



NOISE IMPACT ASSESSMENT

on behalf of

Rochdale Borough Council

for

**Redwood Special Educational
Needs Hub, Land off Heywood Old
Road, Middleton**

Report Number NA103428

Date of Report 9 July 2026

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Summary

A noise assessment has been undertaken to predict the potential impact of noise on a proposed residential development at Redwood Special School on Land off Heywood Old Road, Middleton. It accompanies a planning application for the new Redwood Special Educational Needs Hub, Land off Heywood Old Road, Middleton.

An environmental sound survey has been undertaken to establish the existing sound climate at the site over six consecutive days (including a weekend) enabling the noise climate to be quantified during a typical school day (for noise ingress) and during the night-time (plant noise emissions).

A baseline computer noise model of the proposed development and surrounding site has been assembled based on the proposed site layout.

The likely noise levels at the building façades and existing Noise Sensitive Receptors (NSRs) have been predicted using CadnaA and are presented within this report. Based on the results of the computer modelling and the proposed site layout, mitigation has been proposed in terms of glazing and ventilation specifications, and barriers around the plant area.

The assessment concludes that, provided appropriate mitigation is undertaken as recommended, the impact of noise on and from the proposed development is likely to be low. There is no reason, therefore, for this development to be refused planning permission based on the likely noise impact.

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1	27 April 2026	JL	LWT	First Issue
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Advisory Note

The suitability of any recommended noise mitigation measures within this report should be approved by the relevant architects, structural engineers, building contractors, fire consultants and material manufacturers constituting the wider design team, prior to procurement and field application. This should ensure that when the recommended noise control measures are implemented on site, they will satisfy the requirements of all disciplines and not cause any health and safety issues.

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1 Introduction

- 1.1 Miller Goodall Ltd has undertaken a noise assessment to accompany a planning application for the proposed new Redwood Special Educational Needs Hub, Land off Heywood Old Road, Middleton. The report assesses the potential impact of environmental noise on the proposed development, as well as noise impact of the development on other nearby noise sensitive receptors, and provides details of mitigation measures required to achieve appropriate internal and external criteria at both the new school, the existing school and at residential properties adjacent to the site.

2 Policy, Standards and Guidance

- 2.1 The following planning policy and acoustics standards and guidance have been considered in this assessment:
- Noise Policy Statement for England (NPSE)
 - National Planning Policy Framework (NPPF)
 - Building Bulletin 93: *Acoustic design of schools: performance standards, February 2015* (BB93)
 - BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS 4142)
- 2.2 Further detail of the scope and extent of this guidance is provided in **Appendix A: Policy, Standards and Guidance**.

3 Site Description

- 3.1 The site location is shown in **Appendix B: Site and Monitoring Location**. It is in a sub-urban location at the north western edge of Middleton, with residences to the north west and the east, the existing Edgar Wood Academy to the south west and Langley Lane running across the northern boundary of the site.
- 3.2 Adjacent to the site at the north, is the Silver Birch Stables, with the Birch Pet Hotel on the opposite (northern) side of Langley Lane, beyond which is rural farmland.
- 3.3 Running south-west to north-east, approximately 600 m from the site is the M62, with Birch Services roughly 500 m from the site.

- 3.4 The primary noise source(s) in the area are the M62, with some noise from local roads such as Langley Lane and Heywood Old Road, plus some intermittent noise from the Edgar Wood Academy when children are outside.

4 Proposed Development

- 4.1 The development comprises a single-storey educational building with associated MUGA, nature trail, and 76 total parking spaces for minibuses, disabled parking and regular parking.
- 4.2 Externally, a mechanical services plant area is proposed which will house Air Source Heat Pumps (ASHPs) and a water sprinkler tank. The ASHPs will work with the proposed internal Hybrid Ventilation Units (HVUs) and Mechanical Ventilation with Heat Recovery (MVHR) units to ventilate the building.
- 4.3 The proposed layout is presented in **Appendix C: Site Layout**.

5 Assessment Methodology

- 5.1 An assessment of the impact of environmental noise on the proposed development, and operational noise from the development, has been undertaken to compare the noise with recognised criteria contained within relevant guidance described in **Section 2, Policy, Standards and Guidance**.
- 5.2 An environmental sound survey has been undertaken to quantify the existing levels of sound at the site and to enable a noise model of the site to be created and calibrated. This model has been used to predict noise levels across the site and at the school façade to enable potential mitigation measures to be considered to ensure internal noise criteria are achieved.
- 5.3 Additionally, vehicle traffic, plant noise and noise from the use of the MUGA and nature trail associated with the school have been considered to predict the potential impact of these sources on the pre-existing school and residences.

6 Environmental Sound Survey

6.1 Measurements Procedure

6.1.1 Unattended environmental sound monitoring was undertaken at two positions around the site between approximately 13:15 on Wednesday, 18th March and 14:45 on Tuesday, 24th March 2026. These monitoring positions are considered representative of the existing environmental sound climate at the site and of the nearby noise sensitive receptors.

6.1.2 The two unattended monitoring positions, MP1 and MP2, are indicated in the figure presented in **Appendix C: Site Layout**. Measurement positions were as described in **Table 1**.

Table 1: Noise monitoring locations

Monitoring Location	Location Description
MP1	The microphone was mounted on a tripod. It was positioned in the free-field approximately 1.5 m above local ground level, and 58 m from Langley Lane.
MP2	The microphone was mounted on a tripod. It was positioned in the free-field approximately 1.5 m above local ground level, and 165 m from Heywood old Road.

6.1.3 Measurements were undertaken in accordance with BS 7445-1: 2003¹. Details of the equipment used are set out in **Table 2**.

Table 2: Noise monitoring equipment

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1 ^{[4],[5]} Integrating Real Time 1/3 Octave Sound Analyser	XL2-TA	NTi Audio	A2A-11111-E0	29/10/2025	07414/1
Microphone	MA220	NTi Audio	6908	29/10/2025	07414/1
Pre-amplifier	MC230A	NTi Audio	A14423	29/10/2025	07414/1
Class 1 Field Calibrator	CAL 200	Larson Davies	14154	02/09/2025	07390/1
Outdoor Microphone Housing	WP30	NTi Audio	N/A	N/A	N/A

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

Equipment Description	Type Number	Manufacturer	Serial No.	Date Calibrated	Calibration Certification Number
Class 1 ^{[4],[5]} Integrating Real Time 1/3 Octave Sound Analyser	XL2-TA	NTi Audio	A2A-15860-E0	12/03/2025	07095/2
Microphone	MA220	NTi Audio	8102	12/03/2025	07095/2
Pre-amplifier	MC230A	NTi Audio	A16445	12/03/2025	07095/2
Class 1 Field Calibrator	NOR 1251	Norsonic	32798	06/03/2025	07095/1
Outdoor Microphone Housing	WP30	NTi Audio	N/A	N/A	N/A

6.1.4 The calibration of the sound level meter was checked before and after the measurements, with negligible deviation (≤ 0.1 dB) recorded.

6.1.5 Each measurement period consisted of sequential 100 ms samples. The data has been extracted using NTi Data Explorer software and analysed using an in-house Excel processing sheet to analytically determine representative L_{Aeq} , L_{A90} and $L_{AF,max}$ sound levels. The 100 ms sound levels have not been presented in this report but are kept on file for future reference.

6.2 Environmental Sound Climate

6.2.1 During the installation of the equipment at MPI, the residual sound climate was observed to consist of distant road traffic noise, and birdsong. During the collection of the equipment at MPI, the residual sound climate was observed to be similar, with the addition of some construction noise from an adjacent site to the west.

6.3 Weather Conditions

6.3.1 Weather conditions were observed when the equipment was installed and collected. A summary of the conditions at the beginning and end of the surveys are provided in **Table 3**.

Table 3: Dates, times and weather conditions during noise measurements

Measurement Locations	Date, Time	Weather conditions		
		Description	At Start of Survey	On Completion
MP1 and MP2	2026/03/18, 13:15 to 2026/04/24, 15:00	Temperature:	10 °C	8°C
		Precipitation:	No	No
		Cloud cover (oktas – see opposite):	7	5
		Any fog/snow/ice?	No	No
		Any damp roads/wet ground?	No	No
		Wind speed:	None	3-4 m/s
		Wind direction:	N/A	W
		Any conditions that may cause temp. inversion (e.g. calm nights with no cloud):	No	No

Cloud Cover	
Symbol	Scale in oktas (eighths)
	0 Sky completely clear
	1
	2
	3
	4 Sky half cloudy
	5
	6
	7
	8 Sky completely cloudy
	(9) Sky obstructed from view

6.3.2 With respect to the unattended survey, weather forecasts provided by the Met Office ([Weather and climate change - Met Office](#)) and WUnderground ([Local Weather Forecast, News and Conditions | Weather Underground](#)) were reviewed before attending the site to confirm the weather forecast was appropriate for noise monitoring (i.e. dry, windspeed ≤ 5 m/s and no extreme temperatures) over the proposed monitoring period.

6.3.3 Weather forecasts were then checked during the survey period to ensure that any changes in the forecast, in particular inclement weather, could be noted and recorded. No significant inclement weather was noted in the forecast during any part of the survey period.

6.3.4 Therefore, no data has been excluded from the monitoring data.

7 Monitoring Results

7.1 A time history graph for the full unattended monitoring period at MP1, plotted in 15-minute time intervals, is presented in **Appendix D: Environmental Sound Survey Results**. All data are presented as sound pressure levels in dB re 20 µPa.

7.2 A summary of the broadband measurement data for the unattended monitoring at MPI is provided in **Table 4**, with 15-minute data throughout the survey also presented in **Appendix D: Environmental Sound Survey Results**. Time history graphs for MPI and MP2 are also provided in the appendix, with 15-minute data for MPI and 30 minute data shown for MP2.

Table 4: Summary of unattended environmental sound monitoring results at MPI

Date	Day	Period	Start Time hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}^{*1}$ dB	Overall $L_{AF,max}^{*2}$ dB	$L_{A90,T}^{*3}$ dB
18/03/2026	Wednesday	Daytime	13:15	04:45	52	79	46
18/03/2026	Wednesday	Evening	18:00	05:00	55	72	52
18/03/2026 to 19/03/2026	Wednesday to Thursday	Night-time	23:00	08:00	55	80	46
19/03/2026	Thursday	Daytime	07:00	11:00	56	85	51
19/03/2026	Thursday	Evening	18:00	05:00	54	76	50
19/03/2026 to 20/03/2026	Thursday to Friday	Night-time	23:00	16:30	53	80	48
Overall Daytime Levels					54	85	49
Overall Evening Levels					54	76	52
Overall Night-time Levels					54	80	48

*1. The values presented for the $L_{Aeq,T}$ are the log average of the $L_{Aeq,15min}$ values recorded within the corresponding period, of length T.

*2. The values presented for the $L_{AF,max}$ are the highest $L_{AF,max,15min}$ values recorded within the period.

*3. The values presented for the $L_{A90,T}$ have been calculated using the LRB Method from the Little Red Book of Acoustics², from the $L_{A90,15min}$ values recorded within the corresponding period, of length T. The value presented is the most commonly occurring $L_{A90, 15min}$ value during the period, for which no less than 45% of the total histogram data occurs below.

7.3 A summary of the broadband measurement data for the unattended monitoring at MP2 is presented in **Table 5**.

² The Little Red Book of Acoustics: A Practical Guide, Fourth Edition (2024) published by Blue Tree Acoustics

Table 5: Summary of unattended environmental sound monitoring results at MP2

Date	Day	Period	Start Time hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}^{*1}$ dB	Overall $L_{AF,max}^{*2}$ dB	$L_{A90,T}^{*3}$ dB
18/03/2026	Wednesday	Daytime	13:45	04:15	49	77	42
18/03/2026	Wednesday	Evening	18:00	05:00	52	69	44
18/03/2026 to 19/03/2026	Wednesday to Thursday	Night-time	23:00	08:00	53	66	46
19/03/2026	Thursday	Daytime	07:00	11:00	55	82	49
19/03/2026	Thursday	Evening	18:00	05:00	52	69	50
19/03/2026 to 20/03/2026	Thursday to Friday	Night-time	23:00	08:00	51	75	48
20/03/2026	Friday	Daytime	07:00	11:00	53	82	43
20/03/2026	Friday	Evening	18:00	05:00	54	66	51
20/03/2026 to 21/03/2026	Friday to Saturday	Night-time	23:00	08:00	54	73	51
21/03/2026	Saturday	Daytime	07:00	11:00	53	79	43
21/03/2026	Saturday	Evening	18:00	05:00	53	70	51
21/03/2026 to 22/03/2026	Saturday to Sunday	Night-time	23:00	08:00	53	67	51
22/03/2026	Sunday	Daytime	07:00	11:00	54	73	44
22/03/2026	Sunday	Evening	18:00	05:00	55	80	54
22/03/2026 to 23/03/2026	Sunday to Monday	Night-time	23:00	08:00	52	69	43
23/03/2026	Monday	Daytime	07:00	11:00	57	86	51

Date	Day	Period	Start Time hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}^{*1}$ dB	Overall $L_{AF,max}^{*2}$ dB	$L_{A90,T}^{*3}$ dB
23/03/2026	Monday	Evening	18:00	05:00	52	65	51
23/03/2026 to 24/03/2026	Monday to Tuesday	Night-time	23:00	08:00	52	70	43
24/03/2026	Tuesday	Daytime	07:00	08:00	59	90	55
Overall Daytime Levels					55	90	43
Overall Evening Levels					53	80	51
Overall Night-time Levels					53	75	48

*1. The values presented for the $L_{Aeq,T}$ are the log average of the $L_{Aeq,15min}$ values recorded within the corresponding period, of length T.

*2. The values presented for the $L_{AF,max}$ are the highest $L_{AF,max,15min}$ values recorded within the period.

*3. The values presented for the $L_{A90,T}$ have been calculated using the LRB Method from the Little Red Book of Acoustics³, from the $L_{A90,15min}$ values recorded within the corresponding period, of length T. The value presented is the most commonly occurring $L_{A90,15min}$ value during the period, for which no less than 45% of the total histogram data occurs below.

8 Noise Modelling Methodology

- 8.1 A baseline noise model of noise affecting the proposed development as depicted in the Site Layout (Rev. E) has been assembled using CadnaA noise modelling software.
- 8.2 The general horizontal plan information of the area surrounding and including the proposed development site was imported from Google Earth. This was used to determine road positions, building footprint areas and relative locations and is considered accurate to within 5%.
- 8.3 Topography was imported from the DEFRA LIDAR dataset, and existing building height information was input based on site observations.

³ The Little Red Book of Acoustics: A Practical Guide, Fourth Edition (2024) published by Blue Tree Acoustics

8.4 The following parameters were assigned to the model:

- Propagation of noise using algorithms within ISO 9613:2024 *Acoustics – Attenuation of sound during propagation outdoors*.
- Default ground absorption $G = 0.8$. Representing soft ground across the site.
- No adverse meteorological effects.
- Roads were modelled as CRTN road sources and calibrated using spectral data measured during the survey.
- Three orders of reflection.
- Buildings are reflecting with smooth non-structured facades.
- Noise from children modelled as area sources at 1.2 m above ground level

8.5 Details of the proposed site layout have been obtained from drawings, CAD files and data sheets provided by the client.

8.6 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} and L_{Fmax} noise levels. The modelled results agreed with the measured results to within ± 1 dB L_{Aeq} and ± 1 dB $L_{AF,max}$.

8.7 Five scenarios have been modelled using the plans provided:

- Noise levels affecting the undeveloped site at 1.5 m;
- Noise levels from the site affecting existing and proposed receptors during daytime $L_{Aeq,16hr}$ at 1.5 m;
- Noise levels from the site affecting existing and proposed receptors during daytime $L_{Aeq,16hr}$ at 4.0 m;
- Noise levels from the site affecting existing receptors during night-time $L_{Aeq,16hr}$ at 1.5 m; and
- Noise levels from the site affecting existing receptors during night-time $L_{Aeq,16hr}$ at 4.0 m.

8.8 Noise contour plots have been generated for each of the four scenarios to ensure a worst-case scenario has been assessed.

9 Noise Model Predictions

9.1 Noise Ingress

Façades

- 9.1.1 Screenshots from the CadnaA model are provided in **Appendix E: Noise Model Outputs**. They indicate that across the undeveloped site, daytime $L_{Aeq,16h}$ noise levels at the façades of the proposed school are around 55 dB.
- 9.1.2 These noise levels will require windows to be kept closed, and alternative means of ventilation provided. This is proposed in the form of HVUs and MVHRs, working in concert with ASHPs.
- 9.1.3 The highest noise levels predicted at any noise sensitive façade are at the southern façade of Classroom 8 facing the MUGA. While it is unknown if students will be using the space at the same time as students using the MUGA, it has been assumed for the purposes of assessment that this worst case scenario could occur.
- 9.1.4 Standard twin-leaf masonry construction has been assumed for the purposes of the noise ingress assessment, with negligible contributions to the internal noise levels via the roof compared with the façade. Dimensions have been measured directly from drawings provided by *Equilibrium Architects Ltd*.

Assessment Details

- 9.1.5 Calculations have been undertaken to assess the minimum performance required from potential glazing and ventilation elements of the school to meet the required internal criteria. These noise ingress calculations were undertaken based on the methodology in BS EN 12354-3⁴.
- 9.1.6 The assessment has been based on the following assumptions about the single worst-affected classroom:
- Assessed within Classroom 8 with an internal volume of 131 m³;
 - 54 m² floor area;

⁴ 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

- 8.2 m² glazed area on southern façade;
- 2.4 m floor to ceiling height;
- Reverberation time of 0.4 s (T_{mf}) – SEN classroom criteria;
- Typical twin-leaf masonry façade.

9.1.7 The predicted sound reduction of a typical masonry wall construction (112 mm brickwork, 50 mm cavity with rigid wall ties, 112 mm brickwork) is shown in **Table 6**, and has been used in the assessment.

Table 6: Sound Reduction Index of Wall

Assessed Sound Reduction Index, R_w (dB) at Octave Band Centre Frequency (Hz)								$R_w (+ C_{tr})$, dB
63	125	250	500	1k	2k	4k	8k	
35	37	42	52	60	63	68	68	54 (- 6)

9.1.8 For the purposes of assessment, noise levels have been predicted at 1 m from the southern façade where the noise levels are highest, assuming children are outdoors using the MUGA and woodland area simultaneously. The predicted noise levels at this façade are shown in **Table 7**.

Table 7: Worst case predicted facade noise level

Incident Sound Level, L_{eq} (dB) at Octave Band Centre Frequency (Hz)								L_{Aeq} , dB
63	125	250	500	1k	2k	4k	8k	
43	44	47	54	57	54	50	45	61

Results and Mitigation

9.1.9 Based on the assumptions laid out in the previous sections, the classrooms and concentrated teaching spaces, i.e. not dining rooms, staff rooms, sports rooms or other ancillary spaces, will require mitigation to achieve internal criteria as specified in BB93. A summary of the outcome of the noise ingress calculations is provided in **Table 8**.

Table 8: Predicted internal noise levels

Description	External Noise Levels		BB93 Criteria		Predicted Internal Noise Levels		Exceedance of Criteria		Proposed Glazing and Ventilation
	dB $L_{Aeq,T}$	dB $L_{AF,max}$	dB $L_{Aeq,T}$	dB $L_{AF,max}$	dB $L_{Aeq,T}$	dB $L_{AF,max}$	dB $L_{Aeq,T}$	dB $L_{AF,max}$	
Education Rooms (Classrooms)	61	N/A	30	N/A	30	N/A	0	N/A	Specification Type 1

9.1.10 The sound reduction performance required of the non-masonry elements of the façade are provided in **Table 9**.

Table 9: Sound Reduction Index of non-masonry façade elements

Element	Required Sound Reduction Index, R_w / D_{ne} (dB)								$R_w / D_{ne,w}$ (+ C_{tr}), dB
	at Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Glazing	22	28	23	32	38	42	44	44	35 (− 4)
Vent	29	33	32	29	28	30	34	40	30 (− 1)

9.1.11 It is important to note that the vent performance is indicative only at this stage, as façade mounted mechanical vent selections are considered. Once selected, their performance should be assessed to confirm compliance. This may also impact the glazing performance, and both will depend on the façade performance if that should change. The indicative glazing configuration used in this assessment comprises 10 mm float glass pane / 12 mm air gap / 4 mm float glass pane. Alternative configurations may be used provided the performance is achieved in each octave band as a minimum, following a detailed assessment of the site which should be undertaken as the design process progresses.

10 Noise Emissions

10.1 General

10.1.1 The site will generate potentially significant noise emissions in three different ways: traffic noise associated with collection / drop off at the school, noise from activity in the external areas of the school site, and mechanical services plant. Each of these sources have been considered both independently and in combination to ensure a minimum of disturbance at the nearby NSRs.

10.2 Traffic Noise

Emissions

- 10.2.1 We have been advised that there will be approximately 220 vehicle movements at the site daily. This has been modelled in CadnaA as a road source 6 m wide, and assuming a 30 kph speed limit. Vehicles are modelled from Heywood Old Road (A6045) travelling into the site and looping around the traffic island. We would expect 220 vehicles daily to make a negligible change to overall traffic flows on Heywood Old Road, so this has not been modelled.
- 10.2.2 At the worst affected dwelling, due to the proposed school access, the noise level is predicted to be 39 dB at first floor level. This is significantly below the noise contribution at the receptor from the M62 to the north-west which is 50 dB. Consequently, the access road is unlikely to have any significant impact on noise levels at any NSR, and no further mitigation need be considered for this source.

Mitigation Measures

- 10.2.3 The worst affected façades due to road traffic noise associated with the development have a pre-development daytime noise level of 50 dB $L_{Aeq,16hr}$, which will increase to 51 dB $L_{Aeq,16hr}$ on school days. This difference in level is unlikely to be noticeable. Consequently, this source is unlikely to have any adverse impact at any nearby noise sensitive receptor and would require no further mitigation.

10.3 Activities Noise

Emissions

- 10.3.1 Noise from children has been modelled based on AAAC⁵ *Guideline for Child Care Centre Acoustic Assessment, Version 3.0*. This document provides effective sound power levels for groups of children, and a method for adjusting the level based on the number of children.

⁵ Association of Australasian Acoustical Consultants

Table 10: AAAC – Effective Sound Power Levels ($L_{Aeq,15min}$) for Groups of 10 Children Playing

Element	Required Sound Reduction Index, R_w / D_{ne} (dB)								dB(A)
	at Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
10 Children – 0 to 2 years	54	60	66	72	74	71	67	64	78
10 Children – 2 to 3 years	61	67	73	79	81	78	74	70	85
10 Children – 3 to 5 years	64	70	75	81	83	80	76	72	87

10.3.2 Based on these sound power levels, for which the World Health Organization (WHO) recommends a source height of 1.0 m, the document goes on to give an equation for adjusting noise levels for different numbers of children.

$$\begin{array}{ccc} \text{Effective Sound Power Level} & = & \text{Effective Sound Power Level for} \\ \text{for 'n' children} & & 10 \text{ children} + 10 \log(n/10) \end{array}$$

10.3.3 It is noted that the levels of noise and the spectra for *"boys and girls are assumed to be very similar and therefore are not differentiated in this [AAAC document] guideline."* As the school is proposed to provide 60 educational teaching spaces, the single figure correction is + 8 dB, which has been applied to the spectrum for the 3 to 5 year olds as this is the loudest spectrum to ensure a conservative assessment.

Mitigation Measures

10.3.4 The MUGA and nature trails associated with the school are located to the south and east of the proposed school so will have a proportionally greater impact at receptors further from the access road. Noise is assessed at the existing school to the south and residences to the east.

10.3.5 At the worst-affected education façade to the south, daytime noise levels are 55 dB both with and without the proposed school. Consequently, the proposed school is predicted to have no adverse impact on the existing education buildings to the south west.

10.3.6 At the dwellings to the east, the worst affected façades experience pre-development noise levels of 54 dB L_{Aeq} and 55 dB with the development. This is a change of 1 dB following the construction of the school which is unlikely to be detectable. Activities noise is therefore predicted to also have no adverse impact on the existing dwellings close to the site.

10.4 Plant Noise

Emissions

10.4.1 We understand that the building is to be mechanically ventilated, with external three ASHPs and one condenser unit contained in a plant area to the north east of the building. The plant is expected to operate 24/7, so has been assessed during the night-time period to ensure a worst-case assessment. The plant area is understood to be surrounded by a 1.8 m barrier, which has been included in the model as a close-boarded timber fence.

10.4.2 Single figure sound power levels have been provided for the proposed mechanical services, which have been modelled using a flat A-weighted spectrum equivalent to the single figure for each item. This represents a typical worst-case for such sources, and is shown in **Table 11**.

Table 11: Plant noise used in assessment

Source	Sound Power Level (dB)								dB(A) ¹
	at Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
ASHP	84.7	74.6	67.1	61.7	58.5	57.3	57.5	59.6	67.5
Condenser	73.2	63.1	55.6	50.2	47.0	45.8	46.0	48.1	56

¹ Single figure levels provided by client, equivalent A-weighted spectra determined to match these values.

Mitigation Measures

10.4.3 We understand that the plant area is proposed to have a 1.8 m barrier surrounding it. This has been modelled as a wire-mesh fence providing zero acoustic attenuation (i.e. worst-case scenario). The BS 4142 assessment of noise impact at the most affected NSR during the night-time period is presented in **Table 12**.

Table 12: BS 4142:2014 numerical night-time assessment at worst affected NSR

Parameter	Results	Commentary
Predicted Residual Sound Level	$L_{Aeq,15min} = 56 \text{ dB}$	Typical $L_{Aeq,15min}$ sound level measured during night-time periods.
Measured Background Sound Level	$L_{A90,15min} = 48 \text{ dB}$	Representative background sound level during night-time periods.
Modelled Specific Noise Level	$L_{Aeq,15min} = 30 \text{ dB}$	Modelled noise level at NSR1.
Acoustic Feature Correction	0 dB	No tonality is predicted at the receptors, no intermittency, impulsivity or other characteristics expected as the equipment is new.
Rating Level	$L_{Ar,15min} = 30 \text{ dB}$	Sum of Modelled Specific Noise Level and Acoustic Feature Correction
Excess of Rating Level over Background Sound Level	- 18 dB	The rating level is 18 dB lower than the background sound level.
Outcome	Indication of no adverse impact, depending on the context	While the sources are new in nature, they are significantly below the background sound level, and below the internal criterion. Unlikely to be audible.
Uncertainty of the assessment		There is uncertainty in determining the levels at the receptors as measurements were undertaken at representative positions. However, levels are unlikely to be significantly different.

10.5 It can be seen from **Table 12** that the outcome of the initial numerical BS 4142 assessment indicates no adverse impact at the most affected NSR during night-time period.

10.5.1 A figure showing the predicted noise levels across the open site, including nearby receptors, and following development are shown in **Appendix E: Noise Model Outputs**. The figure shows the predicted noise levels across the site and at receiver locations, as well as corresponding noise contours for the proposed development with mitigation included.

11 Summary and Conclusion

- 11.1 A noise assessment has been undertaken to predict the potential impact of environmental noise on, and noise from a proposed educational development at Redwood Special School on Land off Heywood Old Road, Middleton.
- 11.2 An environmental sound survey to establish the existing sound climate at the site has been undertaken. A computer noise model of the proposed development and surrounding site has been assembled, based on the proposed site layout, and calibrated using sound levels recorded.
- 11.3 Based on the results of the computer noise modelling, indicative façade mitigation has been devised to control noise ingress into the building. Noise mitigation for the building should be considered as the design progresses and mechanical services selections are made to ensure internal criteria are achieved. No specific mitigation is required for the control of noise emissions from any of the sources associated with the development or use of the site.
- 11.4 Based on the assessments undertaken and provided, the recommended acoustic design and any associated mitigation measures are implemented, the assessment concludes that the impact of noise both on, and from, the proposed development is likely to be low. As such, there is no reason to refuse planning permission on the basis of noise effects.

APPENDICES

Appendix A: Policy, Standards and Guidance

1 Noise Policy Statement for England

1.1 The Noise Policy Statement for England (NPSE⁶) sets out the long-term vision of 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.”*

1.2 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.

1.3 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). 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”.

1.4 Importantly, the NPSE goes on to state:

“This does not mean that such adverse effects cannot occur”.

⁶Noise Policy Statement for England, Defra, March 2010

- 1.5 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:

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

- 1.6 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.

2 National Planning Policy Framework

- 2.1 The National Planning Policy Framework (NPPF⁷) was updated most recently in February 2025. The 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.”

- 2.2 At par. 187 NPPF advises 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...”

⁷ National Planning Policy Framework, Ministry of Housing, Communities and Local Government, December 2023

2.3 Par. 198 goes on to state:

“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; ...”

2.4 Par. 200 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.”

3 Department for Education: Acoustic Design of schools: performance standards – Building Bulletin 93, February 2015 (BB93)

Requirement E4 of Approved Document E of the Building Regulations states:

“Each room or other space in a school building shall be designed and constructed in such a way that it has the acoustic conditions and the insulation against disturbance by noise appropriate to its intended use.”

Section 8 of ADE goes on to state that:

"In the Secretary of State's view the normal way of satisfying Requirement E4 will be to meet the values for sound insulation, reverberation time and internal ambient noise which are given in Building Bulletin 93 Acoustic design of schools: performance standards."

Building Bulletin 93 (BB93) presents requirements for internal noise levels, sound insulation between adjacent teaching spaces, and reverberation times within teaching spaces. In addition to this, it provides guidance regarding ancillary spaces which are not included within the Part E remit.

BB93 applies to teaching and non-teaching spaces in temporary, new-build, conversion and refurbished buildings and is applicable directly to school buildings. Higher education buildings e.g. 6th Form Colleges and Universities are not explicitly covered under BB93 but are usually assessed against BB93 as the most relevant standard. BB93 provides the following tables in relation to the assessment of educational spaces.

Table 1 [of BB93]: noise activity and sensitivity levels and upper limits for indoor ambient noise level

Type of room	Room classification for the purpose of airborne sound insulation in Tables 3a and 3b		Upper limit for the indoor ambient noise level <i>L</i> _{Aeq,30mins} dB	
	Activity noise (source room)	Noise tolerance (receiving room)	New build	Refurbishment
Nursery school rooms				
Primary school: classroom, class base, general teaching area, small group room	Average	Medium	35	40
Secondary school: classroom, general teaching area, seminar room, tutorial room, language laboratory				
Open plan: (See also section 1.8 [of BB93])				
Teaching area	Average	Medium	40	45
Resource/breakout area				
Primary music room	High	Medium	35	40

Type of room	Room classification for the purpose of airborne sound insulation in Tables 3a and 3b		Upper limit for the indoor ambient noise level <i>L</i> _{Aeq,30mins} dB	
	Activity noise (source room)	Noise tolerance (receiving room)	New build	Refurbishment
Secondary music classroom ¹				
Small and large practice/group room ¹	Very high	Low	35	40
Performance/recital room ¹				
Ensemble room ¹	Very high	Low	30	35
Recording studio ¹				
Control room – for recording ¹	High	Low	35	40
Control room – not for recording	Average	Medium		
Lecture room	Average	Medium	35	40
Teaching space intended specifically for students with special hearing and communication needs ²	Average	Low	30	35
SEN calming room	High	Low	35	35
Study room (individual study, withdrawal, remedial work, teacher preparation)	Low	Medium	40	45
<i>Libraries:</i>				
Quiet study area	Low	Medium	40	45
Resource area	Average	Medium	40	45
Science laboratory	Average	Medium	40	45
<i>Design and technology:</i>				
Resistant materials, CAD/CAM area	High	High	40	45
Electronics/control, textiles, food, graphics, design/resource area, ICT room, art	Average	Medium	40	45

Type of room	Room classification for the purpose of airborne sound insulation in Tables 3a and 3b		Upper limit for the indoor ambient noise level <i>L</i> _{Aeq,30mins} dB	
	Activity noise (source room)	Noise tolerance (receiving room)	New build	Refurbishment
Drama studio, assembly hall, multi-purpose hall (drama PE audio/visual presentations, assembly, occasional music)	High	Low	35	40
Atrium, circulation space not intended for teaching and learning	Average	Medium	45	50
Sports hall				
Dance studio	High	Medium	40	45
Gymnasium/Activity studio				
Swimming pool	High	High	50	55
Meeting room, Interviewing/counselling room, video conference room	Low	Medium	40	45
Dining room	High	High	45	50
<i>Administration and ancillary spaces:</i>				
Kitchen	High	High	50	55
Office, medical room, staff room	Low	Medium	40	45
Corridor, stairwell, coats and locker area	Average	High	45	55
Changing area	High	High	50	55
Toiler	Average	High	50	55

Notes

¹ Music rooms – the levels of sound insulation between some rooms may not be sufficient for particularly noisy activities and timetabling/management will need to be considered. Wherever possible music accommodation should make use of buffer spaces such as stores to increase the levels of sound insulation between rooms and to isolate rooms where very noisy activities such as drum practice will take place. If timetabling/management or isolation is not possible the levels of

sound insulation should be increased. For further guidance on the design of music accommodation, see 'Music Accommodation in Secondary Schools: a Design Guide', DfE, NBS/RIBA⁸, 2010 and 'Acoustics of Schools: a design guide'⁹

² APSs (Alternative Performance Standards) are commonly required for these rooms and should be agreed by an acoustician and the school client body. See section 0.4 [of BB93].

Table 3a [of BB93]: new build performance standards for airborne sound insulation between spaces

Minimum $D_{nT,w}$ (dB)		Activity noise in source room (see Table 1 [of BB93])			
		Low	Average	High	Very high
Noise tolerance in receiving room (see Table 1 [of BB93])	High	Not applicable	35	45	50
	Medium	40	45	50	55
	Low	45	50	55	55

Table 3b [of BB93]: refurbishment performance standards for airborne sound insulation between spaces

Minimum $D_{nT,w}$ (dB)		Activity noise in source room (see Table 1 [of BB93])			
		Low	Average	High	Very high
Noise tolerance in receiving room (see Table 1 [of BB93])	High	Not applicable	30	35	45
	Medium	30	40	45	45
	Low	35	40	50	50

⁸ Music Accommodation in Secondary schools, a design guide', DfE, NBS/RIBA 2010

⁹ Acoustics of Schools: a design guide', published in 2015 by the Association of Noise Consultants and the Institute of Acoustics

Table 5 [of BB93]: performance standards for impact sound insulation of floors

Type of room (receiving room)	Maximum impact sound pressure level $L'_{nT,w}$ dB	
	New build	Refurbishment
Teaching space intended specifically for students with special hearing or communication needs (See Section 0.4 [of BB93])	55	60
<i>Music:</i>		
Secondary music room		
Small and large practice/group room		
Ensemble room	55	60
Performance/recital room		
Recording studio		
Control room – for recording		
Control room – not for recording		
Nursery school room		
<i>Primary school:</i>		
Classroom, music classroom, class base, general teaching area, small group room		
<i>Secondary school:</i>		
Classroom, general teaching area, seminar room, tutorial room, language laboratory		
Open plan teaching and resource area		
Library		
Lecture room		
Science laboratory		
Drama studio	60	65
Design and technology – resistant materials, CAD/CAM area, electronics/control, textiles, food, graphics, design/resource area, ICT room, Art room		
Assembly hall, multi-purpose hall (drama, PE, audio/visual presentations, assembly, occasional music)		
Sports hall		
Gymnasium/Activity Studio		
Dance studio		
Meeting room, interviewing/counselling room, video conference room		
SEN calming room		

Type of room (receiving room)	Maximum impact sound pressure level $L'_{nT,w}$ dB	
	New build	Refurbishment
Atrium, circulation not teaching and learning		
Swimming pool		
Dining room		
<i>Administration and ancillary spaces:</i>		
Kitchen	65	65
Office, staff room, medical room		
Corridor, stairwell		
Coats and locker area and changing area		
Toilet		

Table 6 [of BB93]: performance standards for reverberation time

Type of room	T_{mf} seconds	
	New build	Refurbishment
Nursery school room		
<i>Primary school:</i> classroom, class base, general teaching area, small group room, SEN calming room	≤ 0.6	≤ 0.8
<i>Secondary school:</i>		
Classroom, general teaching area, seminar room, tutorial room, language laboratory, Study room (individual study, withdrawal, remedial work, teacher preparation)	≤ 0.8	≤ 1.0
Science laboratory		
Design and technology: Resistant materials, CAD/CAM area, electronics/control, textiles, food, graphics, design/resource area, ICT room, art		
<i>Open plan:</i>		
Teaching area	≤ 0.5 (see section 1.8 [of BB93])	≤ 0.5 (see section 1.8 [of BB93])
Resource/Breakout area	≤ 1.2 (see section 1.8 [of BB93])	≤ 1.2 (see section 1.8 [of BB93])
<i>Music:</i>		
Primary music room	≤ 1.0	≤ 1.0
Secondary music classroom	≤ 1.0	≤ 1.0
Practice/group room, volume $\leq 30 \text{ m}^3$	≤ 0.6	≤ 0.8
Practice/group room, volume $> 30 \text{ m}^3$	≤ 0.8	≤ 1.0
Ensemble room, Live room	0.6 – 1.2 ¹	0.6 – 1.2 ¹
Performance/recital room	1.0 – 1.5	1.0 – 1.5

Type of room	<i>T_{mf}</i> seconds	
	New build	Refurbishment
Control room – for recording	≤ 0.5	≤ 0.6
Control room – not for recording	≤ 0.5	≤ 0.6
<i>Lecture rooms:</i>		
Small (fewer than 50 people)	≤ 0.8	≤ 1.0
Large (more than 50 people)	≤ 1.0	≤ 1.0
Teaching space intended specifically for students with special hearing or communication needs (See Section 0.4 [of BB93])	<i>T</i> ≤ 0.4 averaged from 125 Hz to 4 kHz octave band centre frequencies and <i>T</i> ≤ 0.6 s in every octave band in this range	≤ 0.4 ²
Library	≤ 1.0	≤ 1.2
Drama studio	≤ 1.0	≤ 1.0
Atrium, foyer, entrance hall, circulation space not used for teaching and learning	≤ 1.5	≤ 2.0
Assembly hall, multi-purpose hall (drama, PE, audio/visual presentation, assembly, occasional music)	0.8 – 1.2 ¹	0.8 – 1.5 ¹
Indoor sports hall, swimming pool	≤ (1.5 – 2.0) dependent on size of space. See section 1.6.2 [of BB93]	≤ 2.0
Gymnasium/activity studio	≤ 1.5	≤ 2.0
Dance studio	≤ 1.2	≤ 1.5
Meeting room, Interviewing/counselling room, video conference room	≤ 0.8	≤ 0.8
Dining room	≤ 1.0	≤ 1.5
<i>Administration and ancillary spaces</i>		
Kitchen	≤ 1.5	≤ 2.0
Office, medical room, staff room	≤ 1.0	≤ 1.2
Corridor, stairwell	See section 1.7 [of BB93]	See section 1.7 [of BB93]
Coats and locker area, changing area	≤ 1.5	≤ 2.0
Toiler	≤ 1.5	≤ 2.0

Notes

¹ Reverberation time should be within the indicated range, including the values given.

² APSs are commonly required for these rooms and should be agreed by an acoustician and the school client body. See section 0.4 [of BB93].

Table 7 [of BB93]: performance standards for sports halls T_{mf} as a function of floor area

Floor area	Maximum T_{mf} seconds
< 280 m ²	1.5
280 – 530 m ²	$2.0 - \frac{(530 - \text{floor area})}{500}$
> 530 m ²	2.0

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

- 4.1 BS 4142:2014+A1:2019¹⁰ provides guidance on the assessment of the likelihood of complaints relating to noise from industrial sources. 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).
- 4.2 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.
- 4.3 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,*

¹⁰ BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

- *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.*

4.4 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.

Appendix B: Site and Monitoring Location



Appendix C: Site Layout



Appendix D: Environmental Sound Survey Results

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
18/03/2026 13:15	00:15	48	63	46
18/03/2026 13:30	00:15	51	73	46
18/03/2026 13:45	00:15	53	69	48
18/03/2026 14:00	00:15	51	71	47
18/03/2026 14:15	00:15	50	65	46
18/03/2026 14:30	00:15	50	58	46
18/03/2026 14:45	00:15	53	74	47
18/03/2026 15:00	00:15	54	76	47
18/03/2026 15:15	00:15	52	67	47
18/03/2026 15:30	00:15	51	65	48
18/03/2026 15:45	00:15	53	71	48
18/03/2026 16:00	00:15	51	68	47
18/03/2026 16:15	00:15	50	63	46
18/03/2026 16:30	00:15	52	67	48
18/03/2026 16:45	00:15	54	66	49
18/03/2026 17:00	00:15	52	61	49
18/03/2026 17:15	00:15	56	79	49
18/03/2026 17:30	00:15	54	66	48
18/03/2026 17:45	00:15	54	72	48
18/03/2026 18:00	00:15	56	70	49
18/03/2026 18:15	00:15	53	71	50
18/03/2026 18:30	00:15	52	63	48
18/03/2026 18:45	00:15	53	72	47
18/03/2026 19:00	00:15	54	61	51
18/03/2026 19:15	00:15	56	67	54
18/03/2026 19:30	00:15	55	67	52
18/03/2026 19:45	00:15	56	65	53
18/03/2026 20:00	00:15	57	63	55
18/03/2026 20:15	00:15	56	61	54
18/03/2026 20:30	00:15	55	62	53

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
18/03/2026 20:45	00:15	54	63	52
18/03/2026 21:00	00:15	55	60	53
18/03/2026 21:15	00:15	55	68	53
18/03/2026 21:30	00:15	54	66	51
18/03/2026 21:45	00:15	52	59	49
18/03/2026 22:00	00:15	54	60	52
18/03/2026 22:15	00:15	55	69	52
18/03/2026 22:30	00:15	54	64	52
18/03/2026 22:45	00:15	54	61	52
18/03/2026 23:00	00:15	54	60	53
18/03/2026 23:15	00:15	54	62	53
18/03/2026 23:30	00:15	53	61	52
18/03/2026 23:45	00:15	54	62	52
19/03/2026 00:00	00:15	53	60	51
19/03/2026 00:15	00:15	53	64	51
19/03/2026 00:30	00:15	53	60	50
19/03/2026 00:45	00:15	52	58	49
19/03/2026 01:00	00:15	51	60	49
19/03/2026 01:15	00:15	50	57	48
19/03/2026 01:30	00:15	49	58	47
19/03/2026 01:45	00:15	49	56	46
19/03/2026 02:00	00:15	48	59	46
19/03/2026 02:15	00:15	49	61	47
19/03/2026 02:30	00:15	49	57	46
19/03/2026 02:45	00:15	49	55	46
19/03/2026 03:00	00:15	49	57	46
19/03/2026 03:15	00:15	50	61	47
19/03/2026 03:30	00:15	50	57	48
19/03/2026 03:45	00:15	50	57	48
19/03/2026 04:00	00:15	50	60	48
19/03/2026 04:15	00:15	50	57	48
19/03/2026 04:30	00:15	52	61	49

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 04:45	00:15	53	64	51
19/03/2026 05:00	00:15	55	62	52
19/03/2026 05:15	00:15	60	74	54
19/03/2026 05:30	00:15	58	69	56
19/03/2026 05:45	00:15	59	72	56
19/03/2026 06:00	00:15	58	64	57
19/03/2026 06:15	00:15	59	74	57
19/03/2026 06:30	00:15	59	80	57
19/03/2026 06:45	00:15	59	75	57
19/03/2026 07:00	00:15	60	74	56
19/03/2026 07:15	00:15	57	75	55
19/03/2026 07:30	00:15	61	74	55
19/03/2026 07:45	00:15	59	74	55
19/03/2026 08:00	00:15	57	68	55
19/03/2026 08:15	00:15	58	77	54
19/03/2026 08:30	00:15	58	73	54
19/03/2026 08:45	00:15	56	68	54
19/03/2026 09:00	00:15	56	73	53
19/03/2026 09:15	00:15	55	71	52
19/03/2026 09:30	00:15	56	71	52
19/03/2026 09:45	00:15	56	71	53
19/03/2026 10:00	00:15	56	76	52
19/03/2026 10:15	00:15	55	74	52
19/03/2026 10:30	00:15	54	68	51
19/03/2026 10:45	00:15	53	66	50
19/03/2026 11:00	00:15	58	79	51
19/03/2026 11:15	00:15	54	65	51
19/03/2026 11:30	00:15	54	67	51
19/03/2026 11:45	00:15	52	69	49
19/03/2026 12:00	00:15	54	68	49
19/03/2026 12:15	00:15	54	72	50
19/03/2026 12:30	00:15	52	65	49

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 12:45	00:15	55	75	50
19/03/2026 13:00	00:15	57	77	50
19/03/2026 13:15	00:15	53	61	50
19/03/2026 13:30	00:15	53	63	49
19/03/2026 13:45	00:15	55	69	50
19/03/2026 14:00	00:15	57	85	51
19/03/2026 14:15	00:15	54	64	52
19/03/2026 14:30	00:15	55	73	52
19/03/2026 14:45	00:15	54	66	51
19/03/2026 15:00	00:15	54	64	51
19/03/2026 15:15	00:15	54	66	50
19/03/2026 15:30	00:15	55	64	52
19/03/2026 15:45	00:15	55	67	52
19/03/2026 16:00	00:15	55	71	51
19/03/2026 16:15	00:15	55	69	51
19/03/2026 16:30	00:15	54	63	49
19/03/2026 16:45	00:15	54	64	49
19/03/2026 17:00	00:15	56	71	50
19/03/2026 17:15	00:15	54	67	51
19/03/2026 17:30	00:15	55	71	51
19/03/2026 17:45	00:15	56	73	52
19/03/2026 18:00	00:15	56	74	52
19/03/2026 18:15	00:15	56	66	53
19/03/2026 18:30	00:15	56	76	54
19/03/2026 18:45	00:15	55	63	53
19/03/2026 19:00	00:15	55	64	53
19/03/2026 19:15	00:15	55	61	53
19/03/2026 19:30	00:15	54	70	52
19/03/2026 19:45	00:15	54	63	52
19/03/2026 20:00	00:15	55	61	53
19/03/2026 20:15	00:15	55	65	53
19/03/2026 20:30	00:15	54	62	52

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 20:45	00:15	53	66	51
19/03/2026 21:00	00:15	53	61	51
19/03/2026 21:15	00:15	53	62	51
19/03/2026 21:30	00:15	54	60	51
19/03/2026 21:45	00:15	52	60	50
19/03/2026 22:00	00:15	53	62	49
19/03/2026 22:15	00:15	52	64	50
19/03/2026 22:30	00:15	52	60	50
19/03/2026 22:45	00:15	52	58	50
19/03/2026 23:00	00:15	53	63	50
19/03/2026 23:15	00:15	52	73	50
19/03/2026 23:30	00:15	52	60	50
19/03/2026 23:45	00:15	52	60	50
20/03/2026 00:00	00:15	51	62	49
20/03/2026 00:15	00:15	50	57	48
20/03/2026 00:30	00:15	51	60	48
20/03/2026 00:45	00:15	50	58	48
20/03/2026 01:00	00:15	51	69	48
20/03/2026 01:15	00:15	50	56	49
20/03/2026 01:30	00:15	50	57	48
20/03/2026 01:45	00:15	50	57	47
20/03/2026 02:00	00:15	50	56	47
20/03/2026 02:15	00:15	49	55	47
20/03/2026 02:30	00:15	50	58	47
20/03/2026 02:45	00:15	50	56	49
20/03/2026 03:00	00:15	50	59	48
20/03/2026 03:15	00:15	50	61	47
20/03/2026 03:30	00:15	50	57	48
20/03/2026 03:45	00:15	49	59	47
20/03/2026 04:00	00:15	51	58	49
20/03/2026 04:15	00:15	51	58	49
20/03/2026 04:30	00:15	52	59	50

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
20/03/2026 04:45	00:15	52	59	50
20/03/2026 05:00	00:15	53	62	51
20/03/2026 05:15	00:15	55	64	52
20/03/2026 05:30	00:15	61	80	53
20/03/2026 05:45	00:15	57	73	53
20/03/2026 06:00	00:15	58	72	54

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
18/03/2026 13:45	00:15	55	74	45
18/03/2026 14:00	00:15	49	68	44
18/03/2026 14:15	00:15	49	68	43
18/03/2026 14:30	00:15	48	66	42
18/03/2026 14:45	00:15	52	77	43
18/03/2026 15:00	00:15	46	59	43
18/03/2026 15:15	00:15	50	69	43
18/03/2026 15:30	00:15	52	70	44
18/03/2026 15:45	00:15	47	66	43
18/03/2026 16:00	00:15	44	62	41
18/03/2026 16:15	00:15	43	62	40
18/03/2026 16:30	00:15	44	59	41
18/03/2026 16:45	00:15	44	65	42
18/03/2026 17:00	00:15	44	58	42
18/03/2026 17:15	00:15	46	66	42
18/03/2026 17:30	00:15	46	61	42
18/03/2026 17:45	00:15	51	73	43
18/03/2026 18:00	00:15	46	57	44
18/03/2026 18:15	00:15	46	54	44
18/03/2026 18:30	00:15	49	69	44
18/03/2026 18:45	00:15	47	57	44
18/03/2026 19:00	00:15	51	59	45
18/03/2026 19:15	00:15	53	64	51
18/03/2026 19:30	00:15	53	59	51
18/03/2026 19:45	00:15	53	61	50
18/03/2026 20:00	00:15	55	60	54
18/03/2026 20:15	00:15	54	57	52
18/03/2026 20:30	00:15	53	59	51
18/03/2026 20:45	00:15	52	56	50
18/03/2026 21:00	00:15	53	57	52
18/03/2026 21:15	00:15	54	63	52
18/03/2026 21:30	00:15	52	58	50

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
18/03/2026 21:45	00:15	50	57	48
18/03/2026 22:00	00:15	52	56	51
18/03/2026 22:15	00:15	53	66	50
18/03/2026 22:30	00:15	52	63	51
18/03/2026 22:45	00:15	53	59	51
18/03/2026 23:00	00:15	53	58	52
18/03/2026 23:15	00:15	53	57	52
18/03/2026 23:30	00:15	52	56	51
18/03/2026 23:45	00:15	52	57	51
19/03/2026 00:00	00:15	51	56	49
19/03/2026 00:15	00:15	52	63	50
19/03/2026 00:30	00:15	52	58	49
19/03/2026 00:45	00:15	51	56	48
19/03/2026 01:00	00:15	50	56	48
19/03/2026 01:15	00:15	49	55	47
19/03/2026 01:30	00:15	49	55	46
19/03/2026 01:45	00:15	49	56	46
19/03/2026 02:00	00:15	48	53	45
19/03/2026 02:15	00:15	48	55	46
19/03/2026 02:30	00:15	48	56	45
19/03/2026 02:45	00:15	48	54	45
19/03/2026 03:00	00:15	48	55	46
19/03/2026 03:15	00:15	49	57	46
19/03/2026 03:30	00:15	50	55	47
19/03/2026 03:45	00:15	49	55	47
19/03/2026 04:00	00:15	49	53	47
19/03/2026 04:15	00:15	49	53	47
19/03/2026 04:30	00:15	51	55	49
19/03/2026 04:45	00:15	51	59	49
19/03/2026 05:00	00:15	53	57	51
19/03/2026 05:15	00:15	54	58	53
19/03/2026 05:30	00:15	56	61	54

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 05:45	00:15	57	66	55
19/03/2026 06:00	00:15	57	61	56
19/03/2026 06:15	00:15	57	64	56
19/03/2026 06:30	00:15	57	63	56
19/03/2026 06:45	00:15	58	60	57
19/03/2026 07:00	00:15	57	65	55
19/03/2026 07:15	00:15	55	58	54
19/03/2026 07:30	00:15	55	66	54
19/03/2026 07:45	00:15	55	66	53
19/03/2026 08:00	00:15	54	65	53
19/03/2026 08:15	00:15	54	72	53
19/03/2026 08:30	00:15	55	70	53
19/03/2026 08:45	00:15	54	62	52
19/03/2026 09:00	00:15	55	71	53
19/03/2026 09:15	00:15	53	64	51
19/03/2026 09:30	00:15	58	82	51
19/03/2026 09:45	00:15	59	79	53
19/03/2026 10:00	00:15	53	67	51
19/03/2026 10:15	00:15	53	63	51
19/03/2026 10:30	00:15	56	70	51
19/03/2026 10:45	00:15	58	77	52
19/03/2026 11:00	00:15	53	70	50
19/03/2026 11:15	00:15	54	68	50
19/03/2026 11:30	00:15	55	74	50
19/03/2026 11:45	00:15	59	74	51
19/03/2026 12:00	00:15	59	76	51
19/03/2026 12:15	00:15	51	65	48
19/03/2026 12:30	00:15	52	75	48
19/03/2026 12:45	00:15	58	76	50
19/03/2026 13:00	00:15	59	77	51
19/03/2026 13:15	00:15	52	79	49
19/03/2026 13:30	00:15	59	75	50

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 13:45	00:15	59	74	50
19/03/2026 14:00	00:15	54	76	49
19/03/2026 14:15	00:15	56	71	51
19/03/2026 14:30	00:15	59	78	51
19/03/2026 14:45	00:15	54	72	49
19/03/2026 15:00	00:15	51	65	49
19/03/2026 15:15	00:15	51	68	48
19/03/2026 15:30	00:15	52	73	49
19/03/2026 15:45	00:15	51	72	49
19/03/2026 16:00	00:15	52	69	47
19/03/2026 16:15	00:15	48	61	46
19/03/2026 16:30	00:15	47	57	45
19/03/2026 16:45	00:15	47	58	45
19/03/2026 17:00	00:15	48	71	46
19/03/2026 17:15	00:15	50	81	48
19/03/2026 17:30	00:15	50	57	49
19/03/2026 17:45	00:15	51	67	50
19/03/2026 18:00	00:15	52	63	50
19/03/2026 18:15	00:15	54	69	52
19/03/2026 18:30	00:15	53	58	52
19/03/2026 18:45	00:15	52	57	51
19/03/2026 19:00	00:15	52	56	51
19/03/2026 19:15	00:15	52	56	51
19/03/2026 19:30	00:15	52	56	51
19/03/2026 19:45	00:15	52	58	51
19/03/2026 20:00	00:15	53	58	51
19/03/2026 20:15	00:15	53	61	51
19/03/2026 20:30	00:15	52	55	51
19/03/2026 20:45	00:15	51	60	50
19/03/2026 21:00	00:15	51	57	50
19/03/2026 21:15	00:15	52	57	50
19/03/2026 21:30	00:15	52	56	50

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 21:45	00:15	50	54	48
19/03/2026 22:00	00:15	50	55	48
19/03/2026 22:15	00:15	51	59	49
19/03/2026 22:30	00:15	51	55	49
19/03/2026 22:45	00:15	51	55	49
19/03/2026 23:00	00:15	52	59	50
19/03/2026 23:15	00:15	50	63	48
19/03/2026 23:30	00:15	51	57	49
19/03/2026 23:45	00:15	51	63	49
20/03/2026 00:00	00:15	50	56	48
20/03/2026 00:15	00:15	50	58	48
20/03/2026 00:30	00:15	50	59	47
20/03/2026 00:45	00:15	50	57	48
20/03/2026 01:00	00:15	50	64	48
20/03/2026 01:15	00:15	50	56	48
20/03/2026 01:30	00:15	50	55	47
20/03/2026 01:45	00:15	49	54	47
20/03/2026 02:00	00:15	49	57	47
20/03/2026 02:15	00:15	49	56	47
20/03/2026 02:30	00:15	49	56	47
20/03/2026 02:45	00:15	50	55	48
20/03/2026 03:00	00:15	50	56	48
20/03/2026 03:15	00:15	49	54	47
20/03/2026 03:30	00:15	50	57	48
20/03/2026 03:45	00:15	49	57	47
20/03/2026 04:00	00:15	51	55	49
20/03/2026 04:15	00:15	50	56	48
20/03/2026 04:30	00:15	51	57	49
20/03/2026 04:45	00:15	50	55	49
20/03/2026 05:00	00:15	52	67	50
20/03/2026 05:15	00:15	53	57	52
20/03/2026 05:30	00:15	54	58	53

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
20/03/2026 05:45	00:15	55	75	53
20/03/2026 06:00	00:15	54	58	53
20/03/2026 06:15	00:15	55	59	53
20/03/2026 06:30	00:15	53	57	52
20/03/2026 06:45	00:15	51	56	49
20/03/2026 07:00	00:15	50	55	49
20/03/2026 07:15	00:15	51	63	49
20/03/2026 07:30	00:15	52	60	50
20/03/2026 07:45	00:15	49	55	47
20/03/2026 08:00	00:15	47	65	44
20/03/2026 08:15	00:15	48	70	45
20/03/2026 08:30	00:15	51	69	46
20/03/2026 08:45	00:15	46	64	43
20/03/2026 09:00	00:15	45	62	42
20/03/2026 09:15	00:15	46	65	43
20/03/2026 09:30	00:15	45	58	43
20/03/2026 09:45	00:15	48	66	44
20/03/2026 10:00	00:15	46	60	43
20/03/2026 10:15	00:15	47	69	43
20/03/2026 10:30	00:15	46	63	42
20/03/2026 10:45	00:15	45	64	43
20/03/2026 11:00	00:15	52	82	43
20/03/2026 11:15	00:15	58	76	44
20/03/2026 11:30	00:15	51	74	43
20/03/2026 11:45	00:15	56	75	45
20/03/2026 12:00	00:15	57	75	47
20/03/2026 12:15	00:15	51	77	45
20/03/2026 12:30	00:15	58	75	48
20/03/2026 12:45	00:15	59	81	47
20/03/2026 13:00	00:15	47	67	45
20/03/2026 13:15	00:15	47	68	45
20/03/2026 13:30	00:15	58	75	45

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
20/03/2026 13:45	00:15	59	78	47
20/03/2026 14:00	00:15	49	68	44
20/03/2026 14:15	00:15	49	71	42
20/03/2026 14:30	00:15	49	73	43
20/03/2026 14:45	00:15	47	62	43
20/03/2026 15:00	00:15	49	66	45
20/03/2026 15:15	00:15	48	65	45
20/03/2026 15:30	00:15	47	60	44
20/03/2026 15:45	00:15	46	57	43
20/03/2026 16:00	00:15	49	63	43
20/03/2026 16:15	00:15	57	74	44
20/03/2026 16:30	00:15	59	74	45
20/03/2026 16:45	00:15	48	54	45
20/03/2026 17:00	00:15	49	60	47
20/03/2026 17:15	00:15	48	56	47
20/03/2026 17:30	00:15	51	62	48
20/03/2026 17:45	00:15	52	56	51
20/03/2026 18:00	00:15	52	66	51
20/03/2026 18:15	00:15	53	61	52
20/03/2026 18:30	00:15	55	61	53
20/03/2026 18:45	00:15	55	66	54
20/03/2026 19:00	00:15	55	62	53
20/03/2026 19:15	00:15	55	60	53
20/03/2026 19:30	00:15	56	62	54
20/03/2026 19:45	00:15	55	63	53
20/03/2026 20:00	00:15	54	57	53
20/03/2026 20:15	00:15	52	62	51
20/03/2026 20:30	00:15	52	56	51
20/03/2026 20:45	00:15	53	61	51
20/03/2026 21:00	00:15	53	58	51
20/03/2026 21:15	00:15	54	63	52
20/03/2026 21:30	00:15	54	59	52

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
20/03/2026 21:45	00:15	52	58	50
20/03/2026 22:00	00:15	51	59	48
20/03/2026 22:15	00:15	52	56	50
20/03/2026 22:30	00:15	53	59	52
20/03/2026 22:45	00:15	51	59	49
20/03/2026 23:00	00:15	50	56	48
20/03/2026 23:15	00:15	51	61	50
20/03/2026 23:30	00:15	52	58	51
20/03/2026 23:45	00:15	55	59	54
21/03/2026 00:00	00:15	57	60	55
21/03/2026 00:15	00:15	55	61	53
21/03/2026 00:30	00:15	55	60	53
21/03/2026 00:45	00:15	55	60	53
21/03/2026 01:00	00:15	50	55	48
21/03/2026 01:15	00:15	51	57	49
21/03/2026 01:30	00:15	52	59	51
21/03/2026 01:45	00:15	53	61	51
21/03/2026 02:00	00:15	54	59	51
21/03/2026 02:15	00:15	55	61	51
21/03/2026 02:30	00:15	53	57	50
21/03/2026 02:45	00:15	52	59	50
21/03/2026 03:00	00:15	53	58	51
21/03/2026 03:15	00:15	51	63	48
21/03/2026 03:30	00:15	50	55	48
21/03/2026 03:45	00:15	51	57	49
21/03/2026 04:00	00:15	52	59	50
21/03/2026 04:15	00:15	54	59	52
21/03/2026 04:30	00:15	55	58	53
21/03/2026 04:45	00:15	54	61	51
21/03/2026 05:00	00:15	53	57	51
21/03/2026 05:15	00:15	54	58	53
21/03/2026 05:30	00:15	53	58	51

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
21/03/2026 05:45	00:15	53	59	51
21/03/2026 06:00	00:15	54	73	52
21/03/2026 06:15	00:15	56	61	53
21/03/2026 06:30	00:15	58	63	56
21/03/2026 06:45	00:15	56	62	54
21/03/2026 07:00	00:15	57	61	56
21/03/2026 07:15	00:15	57	60	55
21/03/2026 07:30	00:15	56	60	55
21/03/2026 07:45	00:15	54	59	53
21/03/2026 08:00	00:15	52	62	50
21/03/2026 08:15	00:15	50	63	46
21/03/2026 08:30	00:15	50	67	46
21/03/2026 08:45	00:15	48	63	44
21/03/2026 09:00	00:15	45	62	42
21/03/2026 09:15	00:15	46	63	41
21/03/2026 09:30	00:15	43	51	41
21/03/2026 09:45	00:15	46	56	43
21/03/2026 10:00	00:15	46	62	44
21/03/2026 10:15	00:15	57	74	44
21/03/2026 10:30	00:15	58	76	45
21/03/2026 10:45	00:15	62	79	49
21/03/2026 11:00	00:15	51	69	46
21/03/2026 11:15	00:15	46	66	44
21/03/2026 11:30	00:15	59	76	43
21/03/2026 11:45	00:15	45	60	42
21/03/2026 12:00	00:15	45	63	43
21/03/2026 12:15	00:15	46	67	43
21/03/2026 12:30	00:15	44	65	41
21/03/2026 12:45	00:15	46	65	43
21/03/2026 13:00	00:15	48	77	43
21/03/2026 13:15	00:15	46	67	42
21/03/2026 13:30	00:15	46	68	43

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
21/03/2026 13:45	00:15	50	75	44
21/03/2026 14:00	00:15	48	77	45
21/03/2026 14:15	00:15	50	76	46
21/03/2026 14:30	00:15	49	64	45
21/03/2026 14:45	00:15	50	74	47
21/03/2026 15:00	00:15	49	58	48
21/03/2026 15:15	00:15	50	68	48
21/03/2026 15:30	00:15	51	73	47
21/03/2026 15:45	00:15	51	75	49
21/03/2026 16:00	00:15	51	66	48
21/03/2026 16:15	00:15	52	74	49
21/03/2026 16:30	00:15	50	61	48
21/03/2026 16:45	00:15	50	71	48
21/03/2026 17:00	00:15	50	57	48
21/03/2026 17:15	00:15	51	69	49
21/03/2026 17:30	00:15	53	70	50
21/03/2026 17:45	00:15	52	66	50
21/03/2026 18:00	00:15	52	65	51
21/03/2026 18:15	00:15	53	62	52
21/03/2026 18:30	00:15	53	67	51
21/03/2026 18:45	00:15	53	58	52
21/03/2026 19:00	00:15	55	60	53
21/03/2026 19:15	00:15	56	60	55
21/03/2026 19:30	00:15	56	61	54
21/03/2026 19:45	00:15	54	70	52
21/03/2026 20:00	00:15	53	60	51
21/03/2026 20:15	00:15	53	61	51
21/03/2026 20:30	00:15	51	55	49
21/03/2026 20:45	00:15	50	62	48
21/03/2026 21:00	00:15	50	59	48
21/03/2026 21:15	00:15	52	57	50
21/03/2026 21:30	00:15	52	57	50

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
21/03/2026 21:45	00:15	52	55	51
21/03/2026 22:00	00:15	52	55	51
21/03/2026 22:15	00:15	51	56	49
21/03/2026 22:30	00:15	52	62	50
21/03/2026 22:45	00:15	53	57	51
21/03/2026 23:00	00:15	52	63	51
21/03/2026 23:15	00:15	52	57	50
21/03/2026 23:30	00:15	54	63	52
21/03/2026 23:45	00:15	54	58	53
22/03/2026 00:00	00:15	54	60	53
22/03/2026 00:15	00:15	54	59	53
22/03/2026 00:30	00:15	53	57	51
22/03/2026 00:45	00:15	52	57	50
22/03/2026 01:00	00:15	54	57	52
22/03/2026 01:15	00:15	51	57	50
22/03/2026 01:30	00:15	52	61	50
22/03/2026 01:45	00:15	52	57	51
22/03/2026 02:00	00:15	52	57	49
22/03/2026 02:15	00:15	50	59	48
22/03/2026 02:30	00:15	50	56	47
22/03/2026 02:45	00:15	49	57	45
22/03/2026 03:00	00:15	51	61	48
22/03/2026 03:15	00:15	51	56	49
22/03/2026 03:30	00:15	50	55	48
22/03/2026 03:45	00:15	50	55	46
22/03/2026 04:00	00:15	49	54	47
22/03/2026 04:15	00:15	53	59	51
22/03/2026 04:30	00:15	55	62	53
22/03/2026 04:45	00:15	54	60	51
22/03/2026 05:00	00:15	53	58	50
22/03/2026 05:15	00:15	54	66	51
22/03/2026 05:30	00:15	55	63	53

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
22/03/2026 05:45	00:15	55	64	53
22/03/2026 06:00	00:15	54	60	52
22/03/2026 06:15	00:15	53	67	51
22/03/2026 06:30	00:15	55	59	52
22/03/2026 06:45	00:15	57	60	55
22/03/2026 07:00	00:15	57	60	55
22/03/2026 07:15	00:15	54	62	51
22/03/2026 07:30	00:15	51	64	49
22/03/2026 07:45	00:15	49	60	44
22/03/2026 08:00	00:15	43	53	41
22/03/2026 08:15	00:15	43	60	40
22/03/2026 08:30	00:15	46	72	41
22/03/2026 08:45	00:15	47	69	44
22/03/2026 09:00	00:15	46	69	41
22/03/2026 09:15	00:15	46	57	44
22/03/2026 09:30	00:15	49	56	46
22/03/2026 09:45	00:15	51	66	50
22/03/2026 10:00	00:15	52	70	51
22/03/2026 10:15	00:15	52	59	51
22/03/2026 10:30	00:15	52	57	51
22/03/2026 10:45	00:15	53	58	52
22/03/2026 11:00	00:15	53	62	52
22/03/2026 11:15	00:15	54	72	52
22/03/2026 11:30	00:15	54	63	52
22/03/2026 11:45	00:15	52	70	44
22/03/2026 12:00	00:15	47	63	43
22/03/2026 12:15	00:15	48	71	46
22/03/2026 12:30	00:15	49	70	45
22/03/2026 12:45	00:15	47	66	44
22/03/2026 13:00	00:15	50	65	46
22/03/2026 13:15	00:15	53	67	51
22/03/2026 13:30	00:15	54	62	53

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
22/03/2026 13:45	00:15	54	63	53
22/03/2026 14:00	00:15	54	61	53
22/03/2026 14:15	00:15	56	73	55
22/03/2026 14:30	00:15	56	67	54
22/03/2026 14:45	00:15	55	65	52
22/03/2026 15:00	00:15	54	61	53
22/03/2026 15:15	00:15	55	65	53
22/03/2026 15:30	00:15	56	66	53
22/03/2026 15:45	00:15	56	66	54
22/03/2026 16:00	00:15	56	60	54
22/03/2026 16:15	00:15	56	65	54
22/03/2026 16:30	00:15	56	59	54
22/03/2026 16:45	00:15	57	65	55
22/03/2026 17:00	00:15	57	72	56
22/03/2026 17:15	00:15	57	64	55
22/03/2026 17:30	00:15	56	61	55
22/03/2026 17:45	00:15	56	59	55
22/03/2026 18:00	00:15	57	66	55
22/03/2026 18:15	00:15	58	80	55
22/03/2026 18:30	00:15	56	62	55
22/03/2026 18:45	00:15	55	59	54
22/03/2026 19:00	00:15	56	59	55
22/03/2026 19:15	00:15	56	67	55
22/03/2026 19:30	00:15	56	60	55
22/03/2026 19:45	00:15	56	59	55
22/03/2026 20:00	00:15	55	64	54
22/03/2026 20:15	00:15	56	60	55
22/03/2026 20:30	00:15	55	58	54
22/03/2026 20:45	00:15	55	63	54
22/03/2026 21:00	00:15	55	59	54
22/03/2026 21:15	00:15	54	57	52
22/03/2026 21:30	00:15	55	60	54

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
22/03/2026 21:45	00:15	53	57	51
22/03/2026 22:00	00:15	51	54	50
22/03/2026 22:15	00:15	51	55	49
22/03/2026 22:30	00:15	51	57	49
22/03/2026 22:45	00:15	54	59	51
22/03/2026 23:00	00:15	53	58	51
22/03/2026 23:15	00:15	53	60	51
22/03/2026 23:30	00:15	54	59	53
22/03/2026 23:45	00:15	52	57	49
23/03/2026 00:00	00:15	48	56	46
23/03/2026 00:15	00:15	46	53	43
23/03/2026 00:30	00:15	51	55	48
23/03/2026 00:45	00:15	49	54	47
23/03/2026 01:00	00:15	48	55	45
23/03/2026 01:15	00:15	49	56	46
23/03/2026 01:30	00:15	47	55	43
23/03/2026 01:45	00:15	46	52	43
23/03/2026 02:00	00:15	45	53	42
23/03/2026 02:15	00:15	46	52	44
23/03/2026 02:30	00:15	46	52	44
23/03/2026 02:45	00:15	48	54	44
23/03/2026 03:00	00:15	47	53	43
23/03/2026 03:15	00:15	48	55	45
23/03/2026 03:30	00:15	51	55	48
23/03/2026 03:45	00:15	52	59	48
23/03/2026 04:00	00:15	49	55	46
23/03/2026 04:15	00:15	49	55	46
23/03/2026 04:30	00:15	50	55	48
23/03/2026 04:45	00:15	52	56	50
23/03/2026 05:00	00:15	53	58	51
23/03/2026 05:15	00:15	54	59	53
23/03/2026 05:30	00:15	56	60	54

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
23/03/2026 05:45	00:15	56	61	55
23/03/2026 06:00	00:15	56	64	54
23/03/2026 06:15	00:15	56	69	55
23/03/2026 06:30	00:15	58	62	56
23/03/2026 06:45	00:15	57	61	56
23/03/2026 07:00	00:15	58	70	55
23/03/2026 07:15	00:15	53	60	52
23/03/2026 07:30	00:15	52	61	51
23/03/2026 07:45	00:15	50	69	46
23/03/2026 08:00	00:15	49	63	46
23/03/2026 08:15	00:15	50	70	44
23/03/2026 08:30	00:15	52	67	43
23/03/2026 08:45	00:15	47	64	43
23/03/2026 09:00	00:15	47	65	42
23/03/2026 09:15	00:15	46	61	42
23/03/2026 09:30	00:15	57	76	46
23/03/2026 09:45	00:15	60	77	50
23/03/2026 10:00	00:15	53	72	49
23/03/2026 10:15	00:15	55	80	48
23/03/2026 10:30	00:15	60	79	50
23/03/2026 10:45	00:15	59	80	51
23/03/2026 11:00	00:15	51	69	48
23/03/2026 11:15	00:15	60	80	51
23/03/2026 11:30	00:15	51	65	49
23/03/2026 11:45	00:15	51	70	49
23/03/2026 12:00	00:15	52	60	50
23/03/2026 12:15	00:15	53	71	51
23/03/2026 12:30	00:15	60	79	52
23/03/2026 12:45	00:15	65	86	52
23/03/2026 13:00	00:15	53	67	51
23/03/2026 13:15	00:15	53	65	51
23/03/2026 13:30	00:15	58	78	52

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
23/03/2026 13:45	00:15	60	76	53
23/03/2026 14:00	00:15	55	73	52
23/03/2026 14:15	00:15	63	85	53
23/03/2026 14:30	00:15	63	80	54
23/03/2026 14:45	00:15	56	80	52
23/03/2026 15:00	00:15	54	65	53
23/03/2026 15:15	00:15	54	76	52
23/03/2026 15:30	00:15	54	67	52
23/03/2026 15:45	00:15	53	65	52
23/03/2026 16:00	00:15	53	61	52
23/03/2026 16:15	00:15	54	64	52
23/03/2026 16:30	00:15	52	60	51
23/03/2026 16:45	00:15	53	68	51
23/03/2026 17:00	00:15	52	63	51
23/03/2026 17:15	00:15	53	64	52
23/03/2026 17:30	00:15	53	67	52
23/03/2026 17:45	00:15	54	63	52
23/03/2026 18:00	00:15	53	65	52
23/03/2026 18:15	00:15	53	57	51
23/03/2026 18:30	00:15	53	62	52
23/03/2026 18:45	00:15	53	58	52
23/03/2026 19:00	00:15	53	61	52
23/03/2026 19:15	00:15	53	57	52
23/03/2026 19:30	00:15	53	59	51
23/03/2026 19:45	00:15	53	59	52
23/03/2026 20:00	00:15	53	56	51
23/03/2026 20:15	00:15	53	61	51
23/03/2026 20:30	00:15	53	58	51
23/03/2026 20:45	00:15	52	64	50
23/03/2026 21:00	00:15	51	58	49
23/03/2026 21:15	00:15	50	56	48
23/03/2026 21:30	00:15	49	55	47

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
23/03/2026 21:45	00:15	50	58	48
23/03/2026 22:00	00:15	50	56	48
23/03/2026 22:15	00:15	49	55	47
23/03/2026 22:30	00:15	48	59	45
23/03/2026 22:45	00:15	47	53	45
23/03/2026 23:00	00:15	48	58	46
23/03/2026 23:15	00:15	47	57	45
23/03/2026 23:30	00:15	48	65	45
23/03/2026 23:45	00:15	47	58	45
24/03/2026 00:00	00:15	46	57	44
24/03/2026 00:15	00:15	45	51	43
24/03/2026 00:30	00:15	45	51	44
24/03/2026 00:45	00:15	46	58	43
24/03/2026 01:00	00:15	46	53	43
24/03/2026 01:15	00:15	46	53	44
24/03/2026 01:30	00:15	46	55	43
24/03/2026 01:45	00:15	47	56	44
24/03/2026 02:00	00:15	46	54	44
24/03/2026 02:15	00:15	46	51	43
24/03/2026 02:30	00:15	45	52	43
24/03/2026 02:45	00:15	45	52	43
24/03/2026 03:00	00:15	45	52	43
24/03/2026 03:15	00:15	45	52	43
24/03/2026 03:30	00:15	47	53	44
24/03/2026 03:45	00:15	47	53	45
24/03/2026 04:00	00:15	49	54	47
24/03/2026 04:15	00:15	49	57	48
24/03/2026 04:30	00:15	52	57	49
24/03/2026 04:45	00:15	54	59	52
24/03/2026 05:00	00:15	55	65	54
24/03/2026 05:15	00:15	56	60	54
24/03/2026 05:30	00:15	56	59	54

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
24/03/2026 05:45	00:15	56	70	55
24/03/2026 06:00	00:15	57	60	56
24/03/2026 06:15	00:15	58	64	56
24/03/2026 06:30	00:15	57	68	56
24/03/2026 06:45	00:15	56	60	55
24/03/2026 07:00	00:15	56	64	54
24/03/2026 07:15	00:15	55	60	54
24/03/2026 07:30	00:15	56	69	54
24/03/2026 07:45	00:15	56	69	54
24/03/2026 08:00	00:15	56	61	55
24/03/2026 08:15	00:15	56	75	54
24/03/2026 08:30	00:15	57	68	55
24/03/2026 08:45	00:15	56	67	55
24/03/2026 09:00	00:15	56	67	54
24/03/2026 09:15	00:15	56	66	55
24/03/2026 09:30	00:15	57	66	55
24/03/2026 09:45	00:15	56	64	54
24/03/2026 10:00	00:15	57	69	55
24/03/2026 10:15	00:15	57	63	55
24/03/2026 10:30	00:15	58	69	56
24/03/2026 10:45	00:15	57	75	55
24/03/2026 11:00	00:15	57	71	56
24/03/2026 11:15	00:15	67	86	57
24/03/2026 11:30	00:15	57	67	55
24/03/2026 11:45	00:15	57	62	55
24/03/2026 12:00	00:15	56	73	55
24/03/2026 12:15	00:15	57	66	55
24/03/2026 12:30	00:15	63	83	56
24/03/2026 12:45	00:15	66	90	56
24/03/2026 13:00	00:15	58	70	55
24/03/2026 13:15	00:15	59	74	55
24/03/2026 13:30	00:15	63	80	57

Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
24/03/2026 13:45	00:15	63	78	56
24/03/2026 14:00	00:15	57	68	55
24/03/2026 14:15	00:15	56	65	55
24/03/2026 14:30	00:15	57	69	55
18/03/2026 13:45	00:15	55	74	45
18/03/2026 14:00	00:15	49	68	44
18/03/2026 14:15	00:15	49	68	43
18/03/2026 14:30	00:15	48	66	42
18/03/2026 14:45	00:15	52	77	43
18/03/2026 15:00	00:15	46	59	43
18/03/2026 15:15	00:15	50	69	43
18/03/2026 15:30	00:15	52	70	44
18/03/2026 15:45	00:15	47	66	43
18/03/2026 16:00	00:15	44	62	41
18/03/2026 16:15	00:15	43	62	40
18/03/2026 16:30	00:15	44	59	41
18/03/2026 16:45	00:15	44	65	42
18/03/2026 17:00	00:15	44	58	42
18/03/2026 17:15	00:15	46	66	42
18/03/2026 17:30	00:15	46	61	42
18/03/2026 17:45	00:15	51	73	43
18/03/2026 18:00	00:15	46	57	44
18/03/2026 18:15	00:15	46	54	44
18/03/2026 18:30	00:15	49	69	44
18/03/2026 18:45	00:15	47	57	44
18/03/2026 19:00	00:15	51	59	45
18/03/2026 19:15	00:15	53	64	51
18/03/2026 19:30	00:15	53	59	51
18/03/2026 19:45	00:15	53	61	50
18/03/2026 20:00	00:15	55	60	54
18/03/2026 20:15	00:15	54	57	52
18/03/2026 20:30	00:15	53	59	51

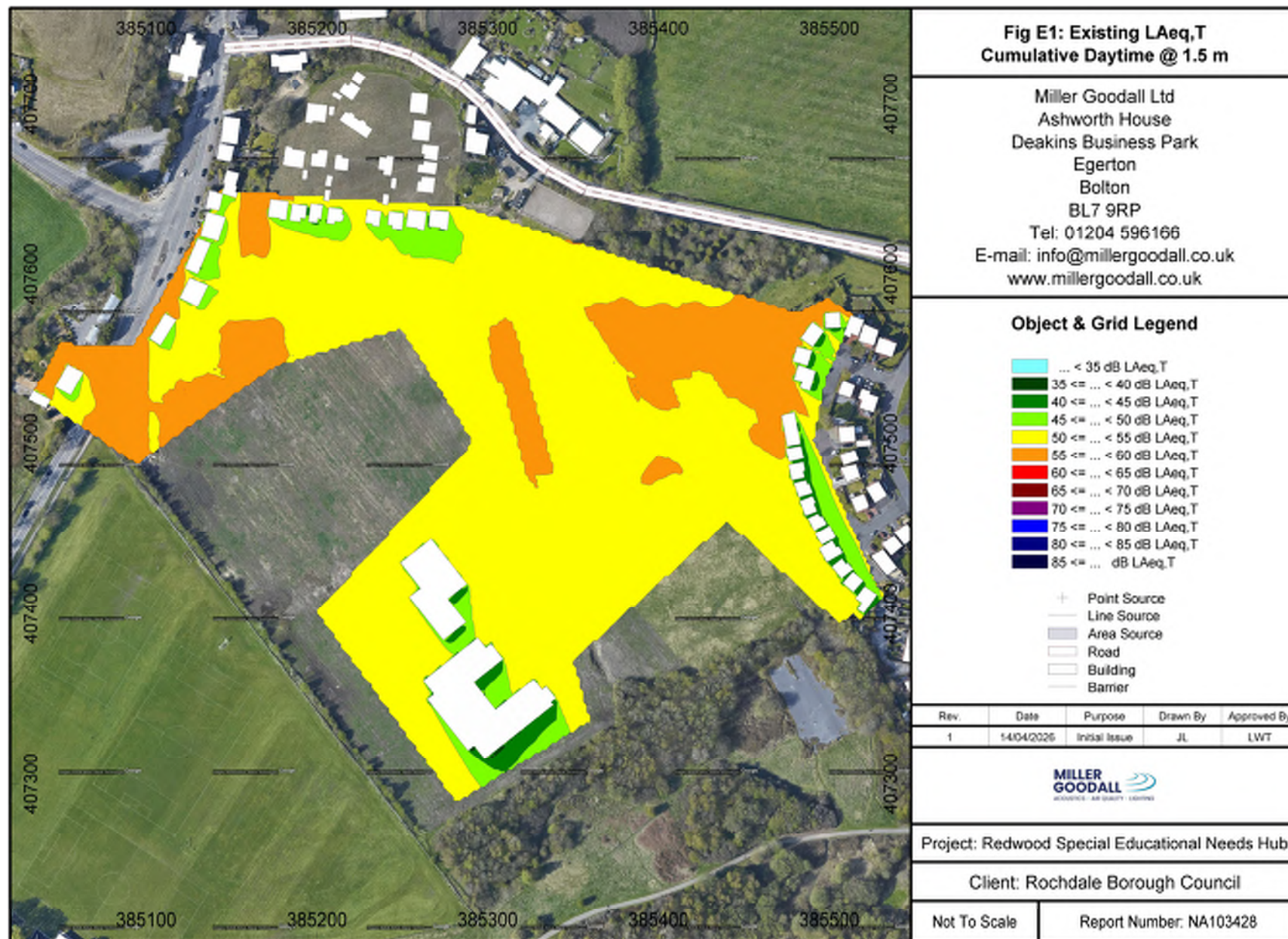
Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
18/03/2026 20:45	00:15	52	56	50
18/03/2026 21:00	00:15	53	57	52
18/03/2026 21:15	00:15	54	63	52
18/03/2026 21:30	00:15	52	58	50
18/03/2026 21:45	00:15	50	57	48
18/03/2026 22:00	00:15	52	56	51
18/03/2026 22:15	00:15	53	66	50
18/03/2026 22:30	00:15	52	63	51
18/03/2026 22:45	00:15	53	59	51
18/03/2026 23:00	00:15	53	58	52
18/03/2026 23:15	00:15	53	57	52
18/03/2026 23:30	00:15	52	56	51
18/03/2026 23:45	00:15	52	57	51
19/03/2026 00:00	00:15	51	56	49
19/03/2026 00:15	00:15	52	63	50
19/03/2026 00:30	00:15	52	58	49
19/03/2026 00:45	00:15	51	56	48
19/03/2026 01:00	00:15	50	56	48
19/03/2026 01:15	00:15	49	55	47
19/03/2026 01:30	00:15	49	55	46
19/03/2026 01:45	00:15	49	56	46
19/03/2026 02:00	00:15	48	53	45
19/03/2026 02:15	00:15	48	55	46
19/03/2026 02:30	00:15	48	56	45
19/03/2026 02:45	00:15	48	54	45
19/03/2026 03:00	00:15	48	55	46
19/03/2026 03:15	00:15	49	57	46
19/03/2026 03:30	00:15	50	55	47
19/03/2026 03:45	00:15	49	55	47
19/03/2026 04:00	00:15	49	53	47
19/03/2026 04:15	00:15	49	53	47
19/03/2026 04:30	00:15	51	55	49

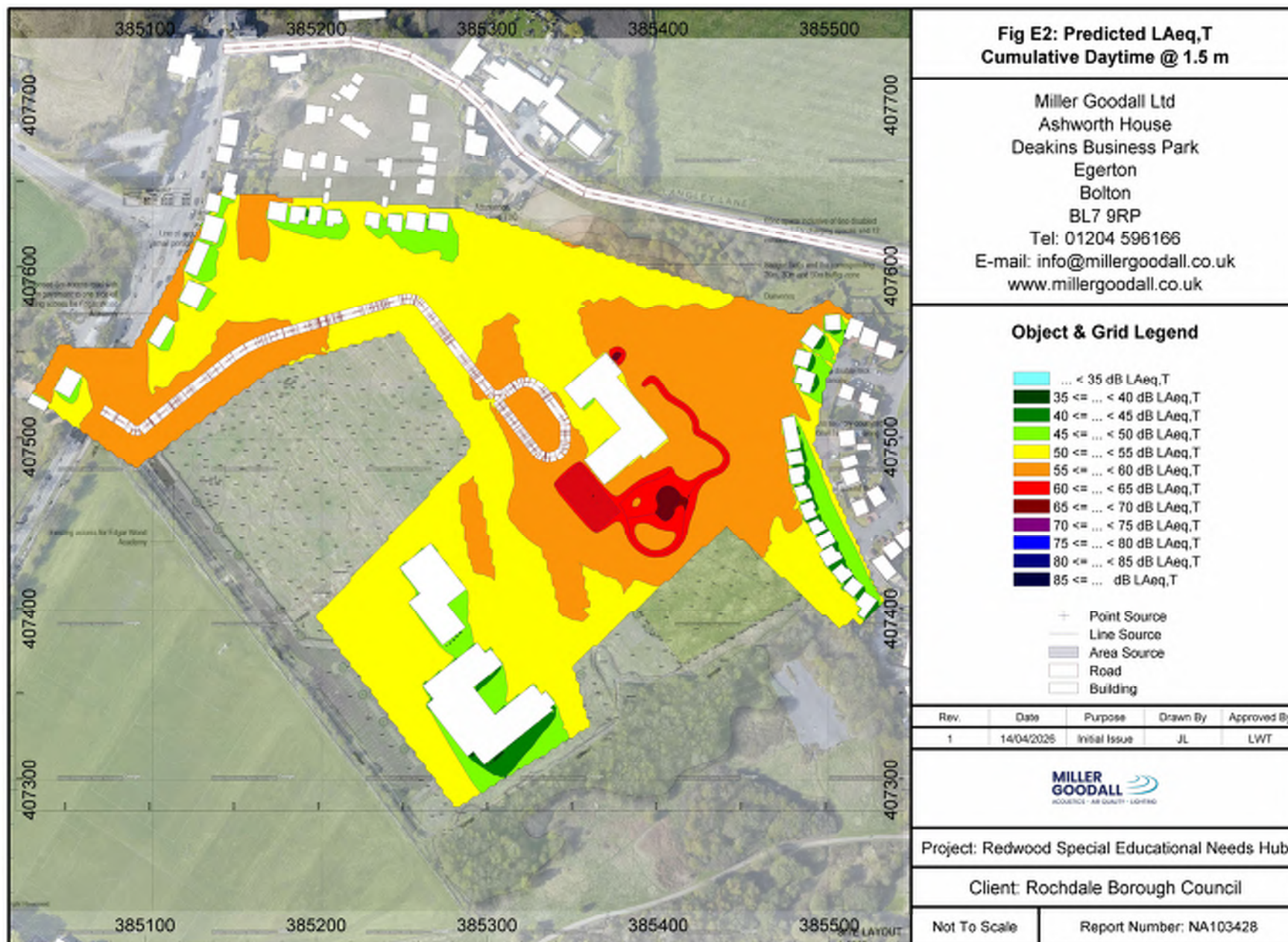
Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 04:45	00:15	51	59	49
19/03/2026 05:00	00:15	53	57	51
19/03/2026 05:15	00:15	54	58	53
19/03/2026 05:30	00:15	56	61	54
19/03/2026 05:45	00:15	57	66	55
19/03/2026 06:00	00:15	57	61	56
19/03/2026 06:15	00:15	57	64	56
19/03/2026 06:30	00:15	57	63	56
19/03/2026 06:45	00:15	58	60	57
19/03/2026 07:00	00:15	57	65	55
19/03/2026 07:15	00:15	55	58	54
19/03/2026 07:30	00:15	55	66	54
19/03/2026 07:45	00:15	55	66	53
19/03/2026 08:00	00:15	54	65	53
19/03/2026 08:15	00:15	54	72	53
19/03/2026 08:30	00:15	55	70	53
19/03/2026 08:45	00:15	54	62	52
19/03/2026 09:00	00:15	55	71	53
19/03/2026 09:15	00:15	53	64	51
19/03/2026 09:30	00:15	58	82	51
19/03/2026 09:45	00:15	59	79	53
19/03/2026 10:00	00:15	53	67	51
19/03/2026 10:15	00:15	53	63	51
19/03/2026 10:30	00:15	56	70	51
19/03/2026 10:45	00:15	58	77	52
19/03/2026 11:00	00:15	53	70	50
19/03/2026 11:15	00:15	54	68	50
19/03/2026 11:30	00:15	55	74	50
19/03/2026 11:45	00:15	59	74	51
19/03/2026 12:00	00:15	59	76	51
19/03/2026 12:15	00:15	51	65	48
19/03/2026 12:30	00:15	52	75	48

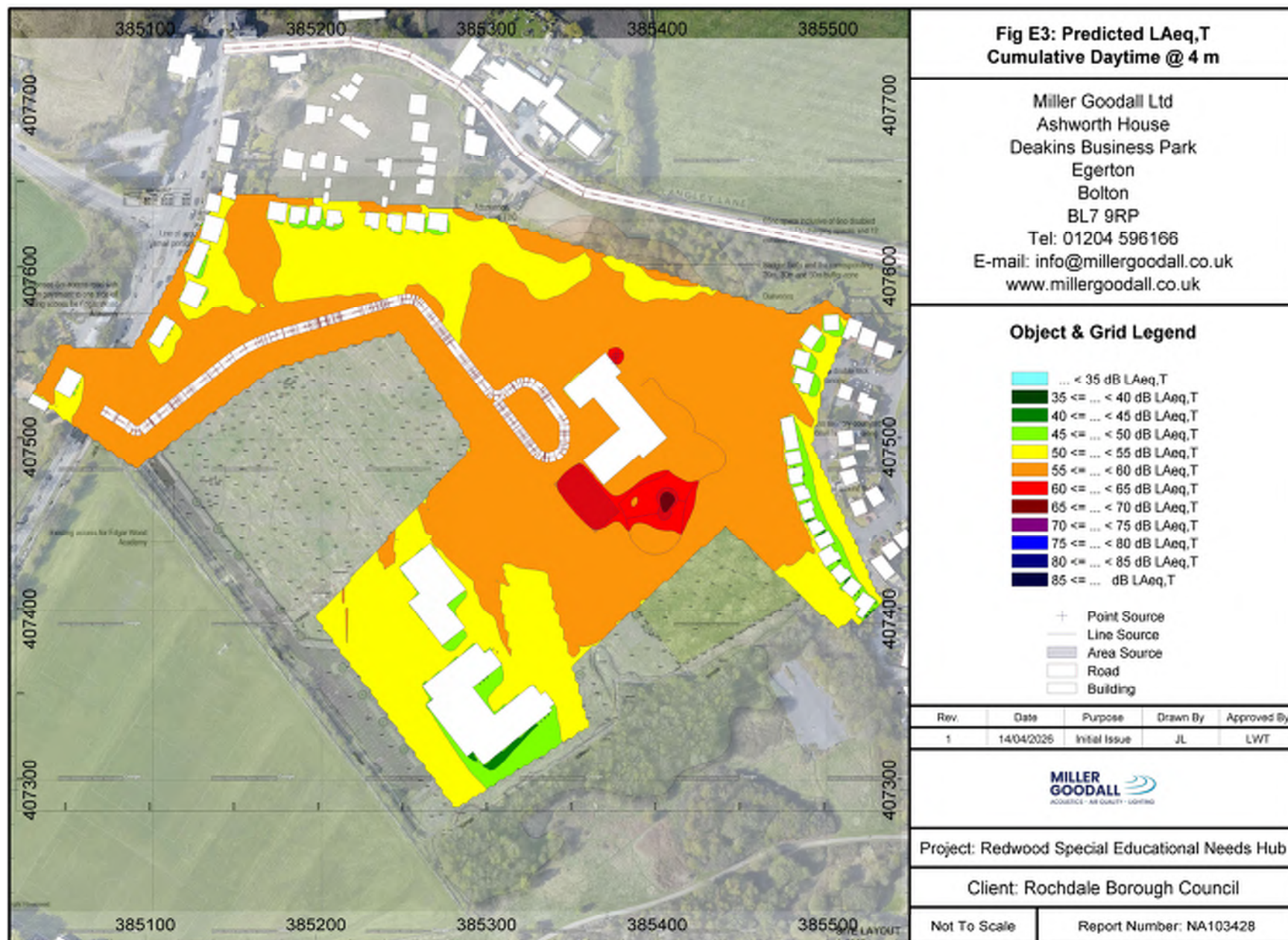
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19/03/2026 13:00	00:15	59	77	51
19/03/2026 13:15	00:15	52	79	49
19/03/2026 13:30	00:15	59	75	50
19/03/2026 13:45	00:15	59	74	50
19/03/2026 14:00	00:15	54	76	49
19/03/2026 14:15	00:15	56	71	51
19/03/2026 14:30	00:15	59	78	51
19/03/2026 14:45	00:15	54	72	49
19/03/2026 15:00	00:15	51	65	49
19/03/2026 15:15	00:15	51	68	48
19/03/2026 15:30	00:15	52	73	49
19/03/2026 15:45	00:15	51	72	49
19/03/2026 16:00	00:15	52	69	47
19/03/2026 16:15	00:15	48	61	46
19/03/2026 16:30	00:15	47	57	45
19/03/2026 16:45	00:15	47	58	45
19/03/2026 17:00	00:15	48	71	46
19/03/2026 17:15	00:15	50	81	48
19/03/2026 17:30	00:15	50	57	49
19/03/2026 17:45	00:15	51	67	50
19/03/2026 18:00	00:15	52	63	50
19/03/2026 18:15	00:15	54	69	52
19/03/2026 18:30	00:15	53	58	52
19/03/2026 18:45	00:15	52	57	51
19/03/2026 19:00	00:15	52	56	51
19/03/2026 19:15	00:15	52	56	51
19/03/2026 19:30	00:15	52	56	51
19/03/2026 19:45	00:15	52	58	51
19/03/2026 20:00	00:15	53	58	51
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19/03/2026 20:30	00:15	52	55	51

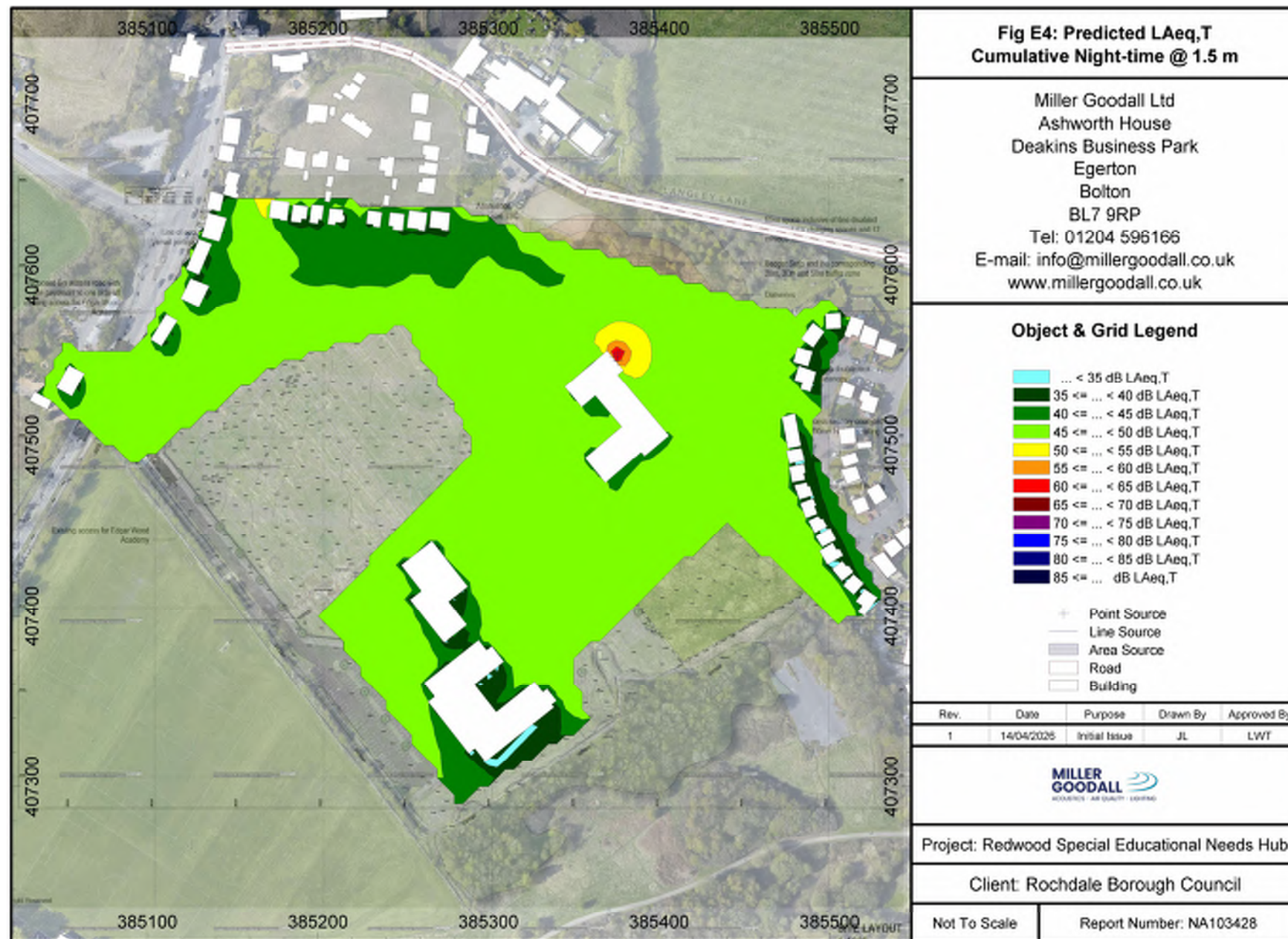
Start Date & Time dd/mm/yyyy hh:mm	Elapsed Time, T hh:mm	$L_{Aeq,T}$ (dB)	$L_{AF,max,T}$ (dB)	$L_{A90,T}$ (dB)
19/03/2026 20:45	00:15	51	60	50
19/03/2026 21:00	00:15	51	57	50
19/03/2026 21:15	00:15	52	57	50
19/03/2026 21:30	00:15	52	56	50
19/03/2026 21:45	00:15	50	54	48
19/03/2026 22:00	00:15	50	55	48
19/03/2026 22:15	00:15	51	59	49
19/03/2026 22:30	00:15	51	55	49
19/03/2026 22:45	00:15	51	55	49
19/03/2026 23:00	00:15	52	59	50
19/03/2026 23:15	00:15	50	63	48
19/03/2026 23:30	00:15	51	57	49
19/03/2026 23:45	00:15	51	63	49
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20/03/2026 00:30	00:15	50	59	47

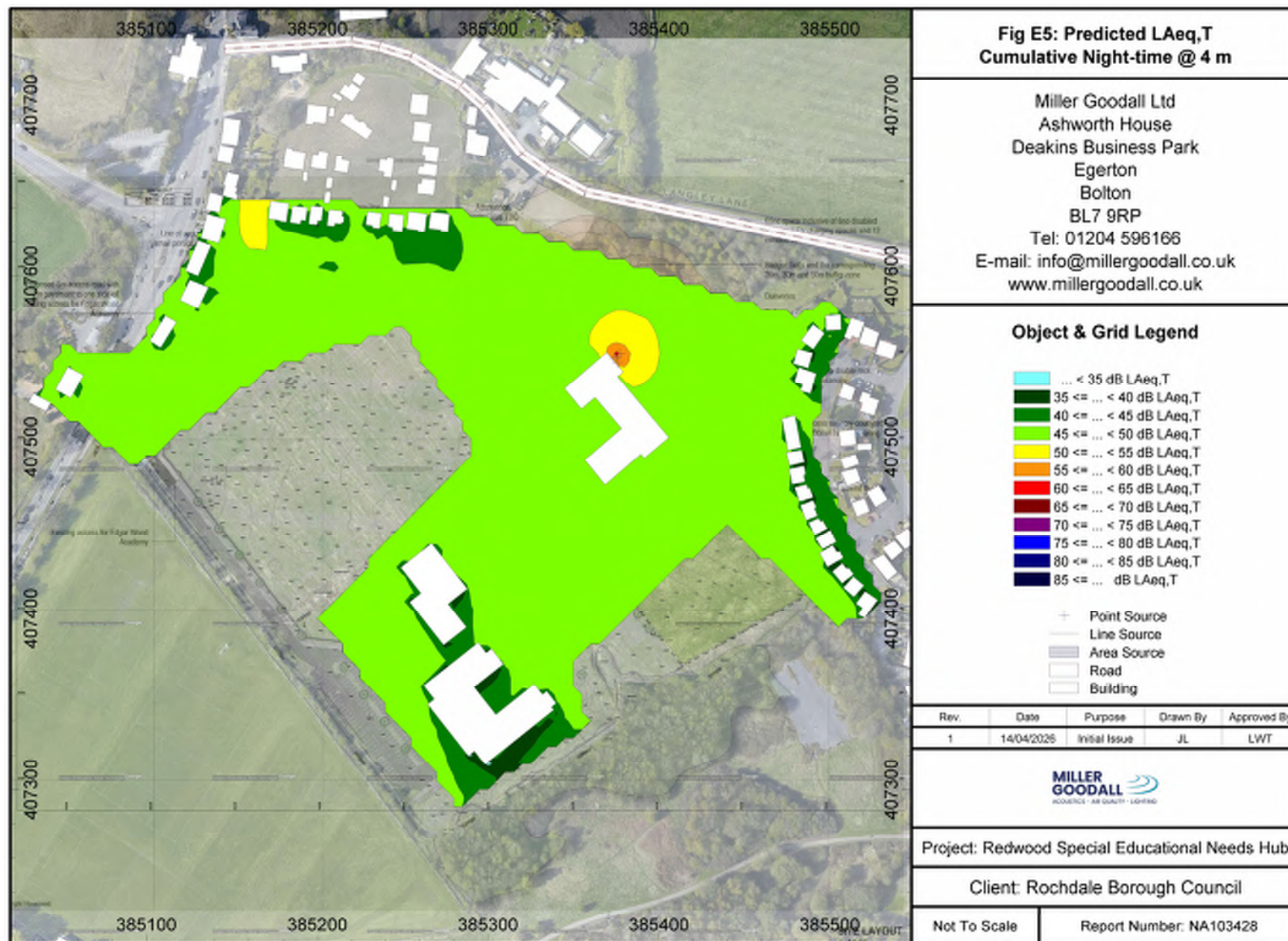
Appendix E: Noise Model Outputs











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 laboratory 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.

$L_{AF,max}$ The highest A-weighted noise level recorded during the time-period using a Fast time-weighting. It is usually used to describe the highest noise level that occurred during the event.

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 BS EN ISO 140-3:1995). It is derived by measurement under laboratory conditions and does not take into account the effects of flanking transmissions.

$D_{nT,w}$ The weighted standardized level difference is a single figure rating used to describe the sound insulation of a construction separating two rooms, for

example a wall or floor, and is defined in BS EN ISO 16283-1:2014 (formerly BS EN ISO 140-4:1998). It is derived by measurement of an in-situ construction and therefore takes into account the effects of flanking transmissions, workmanship etc.

$D_{ne,w}$ 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 (BS EN 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 717-1:2013.

