak-usage hours of the site have also been assessed to provide a robust assessment of noise due to the operation of the site. It has been shown that even when assessing the worst-case single hour period and assuming it could be happening multiple times per day, the potential impact will be minor to negligible at the worst affected receptor, and lower at all other receptors.

APPENDICES

Appendix 1: Planning Policy

Noise Policy Statement for England

The Noise Policy Statement for England (NPSE⁷), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse effects on health and quality of life;*
- *mitigate and minimise adverse effects on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and the quality of life occur.

The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the Statement). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case:

"...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development".

Importantly, the NPSE goes on to state:

"This does not mean that such adverse effects cannot occur".

The Statement does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that:

⁷ Noise Policy Statement for England, Defra, March 2010

"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available"

It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

National Planning Policy Framework

The National Planning Policy Framework (NPPF⁸) initially published in March 2012, was updated most recently in December 2023. One of the documents that the NPPF replaces is Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise"⁹.

The revised NPPF advises that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives). One of these is an environmental objective which is described in par. 8 (c):

"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy."

At par. 180 we are advised that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans..."

Par. 191 goes on to state:

⁸ National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2023

⁹ Planning Policy Guidance 24: Planning and Noise, DCLG, September 1994

“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; ...”

Par. 193 seeks to ensure that any development does not prejudice the legally permitted operations and activities of other, existing non-residential uses, stating:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

Planning Practice Guidance – Noise

As of March 2014, a Planning Practice Guidance¹⁰ for noise was issued which provides additional guidance and elaboration on the NPPF, the guidance was updated in July 2019. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- 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.

¹⁰ Planning Practice Guidance – Noise, <https://www.gov.uk/guidance/noise--2> 22nd July 2019.

In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

“...the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation”.

Examples of these factors include:

- The source and absolute noise level of the source along with the time of day that it occurs;
- Where the noise is non-continuous, the number of noise events and pattern of occurrence;
- The frequency content and acoustic characteristics of the noise;
- The effect of noise on wildlife;
- The acoustic environment of external amenity areas provided as an intrinsic part of the overall design;
- The impact of noise from certain commercial developments such as night clubs and pubs where activities are often at their peak during the evening and night.

The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

“Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed”.

The PPG was amended in December 2014 to clarify guidance on the potential effect of noise from existing businesses on proposed new residential accommodation. Even if existing noise levels are intermittent (for example, from a live music venue), noise will need to be carefully considered and appropriate mitigation measures employed to control noise at the proposed accommodation.

Local Planning Policy

12.7.1 In October 2022, Manchester City Council published the latest edition of their Planning and Noise Technical Guidance document, which details the general approach to noise. This supersedes previous editions of the document.

Entertainment Venues

12.7.2 While there is no specific entertainment venue within the development, it is proposed to be used for weddings which are anticipated to include live music. The guidance for Entertainment Venues is therefore used to inform the assessment and guide the setting of noise limits.

12.7.3 The document makes two statements regarding entertainment noise depending on whether the entertainment venue is structurally connected to the receptor or not. For new residential developments that are structurally connected to entertainment venues (or vice versa):

"Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB ($L_{eq,5min}$) respectively."

12.7.4 And for a new entertainment venue that is structurally detached from other building uses:

"Entertainment noise ($L_{Aeq,5min}$) should be controlled to 5dB below the typical background noise level (L_{A90}) in each octave band at the nearest noise sensitive location."

Noise and vibration from fixed plant/equipment

12.7.5 Specifically with regard to noise from fixed plant/equipment, the document states in Section 3.7.1.5 that:

"Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location."

12.7.6 The document also advises that structure-borne noise and vibration should be considered, e.g. where ventilation equipment is being installed on the roof of a residential apartment block.

Appendix 2: Acoustic Standards and Guidance

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142:2014+A1:2019¹¹ provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. It replaced the 1997 edition of the Standard in October 2014 and was amended in June 2019. The amended version corrected a number of printing errors and further clarified that the standard is used to assess external noise levels, and not internal noise levels (although this can form part of the discussion regarding context). The key aspects of the Standard are summarised below.

The standard presents a method of assessing potential noise impact by comparing the noise level due to industrial sources (the Rating Level) with that of the existing background noise level at the nearest noise sensitive receiver in the absence of the source (the Background Sound Level).

The Specific Noise Level – the noise level produced by the source in question at the assessment location – is determined and a correction applied for certain undesirable acoustic features such as tonality, impulsivity or intermittency. The corrected Specific Noise Level is referred to as the Rating Level.

In order to assess the noise impact, the Background Sound Level is arithmetically subtracted from the Rating Level. The standard states the following:

- *Typically, the greater this difference, the greater the magnitude of the impact,*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context,*
- *A difference of around +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 Sound 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 of the specific sound source having a low impact, depending on the context.*

¹¹ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014+A1:2019 edition places emphasis upon an appreciation of the context, as follows:

An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.

The 2014 edition of BS 4142 also introduced a requirement to consider and report the uncertainty in the data and associated calculations and to take reasonably practicable steps to reduce the level of uncertainty.

Guidelines for Environmental Noise Impact Assessment – IEMA: 2014¹²

These guidelines address the key principles of noise impact assessments that are applicable to all development proposals where noise effects are likely to occur. The guidelines cover:

- How to scope a noise assessment;
 - Issues to be considered when defining the baseline noise environment;
 - Prediction of changes in noise levels as a result of implementing development proposals;
- and
- Definition and evaluation of the significance of the effect of changes in noise levels.

The document provides specific advice on the methodology for assessing the change in the noise environment.

The predicted noise levels are compared to the existing noise environment to determine the level of change in noise, these levels are then compared to “Magnitude of Impact”¹³ given in **Table 15** below. This assessment criteria can only be used for day-time changes.

Table 15: Magnitude of impact (07:00 – 23:00).

Change in Noise Level, x <i>L</i> _{Aeq,16h (07:00 –23:00)} (dB)	Magnitude of Impact
x ≥ 10	Major adverse

¹² Guidelines for Environmental Noise Impact Assessment – Institute of Environmental Management and Assessment (2014)

¹³ Technical Advice Note Assessment of Noise, The Scottish Government (2011)

Change in Noise Level, x <i>L</i> _{Aeq,16h} (07:00 -23:00) (dB)	Magnitude of Impact
5 ≤ x < 10	Moderate adverse
3 ≤ x < 5	Minor adverse
0 ≤ x < 3	Negligible adverse
x < 0	No change

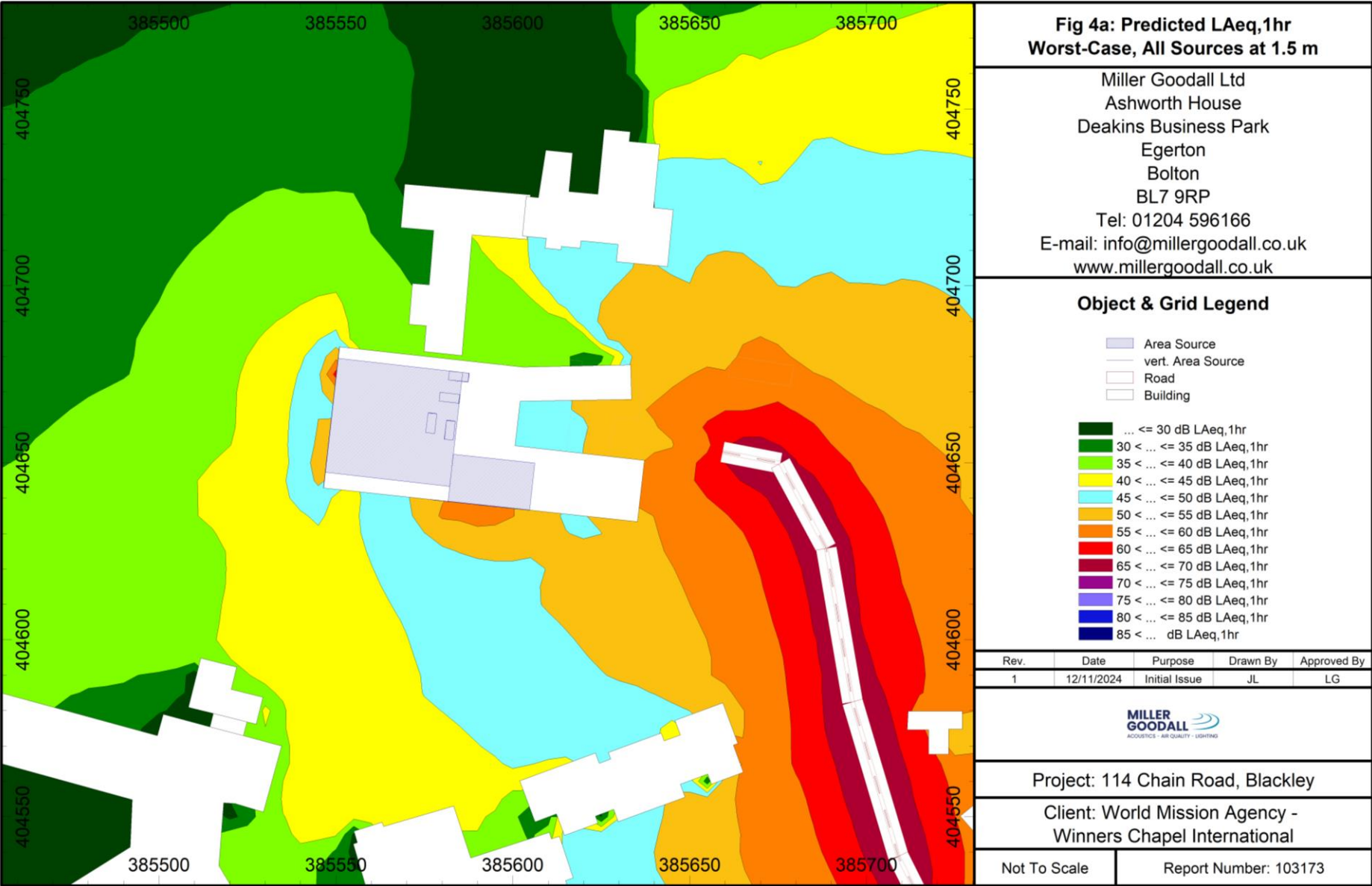
The Little Red Book of Acoustics

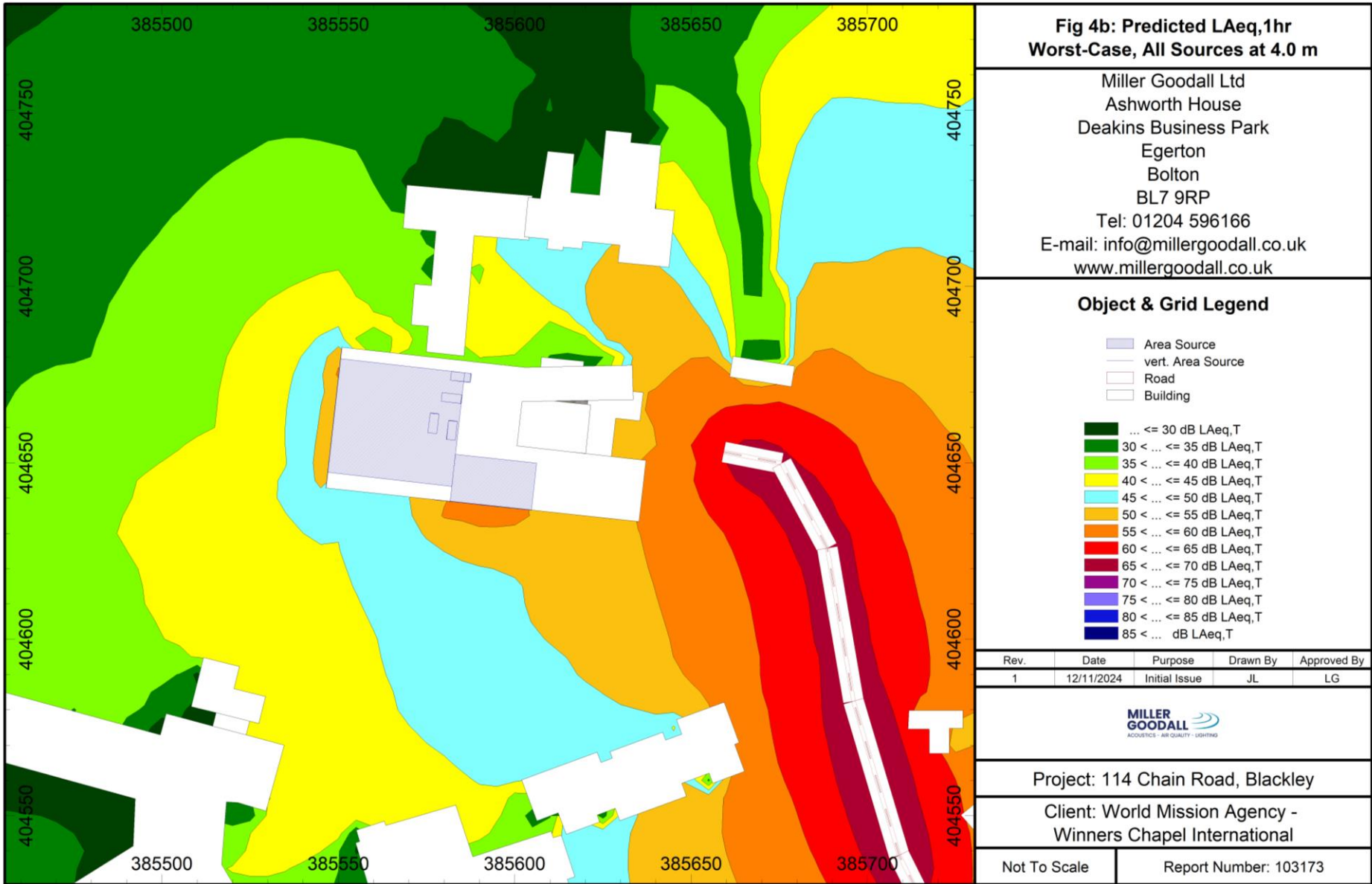
- 12.7.7 Representative background noise levels have been assessed using the statistical method laid out in The Little Red Book of Acoustics, fourth edition. This method involves making a count of background noise levels (in appropriate BS 4142 assessment periods i.e. 1-hour daytime or 15-minute night-time) and start with the noise level occurring most frequently. If two or more noise levels occur equally frequently, only the lowest level is considered as a “candidate” for representative background noise.
- 12.7.8 If more than 45 % of the recorded background noise levels were lower than this “candidate” level, it is discarded and the next most frequently occurring level which is lower than the previous level is the new “candidate”. This process is repeated until no more than 45 % of data is below the “candidate” level (≤ 45 %). The first level to pass this test is considered to be the representative background noise level.

Appendix 3: Monitoring Positions



Appendix 4: Noise Grid Maps







Glossary of Terms

Decibel (dB) The unit used to quantify sound pressure levels; it is derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 μPa , the threshold of normal hearing is in the region of 0 dB, and 140 dB is the threshold of pain. A change of 1 dB is usually only perceptible under controlled conditions.

dB L_A Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB L_A broadly agree with an individual's assessment of loudness. A change of 3 dB L_A is the minimum perceptible under normal conditions, and a change of 10 dB L_A corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB L_A ; normal conversation about 60 dB L_A at 1 meter; heavy road traffic about 80 dB L_A at 10 meters; the level near a pneumatic drill about 100 dB L_A .

$L_{A90,T}$ The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014+A1:2019 it is used to define background noise level.

$L_{Aeq,T}$ The equivalent continuous sound level. The sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

R_w Single number rating used to describe the sound insulation of building elements and is defined in BS EN ISO 10140-2: 2010 (formerly BSEN ISO 140-3:1995). It is derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.

$D_{ne,w}$ The weighted element-normalized level difference is a single figure rating used to describe the sound insulation of small elements within a larger construction and is defined in BS EN ISO 10140-2:2010 (BSEN ISO 140-10:1991). It is most often used to rate the sound insulation performance of ventilator units e.g. trickle vents.

C_{tr} A single-number spectrum adaptation term used to characterise the sound insulation rating with respect to urban traffic. It is defined in ISO 717-1:20-13.

