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Sister Plot C

Preliminary Noise Management Plan

P2335-PNMP-1-JLS P01

28 April 2025

PROJECT	Sister Plot C Preliminary Noise Management Plan
CLIENT	ID Manchester Ltd
DOCUMENT REFERENCE	P2335-PNMP-1-JLS P01
SIGNED	[redacted] Joe Sinker
CHECKED	Mike Hartley
DATE	28 / 04 / 2025

REVISIONS

Issue No.	Reviewer	Authorised by	Approval Date	Summary of Revisions
01	MH	MH	280/4/25	-

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Name of Organisation	Sol Acoustics Limited
Company Registration Number	4218702

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1 Aims and Objectives

1.1 This Noise Management Plan is intended to set out measures to control and limit noise emissions from temporary events in the proposed Sister Civic Square incident upon the nearest noise sensitive receptors.

1.2 Ultimately individual event-specific Noise Management Plan addenda will need to be submitted to and agreed with Manchester City Council and as such, at this stage, this document is considered preliminary in nature, but aims to set out the core principles of the common aspects of the noise management strategy proposed.

2 Event Information

2.1 Event Strategy

2.1.1 The strategic ambitions and anticipated event types as well as the likely frequency of events are set out in the Sister Zone C Event Strategy document prepare by the Sister Events Team.

2.2 Event Types

2.2.1 Table 1 sets out the example event types and as well as the anticipated frequency of such events taken from the Sister Zone C Event Strategy.

Event Type	Anticipated Frequency
Innovation Festival	3 – 4 per year
Cinema, live sports screenings, family-friendly screenings	
Ice rink/roller rink	
Music Festival	
Community events	Monthly
Music events	
Pop-up food markets	
Pop-up theatre – Summer time	
Brand activations – Space commercialisation	Weekly/bi-weekly
Family events/family days out, and sports days	
Wellness events including fitness classes (Running clubs, outdoor HIIT, Yoga, Pilates, etc.)	
Outdoor exhibitions	
Workshops	

Table 1: Event Types and Frequency

2.3 Operational Hours

2.3.1 The operational hours of events with vary from event to event however it is anticipated that no events will take place outside of the hours of 09:00 – 23:00.

2.4 Event Categorisation

2.4.1 In order to establish suitable assessment criteria for noise generated during outdoor events located within the proposed Civic Square it is necessary to consider both the nature of, and the proposed frequency of the anticipated types of events.

2.4.2 Table 2 summarises a proposed categorisation of anticipated event types identifying events as either major or minor, where major events are expected to have potential to generate significant levels of music and patron noise (e.g. During cinema or sporting events screenings or centralised music performances), and where minor events are expected to generate lower and distributed levels of patron and possible localised music noise.

Event Type	Anticipated Frequency	Proposed Noise Limit Categorisation
Innovation Festival	3 – 4 per year	Minor
Cinema, live sports screenings, family-friendly screenings		Major
Ice rink/roller rink		Minor
Music Festival		Major
Community events	Monthly	Major
Music events		Major
Pop-up food markets		Minor
Pop-up theatre – Summer time		Major
Brand activations – Space commercialisation	Weekly/bi-weekly	Minor
Family events/family days out, and sports days		Minor
Wellness events including fitness classes (Running clubs, outdoor HIIT, Yoga, Pilates, etc.)		Minor
Outdoor exhibitions		Minor
Workshops		Minor

Table 2: Proposed Event Noise Limit Categorisations

3 General Event Management

3.1 An identified responsible person shall be on duty at all times during operational events and will be named in the duty log associated with the Civic Square operations. This person shall be contactable continuously throughout the hours of the event by the Plot C Building Management Teams and the on-duty Security Supervisor.

3.2 In addition to this Noise Management Plan additional safety manuals and procedures including policies for stewarding and staffing levels and the consideration of safe maximum public capacities shall also be applied.

3.3 Signage asking patrons to respect the local area and avoid creating excessive noise when using the Civic Square shall be erected at appropriate locations and points of entrance/exit to the event/square.

4 Amplified Music

4.1 When a live event involving amplified sound (e.g. musicians, screening sporting events, etc.), the responsible person shall ensure that no additional sound amplification is brought into the site except for instrument amplifiers, which shall be guided to maintain low volumes to minimise the requirement for loud stage monitor levels.

4.2 Electronic noise limiters shall be incorporated into the proposed loudspeaker system to ensure that the proposed noise limits at the nearest noise sensitive receptors are not exceeded.

4.3 The design of loudspeaker systems shall consider both positioning and directivity of the system such that the containment of generated noise with the audience area is maximised.

4.4 Only the fixed installed loudspeaker system shall be used except for instrument amplifiers during live music events.

4.5 All proposed loudspeaker systems shall be designed by a specialist subcontractor in accordance with the proposed limits applicable at the nearest noise sensitive receptors as presented in Table 3.

Event Classification	Parameter	Music Noise Limit at 1m from nearest Residential Receptor								
		63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	dBA
Major	$L_{eq,15min}$	75	75	-	-	-	-	-	-	55
Minor	$L_{eq,5min}$	49	46	44	43	43	35	25	13	-

Table 3: Music Noise Limits for Temporary Events

4.6 The limits set out above have been derived from Manchester City Council's Guidance on Noise Control for Open Air Concerts and Events, Planning and Noise Technical Guidance, the Noise Council's Code of Practice on Environmental Noise Control at Concerts, and the results of the baseline noise surveys undertaken by Sol Acoustics in June and October 2024 (refer to Appendix B for further information regarding the survey).

4.7 Based on the results of baseline environmental noise surveys undertaken at the site by Sol Acoustics Ltd in June and October 2024, the details of which are set out in Appendix B, the total cumulative plant noise limits for all M&E plant associated with temporary events must be controlled as not to exceed the Rating Level limits ($L_{Ar,Tr}$) presented in Table 4 at nearby noise sensitive receptors.

Cumulative Plant Noise Limits at 1m from any Noise Sensitive Façade, dB $L_{Ar,Tr}$	
Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
45	40

Table 4: Cumulative Plant Noise Limits

4.8 The above maximum permissible noise level limits are specified in terms of the BS 4142 2014+A1:2019 defined Rating Level. The acoustic character of the sound generated from must therefore be considered and where appropriate, an acoustic character correction (penalty) must be applied to the predicted Specific Sound Level when assessing compliance with the above specified receptor noise level limits. These limits are subject to review and approval of the Local Planning Authority

5 Event Specific Noise Management Information

5.1 Manchester City Council's Guidance on Noise Control for Open Air Concerts and Events (August 2022) requests that for all events a Noise Management Plan be submitted to MCC identifying noise monitoring locations and including:

- Noise criteria;
- Assessment inc. predicted noise levels; and
- Noise control/management procedure.

5.2 The contents of this Noise Management Plan are intended to be common to all proposed event types but ultimately additional information we be required to be submitted in the form of a Noise Management Plan Addendum on an event-by-event basis.

5.3 Once the design of the loudspeaker system and specific layouts/arrangements of a planned event are suitably progressed, a noise mapping exercise can be undertaken to predict the event noise levels at the nearest noise sensitive receptors suitable for submission to MCC in a Noise Management Plan addendum.

6 Management Procedures

6.1 All promoters or planners of operational events shall be made aware of any and all limitations pertaining to noise associated with the event type such that there is no expectation that higher levels of noise can be generated than have been deemed permissible.

6.2 Sister Zone C staff will ultimately control the volume of any and all additional equipment supplied such as instruments and amplifiers that has the capacity to produce noise that is not controlled by the limiting system.

6.3 All staff in attendance during operational events will take direct actions to attempt to manage patron noise and aim to ensure that patron behaviour does not become excessively rowdy or boisterous in a manner which is likely to result in increased patron noise levels.

7 Noise Monitoring

7.1 The aims of the noise monitoring are to:

- Establish a database of operational activity noise levels from the various proposed event types;
- Identify potential exceedances of the proposed noise limits and minimise the risk of noise disturbance at the nearest noise sensitive receptors;
- Provide a basis for investigation of noise complaints should they arise;
- To monitor compliance with the proposed event noise limits.

7.2 Noise monitoring shall initially be undertaken continuously during all organised events within the proposed Civic Square with attended sample measurements undertaken in positions representative of the nearest noise sensitive receptors as necessary.

7.3 It is envisaged that once a sufficient database of noise levels associated with different types of events has been established it may be suitable to agree a reduced scheme of monitoring with the Local Planning Authority focussing on the "noisiest" types of events which have the greatest risk of giving rise to a noise disturbance at the nearest noise sensitive premises.

7.4 For each event to be monitored, once the design of any loudspeaker systems are finalised suitable continuous monitoring positions shall be identified. Typically, these positions will be at the mix/control positions for the loudspeaker systems for events with concentrated audience areas or at a position within the Plot C boundary that is deemed representative of the nearest noise sensitive receptors for events where noise sources will be distributed throughout the Square.

7.5 Once the continuous monitoring positions are fixed, maximum source noise levels shall be identified for which it would be expected that, if not exceeded at the source, are unlikely to correlate to an exceedance of the proposed limits at the nearest noise sensitive receptors. However, variations in weather conditions will affect noise transmission so good practice requires that occasional observations in the vicinity of the nearest noise sensitive receptors be undertaken on a semi-regular basis.

7.6 In the event that the operational noise at the nearest noise sensitive receptors is observed to be above the prescribed noise limits then as well as taking action to reduce the noise, consideration shall be given to the cause.

7.7 If the cause is determined not to be an exceptional combination of environmental conditions and is deemed to be recurrent a suitably qualified acoustician, the event operators, and the Sister Events Team will be notified and required to assess the noise levels and potentially make recommendation to reduce noise emissions on a permanent basis, if necessary.

7.8 The particulars of the noise parameters to be continuously monitored are subject to agreement with the Local Planning Authority, to be derived from an analysis of the particulars of the proposed event and the noise limits at the nearest noise sensitive receptors as set out in Table 3.

8 Calibration Procedures

8.1 Calibration is the procedure by which the maximum music noise levels associated with the proposed loudspeaker system are fixed.

8.2 Calibration of the system should be carried out as early as possible in advance of the event taking place.

8.3 The criteria to be used for calibration are subject to agreement with the Local Planning Authority on an event per event basis, and are to be derived from the proposed noise limits at the nearest noise sensitive receptors as set out in Table 3.

8.4 All calibration activity shall be logged and appended to the Noise Management Plan, including record of date of calibration, person responsible for carrying out the calibration, and any practical noise limits or the electronic noise limiter system.

9 Complaints Procedure

9.1 The following key procedures shall be implemented by the site management in response to any substantiated noise complaint from a nearby resident:

- The responsible person shall record the details of the complaint in a log appended to the Noise Management Plan;
- Any noise complaint shall be investigated immediately, and where necessary, the responsible person shall implement measures to reduce noise levels identified by the complaint.
- The complainant shall be informed of the results of the investigation and what mitigation actions were taken as soon as possible by the responsible person or an equivalent representative of the Sister Management Team.
- Part of the complaint investigation procedure shall include consideration of the nature of the operations that were taking place that triggered the complaint. The relevant operational procedures for this type of event shall be reviewed by the operational management team.
- If noise complaints continue to occur, the responsible person shall organise noise monitoring by an independent third party to be carried out at the location of the complainant. The results of this noise monitoring shall be analysed by the independent third party to determine if the permitted noise level agreed with the Local Planning Authority have been exceeded.
- If independent third party analysis concludes that noise limits have been breached, the responsible person shall take actions to reduce levels of noise generated on-site for the remaining duration of the event and all future events.

10 Review Procedure

10.1 Once this preliminary Noise Management Plan has been developed/finalised with the cooperation of the Local Planning Authority, it shall be reviewed in response to any recurrent noise complaint from a resident or at the request of the Local Planning Authority.

10.2 The review process shall include an assessment of identifiable noise sources which have triggered the review and will include suitable mitigation measures and changes to procedure which shall be effective in avoiding undue nuisance of disturbance to nearby residents.

APPENDIX A
Glossary of Acoustic Terms

Term	Abbreviation	Description
Decibel	dB	A scale for comparing the ratios of two quantities, including sound pressure and sound power.
A-weighting	dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the change in sensitivity of the human ear at varying frequencies.
Sound Pressure Level	L_{pA}	A measure of the sound pressure at a particular location. Typically expressed in dB(A) referenced to $2x10^{-5}$ Pascals.
Equivalent Continuous Sound Level	$L_{Aeq,T}$	The steady level of sound over a prescribed period of time which would contain the same total sound energy as the actual fluctuating noise under consideration in the same period of time.
Statistical Sound Levels	L_{A10} and L_{A90}	The level of noise exceeded for a percentage of the time period being sampled, namely 10% or 90% respectively.
Background Sound Level	$L_{A90,T}$	The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of the time period being sampled.
Maximum Sound Level	L_{Amax}	The maximum sound or noise level determined with instrumentation set to either a fast time weighting, L_{AFmax}, or a slow time weighting, L_{Asmax}, as occurring during the time period being sampled.
Sound Power Level	L_{wA}	A measure of the total sound energy radiated from a source. Like sound pressure levels, this is also expressed in dB(A) terms, but it is referenced to 1×10^{-12} W.
Broadband		Sound sampled over a wide range of frequencies.
Narrow band		Sound sampled over a specific, restricted frequency range. Used to ascertain the amplitude and significant of individual, audible tones, and to assist in identifying particular sources of noise within a complex, multi-source soundscape environment.
Ambient Sound	$L_{eq,T}$	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources, both near and far.
Specific Sound Level	$L_{eq,T}$	The Equivalent Continuous A-Weighted Sound Level at an assessment position produced by a specific sound over a given reference time interval, *Tr*
Rating Level	$L_{Ar,Tr}$	The Specific Sound Level plus any adjustment for the acoustic characteristic features of the noise (e.g. intermittency, tones etc.).
Residual Noise	$L_{Aeq,T}$	The ambient sound remaining at given position in a given situation, when the specific sound source is suppressed to such an extent that it no longer contributes to the ambient sound.
Sound Reduction Index	*SRI*	The reduction in sound energy when transmitted through a panel or similar planar element, typically used in relation to single octave or one-third octave frequency band values.
Weighted Sound Reduction Index	R_w	The Sound Reduction Index expressed as a single figure, as expressed against a reference curve.
Dynamic Insertion Loss	*DIL*	Reduction in acoustic energy resulting from the insertion of a noise control element (e.g. an attenuator, acoustic enclosure etc.).

Free Field		Noise measuring location that is free from the presence of sound reflecting objects (except the ground), usually taken to mean being at least 3.5 metres distance from reflective surface(s) or greater.

APPENDIX B
Sister Plot C - Baseline Noise and Vibration Survey

31/01/2025

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Technical Memorandum

Sister Plot C – Baseline Noise and Vibration Survey

1 Introduction

1.1 Sol Acoustics Ltd ("Sol") has been commissioned by ID Manchester Limited ("IDM") to undertake an environmental noise survey as part of an Environmental Impact Assessment ("EIA") for the Sister Plot C development in Manchester to establish the prevailing acoustic conditions at the site.

1.2 This report provides details of the acoustic survey and assessment of the prevailing acoustic environment.

2 Site Description

1.1.1 Plot C forms part of the wider masterplan for the campus known as Sister. Plot C site is located on the corner of Altrincham Street and London Road (A6) in Manchester. The existing site comprises office and educational premises forming part of the North Campus of the University of Manchester, namely, the Barnes Wallace Building, the Moffat Building, The Morton Laboratory, and Staff House.

1.1.2 To the north the site extends to include a section of Altrincham Street and viaduct with elevated railway, to the east the site is bound by London Road (A6). To the south and west the is bordered by other university buildings belonging to the North Campus. The recently renovated Renold building is directly west of the site across the proposed Sister Square (part of the Plot C proposals), and further to the south at the boundary of the North Campus is Mancunian Way (A57(M)) which is partially elevated.

2.1 The nearest noise sensitive receptors are the offices of the Renold Building to the west and the student residential development currently under construction adjacent to the northeast of the site.

2.2 An overview of the site and surroundings is presented in Figure 1.

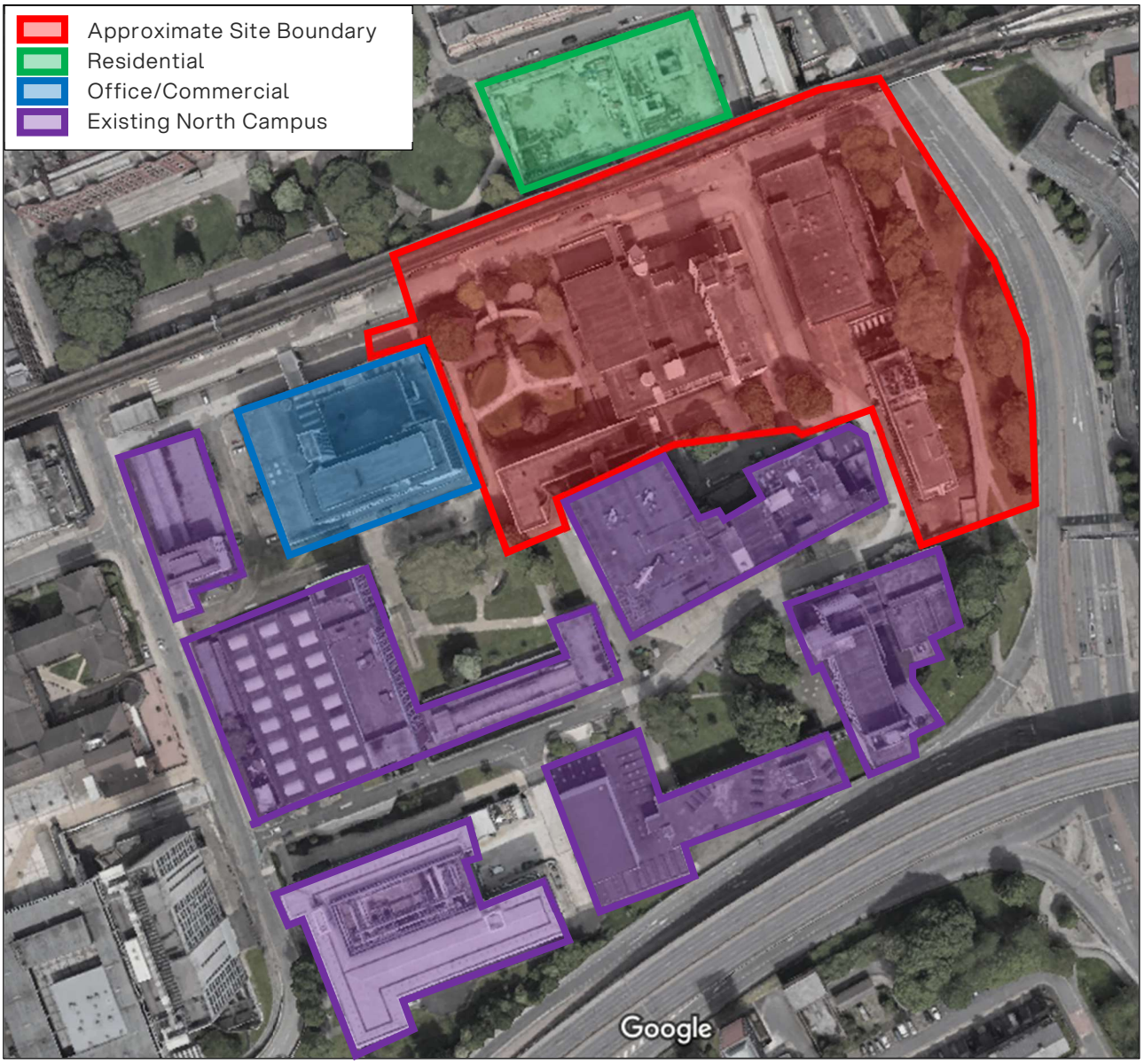

Figure 1: Proposed Development Site and Surroundings (Google Maps, 2024)

3 Baseline Environmental Noise and Vibration Study

3.1 Environmental noise and vibration surveys were conducted by Sol between approximately 13:00 hours on Thursday 27 June 2024 and 13:00 hours on Friday 28 June 2024, and between approximately 14:00 hours on Thursday 17 October 2024 and 13:00 hours on Wednesday 23 October 2024. The surveys consisted of 6No. noise measurement positions and a single vibration measurement position, as shown in Figure 2, and as described in Table 1.

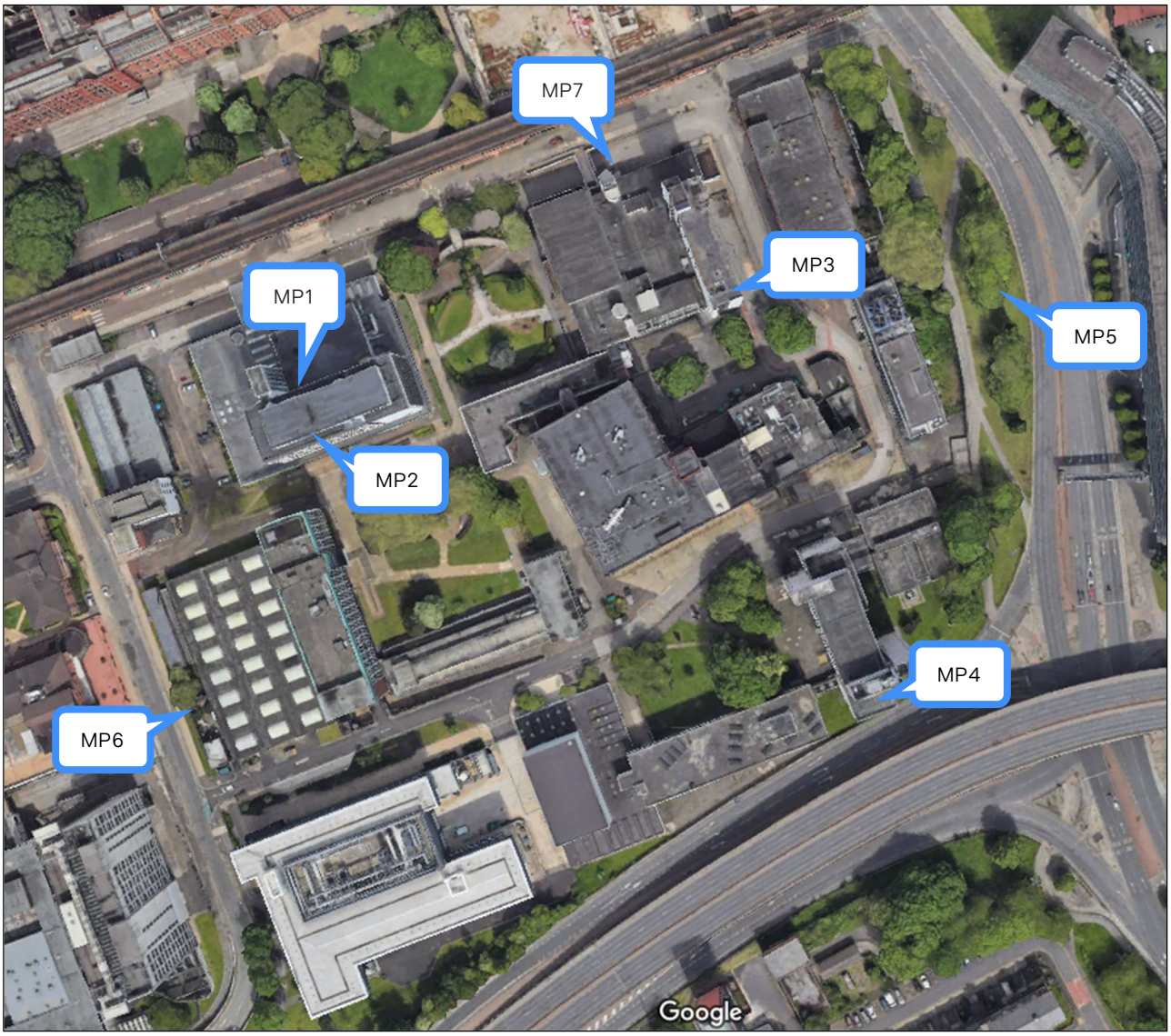

Figure 2: Aerial image showing environmental noise and vibration monitoring locations (Google Maps, 2024)

Measurement Position	Description
MP1 (Unattended Noise Logger, June)	Mast mounted microphone protruding from a fourth floor window, approximately 1m from the northern façade of the Renold building. Sited in "façade" conditions.
MP2 (Unattended Noise Logger, June)	Mast mounted microphone protruding from a fourth floor window, approximately 1m from the southern façade of the Renold building. Sited in "façade" conditions.
MP3 (Unattended Noise Logger, October)	Mast mounted microphone secured approximately 1.5m above the roof of the Wright Robinson building. Sited in "free-field" conditions.
MP4 (Unattended Noise Logger, October)	Mast mounted microphone secured approximately 1.5m above the roof of the Maths and Social Sciences building. Sited in "free-field" conditions.
MP5 (Attended Noise Measurement, October)	Tripod mounted microphone approximately 1.5m above local ground level set back approximately 3m from the nearside edge of London Road (A6). Sited in "free-field" conditions.
MP6 (Attended Noise Measurement, October)	Tripod mounted microphone approximately 1.5m above local ground level set back approximately 3m from the nearside edge Sackville Street. Sited in "free-field" conditions.
MP7 (Unattended Vibration Logger, October)	Ground mounted sensor on the northern boundary of the Barnes Wallis building.

Table 1: Noise and vibration measurement positions

3.2 Type 1 Precision Grade sound measuring instrumentation was exclusively used and microphone windshields were fitted at all times. Full details of the instrumentation used and corresponding traceable calibration records are retained on file by Sol and are available for inspection if required.

3.3 The prevailing weather conditions during both surveys were generally suitable for the purposes of environmental noise measurements, with wind speeds less than 5m/s and rainfall intensity less than 2mm/h, with the exception of some short periods of rainfall between 01:00 and 04:00 on 19October 2024, and some short periods of higher wind speeds between 13:00 and 18:00 on 27 June 2024 and 14:00 and 16:30 on 20 October 2024. These periods shall be omitted from further analysis.

4 Baseline Environmental Noise and Vibration Survey Results

Noise

4.1 Table 2 provides a basic summary of the free-field baseline environmental noise levels measured during the survey:

Measurement Location	Typical Measured Noise Level (dB, Range L_{Aeq}, $L_{Amax,15min}$, $L_{A1,1h}$, $L_{A90,15min}$)				
	Daytime (07:00-23:00)			Night-time (23:00-07:00)	
	$L_{Aeq,T}$	$L_{A1,1h}$	$L_{A90,15min}$	$L_{Aeq,8h}$	$L_{A90,15min}$
MP1	56 (T = 16h)	64 – 74	49 – 58	55	45 – 52
MP2	58 (T = 16h)	64 – 69	55 – 61	58	49 – 60
MP3	66 – 69 (T = 16h)	67 – 85	60 – 67	62 – 64	51 – 66
MP4	75 – 77 (T = 16h)	77 – 82	66 – 76	71 – 72	56 – 75
MP5	73 (T = 1h)	80	63 – 64	-	-
MP6	66 (T = 1h)	72	59 - 60	-	-

Table 2: Summary of typical, measured environmental noise levels, broadband terms

4.2 Table 3 summarises the corresponding time-averaged ($L_{eq,T}$) daytime period ambient noise levels, in linear octave band frequency terms:

Measurement Location	Broadband (A-Weighted) Noise Level, dB $L_{Aeq,T}$	Unweighted Sound Pressure Level ($L_{eq,T}$, dB) @ Octave Band Centre Frequency (Hz)						
		63	125	250	500	1000	2000	4000
MP1 (T = 16h)	56	62	57	53	53	52	47	47
MP2 (T = 16h)	59	61	54	57	54	57	48	38
MP3 (T = 16h)	69	66	63	63	64	67	60	51
MP4 (T = 16h)	77	70	67	69	70	75	68	55
MP5 (T = 1h)	73	72	68	69	67	71	64	54
MP6 (T = 1h)	66	67	62	61	60	63	58	49

Table 3: Summary of time-averaged environmental noise levels, in octave band terms

4.3 A summary of all data measured at Measurement Positions MP1-MP4 is available in Appendix B.

Vibration

4.4 Table 4 summarises the measured z-axis VDV for each day, the presented data represents the highest measured levels across the three axes.

Date	$VDV_{b,day}$ $ms^{-1.75}$
17 October 2024	0.013
18 October 2024	0.014
19 October 2024	0.014
20 October 2024	0.011
21 October 2024	0.014
22 October 2024	0.014
23 October 2024	0.011

Table 4: Measured Vibration Dosage Value $_{b,day}$ in the z-axis

4.5 The measured re-radiated groundborne noise time history is presented in Appendix B.

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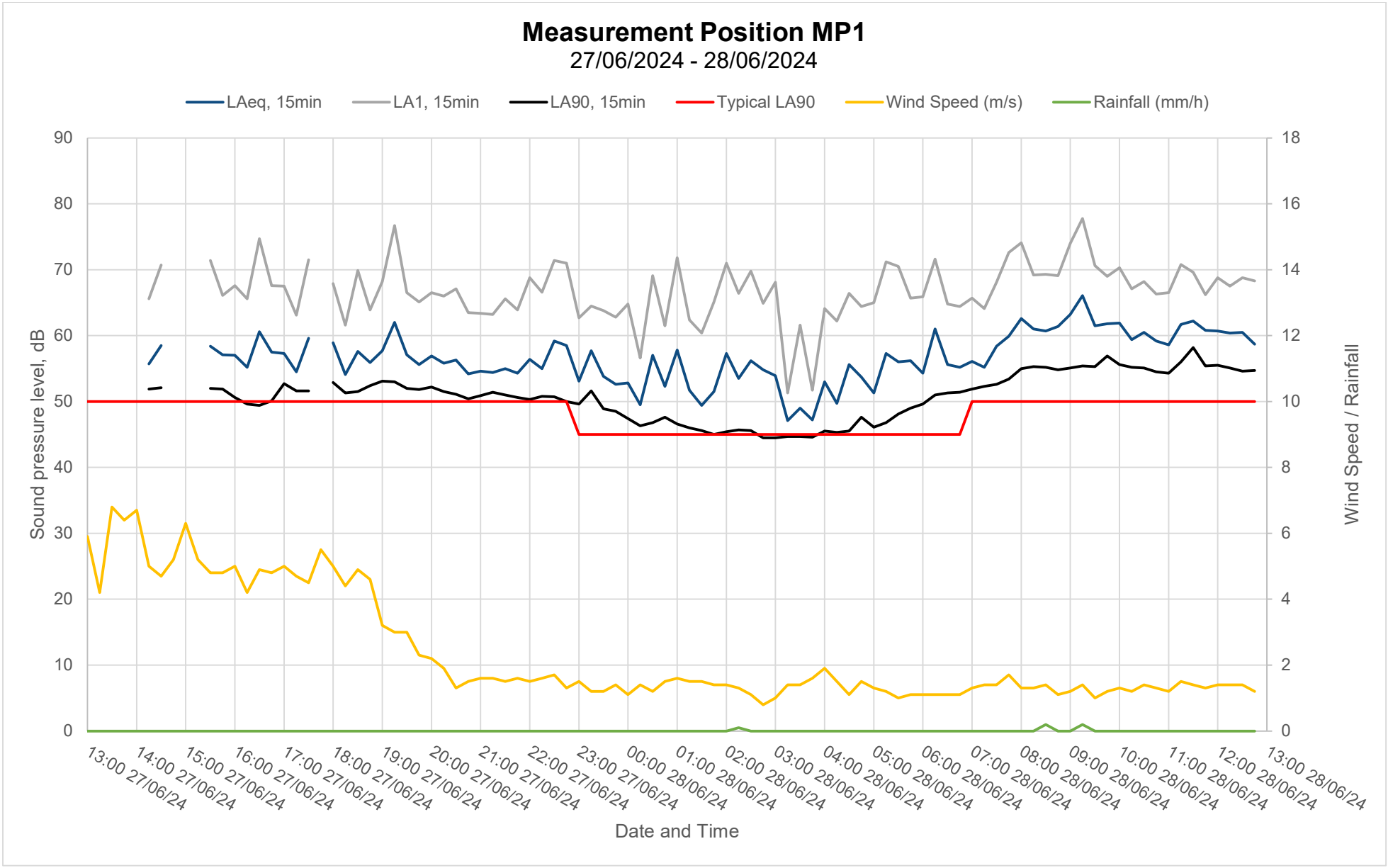
APPENDIX B
Survey Results


Measurement Position MP1
27/06/2024 - 28/06/2024
LAeq, 15min
LA1, 15min
LA90, 15min
Typical LA90
Wind Speed (m/s)
Rainfall (mm/h)
Sound pressure level, dB
Wind Speed / Rainfall
Date and Time
90
80
70
60
50
40
30
20
10
0
18
16
14
12
10
8
6
4
2
0
13:00 27/06/24
14:00 27/06/24
15:00 27/06/24
16:00 27/06/24
17:00 27/06/24
18:00 27/06/24
19:00 27/06/24
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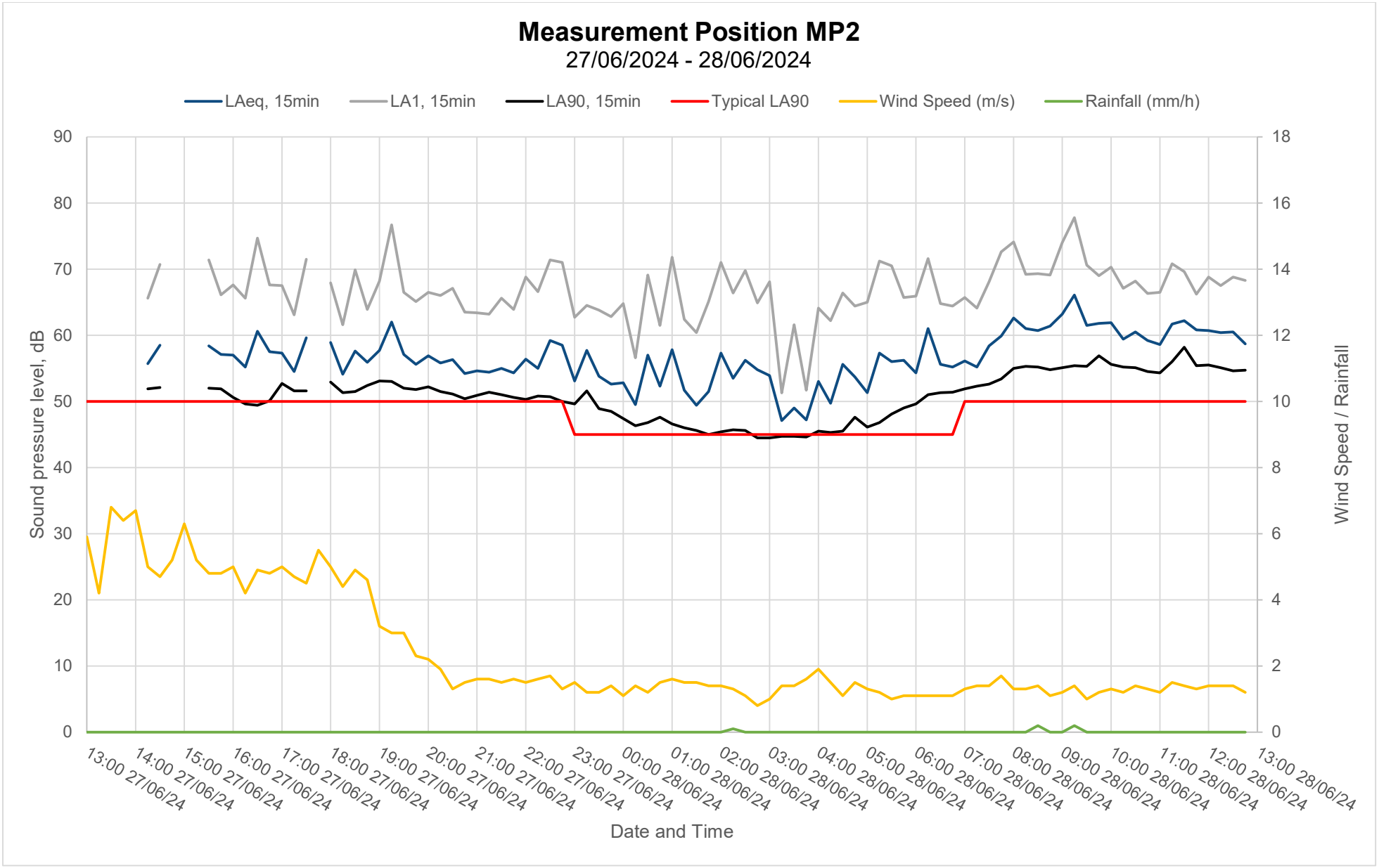
Measurement Position MP2
27/06/2024 - 28/06/2024
LAeq, 15min
LA1, 15min
LA90, 15min
Typical LA90
Wind Speed (m/s)
Rainfall (mm/h)
Sound pressure level, dB
Wind Speed / Rainfall
Date and Time
90
80
70
60
50
40
30
20
10
0
18
16
14
12
10
8
6
4
2
0
13:00 27/06/24
14:00 27/06/24
15:00 27/06/24
16:00 27/06/24
17:00 27/06/24
18:00 27/06/24
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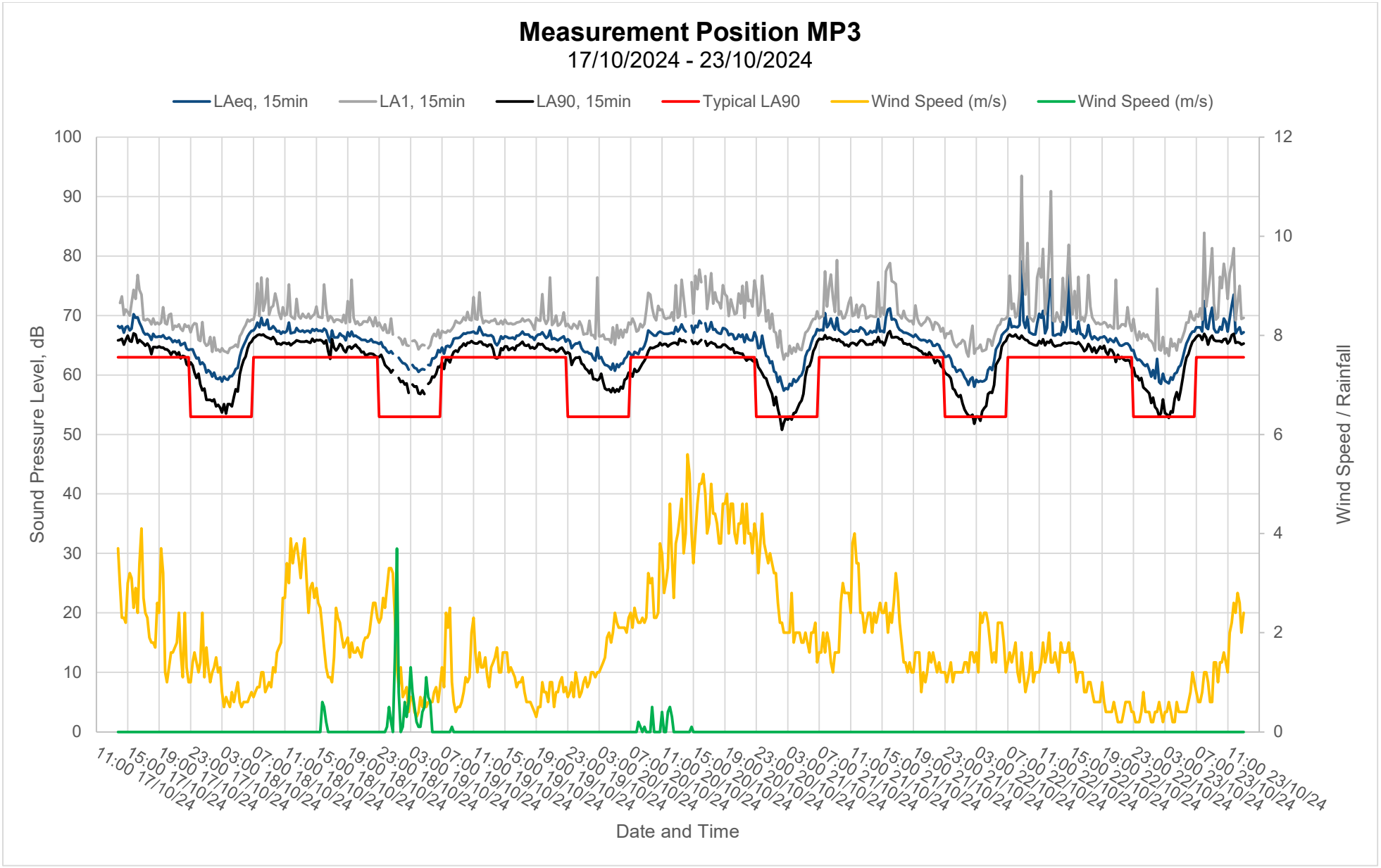
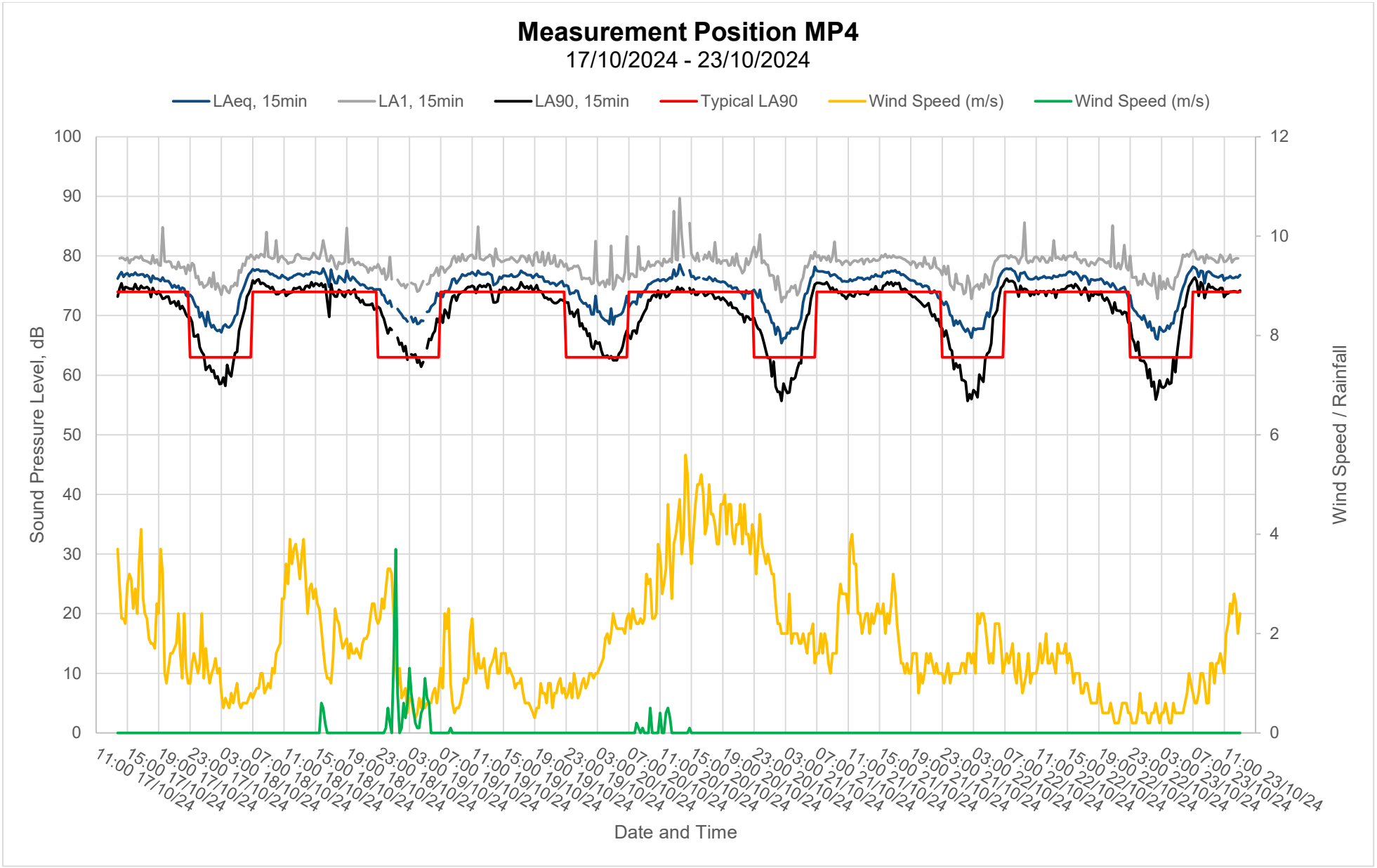
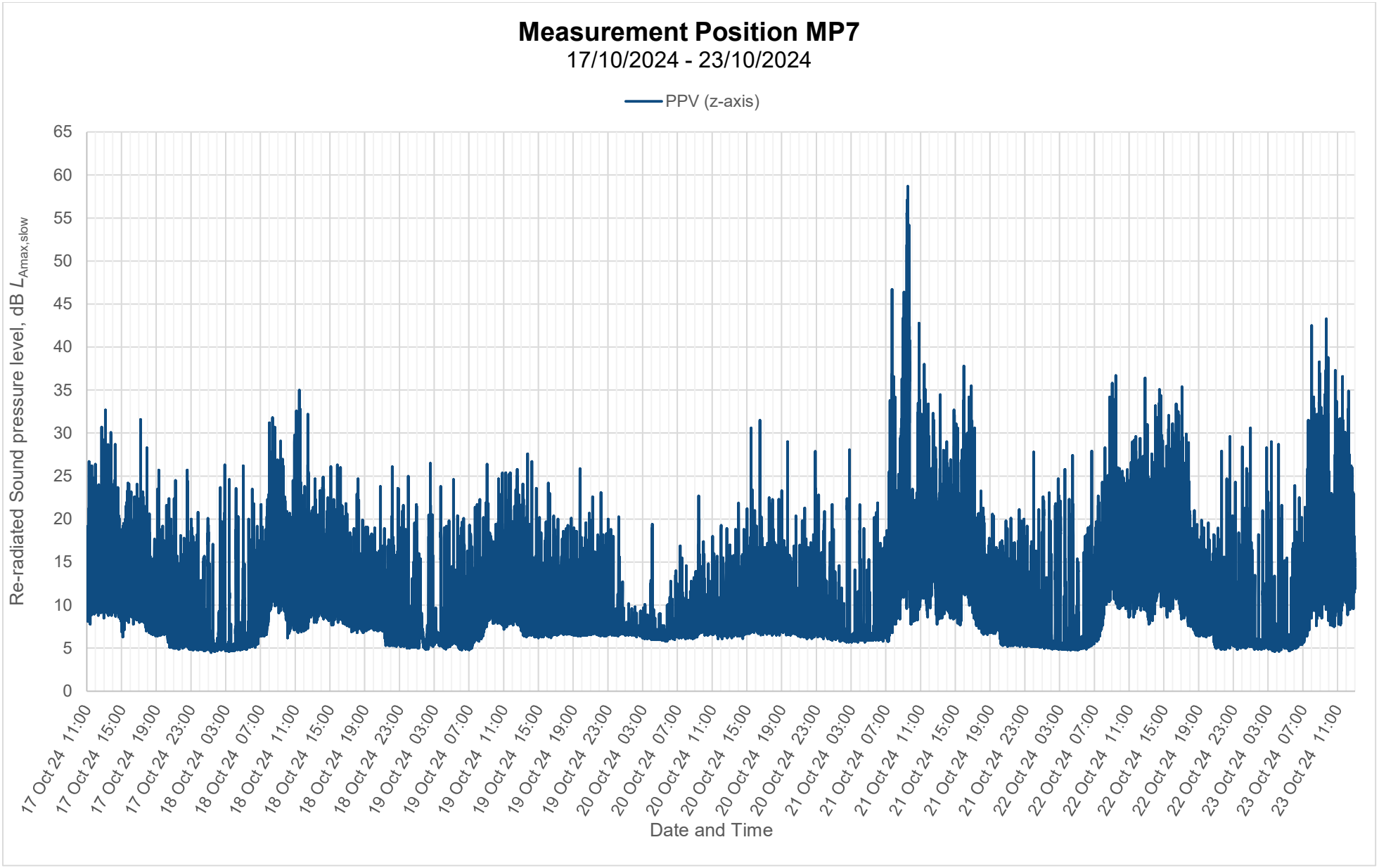
22:00 27/06/24
23:00 27/06/24
00:00 28/06/24
01:00 28/06/24
02:00 28/06/24
03:00 28/06/24
04:00 28/06/24
05:00 28/06/24
06:00 28/06/24
07:00 28/06/24
08:00 28/06/24
09:00 28/06/24
10:00 28/06/24
11:00 28/06/24
12:00 28/06/24
13:00 28/06/24


Measurement Position MP3
17/10/2024 - 23/10/2024
LAeq, 15min
LA1, 15min
LA90, 15min
Typical LA90
Wind Speed (m/s)
Wind Speed (m/s)
Sound Pressure Level, dB
Wind Speed / Rainfall
Date and Time


Measurement Position MP4
17/10/2024 - 23/10/2024
LAeq, 15min
LA1, 15min
LA90, 15min
Typical LA90
Wind Speed (m/s)
Wind Speed (m/s)
Sound Pressure Level, dB
Wind Speed / Rainfall
Date and Time


Measurement Position MP7
17/10/2024 - 23/10/2024
PPV (z-axis)
Re-radiated Sound pressure level, dB $L_{Amax,slow}$
65
60
55
50
45
40
35
30
25
20
15
10
5
0
17 Oct 24 11:00
17 Oct 24 15:00
17 Oct 24 19:00
17 Oct 24 23:00
18 Oct 24 03:00
18 Oct 24 07:00
18 Oct 24 11:00
18 Oct 24 15:00
18 Oct 24 19:00
18 Oct 24 23:00
19 Oct 24 03:00
19 Oct 24 07:00
19 Oct 24 11:00
19 Oct 24 15:00
19 Oct 24 19:00
19 Oct 24 23:00
20 Oct 24 03:00
20 Oct 24 07:00
20 Oct 24 11:00
20 Oct 24 15:00
20 Oct 24 19:00
20 Oct 24 23:00
21 Oct 24 03:00
21 Oct 24 07:00
21 Oct 24 11:00
21 Oct 24 15:00
21 Oct 24 19:00
21 Oct 24 23:00
22 Oct 24 03:00
22 Oct 24 07:00
22 Oct 24 11:00
22 Oct 24 15:00
22 Oct 24 19:00
22 Oct 24 23:00
23 Oct 24 03:00
23 Oct 24 07:00
23 Oct 24 11:00
Date and Time