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Eileen O'Connor Catholic School

Noise and Vibration Impact Assessment

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1 EXECUTIVE SUMMARY

A noise and vibration impact assessment has been prepared on behalf of the proposed development for the new Eileen O'Conner Catholic School located at 84 Gavenlock Road, Mardi. The report is to be submitted as part of the Environmental Impact Statement for a State Significant Development Application (application ID: SSD – 67173718).

The assessment addresses the SEARs related to the noise and vibration impacts, including:

- Construction noise and vibration impacts.
- Operational noise and vibration emissions.
- Noise impacts from additional traffic on nearby public roads generated by the development.
- Impacts on occupant amenity from identified nearby environmental noise sources such as traffic noise.

Ambient noise and vibration levels have been measured at the site using EPA recommended methodologies to establish rating background noise levels at residential receivers, and typical noise levels from the local sources identified as potentially impacting the site.

Assessment criteria for noise and vibration impacts have been established based on EPA guidelines, and other standards relevant to the potential impacts identified. The predicted likely impacts have been assessed against those criteria.

Based on the outcomes of the assessment, controls and mitigation have been proposed to prevent adverse environmental noise impacts at the surrounding properties, and to maintain acceptable school occupant amenity. Section 8.3, 8.4, 8.5, 8.6, 9.7 and 9.8 of the report summarises the preliminary noise and vibration controls and mitigation recommended to maintain the neighbouring residential amenity.

The assessment indicates that the adoption of the recommended controls and mitigation will:

- adequately mitigate impacts at the surrounding receivers from construction and operational noise emissions.
- prevent adverse impacts on school occupant amenity from local environmental noise and vibration sources.

2 INTRODUCTION

A noise and vibration impact assessment has been prepared for the development of a special needs school – Eileen O'Conner Catholic School located within the existing St. Peter's Catholic College at 84 Gavenlock Road, Mardi. This report accompanies an Environmental Impact Statement (EIS) in support of State Significant Development Application (SSD:67173718) for the proposed development.

The assessment addresses the SEARs related to noise and vibration impacts, including:

- Construction noise and vibration impacts.
- Operational noise and vibration emissions.
- Noise impacts from additional traffic on nearby public roads generated by the development.
- Impacts on occupant amenity from identified nearby environmental noise sources such as traffic noise along Keefers Glen.

The subject site and local context are indicated in Figure 1.

The report has been prepared for the sole purpose of a development application assessment and should not be used or relied on for any other purpose.

3 RESPONSE TO SEARS

The following presents the noise and vibration assessment from the SEARs document issued for the SSD Application (SSD – 67173718).

Table 1 – SEARs Requirements SSD-67173718

Issue and Assessment requirements	Documentation
11 Noise and Vibration Provide a noise and vibration assessment prepared in accordance with the relevant NSW Environment Protection Authority (EPA) guidelines. The assessment must detail construction and operational noise (including any public – address system, events, and out of hours use of school facilities) and vibration impacts on nearby sensitive receivers and structures, considers noise intrusion, and outline the proposed management and mitigation measures that would be implemented.	Noise and Vibration Impact Assessment

4 REFERENCED DOCUMENTS

4.1 BACKGROUND INFORMATION USED

The assessment is based on the following drawings, reports and other information:

- Transport and Accessibility Impact Assessment prepared by Traffix (*ref: 23.104r01v02 dated February 2025*).
- Architectural drawings issued by Stanton Dahl Architects dated 10th March 2025.

4.2 GUIDELINES

- Planning Secretary's Environmental Assessment Requirements – Schools (Application Number: SSD-67173718)
- NSW Department of Environment and Heritage, Environmental Protection Authority document – '*Noise Policy for Industry (NPfI) 2017*'.
- Australian Standard AS/NZS 3671:1989 Acoustics – Road traffic noise intrusion – Building siting and construction.
- Australian Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.
- NSW EPA 'Interim Construction Noise Guideline' (ICNG)
- Australian Standard AS2436:2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites"
- DIN4150, 'Vibration in Buildings (2016-12)
- EPA "Assessing Vibration: A Technical guideline".

5 ABBREVIATIONS AND DEFINITIONS

The following Abbreviations and definitions are used in this noise impact assessment.

dB	Decibels - unit for the measurement of sound
dB(A)	A-weighted decibels. Unit of measurement for broadband sound with the A-frequency weighting applied to approximate human loudness perception to sounds of different pitch.
L_{eq}	Energy, time averaged sound level
L_{max}	Maximum sound pressure level, fast response
L_{90}	Sound level exceeded for 90% of the measurement period
R_w	Frequency weighted sound reduction index.
NRC	Average absorption co-efficient for the octave bands with centre frequencies of 250Hz to 2 kHz inclusive.
Day*	For noise emissions assessment - the period from 7 am to 6 pm (Monday to Saturday) and 8 am to 6 pm(Sundays and public holidays). For transportation noise - the period from 7 am to 10 pm
Evening*	Refers to the period from 6 pm to 10 pm.
Night*	The period from 10 pm to 7 am (Monday to Saturday), and 10 pm to 8 am(Sundays and public holidays). For transportation noise - the period from 10 pm to 7am
Project Trigger Level	Target receiver noise levels for a particular noise-generating facility.
Assessment Background Level (ABL)	A-weighted background noise level representative of a single period. (Calculated in accordance with NPfI unless noted otherwise)
Rating Background Level (RBL)	The overall, single-figure A-weighted background level representing each assessment period (day/evening/night) over the whole monitoring period. (Calculated in accordance with NPfI unless noted otherwise)

* Unless nominated otherwise.

6 SITE DESCRIPTION AND THE PROPOSAL

6.1 PROJECT STATEMENT

Catholic Schools Broken Bay (CSBB) provide excellence in Catholic education for the Northern Sydney Metropolitan Area, Northern Beaches and Central Coast of NSW. Due to their work with students with diverse learning needs in their existing schools they have identified the need for a purpose-built school to provide access to inclusive, quality education for students with disability and highly individualised learning needs. A school where educators and allied health professionals work collaboratively to provide resources and services that will help students with disability flourish.

After a review of demographic needs and their existing land assets, CSBB have developed this proposal to develop the Eileen O'Connor Catholic School in Mardi NSW fronting Keefers Glen, on land that was formerly part of St Peter's Catholic College, 84 Gavenlock Road, Mardi.

Project Description:

Catholic Schools Broken Bay (CSBB) are proposing the development of the Eileen O'Connor Catholic School as a purpose-built Kindergarten to Year 12 school for 200 students.

The development involves:

- Demolition of existing sheds, netball courts, infill of existing dam and removal of selected existing trees
- Construction of a two-three storey building comprising of:
    - 20 General Learning Areas catering for 2 streams of Kindergarten to Year 6 and a single stream Years 7-12.
    - Flexible workspaces for Kitchen, TAS (Technology and Applied Studies)/STEAM (Science, Technology, Engineering, the Arts and Mathematics), Visual Arts.
    - State of the art Library.
    - Multi-purpose rooms to cater for activities including gym, fitness, performing arts space and school community events
    - Sensory indoor and outdoor play spaces, basketball court and landscaping
    - Complimentary learning spaces to support collaboration with allied health professionals for tailored interventions and in-class support.
    - Amenities and storerooms
    - Administration and operational facilities
    - Three car parking areas for cars and buses with independent entry & exit points from the site.
    - Parent/carer and transport provider drop off area including a covered drop off zone
- Ancillary works including site services infrastructure
- Universally accessible connections across the campus.

Table 2 - School Uses and Operating Times

Item	Use	Times
General	The proposed School will cater for special needs students from Kindergarten to Year 12. The school will have the following capacity following completion of the development: 71 full time staff 200 Students	Staff Access: Monday – Friday 7am - 5pm Student Access: 9am – 3pm
Outdoor Play Areas	Intended to only be used by school during school operating hours. Occasional afternoon and weekend use for sports tournaments/competitions by community and school	Weekdays – available for use from 3pm until 6pm (allow for additional 1hr pack down until 7pm). Saturdays - between 8.00am and 6.00pm (allow for additional 1hr pack down until 7pm). Sundays and public holidays – no use
OOSH	Out of school hours (OOSH) use of the school facilities.	To be confirmed
Library	Intended use by school only.	Normal school hours only.
Maintenance And Waste Vehicles	As required to service the school.	Between 7am and 6pm

6.2 SENSITIVE RECEIVERS

The following table lists the nearest/potentially most impacted sensitive receivers surrounding the site. A site map indicating nearby noise sensitive receivers and measurement locations is presented in Figure 1.

Table 3 – Sensitive Receivers

Receiver (Refer Figure 1)	Receiver Type	Comment
R1	Residential	Residential dwellings along Keefers Glen and Brickendon Avenue facing North and West.
R2	Residential	Residential dwellings along Deloraine Glen and Woodbury Park Drive facing South.
S1	School	Existing St. Peter's Catholic College that will be subjected to future redevelopment.

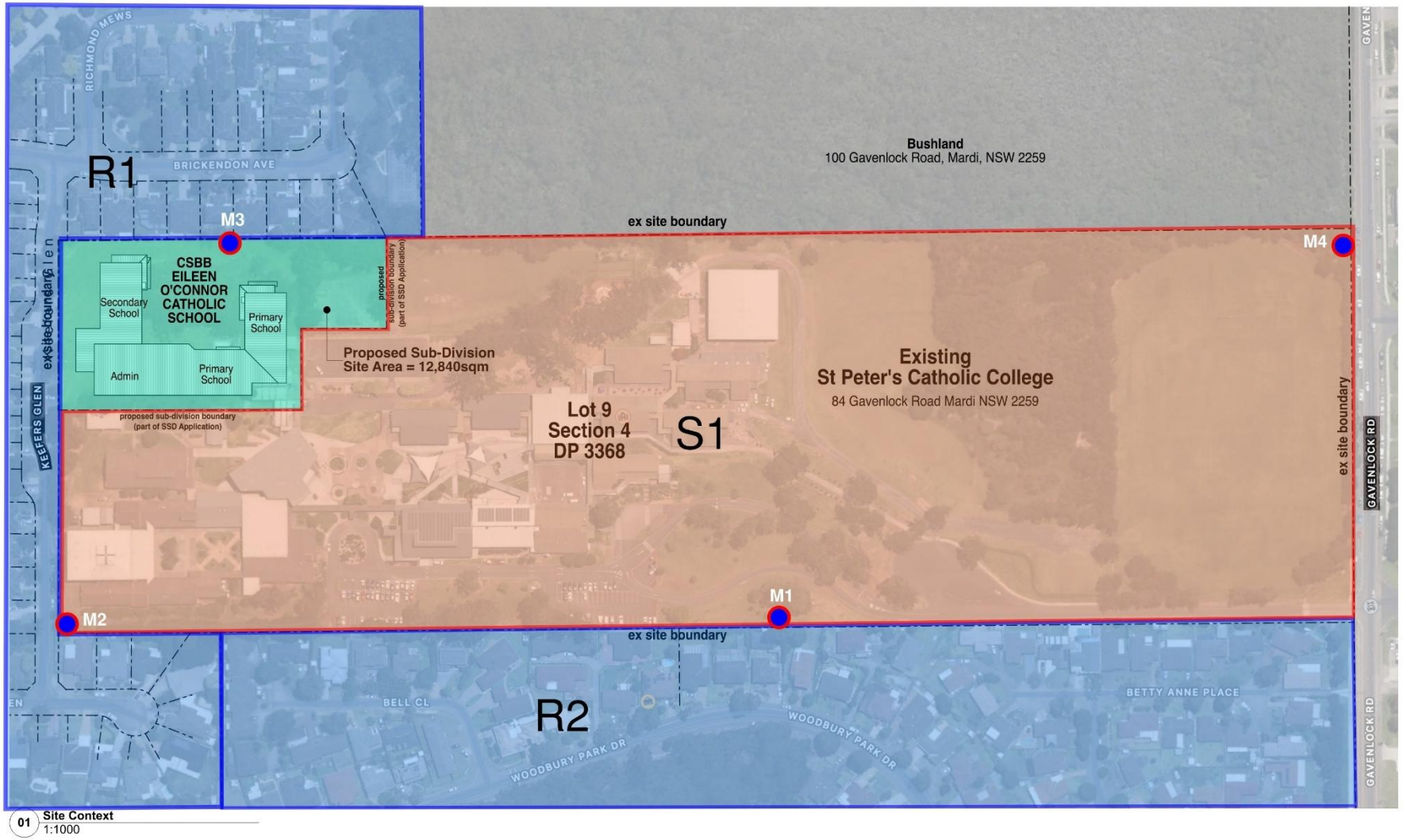


Figure 1: Site map and sensitive receivers identified.

Project Site

Residential Receivers

School Receivers

Monitoring Locations

7 AMBIENT NOISE SURVEY

7.1 UNATTENDED BACKGROUND NOISE MONITORING

Unattended monitoring was undertaken at multiple location within the school to understand the noise levels from different sources.

Four unattended noise monitors were installed within the whole project development. Refer to Figure 1 for detailed location.

7.1.1 Measurement Period

Unattended noise monitoring for background noise was conducted between Tuesday 18th July 2023 to Monday 31st July 2023.

7.1.2 Summarised Background Noise Levels

Background levels have been calculated from the long term, unattended noise monitoring data. Refer to the Appendix B for the daily graphs.

The assessment and rating background levels have been determined based on the methodology in the Noise Policy for Industry Fact Sheet B. Periods affected by adverse weather conditions (as defined by NPfI Fact Sheet B) or extraneous noise are also indicated. Weather data was obtained from records provided by the Bureau of Meteorology for the weather station located at Gosford Weather Station.

The day, evening and night periods correspond to the NPfI guideline being:

- Day - period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays
- Evening - the period from 6 pm to 10 pm
- Night - the remaining periods

The following table summarises the rating background noise levels determined for the day, evening and night periods as defined in the NPfI.

Table 4 – Summarised Measured Noise Levels

Location	Time of day	Rating Background Noise Level $dB(A)_{L90(Period)}$	Traffic Noise Levels $dB(A)L_{eq(period)}$
M1 – South East	Day (7am – 6pm)	42	52 $dB(A)L_{eq(15hr - daytime)}$ 47 $dB(A)L_{eq(9hr - nighttime)}$
	Evening (6pm – 10pm)	42	
	Night (10pm – 7am)	37	
M2 – South West	Day (7am – 6pm)	42	55 $dB(A)L_{eq(15hr - daytime)}$ 51 $dB(A)L_{eq(9hr - nighttime)}$
	Evening (6pm – 10pm)	42	
	Night (10pm – 7am)	39	
M3 – North West	Day (7am – 6pm)	40	54 $dB(A)L_{eq(15hr - daytime)}$ 51 $dB(A)L_{eq(9hr - nighttime)}$
	Evening (6pm – 10pm)	40*	
	Night (10pm – 7am)	36	
M4 – North East	Day (7am – 6pm)	44	59 $dB(A)L_{eq(15hr - daytime)}$ 54 $dB(A)L_{eq(9hr - nighttime)}$
	Evening (6pm – 10pm)	43	
	Night (10pm – 7am)	38	

**Background noise levels have been corrected based on the NPfI 2017 noise requirements that the evening and night period cannot be higher than the daytime noise levels.*

7.1.3 Specific Rating Background Noise Levels Used for the Assessment

The Eileen O'Conner Catholic School is situated along the northwest boundary mainly facing towards R1 along Keefers Glen. Therefore, the closest noise data will be used to establish the noise limits for the school.

Table 5 – Specific Rating Background Noise Levels

Location	Time of day	Rating Background Noise Level $dB(A)_{L90(Period)}$
M3 – North West	Day (7am – 6pm)	40
	Evening (6pm – 10pm)	40*
	Night (10pm – 7am)	36

8 OPERATIONAL NOISE EMISSION ASSESSMENT

In the pre-DA meeting, Central Coast Council made a note to allow consideration towards the noise impacts from ongoing operations of the school in accordance with the NSW EPA Noise Policy for Industry 2017.

8.1 NOISE EMISSION REQUIREMENTS

8.1.1 State Environmental Planning Policy (Educational Establishments and Childcare Facilities) 2017

Schools – Complying Development

6 Noise

A new building or (if the development is an alteration or addition to an existing building for the purpose of chancing its use) an existing building that is to be used for the purpose of a school for school-based child care must be designed so not to emit noise exceeding an LAeq of 5dB(A) above background noise when measured at any lot boundary.

8.1.2 Noise Policy for Industry 2017 (NPfI)

For residential receivers, three criteria are assessed:

- Intrusive assessment– that is, how audible loud is the emitted noise compared to ambient, background noise. Criteria are determined relative to the measured rating background noise level (RBL + 5 dB(A)).
- Amenity assessment – that is, how loud is the absolute level of emitted noise, including cumulative noise from other existing sources considered to be "industrial" emissions. The NPfI nominates appropriate amenity noise levels depending on the receiver type and prevailing noise environment/zoning.
- Maximum Noise assessment – will high-level, short-term noise events cause adversely impact sleep at night. Assessment trigger levels are determined relative to the measured night rating background noise level, and assessed externally, outside rooms where sleep is likely to occur. This assessment is not required for the proposed development as operation during the night period is not proposed.

For residential receivers, the lower of the relevant intrusiveness and amenity trigger levels are adopted. The predicted noise emissions are assessed against the trigger level. Noise emissions not exceeding the trigger levels indicate that adverse impact will not be produced. A maximum noise level assessment is separately undertaken if night time emissions occur.

For other receiver types, only an "amenity" assessment is required.

The project noise trigger level (as outlined in section 2.1 of the policy) is the lower of the intrusiveness and project amenity noise levels. The project noise trigger levels are presented in the table below.

Table 6 – Project Noise Trigger Levels

Location	Period/Time	Rating Background Noise Level dB(A)$_{L90(Period)}$	Intrusiveness Noise Levels dB(A)$L_{Aeq(15min)}$	Project Amenity Noise Levels dB(A)$L_{Aeq(15min)}$	Project Noise Trigger Levels dB(A)$L_{Aeq(15min)}$
Residential Receivers	Day (7am-6pm)	40	45	53	**45**
	Evening (6pm-10pm)	40*	45	43	**43**
	Night (10pm-7am)	36	41	38	**38**
Commercial Receivers	When in Use	-	-	63	**63**
School Classroom - internal	When in Use	-	-	33	**33**
Active Recreation Area	When in Use	-	-	53	**53**

**Background noise levels have been corrected based on the NPfI 2017 noise requirements that the evening and night period cannot be higher than the daytime noise levels.*

8.1.3 Guidelines for School Activities

The Noise Guide for Local Government (NGLG) document indicates that:

- The EPA is the Appropriate Regulatory Authority for public schools.
- Schools are required to comply with the Protection of the Environment Operations Act, and subject to Clause 139 (operation of plant).
- *Meriden v Pedavoli [2009 NSWLEC 183]* in the NSW Land and Environment Court is cited in the NGLG as being relevant to noise emissions from schools. The decision notes that "*All noise that emanates from the normal activities at a school is not offensive*".

Part 3.4 and Schedule 8 of the TISEPP stipulate requirements for school development. There are no specific requirements relating to noise emissions, other than when seeking "complying development" consent, which are:

- compliance with any existing conditions of development consent.
- "Schedule 6 Schools – complying development" Clause 6 "Noise" of the TISEPP includes the following complying development condition:

  A new building or (if the development is an alteration or addition to an existing building for the purpose of changing its use) an existing building that is to be used for the purpose of a school or school-based child care must be designed so as not to emit noise exceeding an L_{Aeq} of 5 dB(A) above background noise when measured at any property boundary.

8.2 NOISE EMITTING SOURCES

The following noise sources associated with the proposed development have been identified:

- "Normal" school activities including internal and external teaching, external recess and sporting activities, maintenance activities.
- External playground areas for active and recreational play purposes.
- Equipment, public address systems, air conditioning and ventilation plant.
- Vehicle movements on the site and on local roads.

8.3 NORMAL SCHOOL ACTIVITIES

8.3.1 External Activities Noise Impact Review

8.3.1.1 General Discussion

In respect of typical school external activities:

- The proposed site for EOCCS is not used as sports fields by St. Peter's Catholic College. As such, the use of any proposed outdoor activity areas will not significantly affect the existing level of noise impact to nearby residential receivers.

- Additionally, schools are typically sited in locations that enable community integration and access, and this generally results in schools being located close to residential properties. Therefore, playgrounds and sport fields are commonly located near residential properties.

- Planning of the school layout can minimise emissions to sensitive receivers. More intensive uses may be located so that distance separation to receivers is maximised, or they are screening by school buildings or landscaping. However, the extent to which this can be practically achieved is typically limited due to site constraints and the need to meet other desirable planning outcomes for the school.

- External activity noise impact at surrounding receivers can be reduced by erecting noise barriers/mounding around the school. These barriers have other negative impacts, including security, overshadowing and visual impacts, and, considering Eileen O'Conner Catholic School is a special needs school, where solid barriers may introduce injury risks to the students. Within Schedule 8 of the TISEPP requires that these aspects be addressed in the design of schools. Because the moderate level of noise impact from normal school activities, and for these reasons sated, barriers are typically not used in schools.

8.3.1.2 External Noise Sources (Outdoor Dance Stage Area)

Noise emissions from the proposed use of dance stage and amphitheatre area have been assessed and summarised below:

- An analysis has been conducted assuming that the maximum sound pressure level emitted is 85dB(A)$L_{eq.}$
- It is important to note that for typical use such as school assembly and other passive activities, the noise levels would typically be around a spatially averaged L_{eq} of 75 dB(A).. The current area is an open field used for sports activities that would generate a similar noise level.
- The open dance stage area will be in direct line of sight from the residential receivers along the Northern boundary, however as it is approximately 50m set back from the receivers, it is predicted that noise levels at the receiver from the use of the stage would be less than 45dB(A).
- The open stage area will also be used for imaginative play during recess hours and drama lessons. It is expected that music will be played within the short period of time. However, all activities will be undertaken within normal school hours.
- In the event that the space is to be used outside of the normal school hours or for community use, a separate noise emission assessment with specific details such as the number of patrons and use of music for the event is to be considered. Site specific attenuation methods and management controls can be provided to ensure the noise levels are controlled.

8.3.1.3 The Use of PE Court

- Based on the architectural plans, the proposed PE court located at the north east of the site would be the highest noise generating source, particularly to residents to the north due to its proximity to those receivers. When the court is in use it is predicted that 50dB(A) would be generated at the nearest receivers to the north with 10 children evenly distributed across the court area. With respect to the noise levels generated we note:
    - The usage of PE court would generally impact the closest residential dwellings, however, impacts to residences further away from the area would be lower.
    - The area is currently an open field used by the existing students for sports and outdoor activities. The noise emissions and regularity of the proposed activities will not differ significantly from the existing use.
    - The courts would generally be used passively during break times, after school club activities or during sport competitions. It is expected that these events would occur mostly during day light hours.
    - The residences have existing barriers that are at least 1.5m high for visual privacy purposes, and these barriers also provide acoustic screening to the residences. The screening has not been factored into the predictions given that the noise sources are not static, and that the level of noise attenuation provided will differ depending on the proximity of the barrier to the noise source. Notwithstanding, it is noted the noise levels generated will typically be lower than the predicted worst case noise level.
- In light of the above, and in the context of the existing noise environment, noise impact from the use of the PE court is considered reasonable as it is not expected that the court will be used outside of operational school hours or on the weekends.

8.3.2 Internal Activities Noise Impact Review

For typical activities within school buildings, while the LEC decision indicates that normal school activities are not considered to be offensive, "background noise level plus 5 dB(A)" for emissions to adjacent residential properties has been adopted as a design goal, which is consistent with the complying development condition for school buildings.

A review of noise from typical internal activities has been undertaken to determine whether noise emissions are likely to exceed the background noise level by more than 5 dB(A). Where exceedances of this noise level are predicted, the measures available to reasonably minimise noise emissions are discussed.

Rating background noise levels have been established from long term ambient noise monitoring, which is summarised in Appendix A and Appendix B. The applicable goals are summarised in the following table.

Table 7 – Noise Goal for Emissions from Buildings

Location	Time of day	RBL,dB(A)$L_{eq(period)}$	Background + 5 dB(A)
R1 and R2	Day (7am – 6pm)	40	45
	Evening (6pm – 10pm)	40	45

Noise emissions to the surrounding properties have been predicted based on the following:

- The SSDA architectural drawings.
- Open windows to a combined area of 5% of the floor area.
- The following internal sound pressure level spectra:

Table 8 – Typical School Activity Internal Noise Levels (dB, Leq)

Room / Activity	Octave Band Centre Frequency Hz								dB(A)
	63	125	250	500	1k	2k	4k	8k	
General Teaching	-	69	69	69	63	60	60	58	**68**
Music Practice	81	81	78	76	76	73	70	64	**80**

The following table summarises the predicted assessed, worst-case noise levels at the surrounding receivers taking into account building envelope attenuation, distance attenuation, and directivity and barrier attenuations where present.

Table 9 – Internal Noise Emission Predictions (dB(A)L_{eq})

Source Room	Receiver	Predicted Noise Level	Background + 5 dB(A)	Cumulative Noise Consideration – dB(A)	Comments
GLA rooms with windows open	Receivers on the West	29	≤45	<2	Complies with the Noise Objectives
	Receivers on the North	29	≤45	<2	Complies with the Noise Objectives

The predictions indicate that noise emissions to the surrounding sensitive receivers do not exceed the noise goal.

8.4 PUBLIC ADDRESS SYSTEMS AND SCHOOL BELL

The school bell/PA system would generally only operate during normal school hours. Minimise noise spill to adjacent properties and do not exceed NPfI intrusiveness criteria by adopting one or more of the following principles:

- Using a large number of smaller speakers placed close to the targeted area of coverage.
- Use of high directional speakers (angled downwards) that target the desired area of coverage.
- Locating speakers so they are screened and as far as possible from surrounding receivers.
- Minimising announcements.
- Selecting bell sounds with characteristics that are less intrusive.

8.5 MAINTENANCE ACTIVITIES

This includes regular site maintenance such as cleaning, lawn mowing, ad-hoc repairs, and waste management. These are typical activities that are carried out in schools and noise impacts (if any) can be managed by scheduling these to normally occur between 7am and 6pm Monday to Friday and 8am to 1pm Saturdays. For waste collection 7am to 6pm weekdays is preferred.

8.6 NON-SCHOOL USES AND AFTER-HOURS ACTIVITIES

Detailed out of hours activities are unknown at this stage, however it would be similar to the noise levels presented in Table 9. Above. This mainly would include parent/teacher nights, election activities, music practices which typically occur within a classroom/hall. It is recommended to have the windows to remain close during these hours.

8.7 NOISE FROM MECHANICAL PLANT

The primary sources of noise are from mechanical ventilation and air conditioning plant. This plant does not produce "maximum noise events", and would not normally operate during the EPA night period. Therefore, a "maximum noise level assessment" is not required for these noise sources.

There is insufficient information on which to undertake a quantitative assessment of noise emissions. As the plant associated with typical school developments are generally not major installations and are distributed through the school, noise emissions compliant with the nominated trigger levels can be achieved through a combination of typical mitigation methods including:

- Selecting quiet plant.
- Locating plant away from sensitive receivers, and using buildings on the site and/or dedicated solid barriers to screen plant from receivers.
- Enclosing or treating plant to reduce noise emissions.

A detailed acoustic assessment of all ventilation or other plant items should be undertaken at construction certificate stage once equipment items are selected and locations are finalised.

8.8 VEHICLE MOVEMENTS ON THE SITE AND ON LOCAL ROADS

8.8.1 Vehicle Movements on the Site

Noise modelling using SoundPlan was conducted in accordance with the traffic impact assessment prepared for the development. (See Figure 2 to Figure 4.for the 3D modelled results).

On-site movements occur as a result of staff, visitor and carer vehicles, waste and maintenance vehicles accessing parking spaces and manoeuvring in the carpark, and a limited number of school buses as indicated in Table 10 below. Carpark activity will occur primarily between 7am and 6pm. Occasional use of the carpark up to 10pm for parent/teacher nights, meetings and presentation will occur occasionally throughout the school year only.

Noise to the most impacted receivers from carpark use has been predicted based on:

- Small vehicle average sound power level of 84 dB(A).
- Heavy vehicles or buses average sound power level of 94dB(A).
- All vehicles to be moving at 10km/hr within the school and 40km/hr along the local road school zone.
- In addition to the above, the existing traffic movements are also included within the assessment.
- Vehicle paths indicated by the site plan showing the location of the carparks.

Table 10 -Traffic Numbers Based on Traffic Report

Source	AM Peak (vehicles/hr)	PM Peak(vehicles/hr)
Existing Traffic	Light Vehicles – 35	Light Vehicles – 28
	Heavy Vehicles - 3	Heavy Vehicles - 4
Additional Traffic Generation	Staff Vehicles - 60	Staff Vehicles - 60
	Parents Vehicles – 200	Parents Vehicles – 200
	School Bus- 2	School Bus- 2

8.8.2 Public Road Traffic Noise Generated by the Proposed Development

The impact of additional traffic generated by the proposed development has been assessed using the EPA RNP, which states the following:

- Section 2.3 of the RNP provides noise assessment criteria at residential (Table 3) and non-residential receivers (Table 4), and for different road classifications.
- Where existing traffic noise is already close to or exceeds the criteria in Tables 3 or 4, the RNP indicates the increase in noise should be assessed instead of the absolute level. For sensitive land uses affected by additional traffic on existing roads, any increase in the total traffic noise level should be limited to 2dB(A) above that of the corresponding 'no build option'. The RNP indicates that an increase of up to 2dB(A) represents a minor impact that is considered barely perceptible to the average person.
- Where nighttime traffic movements are proposed, the impact on sleep from maximum noise events generated by these movements should also be considered for residential receivers.

The following table summarises the peak hour noise impact resulting from traffic generated by the proposed development on public roads based on traffic data obtained from the Traffic Assessment.

Table 11 – Noise Impact Assessment – Local Road Noise

Road	Receivers	Predicted Maximum Noise Levels dB(A)L_{eq}	Existing Measured Traffic Noise Levels dB(A)L_{eq}	Comments
Keefers Glen	R1	56	54 dB(A)$L_{eq(15hr - daytime)}$	2 dB increase, which is considered minor impact

The analysis indicates that the increase in noise from traffic on any of the surrounding roads does not exceed 2 dB(A). The increase in road traffic noise as a result of the proposal would not be noticeable and is compliant with the objectives of the RNP.

8.8.3 Traffic Noise Results

The SoundPlan results are as shown from Figure 2 to Figure 4 below.

In general, with the increase of traffic along Keefers Glen and the surrounding local roads will only increase 1-2dB(A) from the existing measured traffic noise.

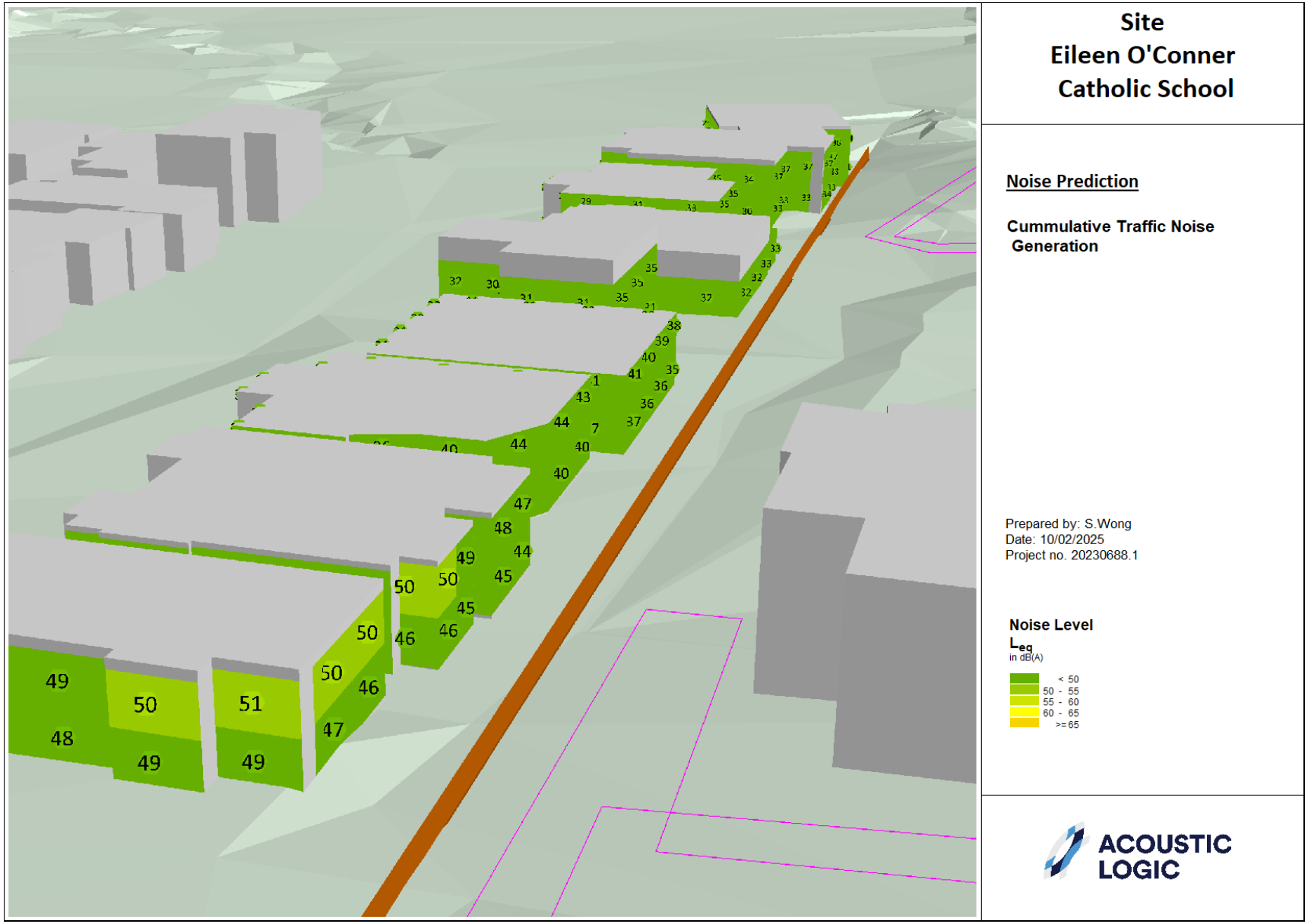


Figure 2: Traffic Noise Levels Generated Along the North

Figure 3: Traffic Noise Levels Generated Along the West

Figure 4: Traffic Noise Levels Generated Along the North East.

9 PRELIMINARY CONSTRUCTION NOISE AND VIBRATION ASSESSMENT

A preliminary construction noise and vibration advice is provided in the following section, a detailed assessment is typically conducted once the proposed construction activities and equipment has been finalised. This assessment will present the relevant the noise management levels, and vibration criteria based on industry standards as follows:

- NSW EPA 'Interim Construction Noise Guideline' (ICNG)
- Australian Standard AS2436:2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites"
- DIN4150, 'Vibration in Buildings (2016-12)
- EPA "Assessing Vibration: A Technical guideline".

9.1 EPA INTERIM CONSTRUCTION NOISE GUIDELINE

The EPA Interim Construction Noise Guideline (ICNG) assessment requires:

- Determination of noise generation goals (based on ambient noise monitoring).
- Review of operational noise levels at nearby development.
- If necessary, recommendation of noise controls strategies in the event that compliance with noise emission goals is not possible.

EPA guidelines adopt differing strategies for noise control depending on the predicted noise level at the nearest receivers. As the surrounding receivers are residential, the following management levels applies.

Table 12 – Summarised Noise Management Levels

Receivers	Noise Management Level – dB(A)$L_{eq(15min)}$	Highly Noise Affected level dB(A)$L_{eq(15min)}$
Residential	45	75

If noise levels exceeded the management levels identified in the table above, reasonable and feasible noise management techniques will be reviewed.

9.2 VIBRATION CRITERIA

Vibration caused by construction at any residence or structure outside the subject site must be limited to:

- For structural damage vibration, German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures; and*
- For human exposure to vibration, the evaluation criteria presented in the British Standard BS 6472:1992 *Guide to Evaluate Human Exposure to Vibration in Buildings (1Hz to 80Hz)* for low probability of adverse comment.

9.2.1 Structure Borne Vibrations (Building Damage Criteria)

German Standard DIN 4150-3 (2016-12) provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 (2016-12) are presented in Table 3.

It is noted that the peak velocity is the value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

Table 3 – DIN 4150-3 (2016-12) Safe Limits for Building Vibration

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms^{-1})			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

9.2.2 Assessing Amenity

The NSW EPA document "*Assessing Vibration: A Technical Guideline*" provides procedures for assessing tactile vibration and regenerated noise within potentially affected buildings and is used in the assessment of vibration impact on amenity.

Relevant criteria are presented below.

Table 4 – EPA Recommended Vibration Criteria

		RMS acceleration Z-axis (m/s^2)		RMS velocity Y-axis (m/s^2)		Peak velocity X-axis (m/s^2)	
Place	Time	Preferred	Maximum	Preferred	Maximum	Preferred	Maximum
Continuous Vibration							
Residences	Daytime	0.010	0.020	0.0071	0.014	0.0071	0.014
	Night-time	0.007	0.014	0.005	0.010	0.005	0.010
Offices, Schools, Educational Institutions	Day or night time	0.04	0.08	0.029	0.058	0.029	0.058
Impulsive Vibration							
Residences	Daytime	0.30	0.60	0.21	0.42	0.21	0.42
	Night-time	0.10	0.20	0.071	0.14	0.071	0.14
Offices, Schools, Educational Institutions	Day or night time	0.64	1.28	0.49	0.92	0.49	0.92

9.3 ACTIVITIES TO BE CONDUCTED AND THE ASSOCIATED NOISE SOURCES

For this project, the most significant sources of noise or vibration generated during construction will be building structure works. The following table presents assessment noise levels for typical construction equipment expected to be used during the construction of the proposal.

Table 13 - Sound Power Levels of the Typical Equipment

Equipment / Process	Sound Power Level dB(A)*
Concrete Pump	110
Trucks	100
Bobcat	105
Crane (electric)	85
Powered Hand Tools	95-100

The noise levels presented in the above table are derived from the following sources, namely:

- Table A1 of Australian Standard 2436-2010.
- Data held by this office from other similar studies.

Noise levels take into account correction factors (for tonality, intermittency where necessary).

9.4 NOISE PREDICTIONS

The predicted noise levels during excavation and construction will depend on:

- The activity undertaken.
- The distance between the work site and the receiver. The distance between the noise source and the receiver will vary depending on which end of the site the work is undertaken. For this reason, the predicted noise levels will be presented as a range.

Predicted noise levels are presented in the following tables. Predictions take into account the expected noise reduction as a result of distance only.

Table 14 – Predicted Noise Generation to Residential Receivers South of Site

Activity	Predicted Level dB(A) $L_{eq(15min)}$ (External)	Comment
Concrete Pump	62-90	Exceeds Highly Noise Affected Level (HNAL)
Trucks	58-72	Exceeds NAML
Bobcat	57-85	Exceeds HNAL when close to site boundaries
Crane/hoist (electric)	37-65	Exceeds NAML, below HNAML at all times.
Powered Hand Tools (Externally)	47-67	Exceeds NAML, below HNAML at all times.

9.5 DISCUSSION – NOISE

Without mitigation noise at the sensitive receivers around the site will exceed the highly noise affected level. Demolition of the existing buildings and excavation works would be the largest contribution for noise. During structural works, concrete pumps are anticipated to generate the highest noise impact.

9.6 DISCUSSION - VIBRATION

Vibration levels are expected to be within the limits as the nearest building to be demolished are approximately 50m away. However, during excavation and structural works, the vibration levels will be recommended to be monitored to ensure that it does not adversely affect the residents along the northern boundary.

9.7 RECOMMENDATIONS

In light of the above, the following recommendations are made:

- A detailed noise management plan should be developed by the main contractor that describes in detail the construction phases, programme, processes and equipment used, noise impact assessment and proposed mitigation and management.
- Quiet work methods/technologies:
    - Materials handling/vehicles:

- Trucks and bobcats to use a non-tonal reversing beacon (subject to OH&S requirements) to minimise potential disturbance of neighbours.
- Avoid careless dropping of construction materials into empty trucks.
- Trucks, trailers and concrete trucks (if feasible) should turn off their engines during idling to reduce noise impacts (unless truck ignition needs to remain on during concrete pumping).

- Complaints handling - In the event of complaint, the procedures outlined in Sections 9.9 should be adopted.
- Site Induction:
  - A copy of the Noise Management Plan is to be available to contractors. The location of the Noise Management Plan should be advised in any site induction.
  - Site induction should also detail the site contact is to be notified in the event of noise complaint.

9.8 GENERAL RECOMMENDATIONS

A detailed assessment is recommended once construction methodologies and equipment has been finalised, this is typically assessed during construction stage. The typical noise management practices which may be adopted are discussed below.

9.8.1 Acoustic Barrier

Barriers or screens can be an effective means of reducing noise. Barriers can be located either at the source or receiver. The placement of barriers at the source is generally only effective for static plant (tower cranes). Equipment which is on the move or working in rough or undulating terrain cannot be effectively attenuated by placing barriers at the source. Barriers can also be placed between the source and the receiver.

The degree of noise reduction provided by barriers is dependent on the amount by which line of sight can be blocked by the barrier. If the receiver is totally shielded from the noise source reductions of up to 15 dB(A) can be affected. Where only partial obstruction of line of sight occurs, noise reductions of 5 to 8 dB(A) may be achieved. Where no line of sight is obstructed by the barrier, generally no noise reduction will occur.

As barriers are used to provide shielding and do not act as an enclosure, the material they are constructed from should have a noise reduction performance which is approximately 10dB(A) greater than the maximum reduction provided by the barrier. In this case the use of a material such as 10 or 15mm plywood would be acceptable for the barriers.

9.8.1.1 Silencing Devices

Where construction process or appliances are noisy, the use of silencing devices may be possible. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

9.8.2 Material Handling

The installation of rubber matting over material handling areas can reduce the sound of impacts due to material being dropped by up to 20dB(A).

9.8.3 Treatment of Specific Equipment

In certain cases, it may be possible to specially treat a piece of equipment to reduce the sound levels emitted. These may take the form of engine shrouding, or special industrial silencers fitted to exhausts.

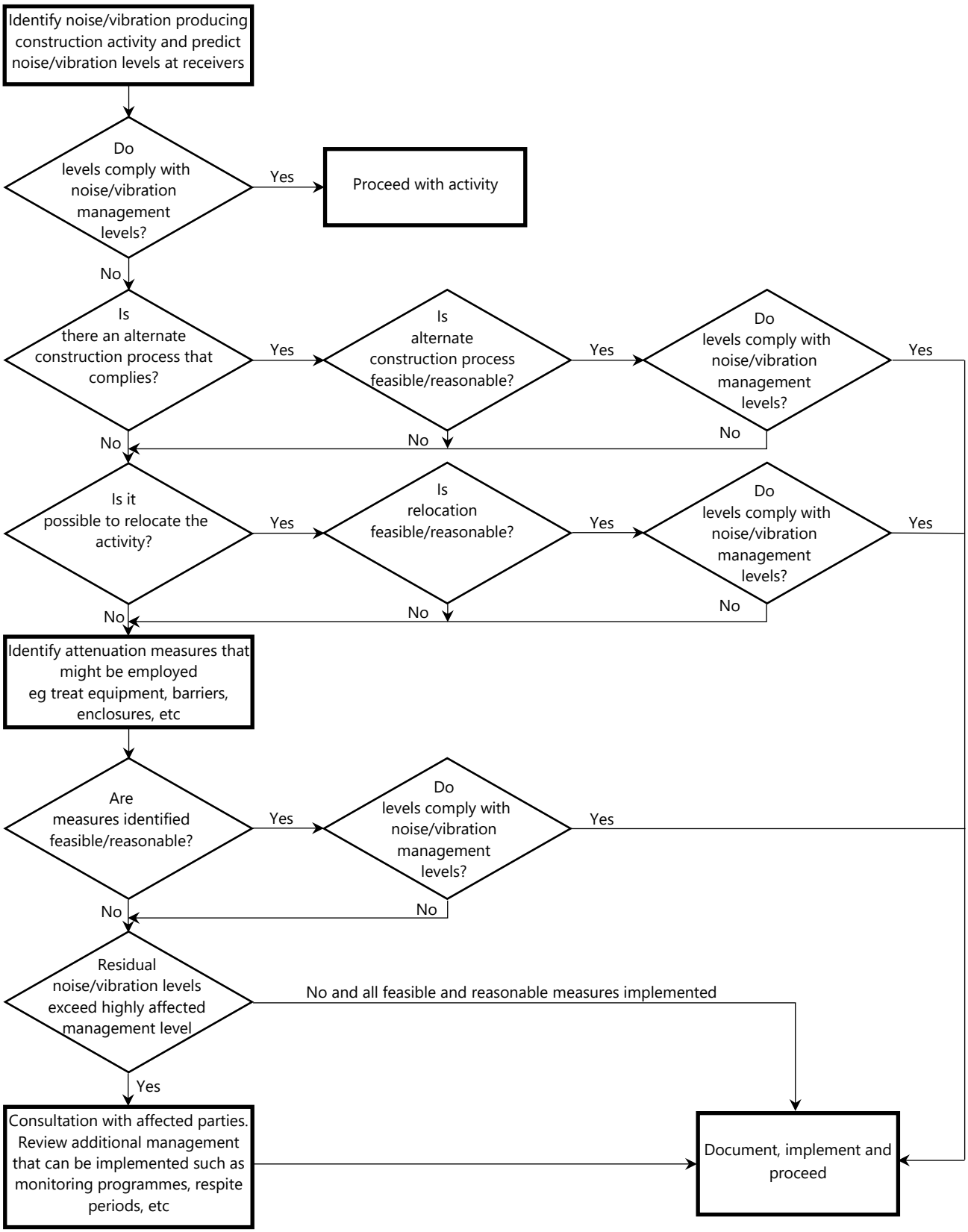
9.8.4 Establishment of Site Practices

This involves the formulation of work practices to reduce noise generation. This includes locating fixed plant items as far as possible from residents as well as rotating plant and equipment to provide respite to receivers.

Construction vehicles accessing the site should not queue in residential streets and should only use the designated construction vehicle routes. Loading of these vehicles should occur as far as possible from any sensitive receiver.

9.8.5 Assessment Methodology and Mitigation Methods

The flow chart that follows illustrates the process to be followed to minimise the impact associated with these activities.



9.9 COMMUNITY INTERACTION AND COMPLAINTS HANDLING

9.9.1 Establishment Of Direct Communication with Affected Parties

In order for any construction noise management programme to work effectively, continuous communication is required between all parties which may be potentially impacted upon, the builder and the regulatory authority. This establishes a dynamic response process which allows for the adjustment of control methods and criteria for the benefit of all parties.

The objective in undertaking a consultation process is to:

- Inform and educate the groups about the project and the noise controls being implemented.
- Increase understanding of all acoustic issues related to the project and options available.
- Identify group concerns generated by the project, so that they can be addressed.
- Ensure that concerned individuals or groups are aware of and have access to the Site Complaints Register which will be used to address any construction noise related problems should they arise.

To ensure that this process is effective, regular scheduled meetings may be required for a finite period, until all issues have been addressed and the evidence of successful implementation is embraced by all parties.

An additional step in this process is to produce a newsletter informing nearby residents of upcoming activities that are likely to generate higher noise/vibration levels.

9.9.2 Dealing With Complaints

Should ongoing complaints of excessive noise, vibration or dust occur, immediate measures will be undertaken to investigate the complaint, the cause of the exceedances and identify the required changes to work practices. In the case of exceedances of the vibration and dust limits, all work potentially producing vibration or dust is to cease until the exceedance is investigated. The effectiveness of any changes will be verified before continuing. Documentation and training of site staff will occur to ensure the practices that produced the exceedances are not repeated.

If a noise complaint is received the complaint will be recorded on a Noise Complaint Form. The complaint form is to list:

- The name and address of the complainant (if provided).
- The time and date the complaint was received.
- The nature of the complaint and the time and date the noise was heard.
- The name of the employee who received the complaint.
- Actions taken to investigate the complaint, and a summary of the results of the investigation.
- Required remedial action, if required.
- Validation of the remedial action.
- If necessary, setup vibration monitoring at the location representing the nearest affected vibration receiver, with alarm device which can inform the project manager on site if the vibration exceedance happened.
- Summary of feedback to the complainant.

A permanent register of complaints will be held.

All complaints received will be fully investigated and reported to management. The complainant must also be notified of the results and actions arising from the investigation.

The investigation of a complaint must involve where applicable.

- noise measurements at the affected receiver.
- an investigation of the activities occurring at the time of the incident.
- inspection of the activity to determine whether any undue noise is being emitted by equipment; and
- Whether work practices were being carried out either within established guidelines or outside these guidelines.

Where an item of plant is found to be emitting excessive noise, the cause is to be rectified as soon as possible. Where work practices within established guidelines are found to result in excessive noise being generated then the guidelines are to be modified so as to reduce noise emissions to acceptable levels. Where guidelines are not being followed, the additional training and counselling of employees is to be carried out.

Measurement or other methods shall validate the results of any corrective actions arising from a complaint where applicable.

10 CONCLUSION

This report presents an acoustic assessment of noise and vibration impacts associated with the new Eileen O'Conner Catholic School located at 84 Gavenlock Road, Mardi. The report is to be submitted as part of the Environmental Impact Statement for a State Significant Development Application (application ID: SSD – 67173718).

Noise and vibration impact assessment has been conducted based on the following documents:

- Planning Secretary's Environmental Assessment Requirements – Schools (Application Number: SSD-67173718)
- NSW Department of Environment and Heritage, Environmental Protection Authority document – '*Noise Policy for Industry (NPfI) 2017*'.
- Australian Standard AS/NZS 3671:1989 Acoustics – Road traffic noise intrusion – Building siting and construction.
- Australian Standard AS/NZS 2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors.
- NSW EPA 'Interim Construction Noise Guideline' (ICNG)
- Australian Standard AS2436:2010 "Guide to Noise Control on Construction, Maintenance and Demolition Sites"
- DIN4150, 'Vibration in Buildings (2016-12)
- EPA "Assessing Vibration: A Technical guideline".

We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

Acoustic Logic Pty Ltd
Samantha Wong

APPENDIX A: MONITORING DETAILS

A.1 UNATTENDED NOISE BACKGROUND NOISE MONITORING

NSW EPA's Rating Background Noise Level (RBL) assessment procedure requires determination of background noise level for each day (the ABL) then the median of the individual days as set out for the entire monitoring period.

Appendix in this report present results of unattended noise monitoring conducted at the project site. Weather affected data was excluded from the assessment. The processed RBL (lowest 10^{th} percentile noise levels during operation time period) are presented in Table 1

A.2 MEASUREMENT EQUIPMENT

Equipment used consisted of one Rion NL-42 noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. Noise monitoring data is provided in Appendix 3.

APPENDIX B : UNATTENDED NOISE MONITORING GRAPHS

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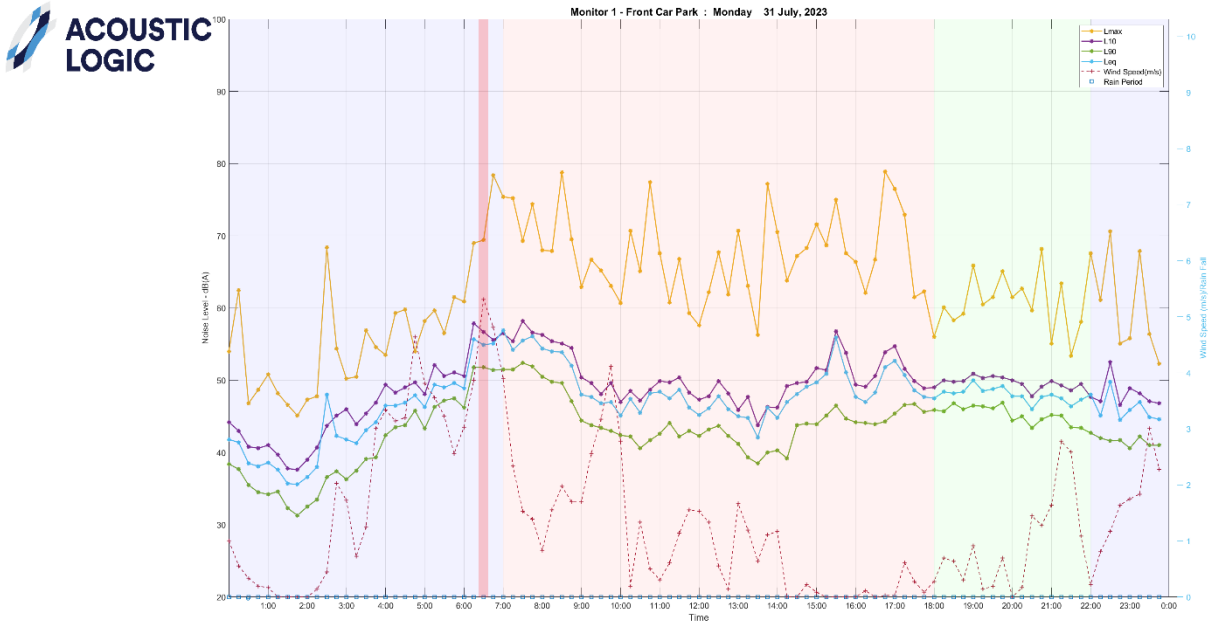

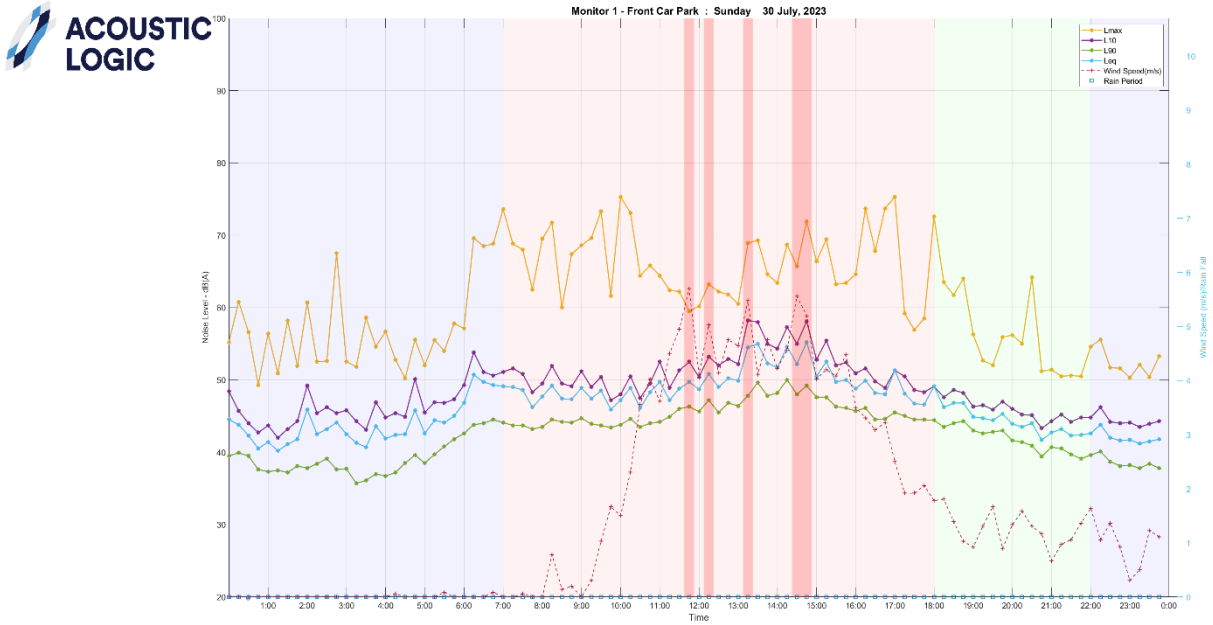

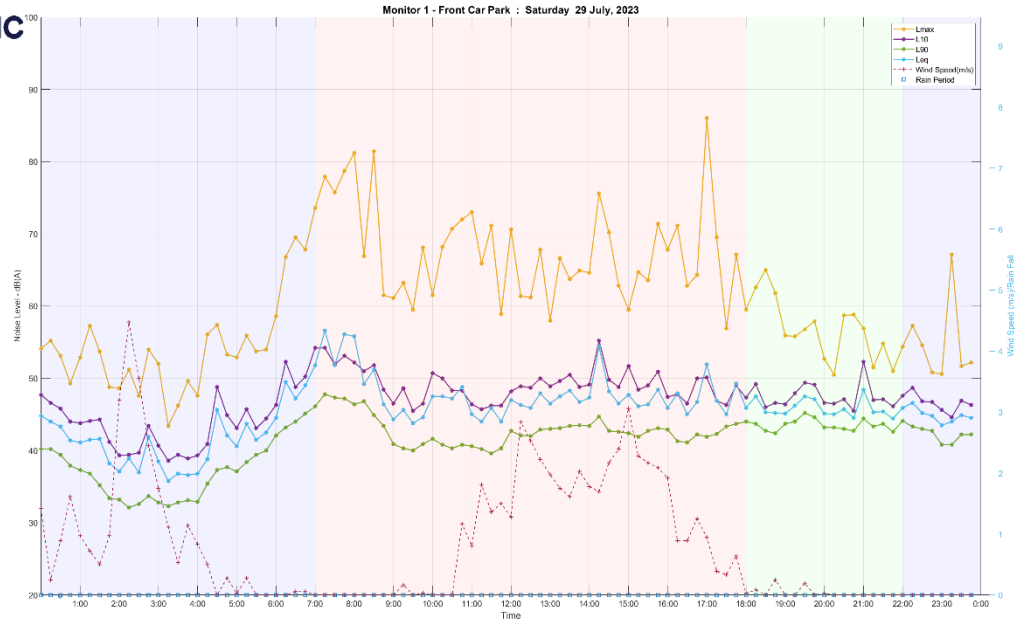
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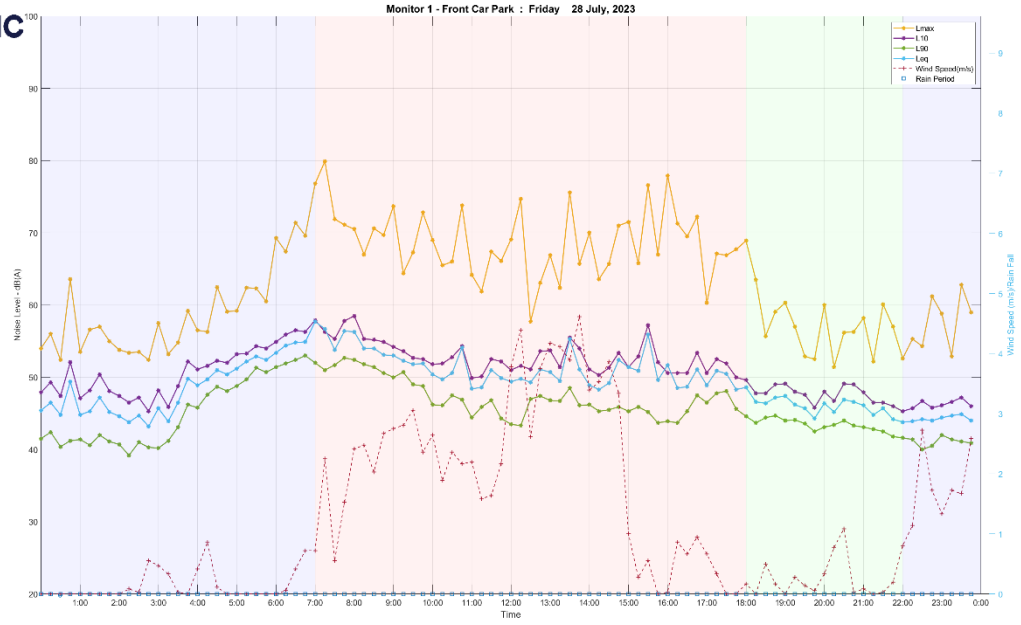
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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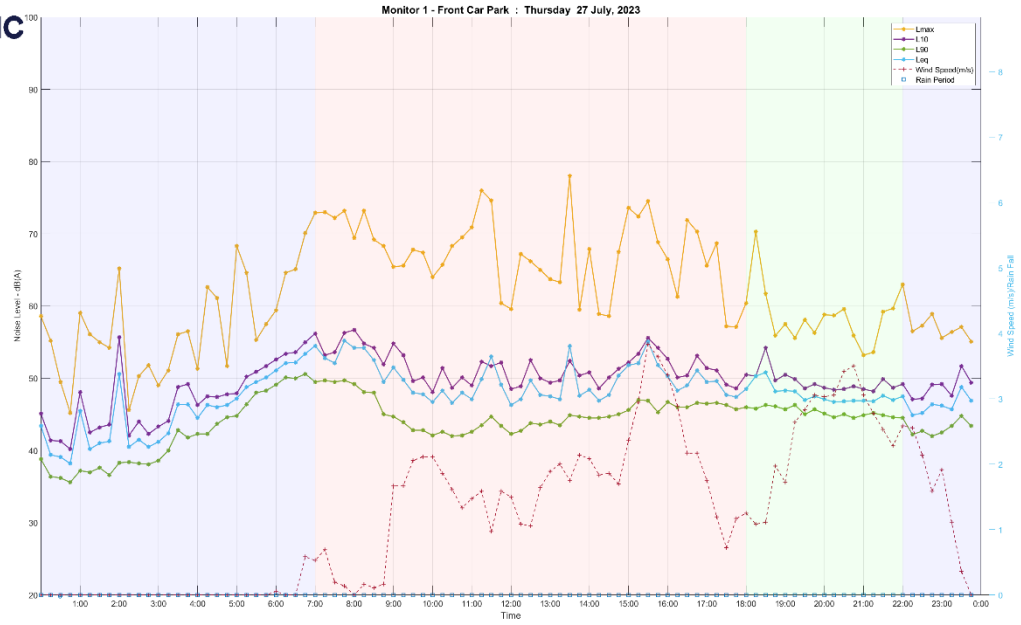
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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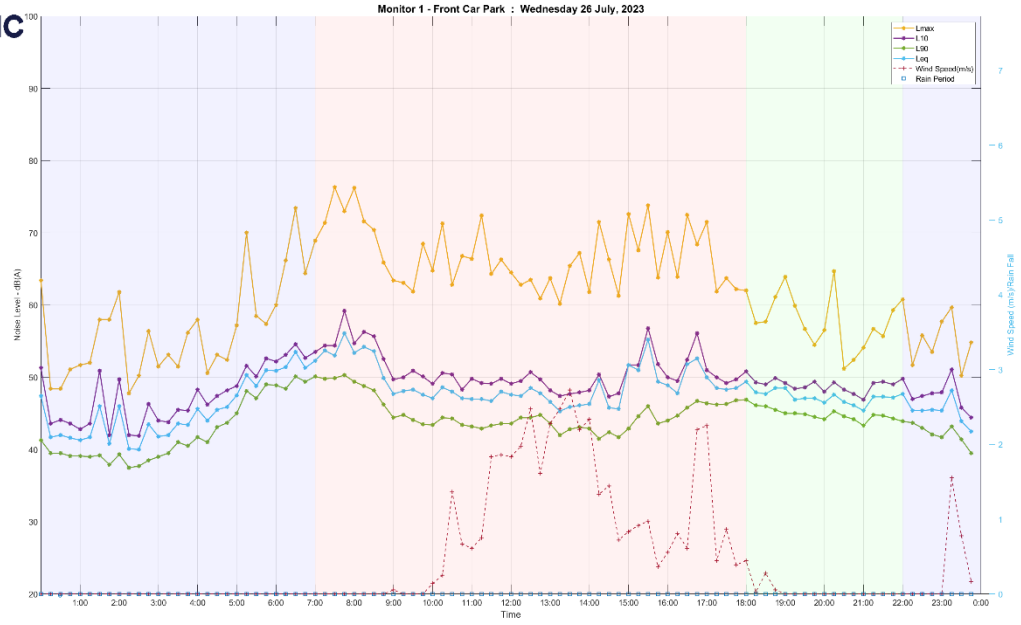
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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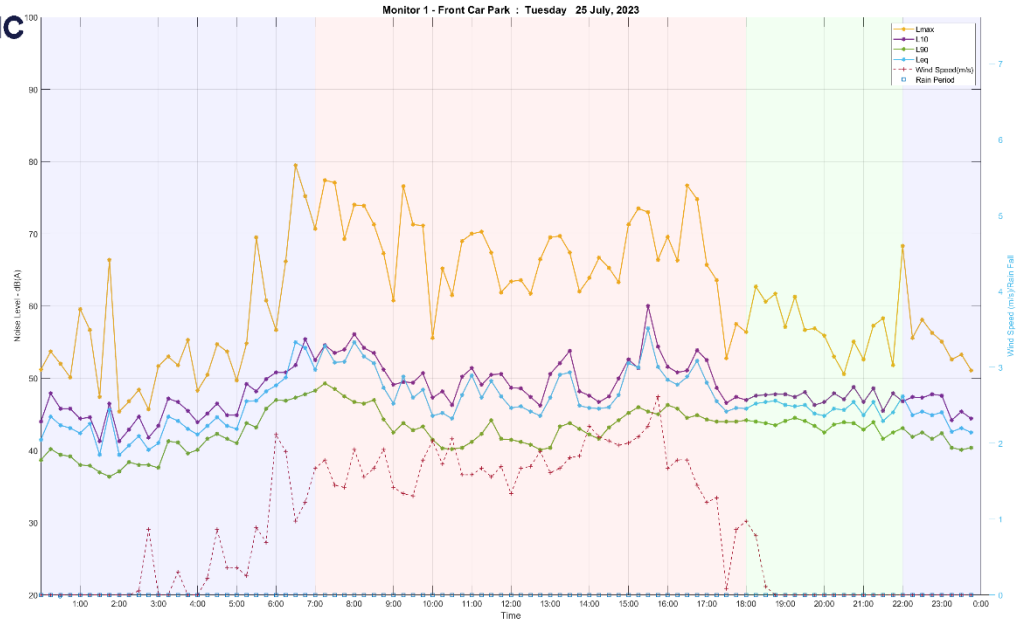
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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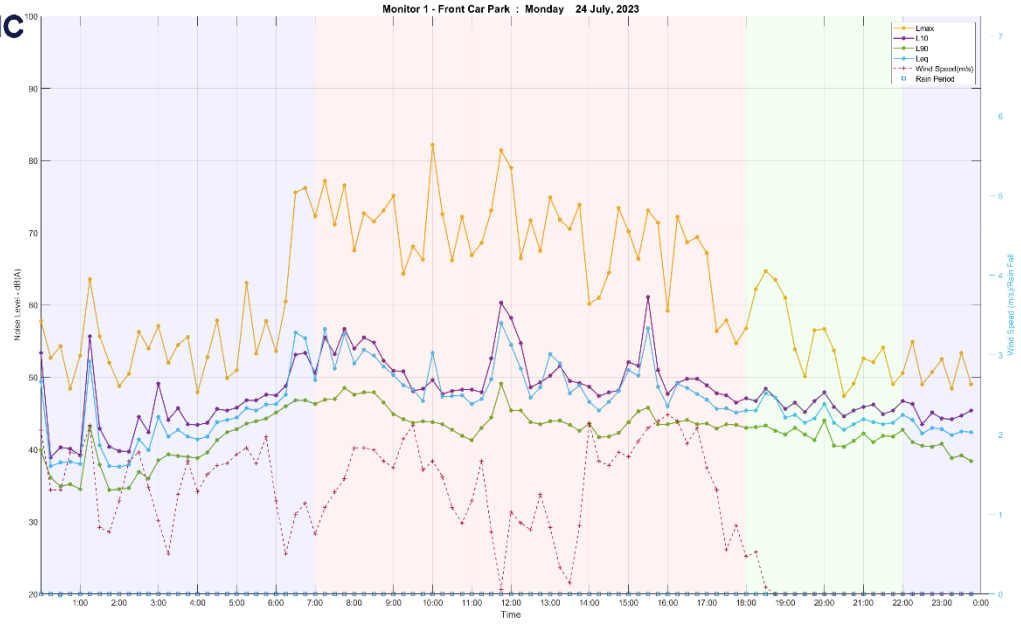
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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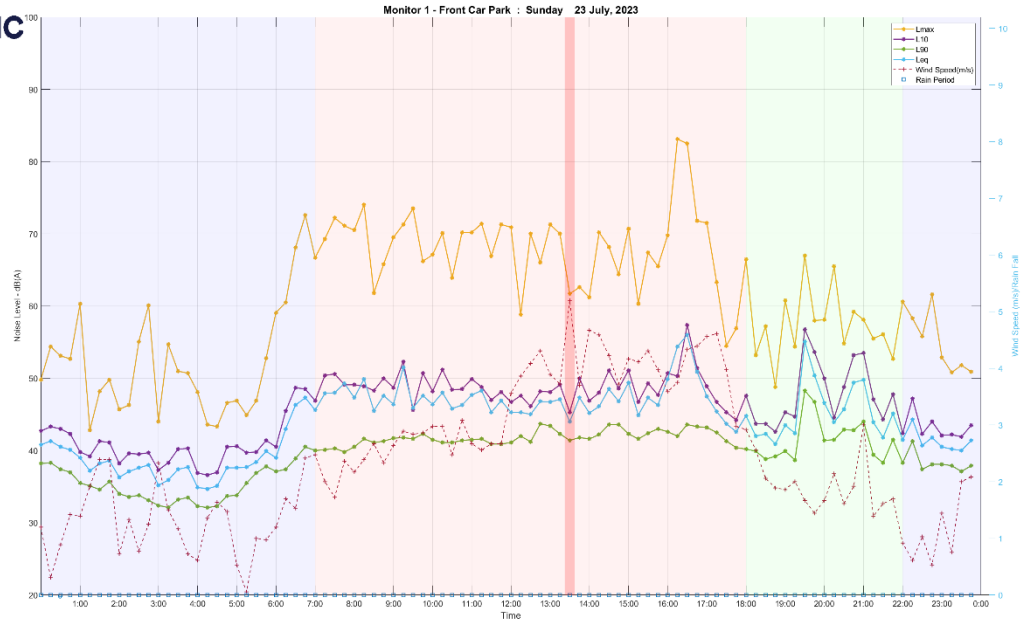
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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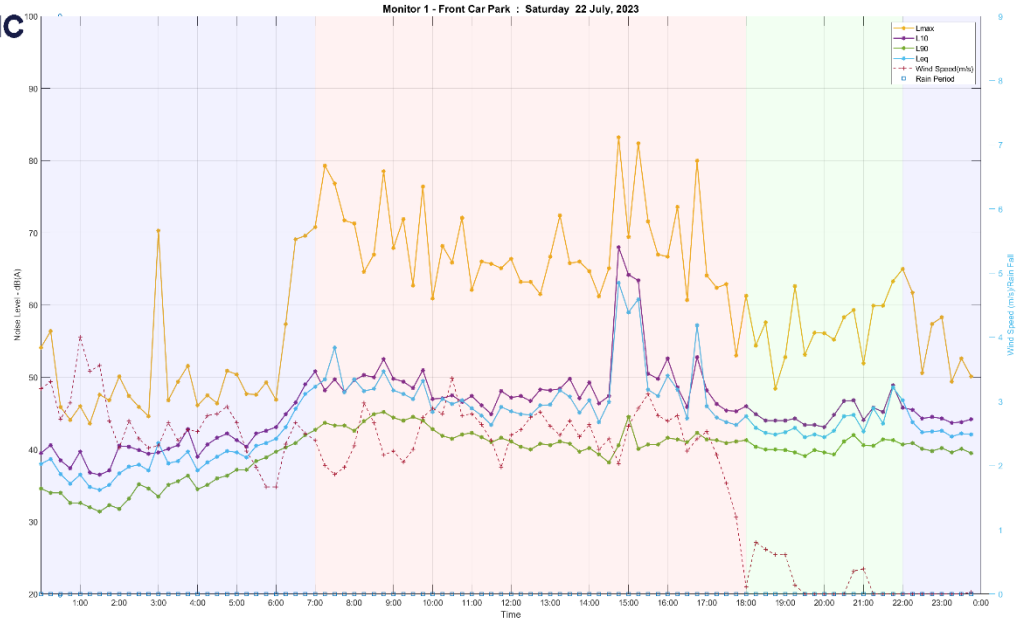
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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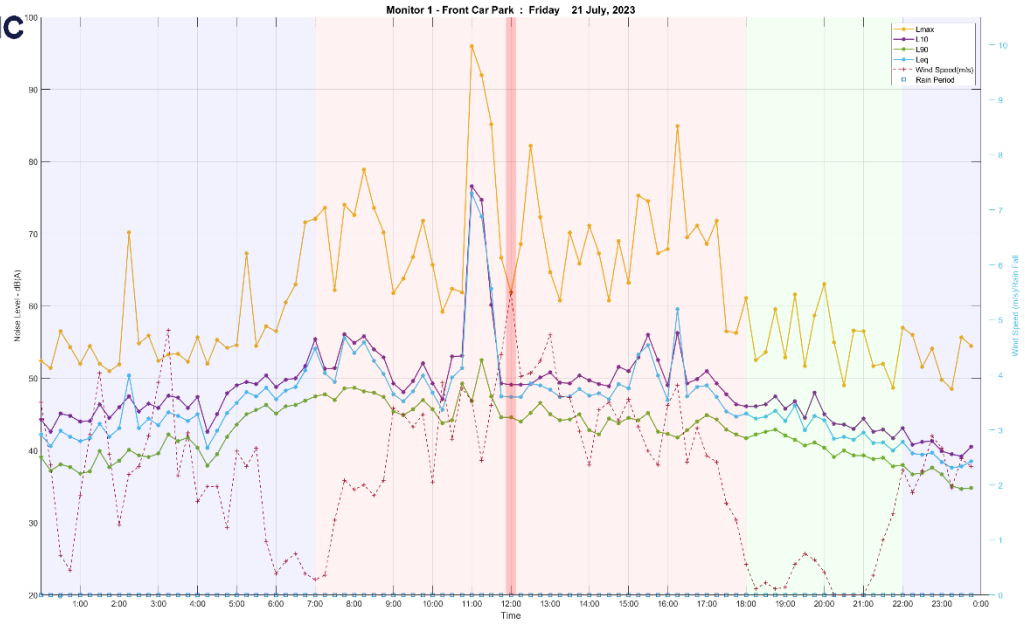
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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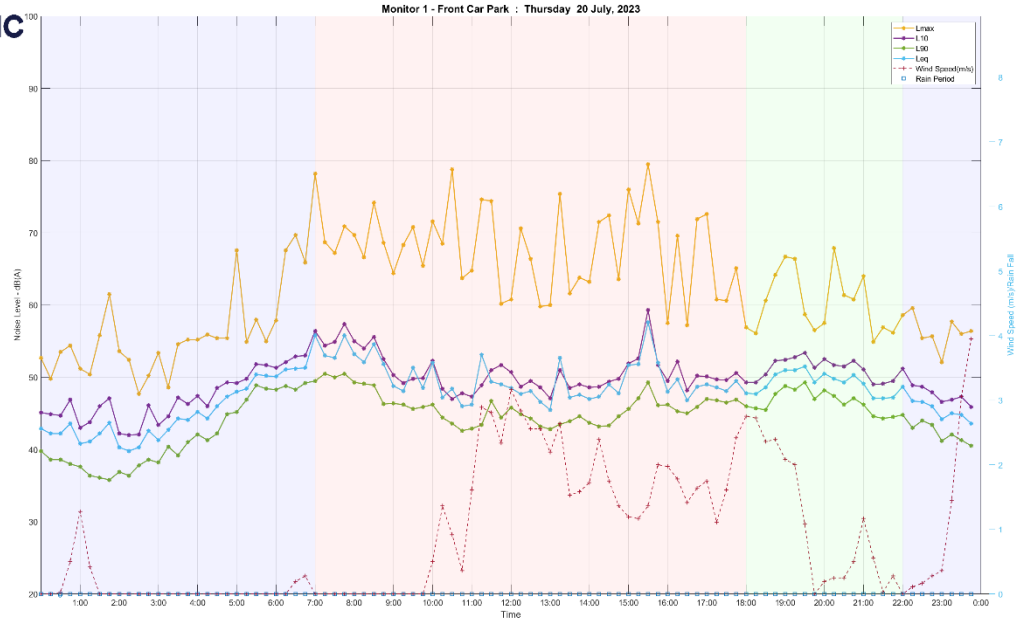
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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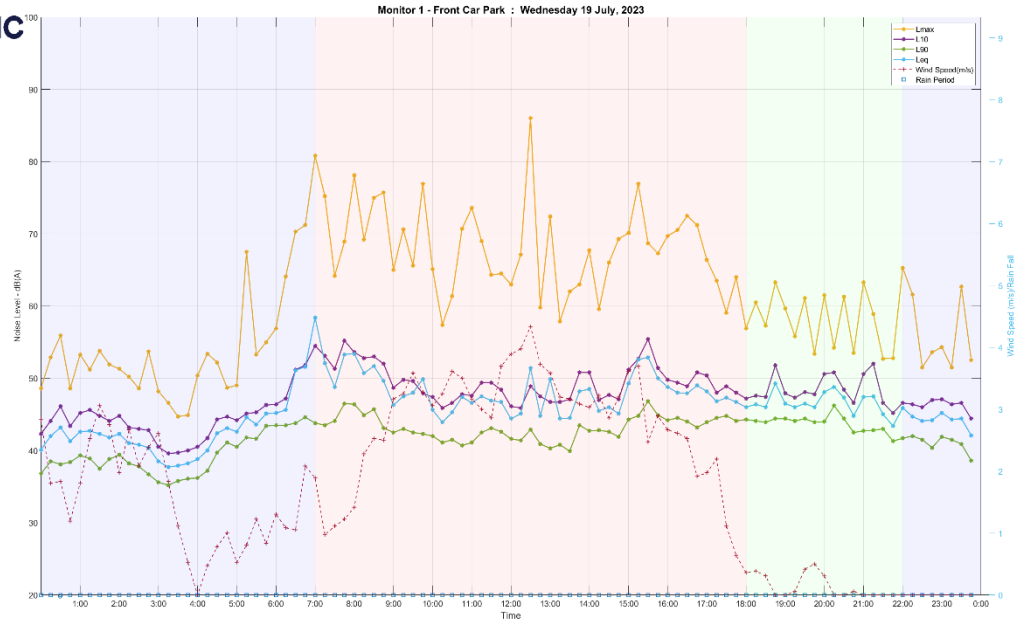
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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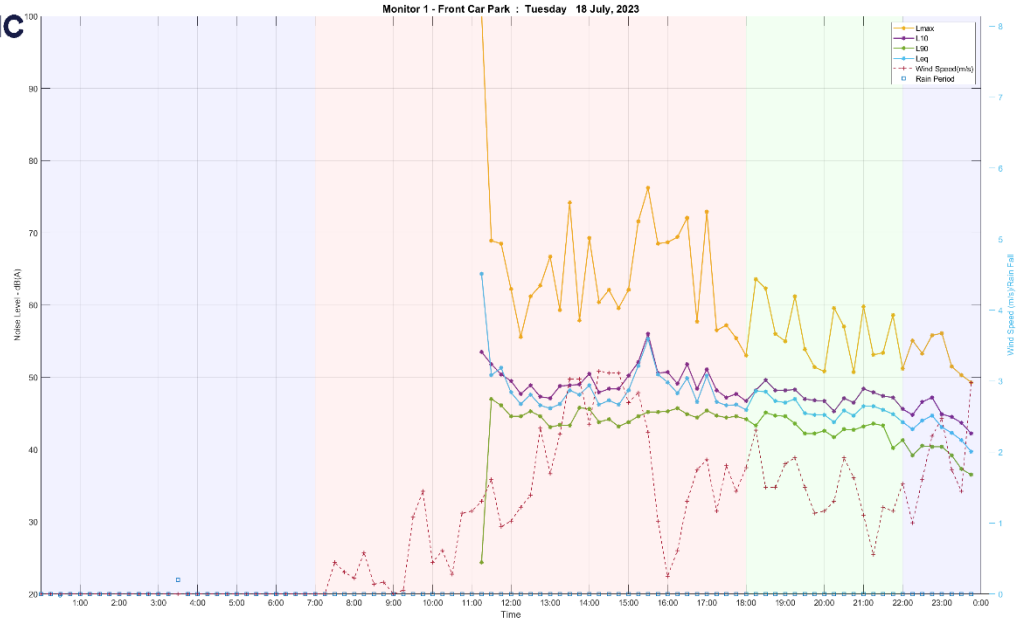
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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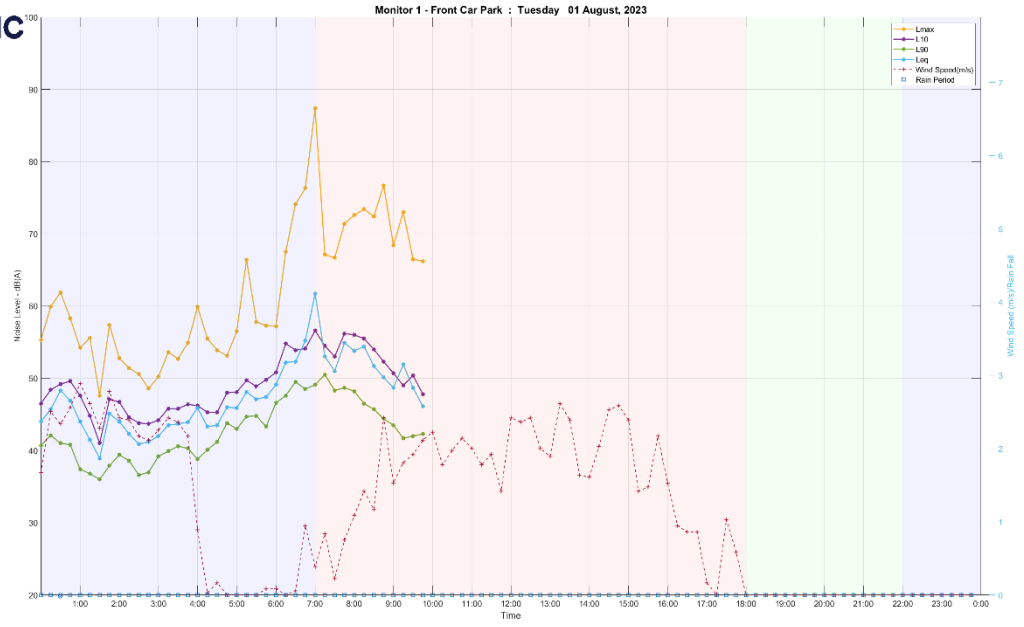
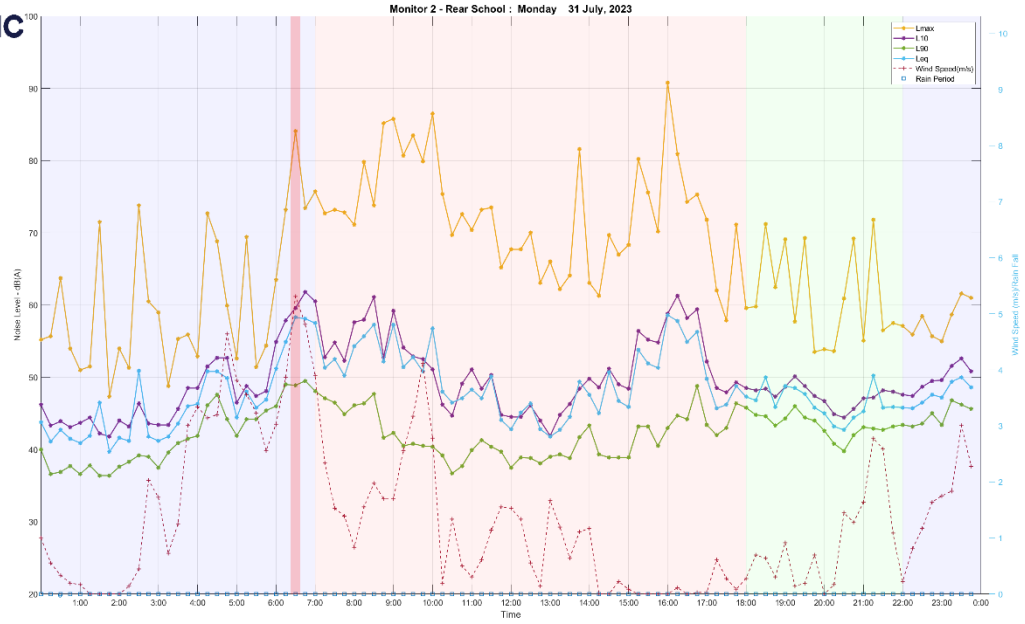
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time



Wind Speed is corrected using factor 1.0000 based on logger location

MONITOR 2: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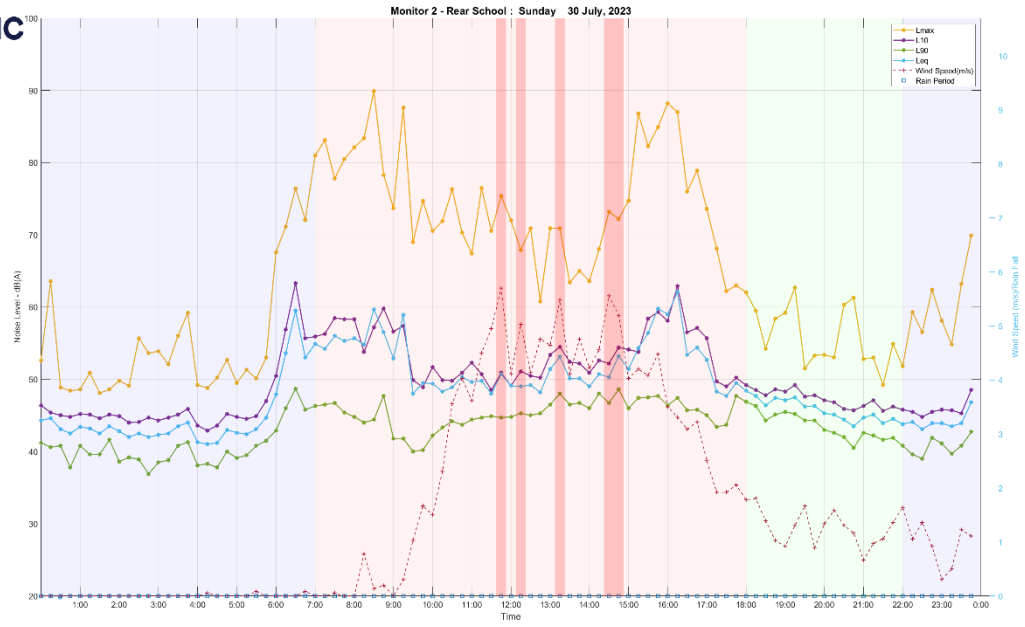
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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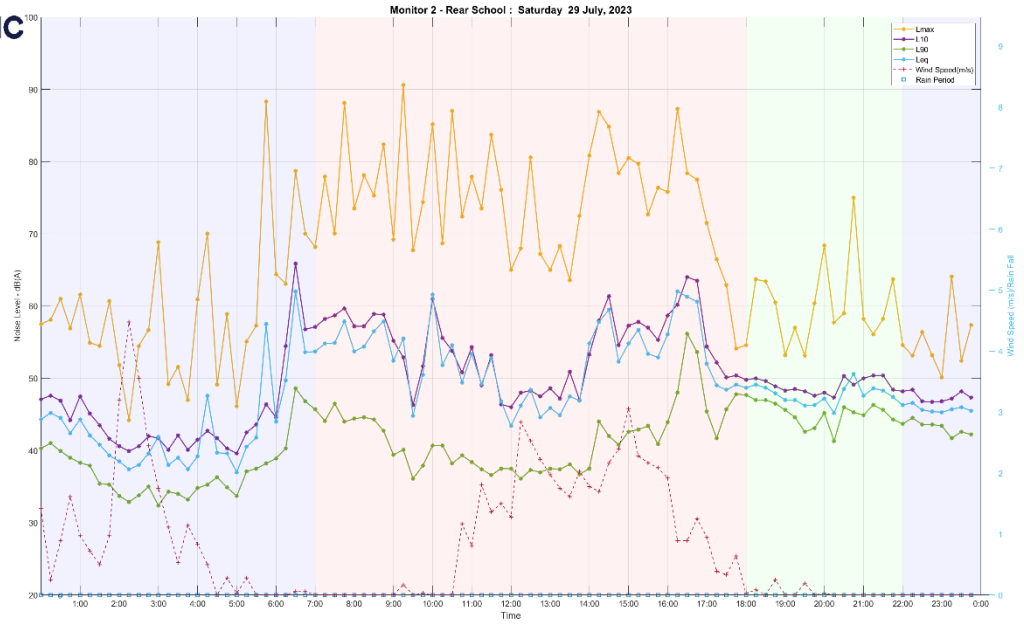
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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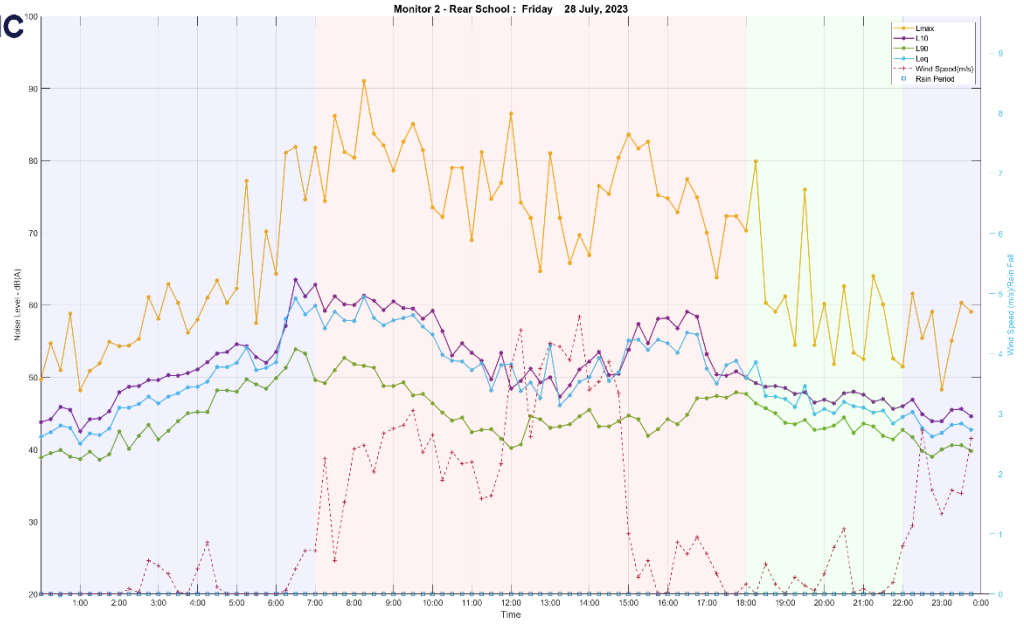
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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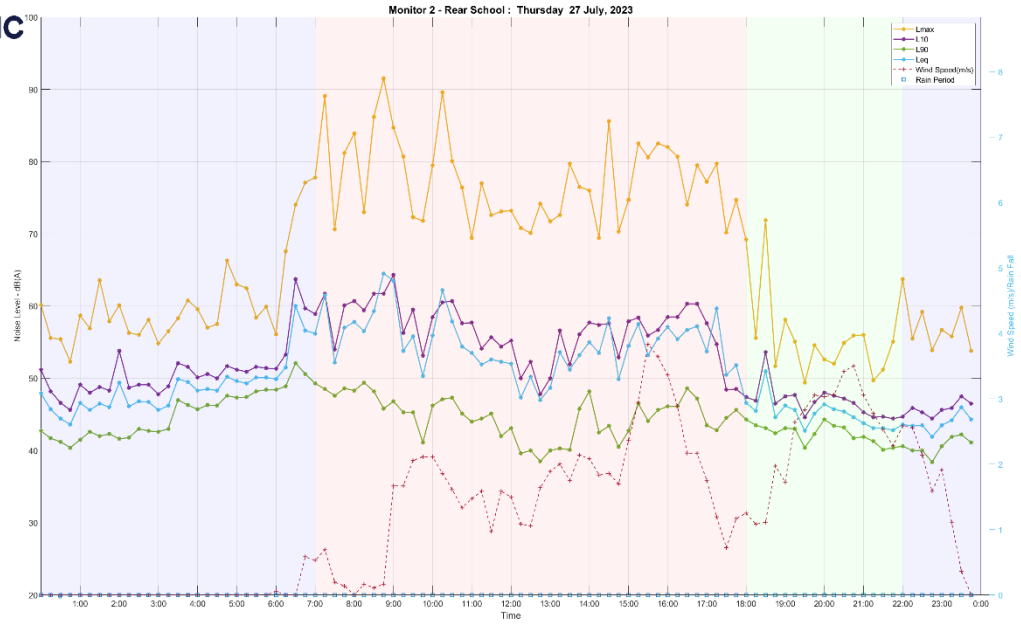
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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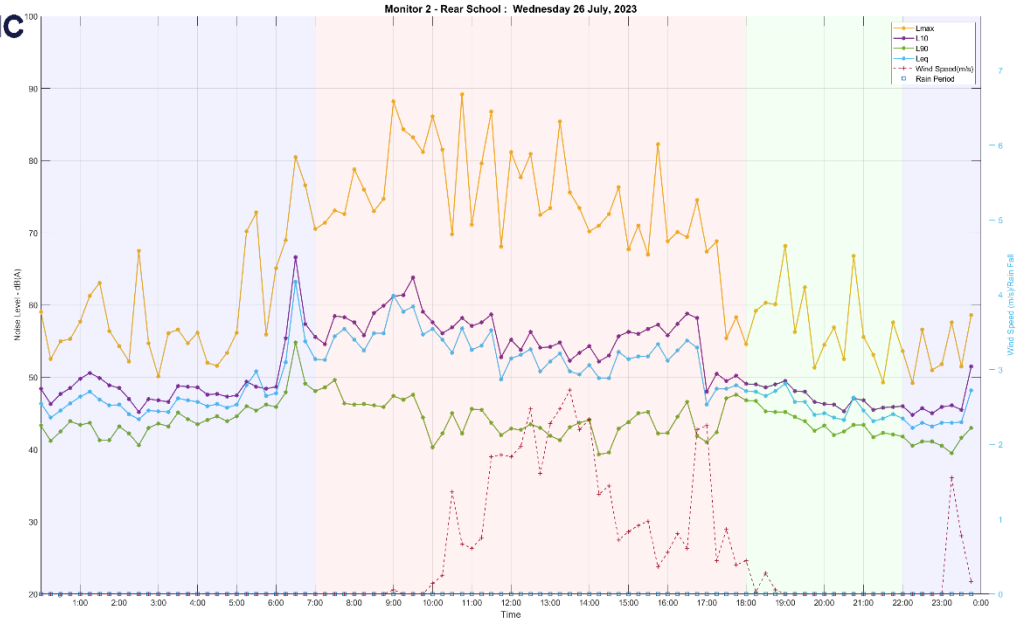
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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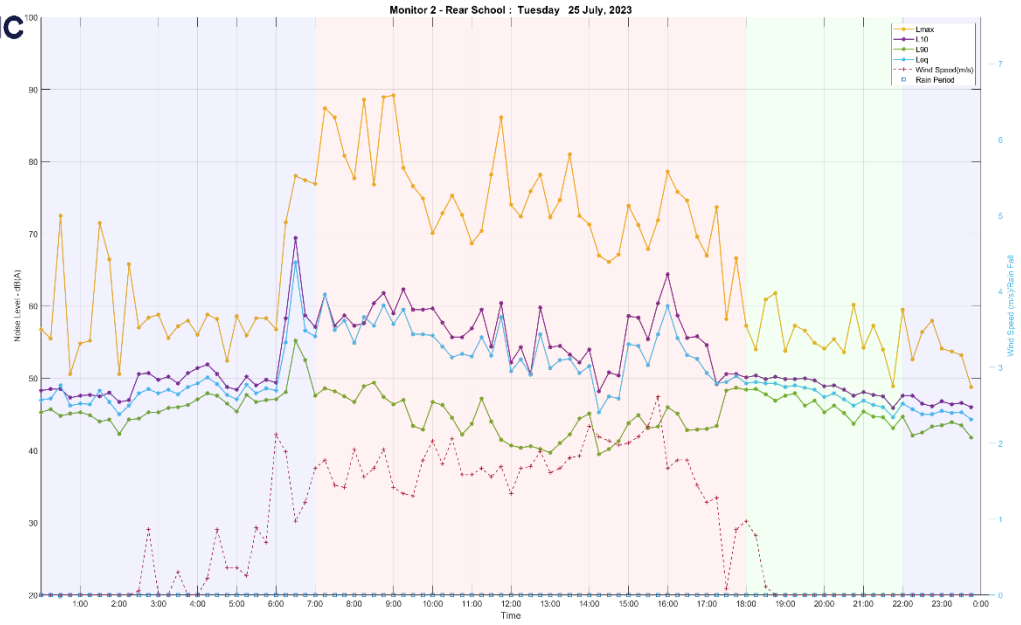
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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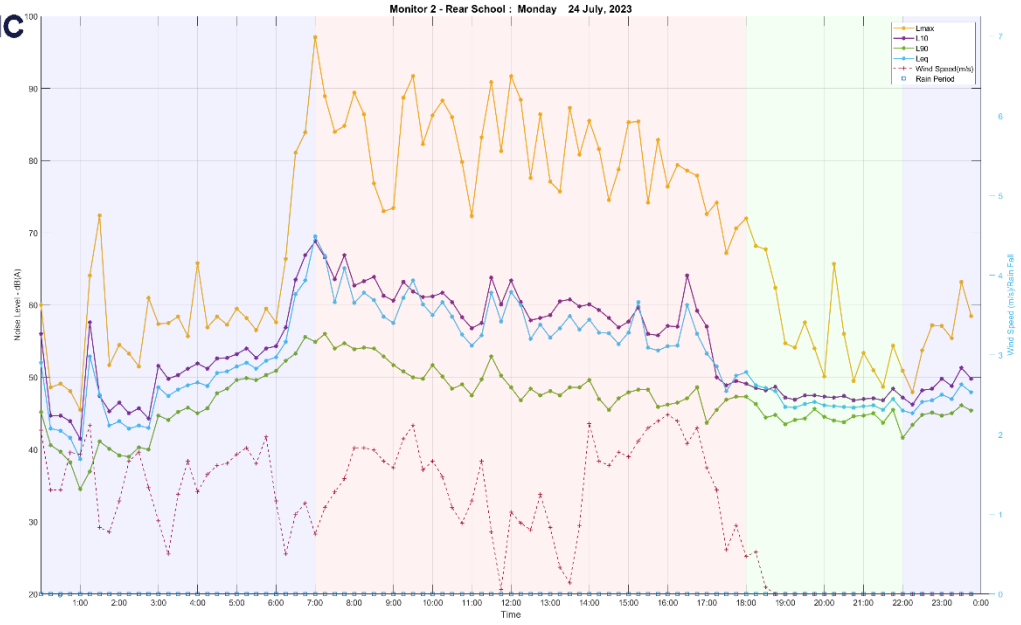
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time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Lmax
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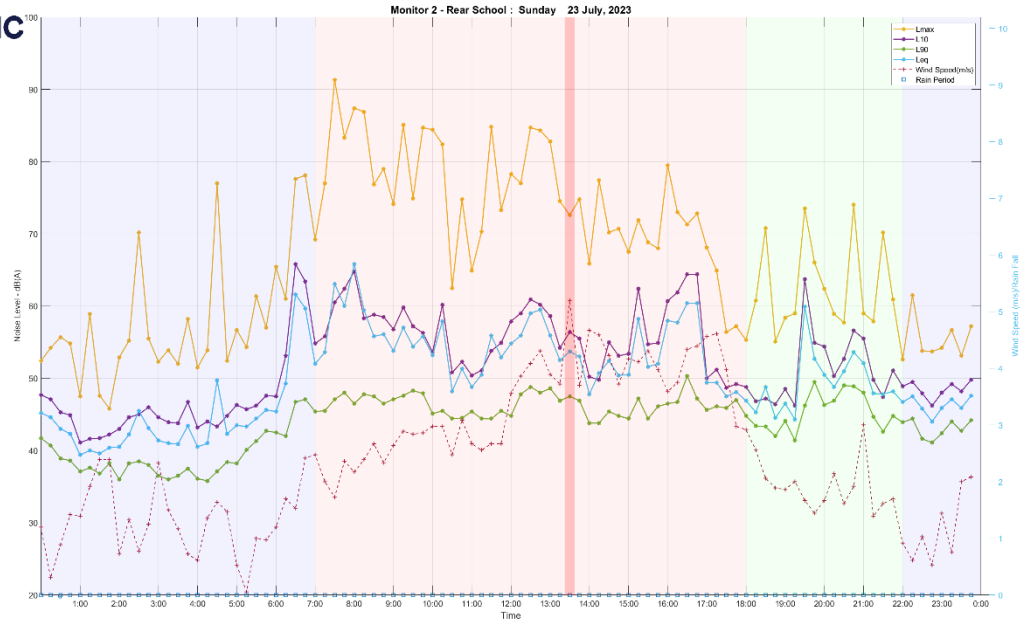
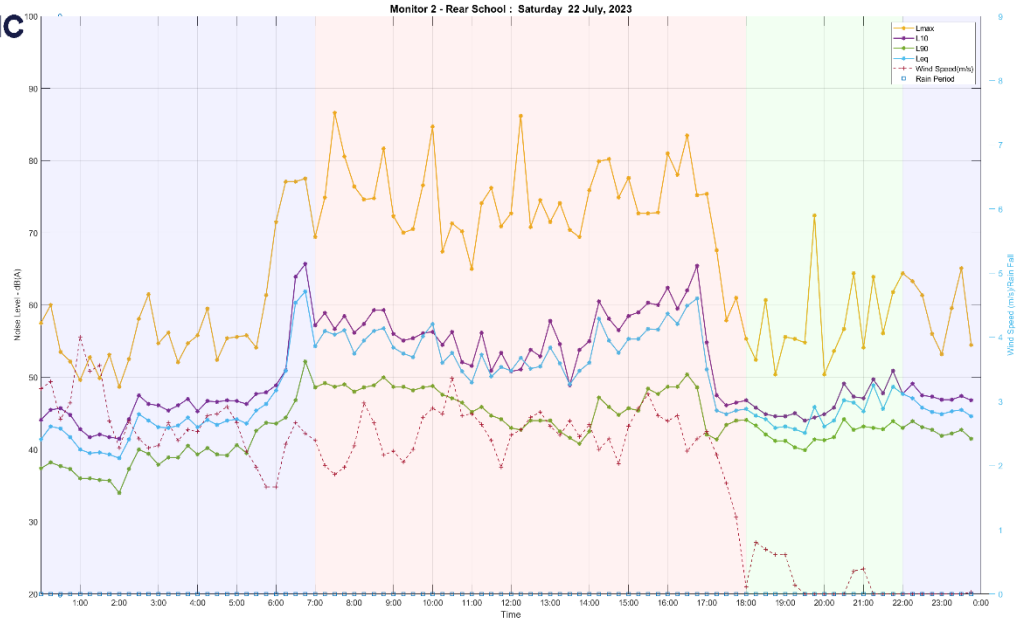
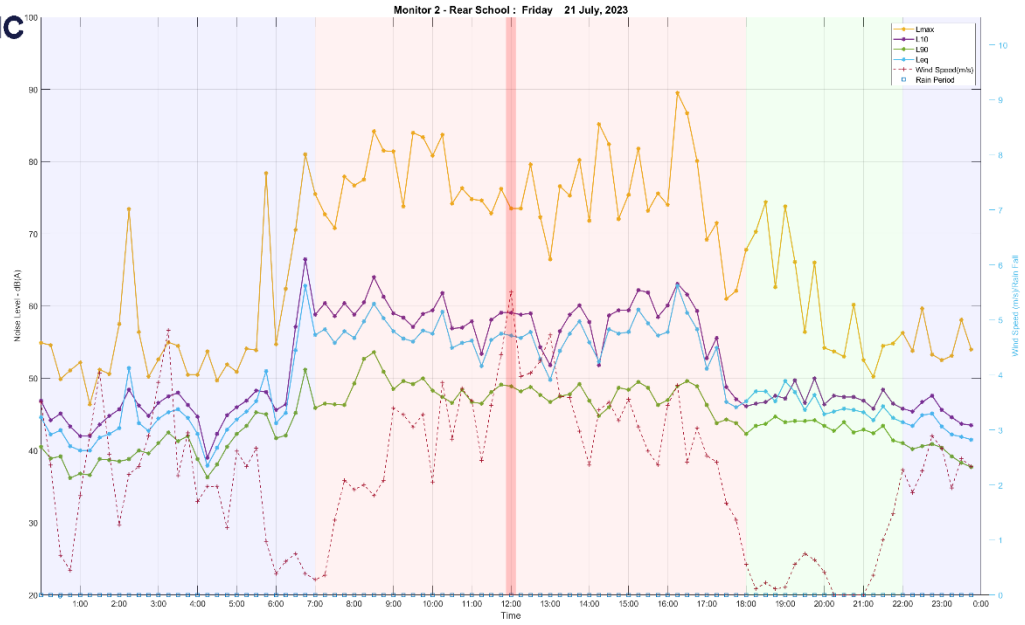
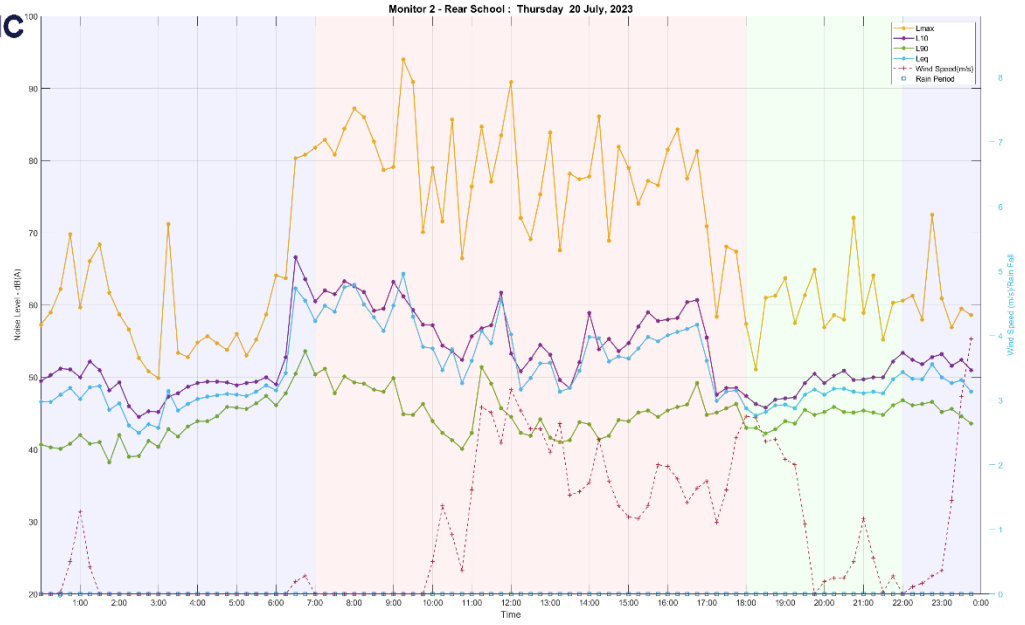
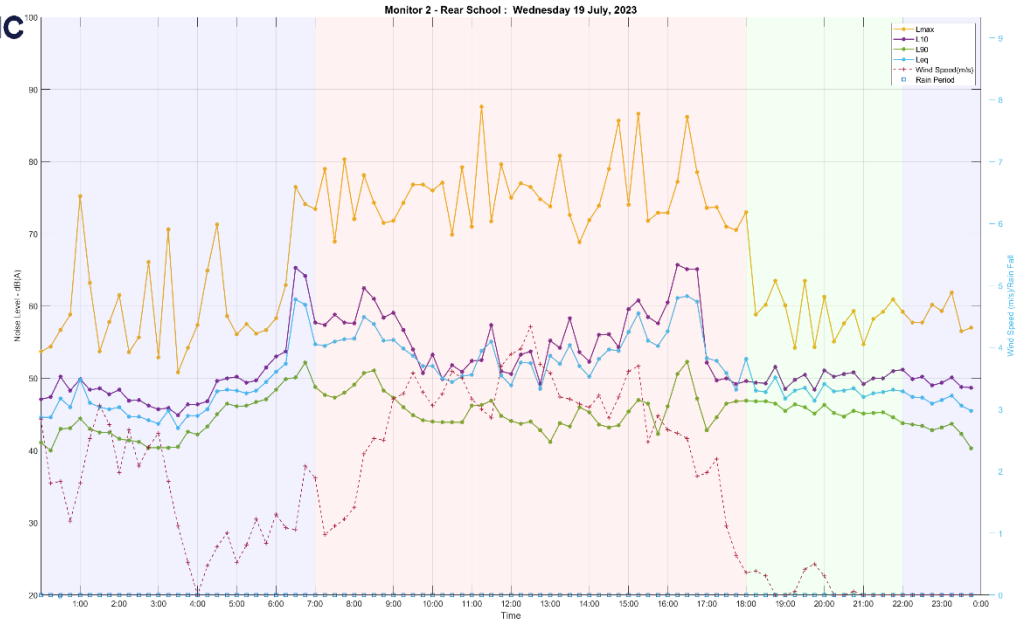
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

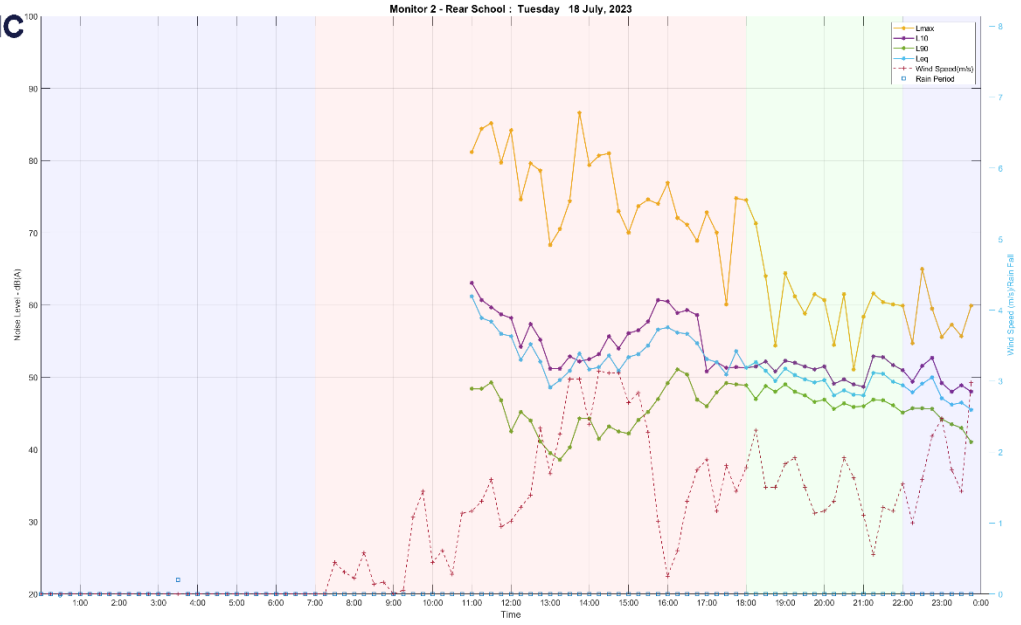

Monitor 2 - Rear School : Sunday 23 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

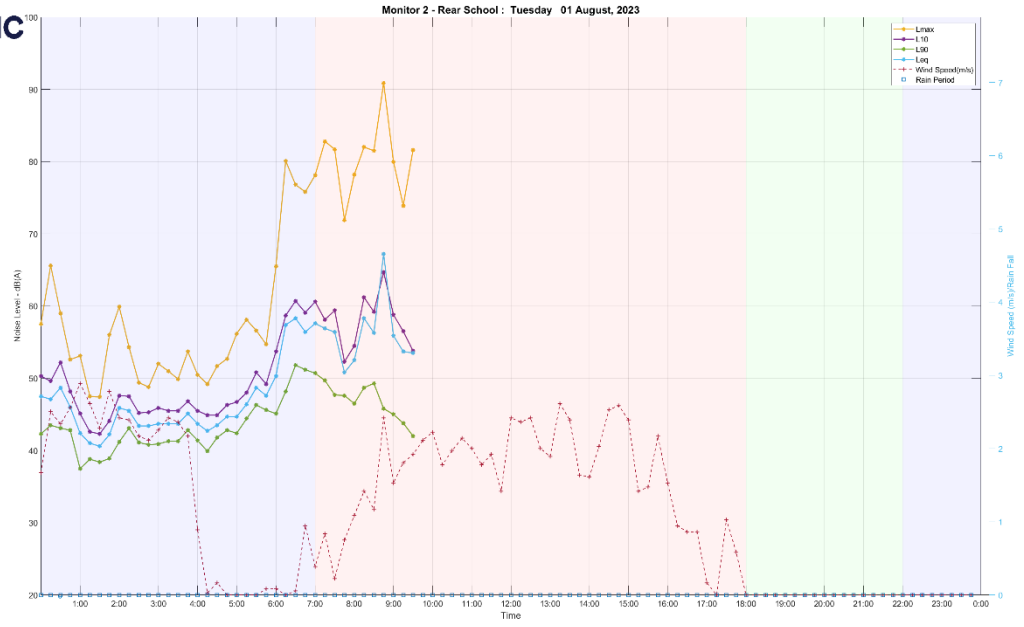

Monitor 2 - Rear School : Saturday 22 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


Monitor 2 - Rear School : Friday 21 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


Monitor 2 - Rear School : Thursday 20 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

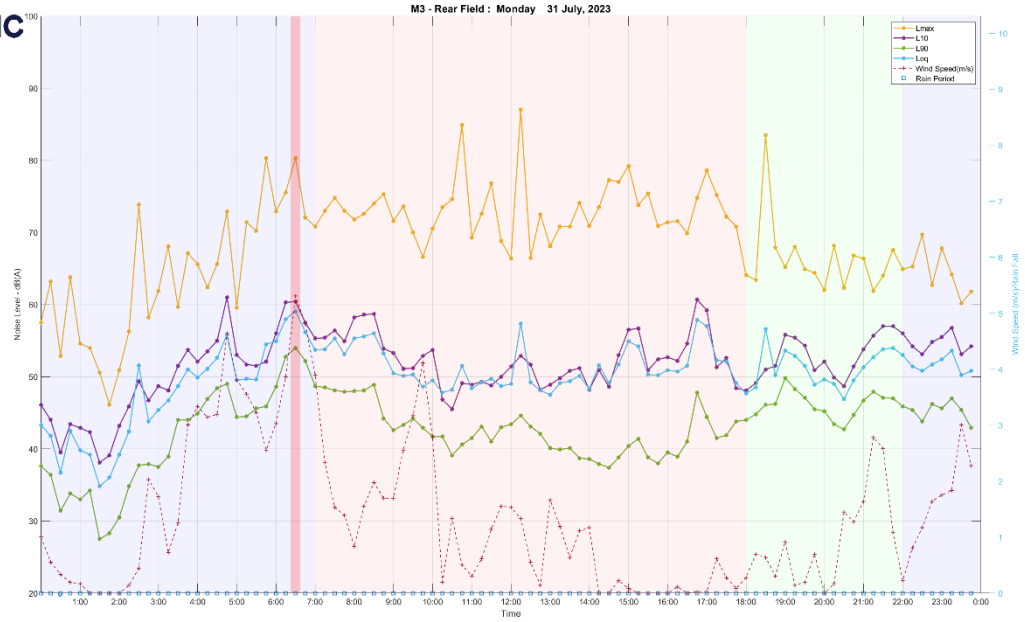

Monitor 2 - Rear School : Wednesday 19 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

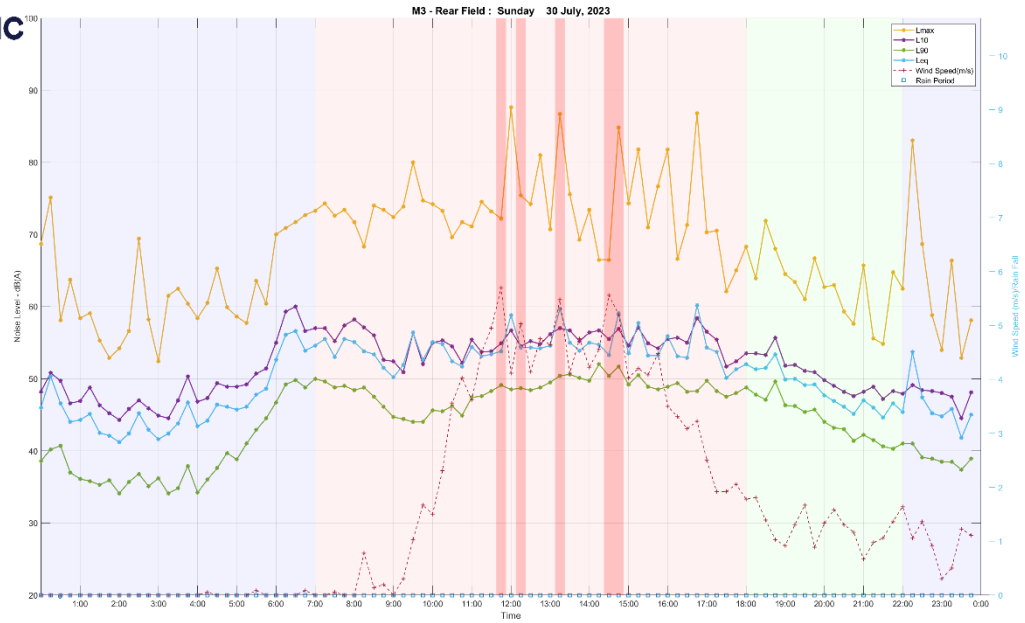

Monitor 2 - Rear School : Tuesday 18 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

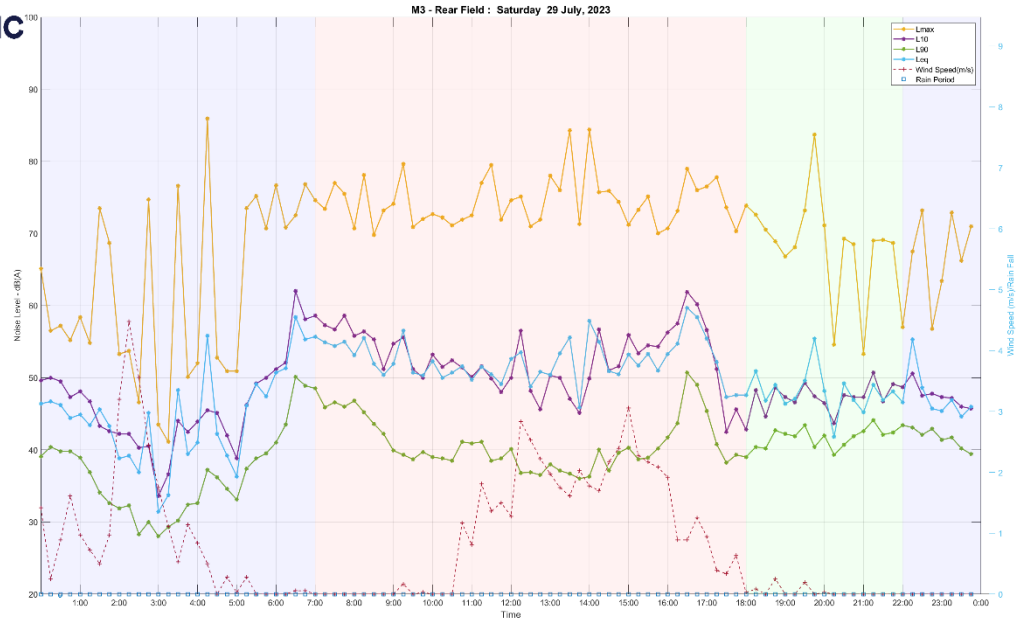


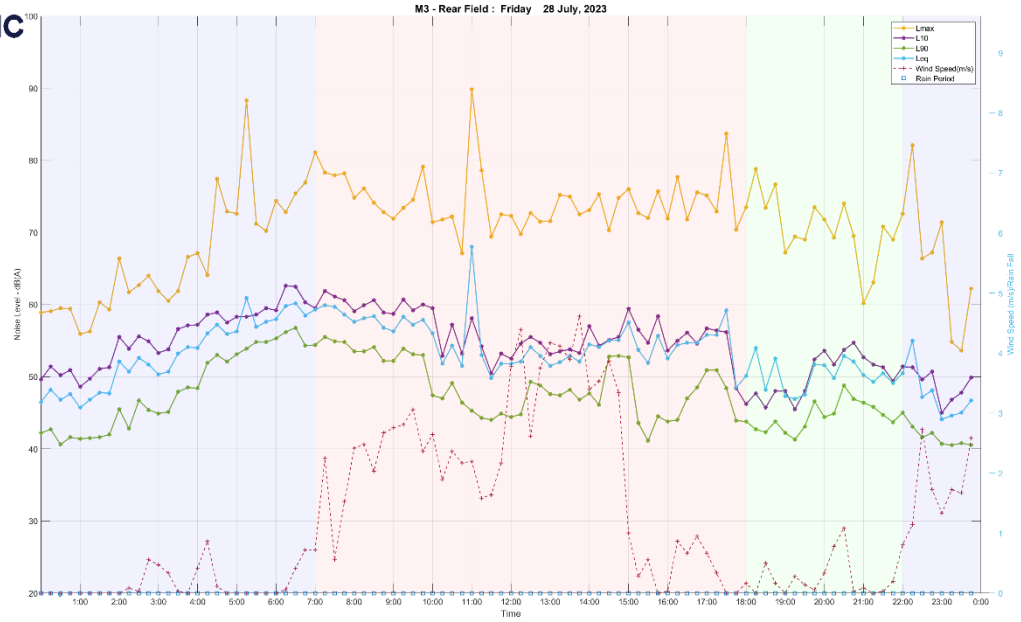
Wind Speed is corrected using factor 1.0000 based on logger location

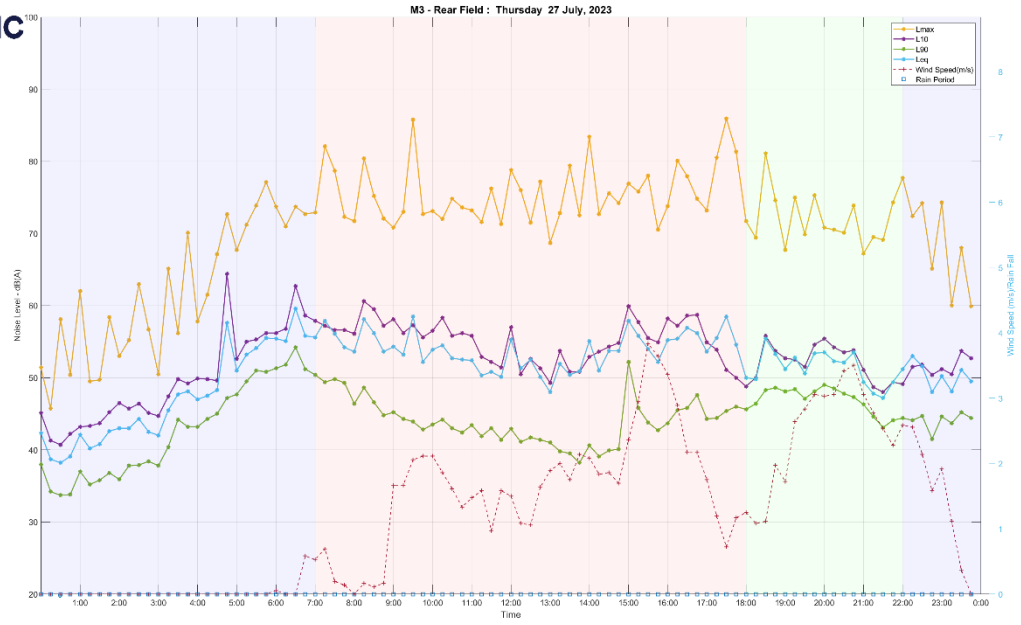
MONITOR 3:

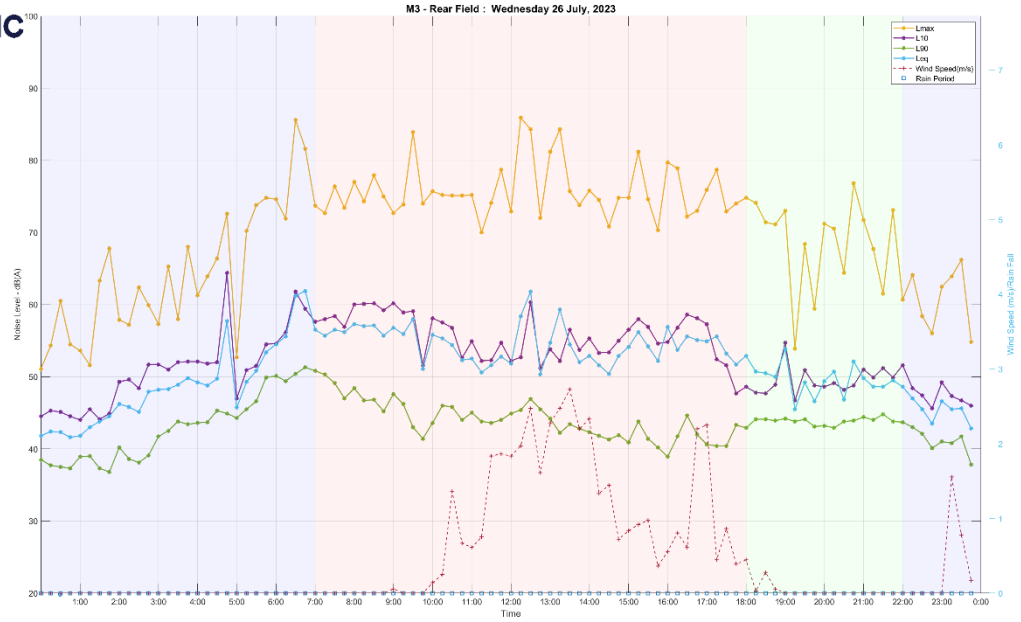

M3 - Rear Field : Monday 31 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain / dl
Time

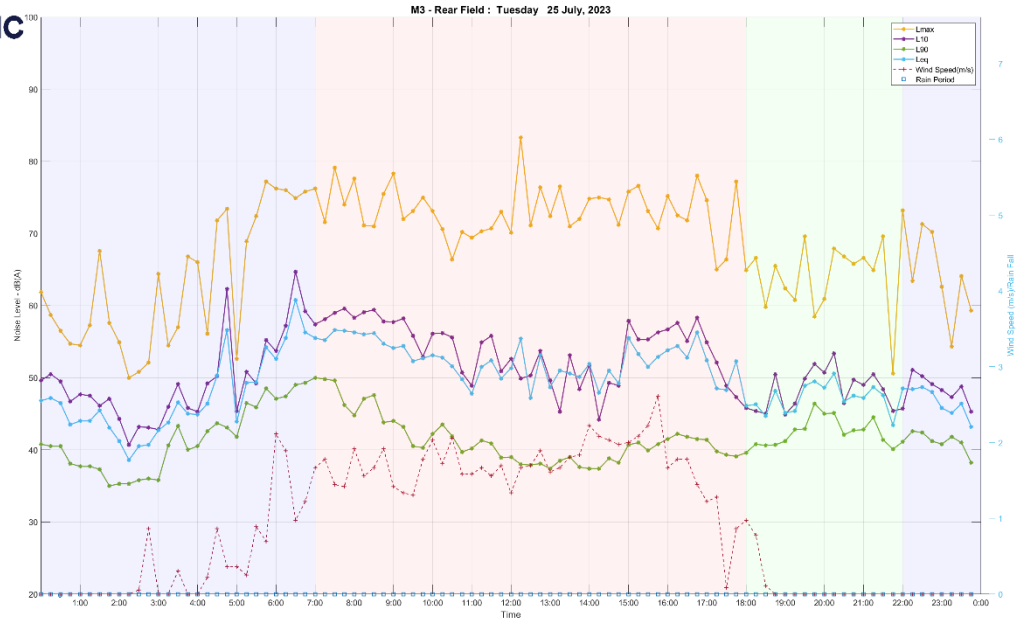

M3 - Rear Field : Sunday 30 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain / dl
Time

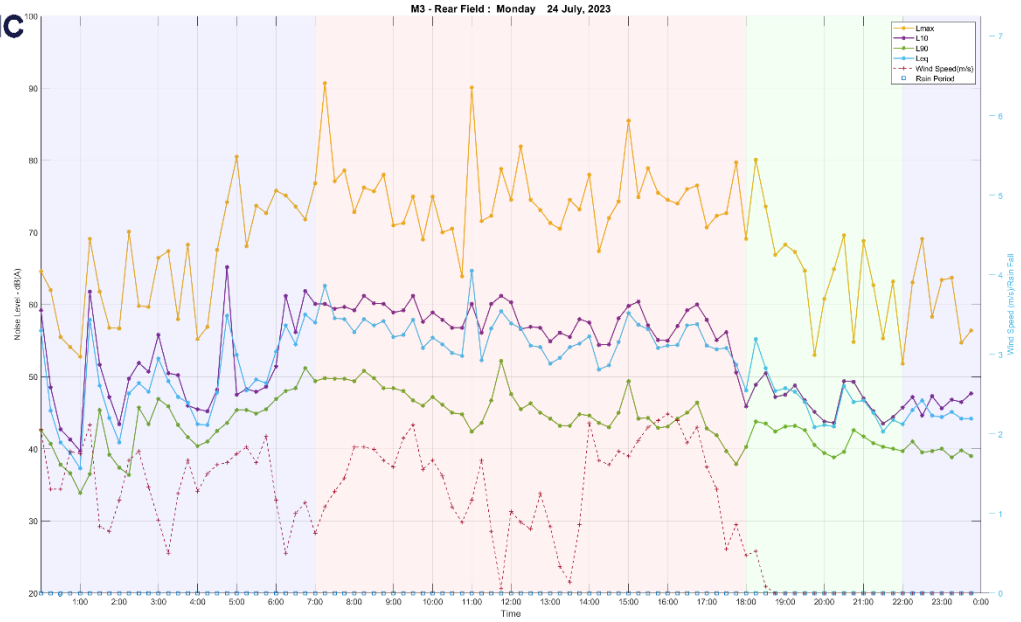

M3 - Rear Field : Saturday 29 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

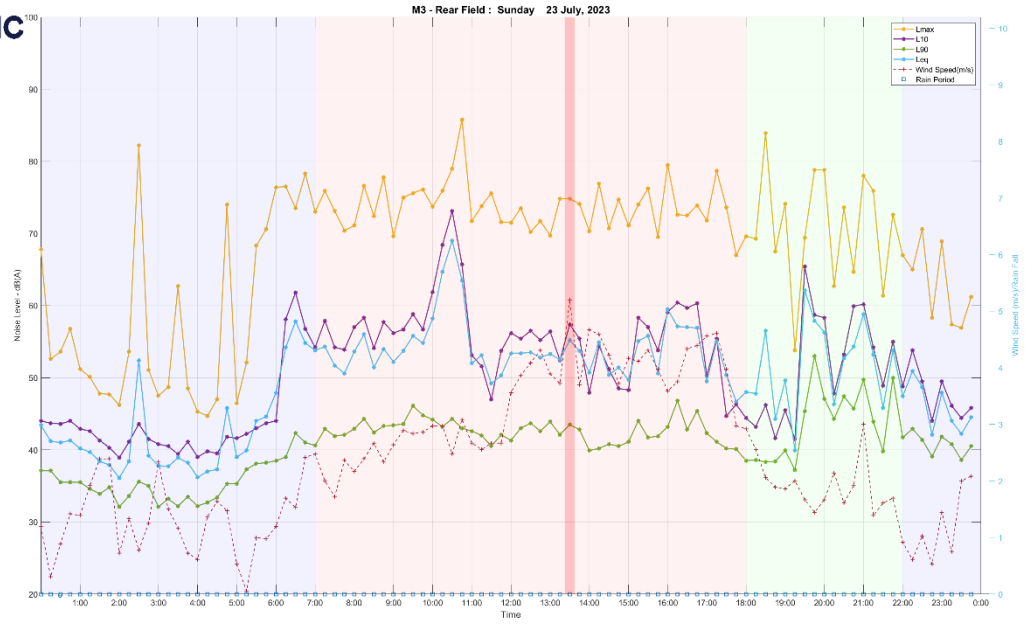

M3 - Rear Field : Friday 28 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

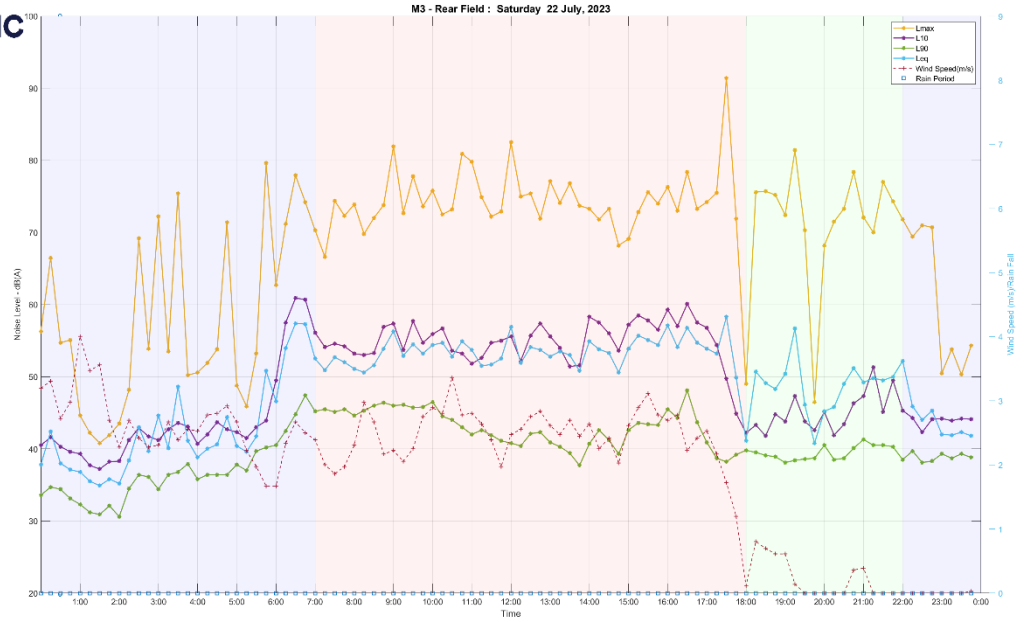

M3 - Rear Field : Thursday 27 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

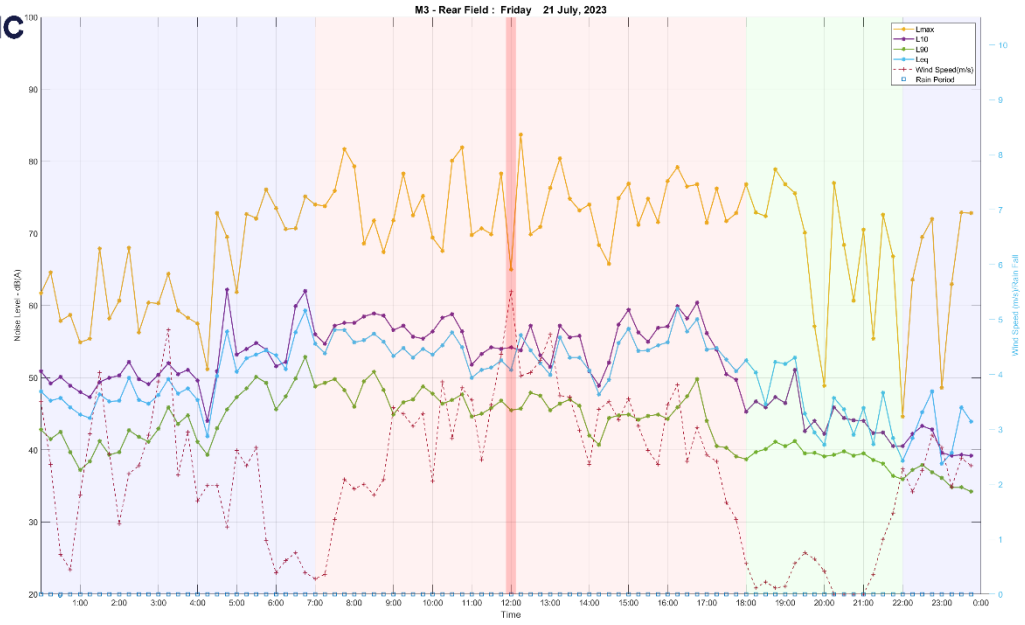

M3 - Rear Field : Wednesday 26 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

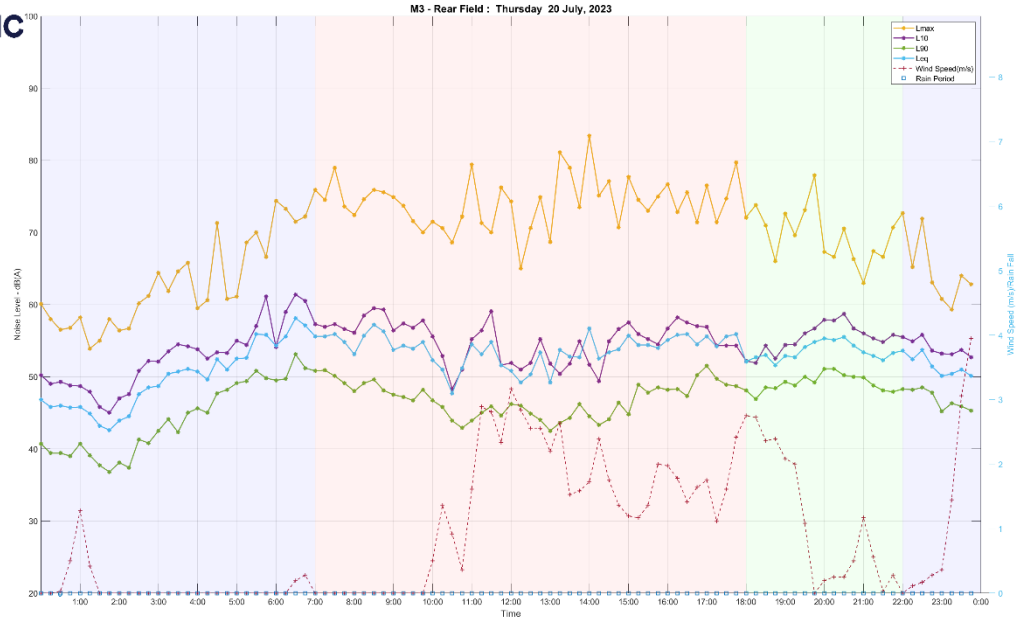

M3 - Rear Field : Tuesday 25 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

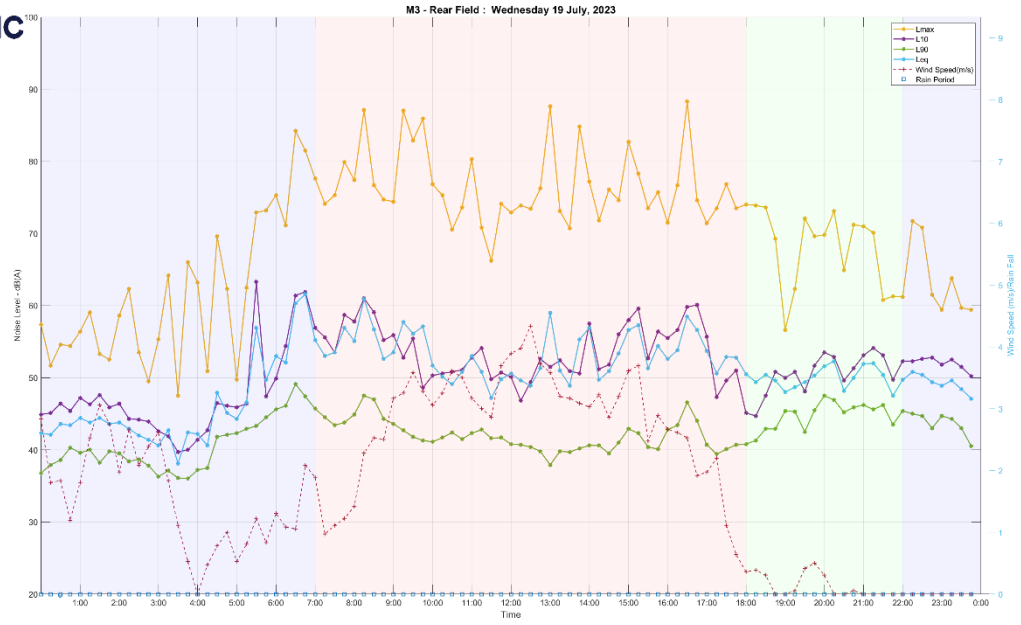

M3 - Rear Field : Monday 24 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

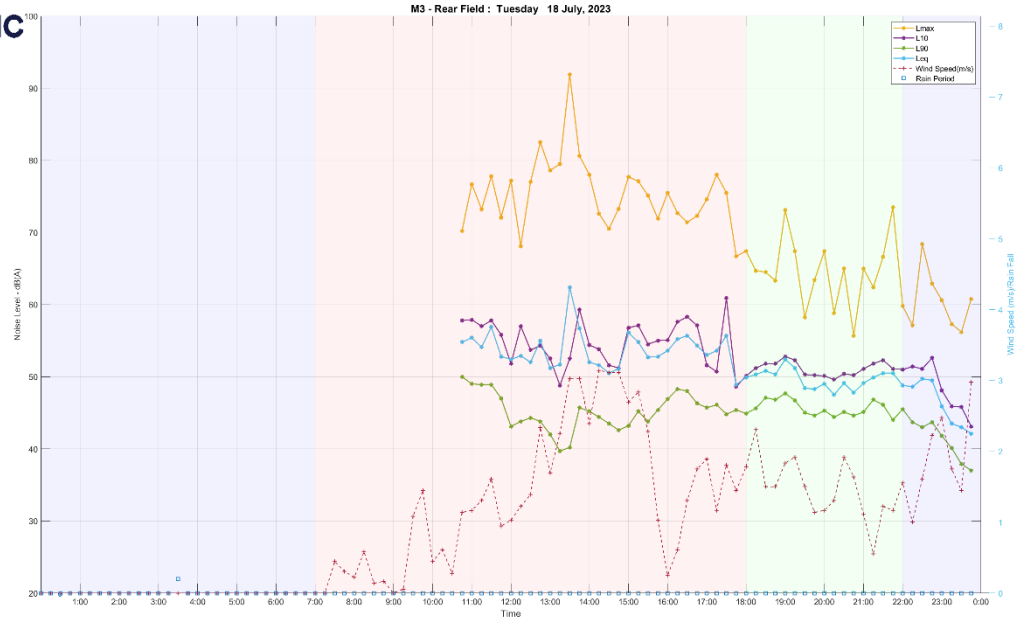

M3 - Rear Field : Sunday 23 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

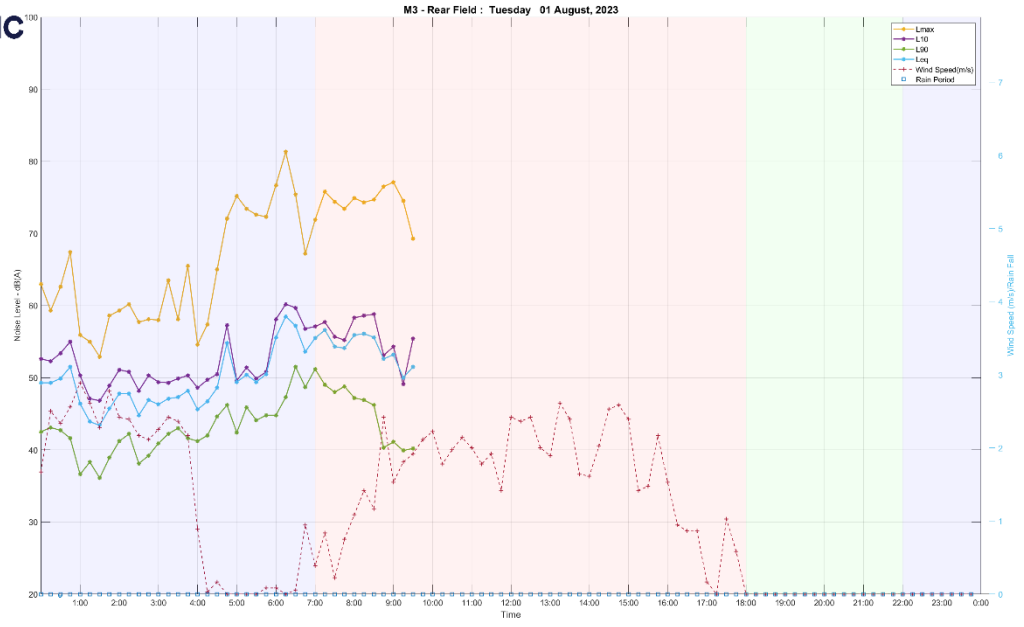

M3 - Rear Field : Saturday 22 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


M3 - Rear Field : Friday 21 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


M3 - Rear Field : Thursday 20 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

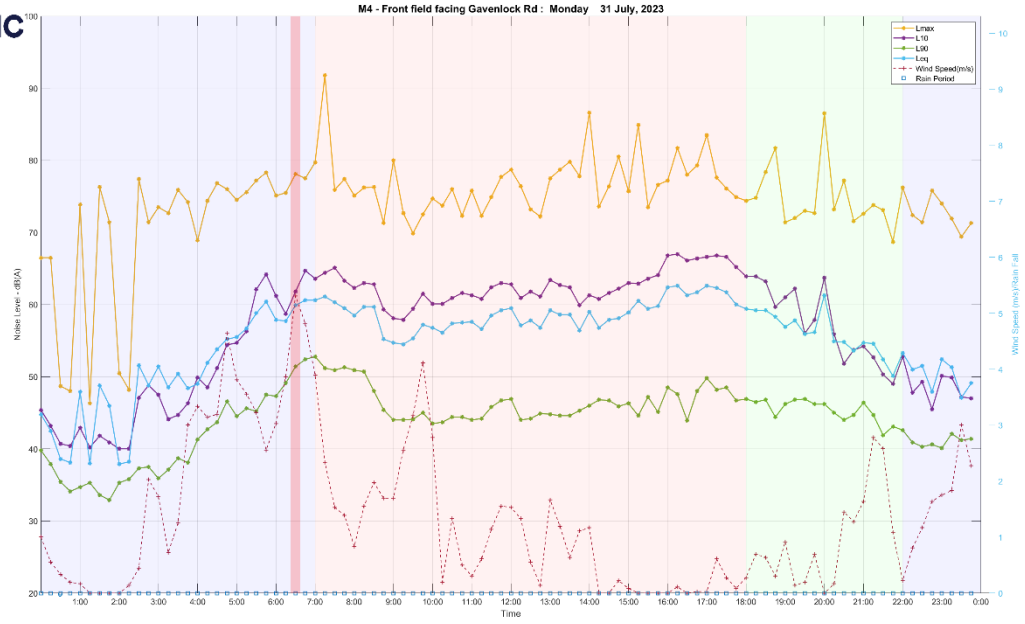

M3 - Rear Field : Wednesday 19 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

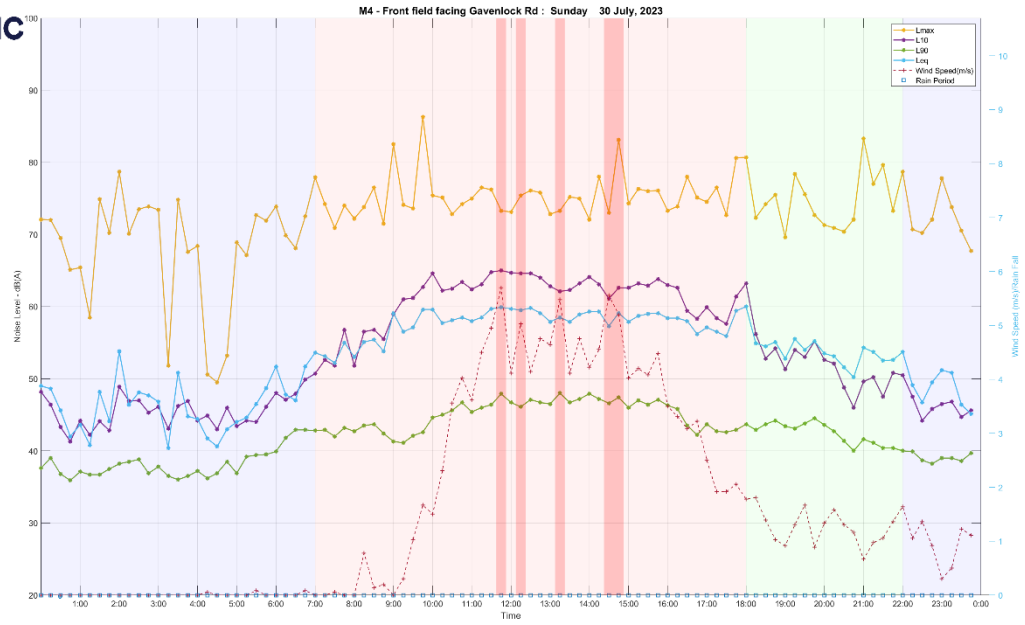

M3 - Rear Field : Tuesday 18 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

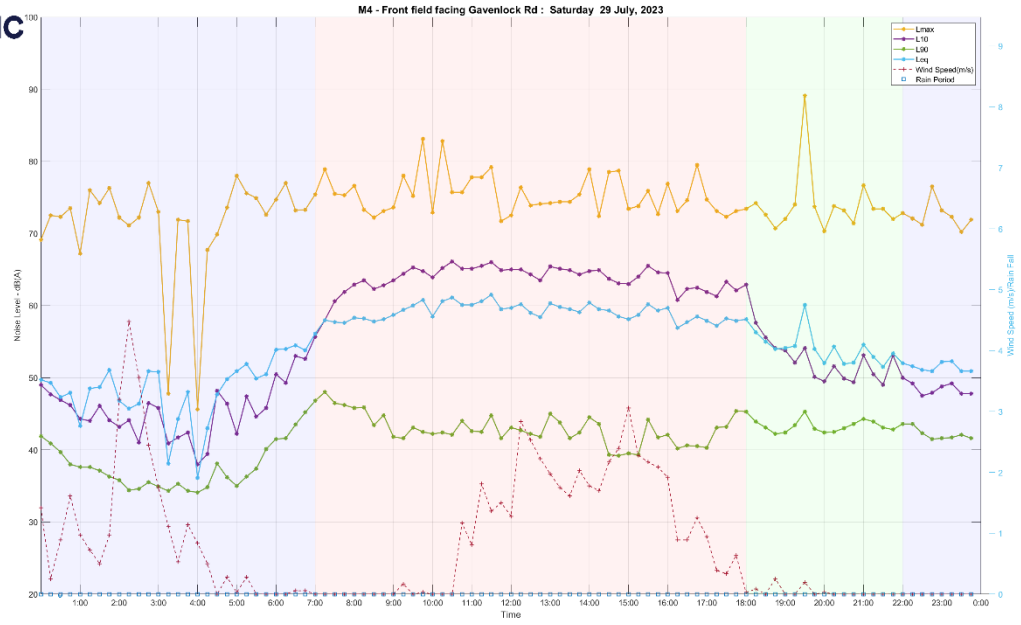


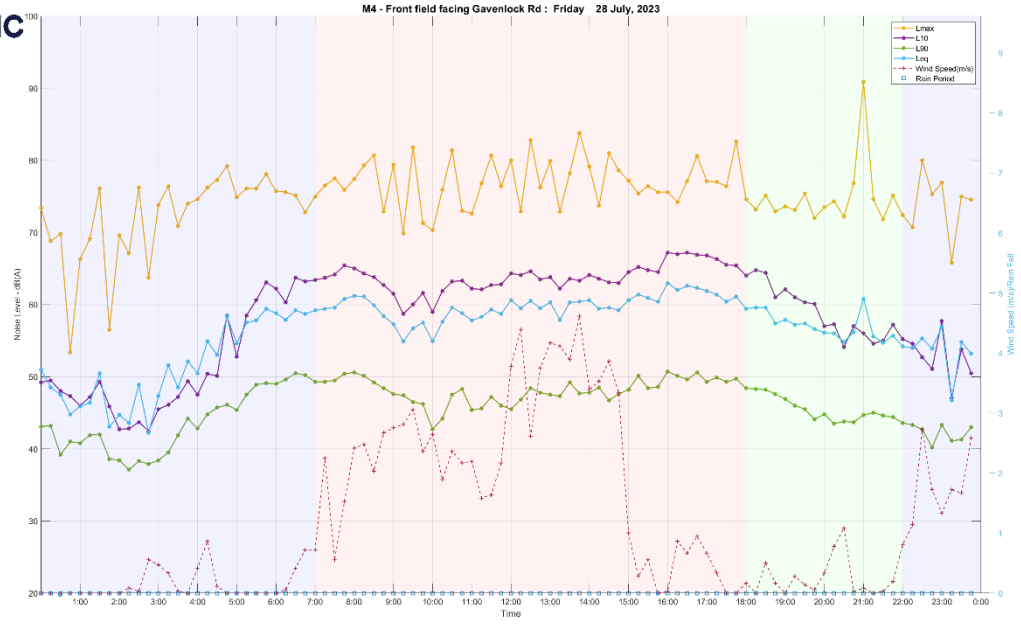
Wind Speed is corrected using factor 1.0000 based on logger location

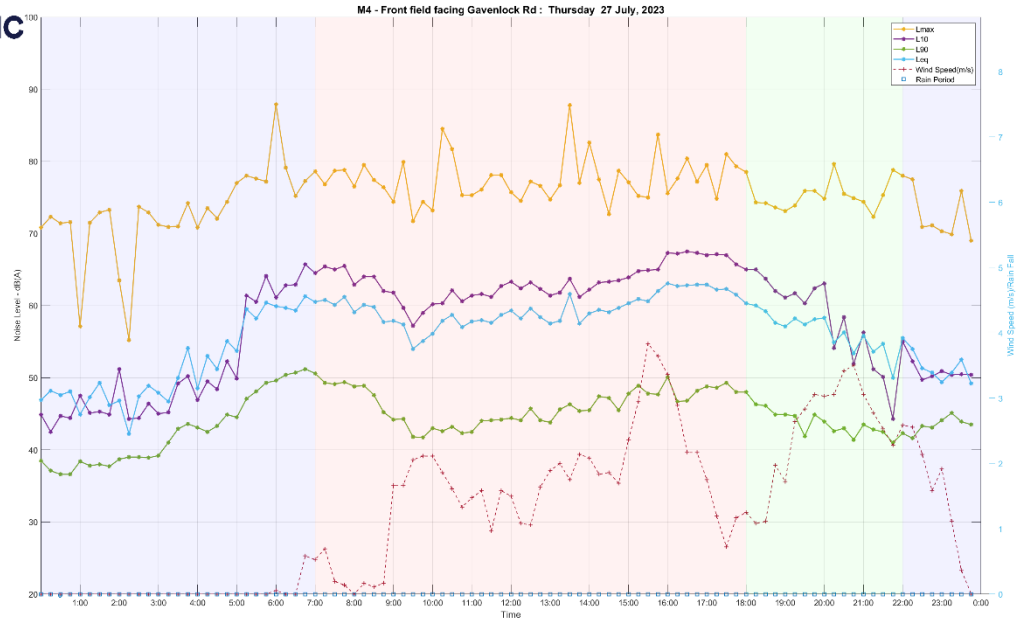
MONITOR 4:

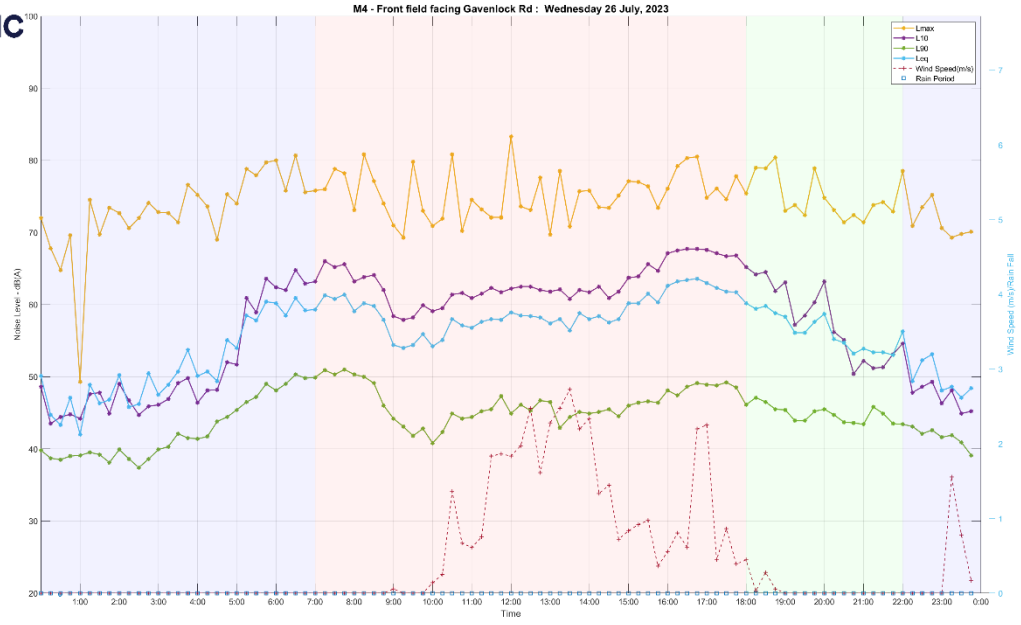

M4 - Front field facing Gavenlock Rd : Monday 31 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain / dl
Time

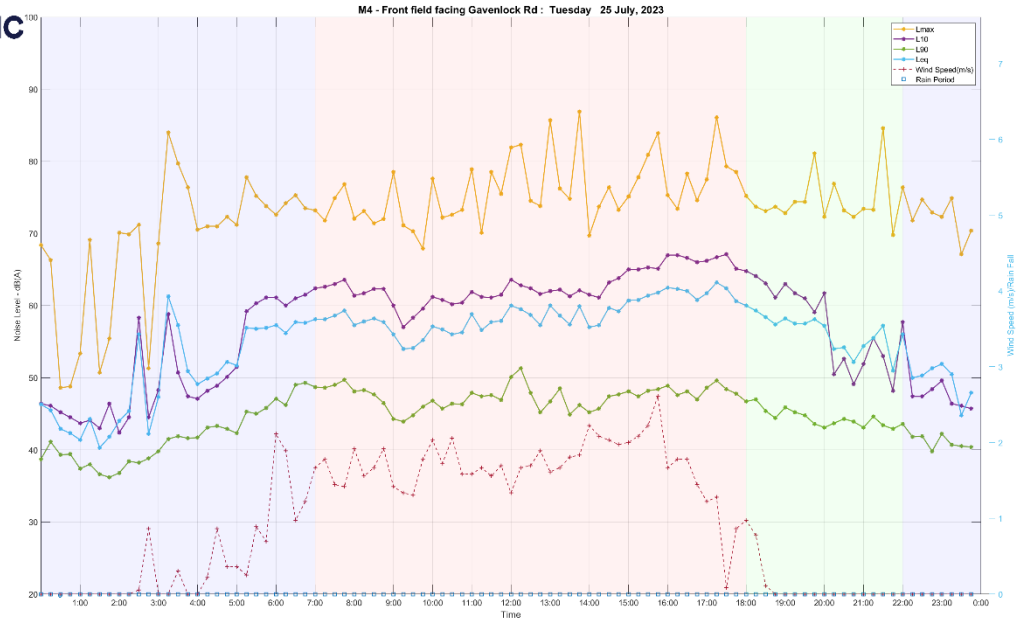

M4 - Front field facing Gavenlock Rd : Sunday 30 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain / dl
Time

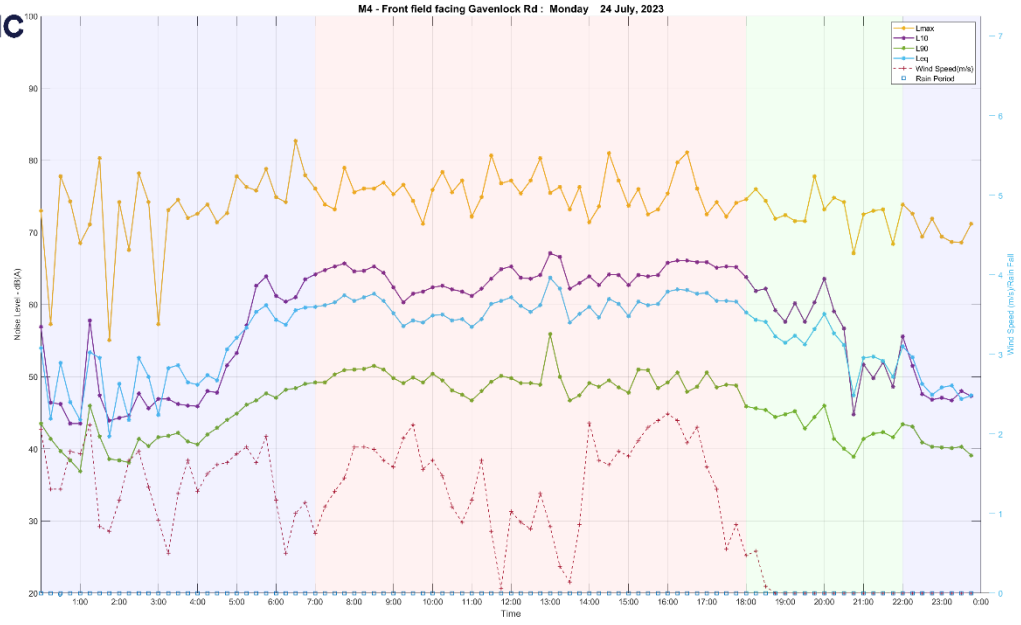

M4 - Front field facing Gavenlock Rd : Saturday 29 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

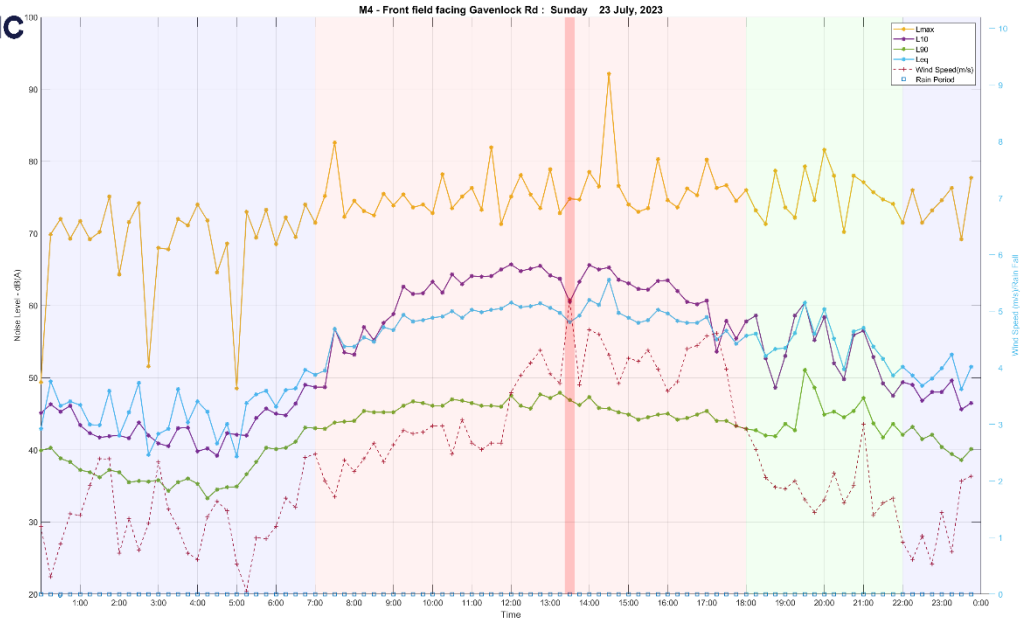

M4 - Front field facing Gavenlock Rd : Friday 28 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

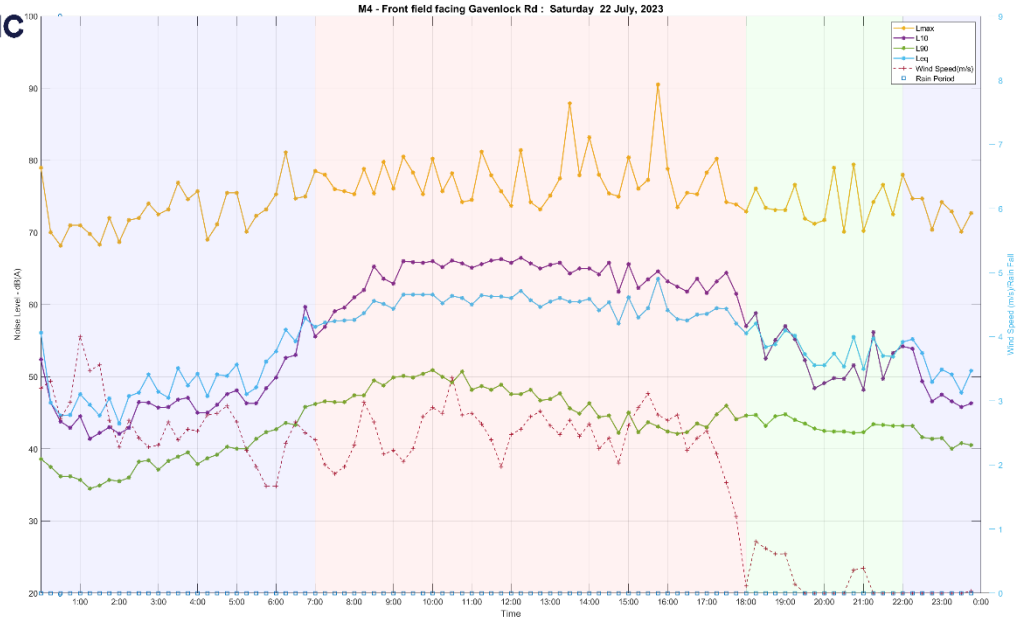

M4 - Front field facing Gavenlock Rd : Thursday 27 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

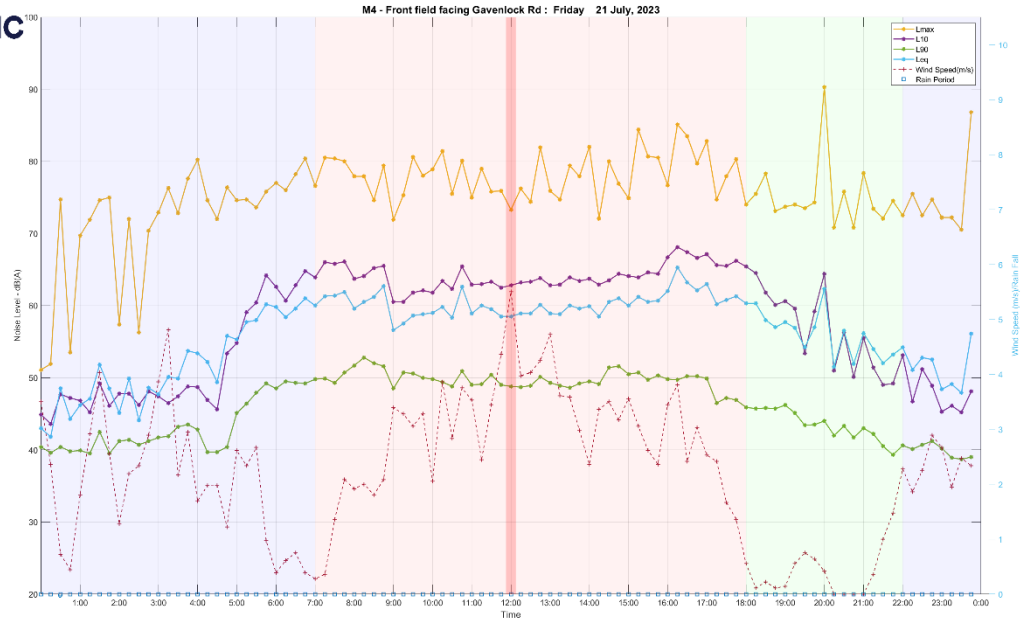

M4 - Front field facing Gavenlock Rd : Wednesday 26 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

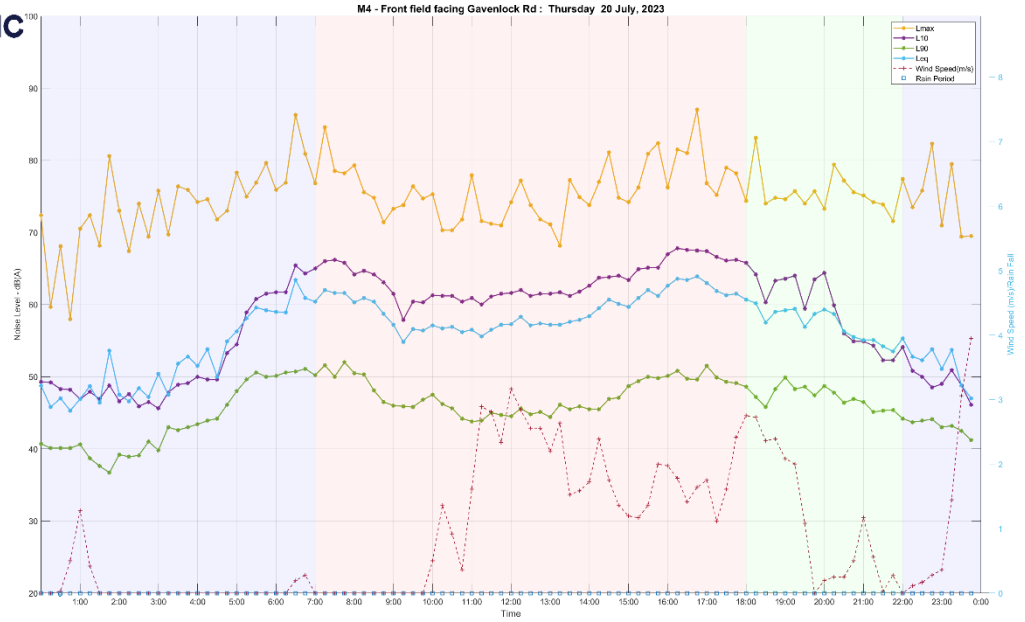

M4 - Front field facing Gavenlock Rd : Tuesday 25 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

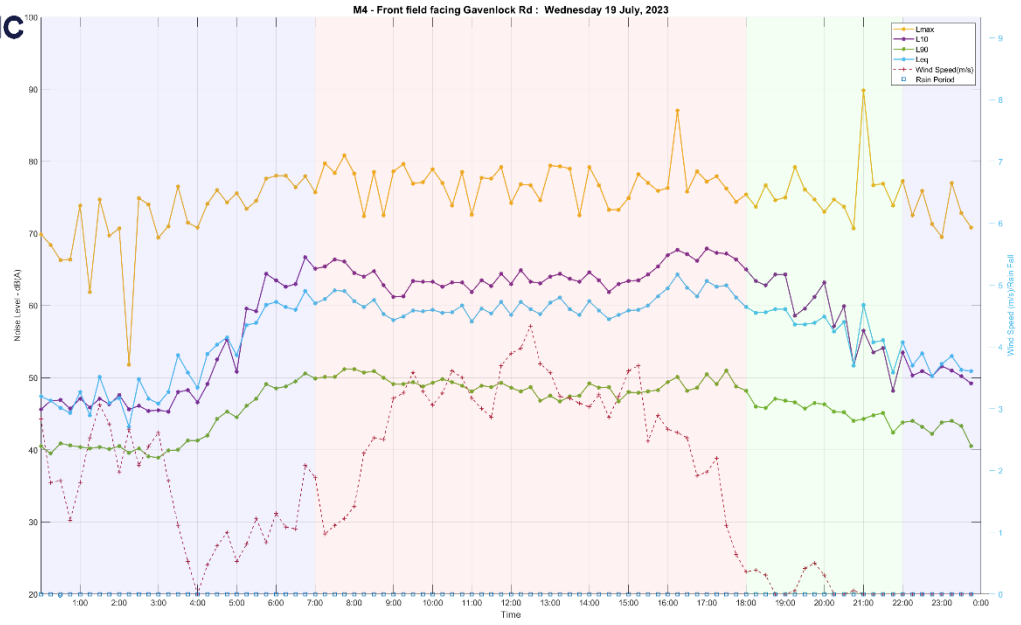

M4 - Front field facing Gavenlock Rd : Monday 24 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

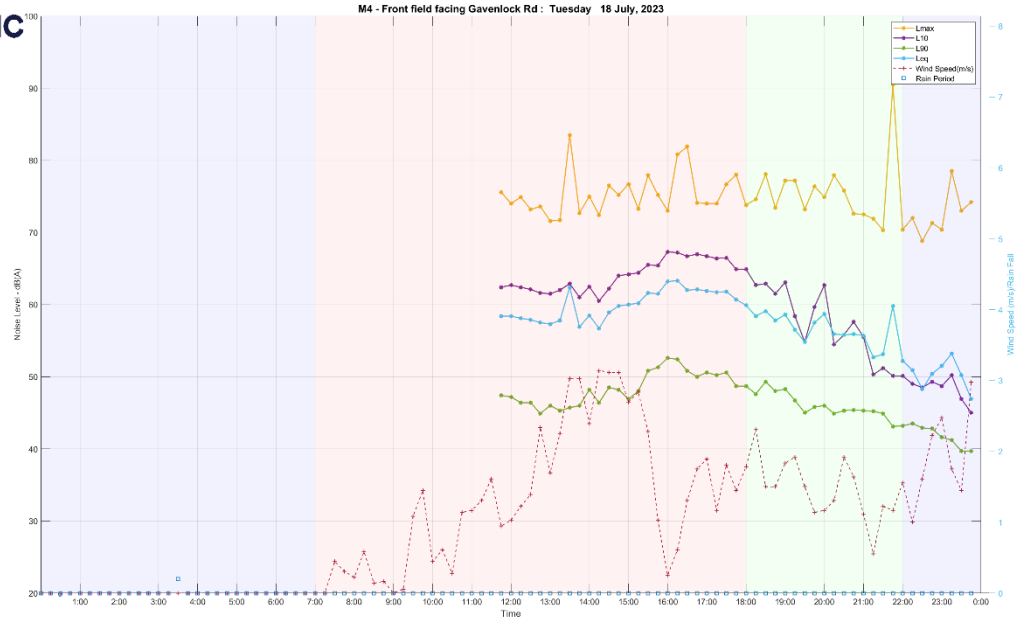

M4 - Front field facing Gavenlock Rd : Sunday 23 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time

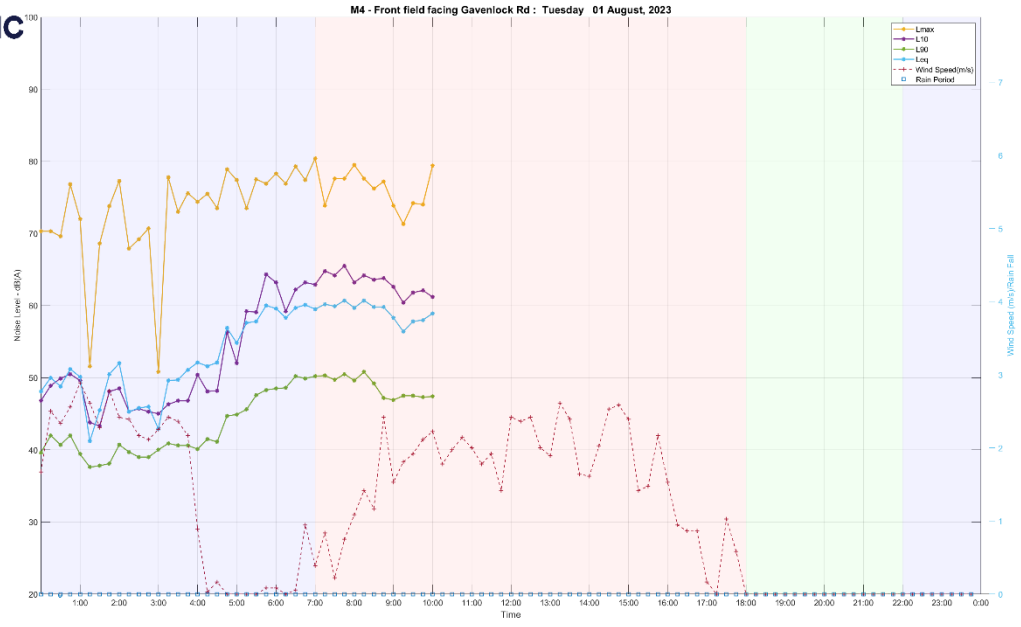

M4 - Front field facing Gavenlock Rd : Saturday 22 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


M4 - Front field facing Gavenlock Rd : Friday 21 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


M4 - Front field facing Gavenlock Rd : Thursday 20 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


M4 - Front field facing Gavenlock Rd : Wednesday 19 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time


M4 - Front field facing Gavenlock Rd : Tuesday 18 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time



Wind Speed is corrected using factor 1.0000 based on logger location