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116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, NSW 2086

DA Acoustic Assessment

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3	18/03/2024	20230707.1/1803A/R3/PF	PF		PF

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1 INTRODUCTION

This report has been prepared to assess the impact of noise generated by nearby transportation sources on the occupant amenity of the proposed residential development at 116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest. The measures likely to be required to adequately mitigate any identified potential impacts have been determined.

Noise from Frenchs Forest Road West has been assessed.

The subject site and local context are indicated in Figure 2.

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.

2 REFERENCED DOCUMENTS

2.1.1 Background Information Used

The assessment is based on the following drawings:

- Architectural drawings prepared by Brewster Murray Architecture. Refer to Appendix C Natural Ventilation mark up.

2.1.2 Guidelines

The following planning instruments and guidelines have been used in the assessment:

- State Environmental Planning Policy (Transport and Infrastructure) 2021 ("**TI SEPP**").
- Development Near Rail Corridors and Busy Roads – Interim Guideline ("**DNRCBR**") (Department of Planning, 2008)
- NSW Road Noise Policy ("**RNP**") (Department of Environment, Climate Change and Water NSW, March 2011)
- Northern Beaches Council *Warringah Development Control Plan* 2011 ("**DCP**")

3 SITE DESCRIPTION AND THE PROPOSAL

The project site is located at 116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, and consists of:

- Three residential buildings: Buildings A and B have 6 levels and Building C has 5 levels, and
- Shared Basement and mezzanine level car parking

3.1 NOISE SOURCES IDENTIFIED

The following significant noise sources have been identified as potentially impacting the site:

- Frenchs Forest Road West. Reference to the Transport for NSW website indicates that this road carries daily traffic volumes of more than 20,000 vehicles per day. The development should comply with the requirements of the TI SEPP and DNRCBR. See map No. 12B below.

Figure 1 – RMS Map No.12B and approximate location of project site

- Gladys Avenue. Reference to the Transport for NSW website indicates that this road carries daily traffic volumes of less than 20,000 vehicles per day. There is no requirement to comply with the requirements of the TI SEPP. Noise impacts will be assessed with reference to the DCP guidelines.

3.2 NOISE RECEIVERS IDENTIFIED

The nearest noise receivers around the site include:

- **R1**: Residential Receiver 1 – Multi-storey residential houses to the west of the site at 122-124 Frenchs Forest Road West, Frenchs Forest
- **R2**: Residential Receiver 2 – Multi-storey residential buildings to the north west of the site at 1, 7 & 9 Gladys Avenue, Frenchs Forest
- **R3**: Residential Receiver 3 – Multi-storey residential houses to the northeast of the site at 1, 13-15 Gladys Avenue, Frenchs Forest
- **R4**: Residential Receiver 4 – Multi-storey residential buildings to the east of the site at 112-114 Frenchs Forest Road West, Frenchs Forest
- **H1**: Hospital 1 – Northern Beaches Hospital to the south across Frenchs Forest Road West at 105 Frenchs Forest Road West, Frenchs Forest

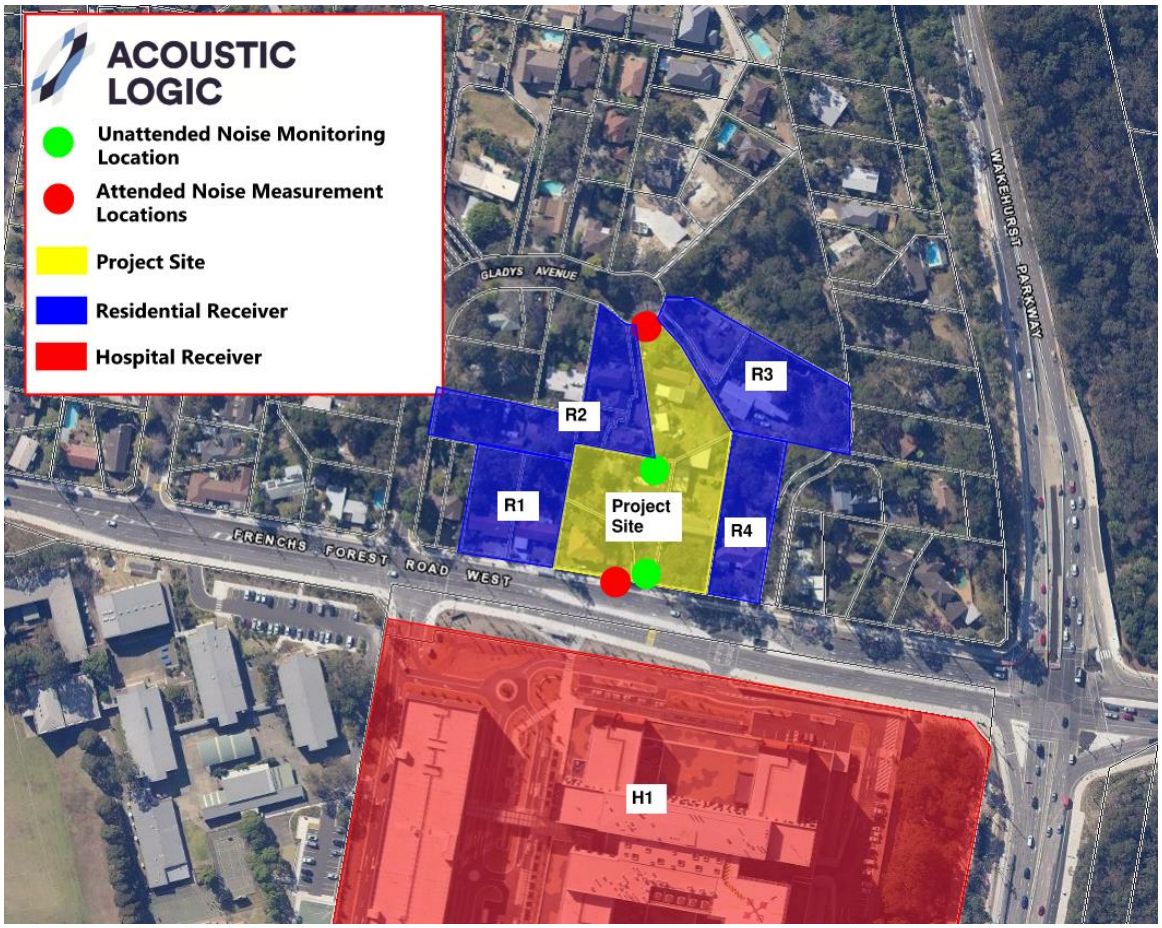


Figure 2 – Site Plan Showing Local Context and Noise Monitoring Locations

4 GUIDELINES AND ASSESSMENT CRITERIA

4.1 STATE ENVIRONMENTAL PLANNING POLICY (TRANSPORT AND INFRASTRUCTURE) 2021

Certain development adjacent to major roadways must have regard to TI SEPP Clause 2.119, which is repeated below:

4.1.1 Section 2.119 Impact of Road Noise or Vibration on Non-Road Development

(1) This section applies to development for any of the following purposes that is on land in or adjacent to the road corridor for a freeway, a tollway or a transitway or any other road with an annual average daily traffic volume of more than 20,000 vehicles (based on the traffic volume data published on the website of TfNSW) and that the consent authority considers is likely to be adversely affected by road noise or vibration—

(a) residential accommodation,

(b) a place of public worship,

(c) a hospital,

(d) an educational establishment or centre-based child care facility.

(2) If the development is for the purposes of residential accommodation, the consent authority must not grant consent to the development unless it is satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:

(a) in any bedroom in the residential accommodation—35 dB(A) at any time between 10 pm and 7am,

(b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom, or hallway)—40 dB(A) at any time

4.2 DEVELOPMENT NEAR RAIL CORRIDORS AND BUSY ROADS – INTERIM GUIDELINE

The guideline provides guidance for the planning and assessment of noise sensitive development impacted by roads and railways, and in particular those uses required to be addressed under the TI SEPP. The assessment criteria broadly mirror those in the TI SEPP, as well as providing additional guidance.

4.2.1 Internal Noise Criteria – Airborne Noise

Table 3.1 of the guideline summarises the internal traffic noise levels that should be achieved in noise sensitive developments including residential buildings. The $L_{eq,9hr}$ descriptor is recommended to assess noise levels in sleeping areas (bedrooms) and the $L_{eq,15hr}$ descriptor is recommended to assess noise levels in other habitable rooms.

Table 3.1 of DNRCBR is repeated below.

Table 1 – DNRCBR Airborne Noise Criteria

Building Use	Room	Noise Level dB(A) L_{eq}
Residential	Sleeping Area (Bedroom)	35 (10pm to 7am)
	Other habitable rooms (excl. garages, kitchens, bathrooms & hallways)	40 (7am to10pm)

4.2.2 Ventilation

The DNRCBR recommends that when "windows open" noise levels are excessive, which is defined as when the "windows open" noise level exceeds the "windows closed" criterion by more than 10 dB(A), the occupants should be able to *"leave their windows closed, if they so desire, and also meet the ventilation requirements of the Building Code of Australia (BCA)."*

With windows open, the allowable internal noise goal is permitted to be 10 dB(A) higher than when the windows are closed (i.e. – allowable level in bedrooms becomes 45 dB(A) $L_{eq(9\ hr)}$ and 50 dB(A) $L_{eq(anytime)}$ in living rooms) if the NSW planning methodology is implemented.

4.2.3 LEP/DCP Assessment Criteria

Warringah DCP requirement is a general requirement and does not provide numerical assessment criteria. Therefore, AS2107:2016 will be adopted to assess impacts.

4.3 ADOPTED PROJECT SPECIFIC CRITERIA

The following table provides the criteria adopted for this assessment based on the applicable instruments and guidelines.

Table 2 – Noise Assessment Criteria

Building Use	Room	Noise Level dB(A) L_{eq}
Residential	Sleeping Area (Bedroom)	35 (10pm to 7am)
	Other habitable rooms (excl. garages, kitchens, bathrooms & hallways)	40 (anytime)

5 AIRBORNE NOISE ASSESSMENT

An assessment of noise impact has been undertaken using the following methodology:

- Windows Closed Noise Levels

  Windows closed noise levels were calculated to the centre of the room using the predicted octave band façade incident external noise levels and, for each façade element, correcting for the exposed area, octave band sound transmission loss and room sound power to pressure correction. The room noise level was calculated by accumulating all significant noise paths.

  Envelope performance requirements to comply with the noise criteria stipulated in Section 4.3 have been assessed, and are provided in Section 6.

- Windows Open Noise Levels

  "Windows open" noise levels have been calculated by subtracting 10 dB(A) from the external noise level, as promulgated by the RNP (Table 7).

5.1 EXTERNAL NOISE LEVELS

5.1.1 Noise Measurements

Existing noise levels from the transportation sources have been measured using the methodology outlined in Appendix B3 of the RNP as a basis, and representative noise levels determined from analysis of the data. APPENDIX A summarises the measurements and data obtained, and the calculated noise descriptors. These are summarised in the following table.

Table 3 – Noise Measurement Summary

Location	Noise Source	Descriptor/Time Period	Noise Level (dB(A))
Front of project site facing Frenchs Forest Rd West	Frenchs Forest Rd West	$L_{eq,15hr}$ (Daytime)	62
		$L_{eq,9hr}$ (Night Time)	54
Back of the project site facing Gladys Avenue	Gladys Avenue	$L_{eq,15hr}$ (Daytime)	46
		$L_{eq,9hr}$ (Night Time)	46

5.1.2 Calculation of External Road Noise Levels

The measured noise levels have been used as a basis for predicting noise levels around the development by:

- Accounting for any likely changes in traffic volumes in the long term.

  For the subject roads, analysis of traffic volumes on the TfNSW website indicates there has been no significant increase in traffic volumes. Given this, and the trend to quieter electric vehicles, a zero long term increase in noise has been adopted.

- Correcting for different distances between the noise source compared to the monitoring location.

- Barrier effects, where applicable.

- Reflections off adjacent structures, where significant.

Noise levels around the site have been predicted using the Soundplan 8.0 computer model. The model is able to façade noise levels, taking into account the factors indicated above.

The model:

- Has been calibrated for each noise source using the relevant measured noise levels, with any long-term change in noise level applied.

- Includes a digitised geo-map of the proposed building and any nearby structures that may affect noise levels at the site.

- ISO 9613-2:1996 "Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation" noise propagation standard was adopted.

The modelling assumptions include:

- Noise source heights:

  - Passenger cars and light commercial vehicles at 1m above the roadway.

- Data obtained from Geoscape for the surrounding land, roadways and built form.

Soundplan modelling outputs are provided in the APPENDIX B. Soundplan "grid noise map" contours include a 2.5dB façade reflection increase close to a façade. Soundplan "façade noise maps" do not include a façade reflection allowance, and therefore do not require correction.

5.2 DISCUSSION

The modelling indicates that mitigation of noise impacts is needed to achieve compliance with the nominated assessment criteria. Complying mitigation is provided in Section 6.

6 COMPLYING MITIGATION

The following treatment is indicated for the proposed development to comply with the nominated assessment criteria.

6.1 BUILDING ENVELOPE

The assessment indicates that the building envelope is required to be upgraded beyond what is considered to be a "standard" form of construction to comply with the internal noise criteria.

1.1.1 Glazed Windows and Doors

Acoustically rated external windows and doors are required. Aluminium framed/sliding glass doors and windows will be satisfactory provided they meet the following criteria.

All external windows and doors listed are required to be fitted with Q-lon type (or equal) acoustic seals. (**Mohair Seals are unacceptable**). The suitability of alternative seal types should be determined to an appropriately qualified acoustic expert.

The complying constructions are listed below.

Table 3 – Complying Glazing Constructions

Buildings	Facade	Space	Glazing Construction	Acoustic Seals
Buildings A&B	Southern, western and eastern façades	Bedroom	6.38mm laminated	**Yes**
		Living room		
	Northern facade	Bedroom	6mm float	
		Living room		
Buildings C	All facades	Bedroom	6mm float	
		Livingroom		

Thicker glazing may be required for structural, safety or other purposes. Where it is required to use thicker glazing than scheduled, this will also be acoustically acceptable.

It is recommended that only window systems having test results indicating compliance with the required ratings obtained in a certified laboratory be used where windows with acoustic seals have been recommended.

In addition to complying with the minimum scheduled glazing thickness, the R_w rating of the glazing fitted into open-able frames and fixed into the building opening should not be lower than the values listed in

Table 4 below. This will require the use of acoustic seals around the full perimeter of open-able frames and the frame will need to be sealed into the building opening using a flexible sealant.

Table 4 - Minimum R_w of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum R_w/Rw+C_{tr} of Installed Window
4mm float or toughened	28
6mm float or toughened	30
6.38mm laminated	31

1.1.2 External Roof and Ceiling Construction

The external roof construction is currently proposed to be masonry. No additional acoustic upgrade is required.

In the event that any penetrations are required through the external skin, an acoustic sealant should be used to minimise all gaps.

1.1.3 External Walls

External walls constructed from concrete/masonry elements will not require any acoustic upgrading to achieve the acoustic requirements.

In the event that any penetrations are required through the external skin, an acoustic grade sealant should be used to minimise all gaps.

6.2 VENTILATION REQUIREMENTS

The following rooms require supplementary ventilation complying with the BCA with room's windows closed:

- Building A, bedroom windows to the southern façade facing Frenchs Forest Road.

Alternatively, natural ventilation for those rooms can be achieved by using windows/sliding doors to the western or eastern facades. A mark up for natural ventilation has been presented in ***Appendix C Natural Ventilation mark up***.

All other buildings and facades will be able to achieve natural ventilation with windows open.

Any supplementary ventilation system proposed to be installed should be acoustically designed to ensure that the acoustic performance of the envelope is not reduced, with the required indoor noise levels are achieved, and does not exceed Council criteria for noise emission to nearby properties.

7 NOISE EMISSION CRITERIA

The noise emission from the project site shall comply with the requirements of the following documents:

- Northern Beaches Council *Warringah Development Control Plan* 2011, and
- NSW Environmental Protection Authority (EPA) *Noise Policy for Industry* (NPI) 2017.

7.1 WARRINGAH COUNCIL DCP 2011

Part D3 of the DCP has proposed the following noise emission criteria:

> ***D3 Noise***
>
> ***Requirements***
>
> *1. Noise from combined operation of all mechanical plant and equipment must not generate noise levels that exceed the ambient background noise by more than 5dB(A) when measured in accordance with the NSW Industrial Noise Policy at the receiving boundary of residential and other noise sensitive land uses.*

7.2 NSW EPA NOISE POLICY FOR INDUSTRY (NPI) 2017

The EPA NPI has two criteria which both are required to be satisfied, namely Intrusiveness and amenity. The NPI sets out acceptable noise levels for various localities. The policy indicates four categories to assess the appropriate noise level at a site. They are rural, suburban, urban and urban/industrial interface. Under the policy the nearest residential receivers would be assessed against the suburban criteria.

Noise levels are to be assessed at the property boundary or nearby dwelling, or at the balcony or façade of an apartment.

7.2.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the L_{eq} descriptor not exceed the background noise level by more than 5dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

Background noise levels adopted are presented in Appendix A.2. Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

Table 7-1 – NPfI Intrusiveness Criteria

Receiver	Time of day	Background Noise Level dB(A)L_{90}	Intrusiveness Criteria Background +5dB(A)
Receivers R1 & R4	Day	48	53
	Evening	42	47
	Night	36	41
Receivers R2 & R3	Day	40	45
	Evening	36	41
	Night	30	35

7.2.2 Project Amenity Criterion

The guideline is intended to limit the absolute noise level from all noise sources to a level that is consistent with the general environment.

The EPA's NPI sets out acceptable noise levels for various localities. The recommended noise amenity area is based upon the measured background noise levels at the sensitive receiver. Based on the measured background noise levels detailed in Appendix A.2, the Noise Policy for Industry suggests the adoption of the 'suburban' categorisation.

The NPI requires project amenity noise levels to be calculated in the following manner:

$L_{Aeq,15min}$ = Recommended Amenity Noise Level – 5 dB(A) + 3 dB(A)

The amenity levels appropriate for the receivers surrounding the site are presented in Table 7-2.

Table 7-2 – NPfI Project Amenity Noise Levels

Type of Receiver	Time of day	Recommended Noise Level dB(A)$L_{eq(period)}$	Project Amenity Noise Level dB(A)$L_{eq(15\ minute)}$
Residential – suburban	Day	55	53
	Evening	45	43
	Night	40	38
Hospital ward Internal External	 Noisiest 1 hour Noisiest 1 hour	 35 50	 33 48

The NSW EPA Noise Policy for Industry (2017) defines:

- Day as the period from 7 am to 6 pm Monday to Saturday and 8 am to 6 pm Sundays and Public Holidays.
- Evening as the period from 6 pm to 10 pm.
- Night as the period from 10 pm to 7 am Monday to Saturday and 10 pm to 8 am Sundays and Public Holidays.

7.2.3 Sleep Arousal Criteria

The Noise Policy for Industry recommends the following noise limits to mitigate sleeping disturbance:

Where the subject development / premises night -time noise levels at a residential location exceed:

- *$L_{eq,15min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or*
- *L_{Fmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is the greater,*

a detailed maximum noise level even assessment should be undertaken.

Table 7-3 – Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night) dB(A)L_{90}	Emergence Level
Residential Receivers R1 & R4	36 dB(A) L_{90} Night (10pm – 7am)	41 dB(A)$L_{eq,\ 15min}$; 52 dB(A)L_{Fmax}
Residential Receivers R2 & R3	30 dB(A) L_{90} Night (10pm – 7am)	40 dB(A)$L_{eq,\ 15min}$; 52 dB(A)L_{Fmax}

7.3 SUMMARISED NOISE EMISSION CRITERIA

Table 7-4 – EPA NPI Noise Emission Criteria for Residential Receivers

Receiver	Time Period	Assessment Background Noise Level dB(A)L_{90}	Project Amenity Criteria dB(A) L_{eq}	Intrusiveness Criteria $L_{eq(15min)}$	DCP Criteria	NPI Criteria for Sleep Disturbance
R1 & R4	Day	48	53	53	**53**	N/A
	Evening	42	43	47	**47**	N/A
	Night	36	38	41	**41**	41 dB(A)$L_{eq, 15min}$; 52 dB(A)L_{Fmax}
R2 & R3	Day	40	53	45	**45**	N/A
	Evening	36	43	41	**41**	N/A
	Night	30	38	35	**35**	40 dB(A)$L_{eq, 15min}$; 52 dB(A)L_{Fmax}

The project noise trigger levels are indicated by the bolded values in the table above.

Table 7-5 – EPA NPI Noise Emission Criteria for Other Receivers

Type of Receivers	Time Period	Project Amenity Criteria dB(A) $L_{eq\ (15min)}$
Hospital ward Internal External	 Noisiest 1 hour Noisiest 1 hour	 33 48

8 NOISE EMISSION ASSESSMENT

8.1 MECHANICAL PLANT NOISE

Detailed plant selection has not been undertaken at this stage, as plant selections have not been determined. Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels. Satisfactory levels will be achievable through appropriate plant selection and location and, if necessary, standard acoustic treatments such as duct lining, acoustic silencers and enclosures.

Noise emissions from all mechanical services plant to the closest residential receiver should comply with the noise emission criteria in Section 6.

Detailed acoustic review should be undertaken at CC stage to determine acoustic treatments to control noise emissions to satisfactory levels.

9 CONCLUSION

This report has been prepared to assess the impact of noise generated by nearby transportation sources on the occupant amenity of the proposed development at 116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest.

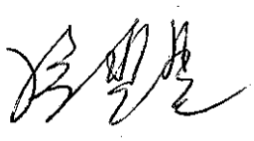
NSW planning instruments, guidelines and local authority planning guidelines have been used to develop project specific assessment criteria.

Noise impacts have been predicted at the subject development based on site measurements. The predicted impacts have been assessed against the project specific criteria. Measures needed to mitigate any identified potential impacts have been determined and are presented in the report.

The assessment has demonstrated that the proposed development is able to provide an adequate level of amenity in respect on noise impact from nearby roads provided with the incorporation fs mitigation of the type indicated in this assessment.

External noise emissions criteria have been setup in this report to satisfy the requirements from NSW planning and Council requirements. Once detailed location and selections of all proposed mechanical plant are known, an acoustic review should be undertaken to ensure compliance with the above. This should be undertaken during CC stage.

Yours faithfully,



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APPENDIX A AMBIENT NOISE MONITORING

This appendix summarises the ambient noise data measured near the subject site, and the calculated noise level descriptors adopted to characterise the existing noise environment.

Monitoring has been undertaken to provide the following ambient data:

- Traffic noise levels from Frenchs Forest Road West, and
- Background noise levels at the backyard of 116 Frenchs Forest Road West.

A.1 UNATTENDED LONG TERM NOISE MONITORING

A.1.1 Ambient Noise Descriptors

Ambient noise constantly varies in level from moment to moment, so it is not possible to accurately determine prevailing noise conditions by measuring a single, instantaneous noise level.

To quantify ambient noise, a 15-minute measurement interval is typically utilised. Noise levels are monitored on a continuous basis over this period, and statistical and integrating techniques are used to characterise the noise being measured.

The principal measurement parameters are:

L_{eq} - represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the measurement period. L_{eq} is important in the assessment of noise impact as it closely corresponds with how humans perceive the loudness of steady state and quasi-steady state noise sources (such as traffic noise).

L_{90} – This is commonly used as a measure of the background noise level as it represents the noise level heard in the quieter periods during the measurement interval. The L_{90} parameter is used to set noise emission criteria for potentially intrusive noise sources since the disturbance caused by a noise source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L_{90} level.

L_{10} is used in some guidelines to measure noise produced by an intrusive noise source since it represents the average of the loudest noise levels produced at the source. Typically, this is used to assess noise from licenced venues.

L_{max} is the highest noise level produced during a noise event and is typically used to assess sleep arousal impacts from short term noise events during the night. It is also used to assess internal noise levels resulting from aircraft and railway ground vibration induced noise.

L_1 is sometimes used in place of L_{max} to represent a typical noise level from a number of high-level, short-term noise events.

A.1.2 Equipment Used

Unattended noise monitoring was conducted using the following equipment:

- Rion NL-42 (Type 2)
- Rion Sound Level Calibrator Type NC 74

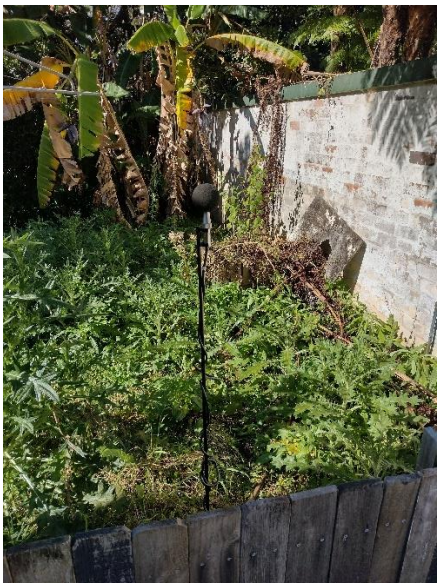
The monitoring was continuous, with statistical noise levels recorded at 15-minute intervals throughout the monitoring period. Measurements were taken on "A" frequency weighting and fast time response, unless noted otherwise.

All monitoring equipment used retains current calibration - either manufacturers' calibration or NATA certified calibration. The monitors were field calibrated at the beginning and the end of the measurement with no significant drift in calibration noted.

A.1.3 Locations Monitored

Detailed locations of the noise monitoring are presented in Figure 2. Photographs of the monitoring locations are provided below:

Noise monitor Facing Frenchs Forest Road West



Noise monitor at the backyard.

A.1.4 Weather Affected and Extraneous/Outlying Data

Periods affected by adverse weather conditions are indicated on the following data graphs. Weather data was obtained from records provided by the Bureau of Meteorology for the following station:

- Terrey Hills

The following periods have been identified as likely to contain significant periods of non-representative data and have been excluded from the assessment:

- 23/7/2023 Night

As the Bureau of Meteorology wind data is typically obtained at an exposed location at 10m above ground level, and the monitoring locations were at approximately 1.5m above ground in more sheltered locations a wind multiplying factor of 0.5 has been applied to the BOM data to estimate the wind speed at the microphone location.

A.2 CALCULATION OF REPRESENTATIVE AMBIENT NOISE LEVELS

The noise data for the day and night periods have been processed to determine the period ambient noise levels at the monitoring locations. Noise levels that are in bold type indicate that these periods were determined to have been significantly affected by non-representative noise sources and these periods were excluded from subsequent calculations.

Where monitoring was conducted within 3m of a significant sound reflecting surface, 2.5 dB(A) has been subtracted from the calculated rating background to account for an increase in noise from reflections.

The following tables summarise the daily measurements and the representative noise levels at each location

Table 6 –Ambient Noise – Facing Frenchs Forest Road West

Date	Noise Level dB(A) $L_{eq,\ period}$		
	Day	**Evening**	**Night**
14/07/2023	0	42.6	33.5
15/07/2023	46.7	41	34.8
16/07/2023	44.3	41.1	35.6
17/07/2023	48.7	41.4	33.6
18/07/2023	48.3	41.8	36.4
19/07/2023	49.2	42.3	37.5
20/07/2023	47.8	44.9	36.7
21/07/2023	49.5	42.8	36.5
22/07/2023	47.7	42	36.6
23/07/2023	46	41.9	0
24/07/2023	49.9	42.7	36
Log Average	**48**	**42**	**36**

Table 7 –Ambient Noise – Back of the Site Facing R2

Date	Noise Level dB(A) $L_{eq, period}$		
	Day	Evening	Night
14/07/2023	0	37.8	25.4
15/07/2023	40.3	36.1	26.4
16/07/2023	37.7	36.5	27.3
17/07/2023	40.5	36.1	26.3
18/07/2023	38.9	35.2	29.1
19/07/2023	40.1	35.1	29.6
20/07/2023	40.1	37.3	30.2
21/07/2023	40.8	36.4	29.2
22/07/2023	39.6	35	29.2
23/07/2023	39.7	35.9	0
24/07/2023	41.2	36	27.7
Log Average	**40**	**36**	**30***

*Nighttime RBL has been adjusted as it's lower than recommended RBL in NPI

A.3 ATTENDED NOISE MONITORING

A.3.1 Equipment Used

Attended noise monitoring was conducted using:

- Norsonics SA 140 (Type 1) sound analyser

The sound level meter equipment used retain current calibration - either manufacturers' calibration or NATA certified calibration, and were field calibrated at the beginning and the end of the measurement with no significant drift in calibration noted.

A.3.2 Locations Monitored

The attend measurement locations are indicated in Figure 2 and are described below:

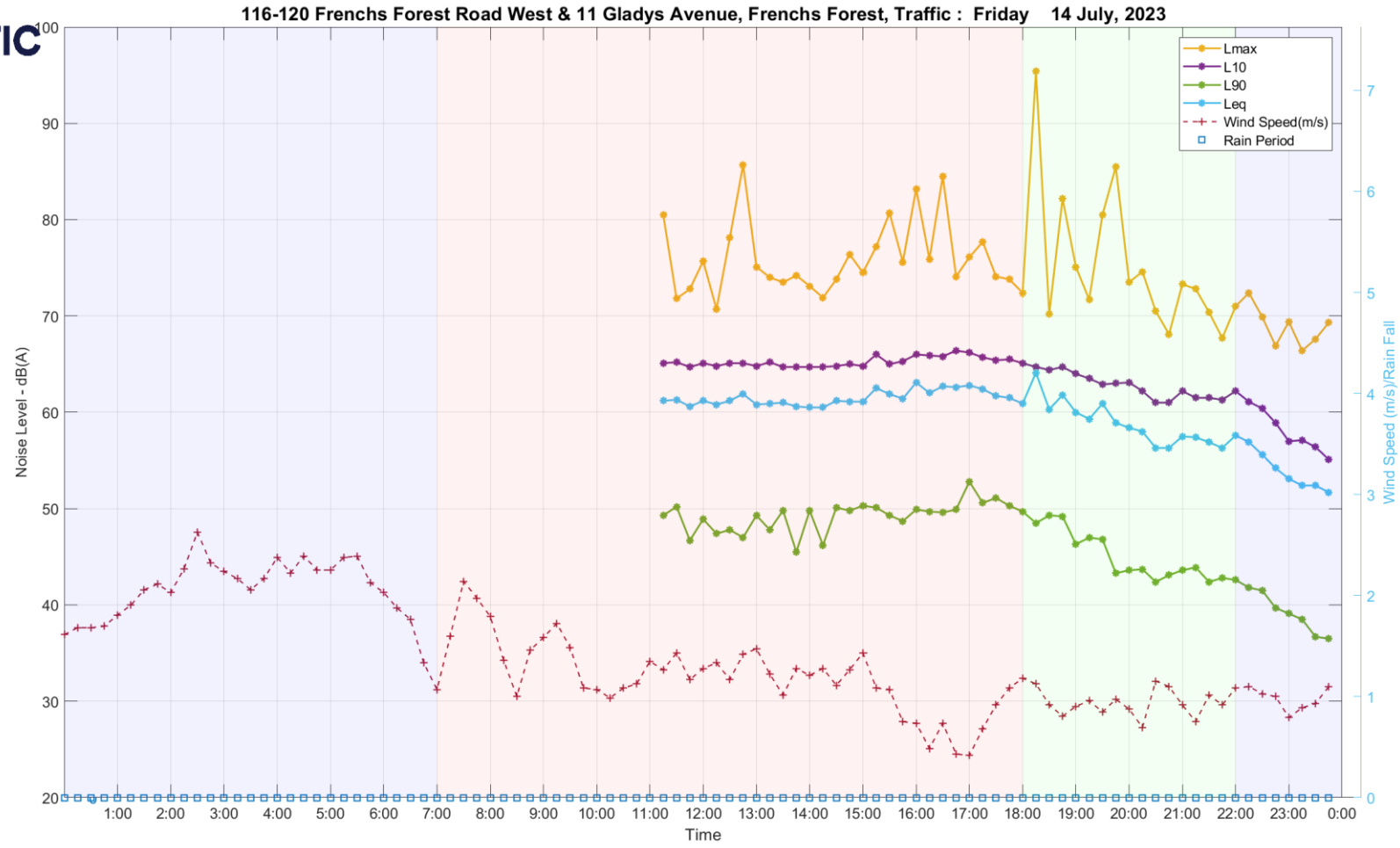
- In front of the site at 2m from kerb of Frenchs Forest Road West
- Back of the project site facing receiver R2

A.3.3 Results

Attend traffic measurement results are presented in Section 5.1.1.

A.4 UNATTENDED MONITORING DATA GRAPHS

NOISE MONITORING FACING FRENCHS FOREST ROAD WEST


116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Friday 14 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
100
90
80
70
60
50
40
30
20
7
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5
4
3
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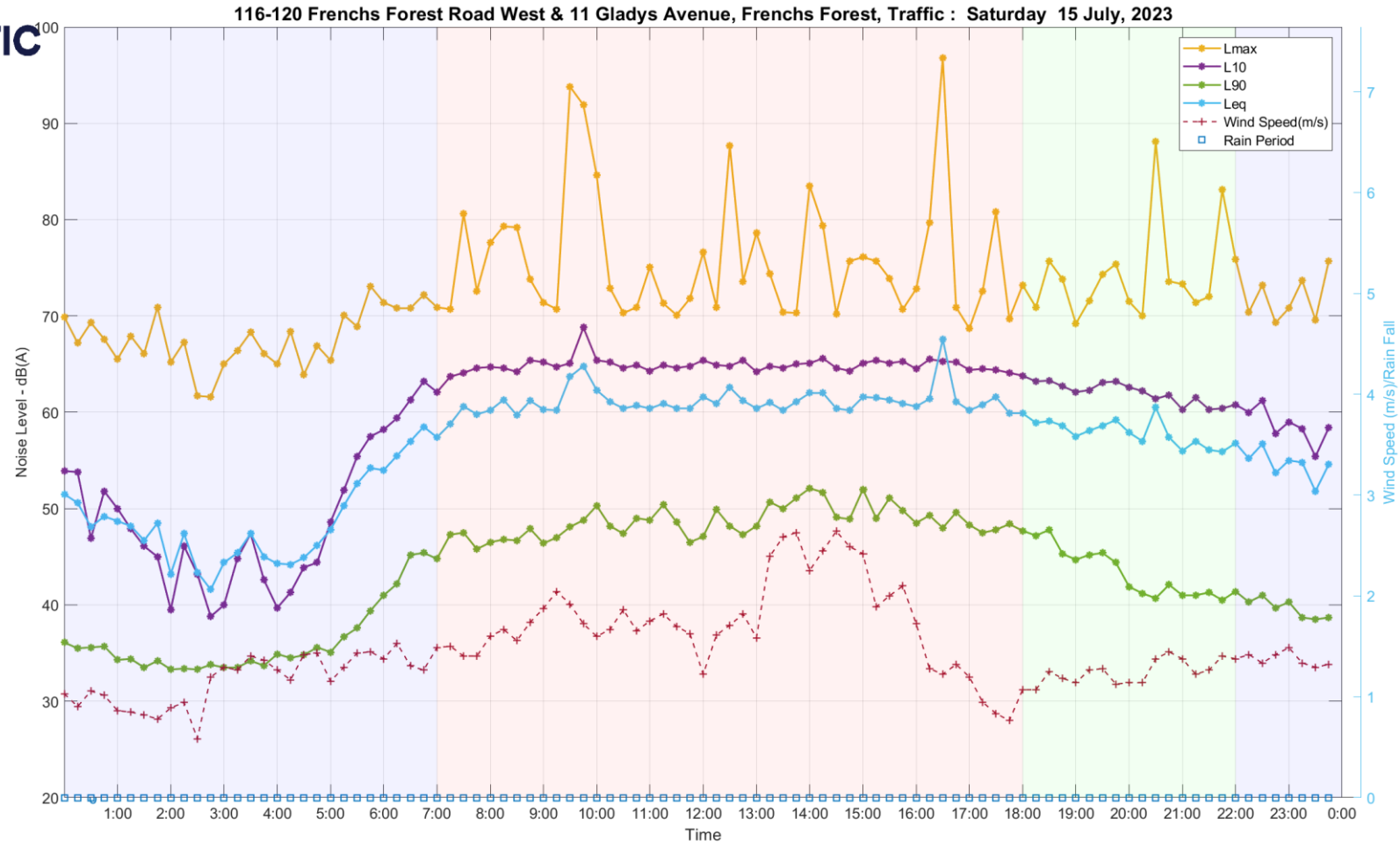
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Saturday 15 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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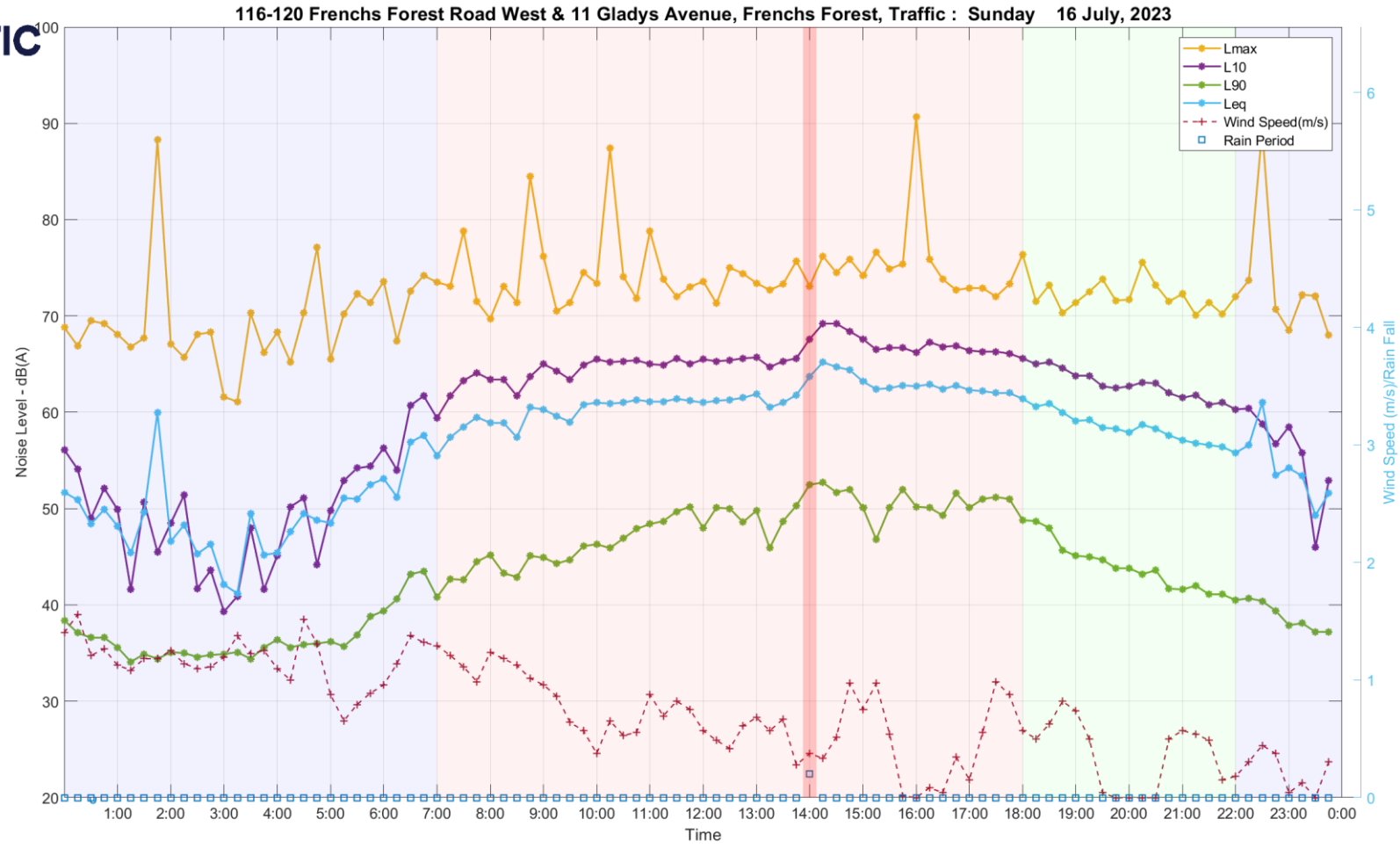
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Sunday 16 July, 2023
Lmax
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L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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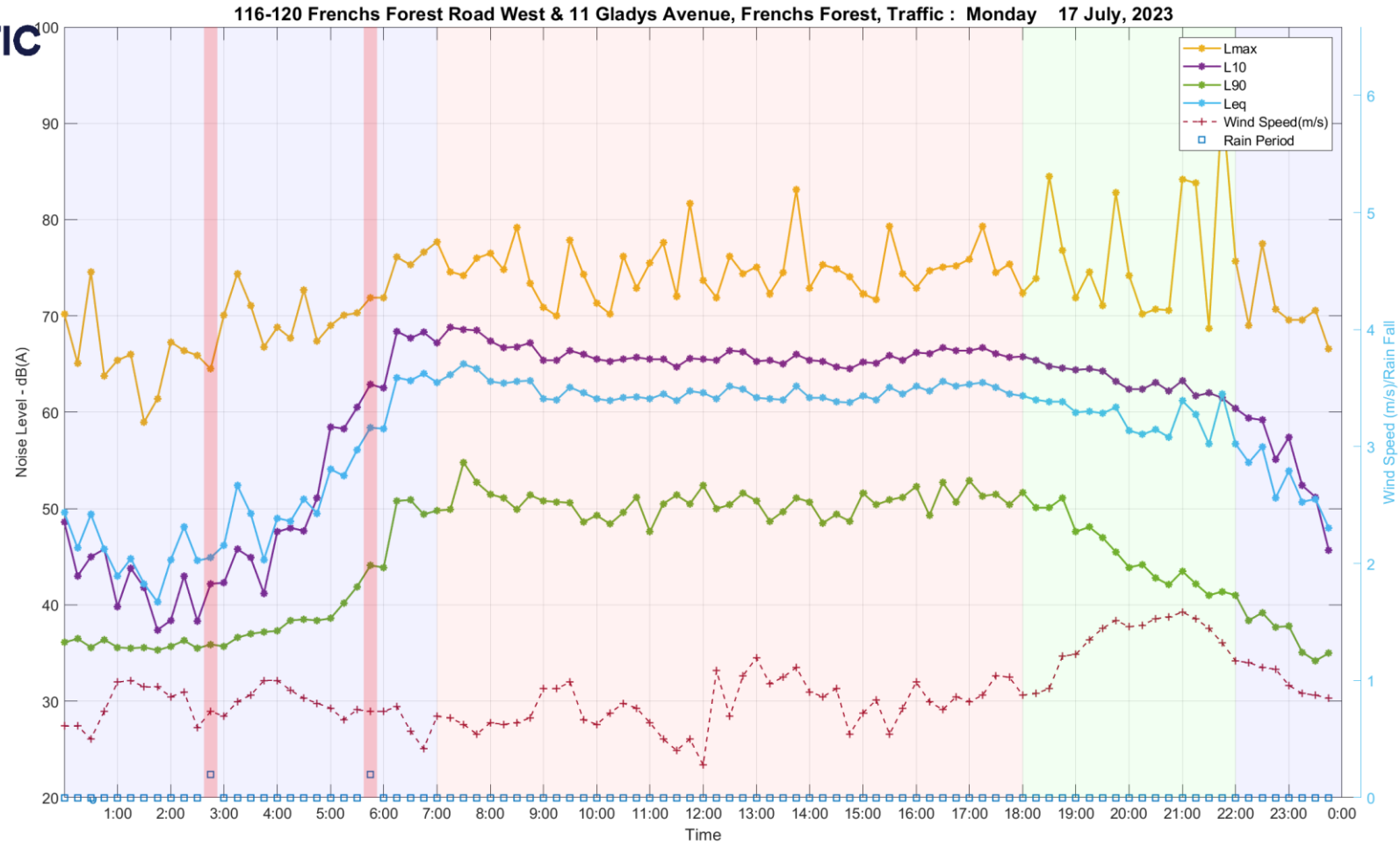
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Monday 17 July, 2023
Lmax
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L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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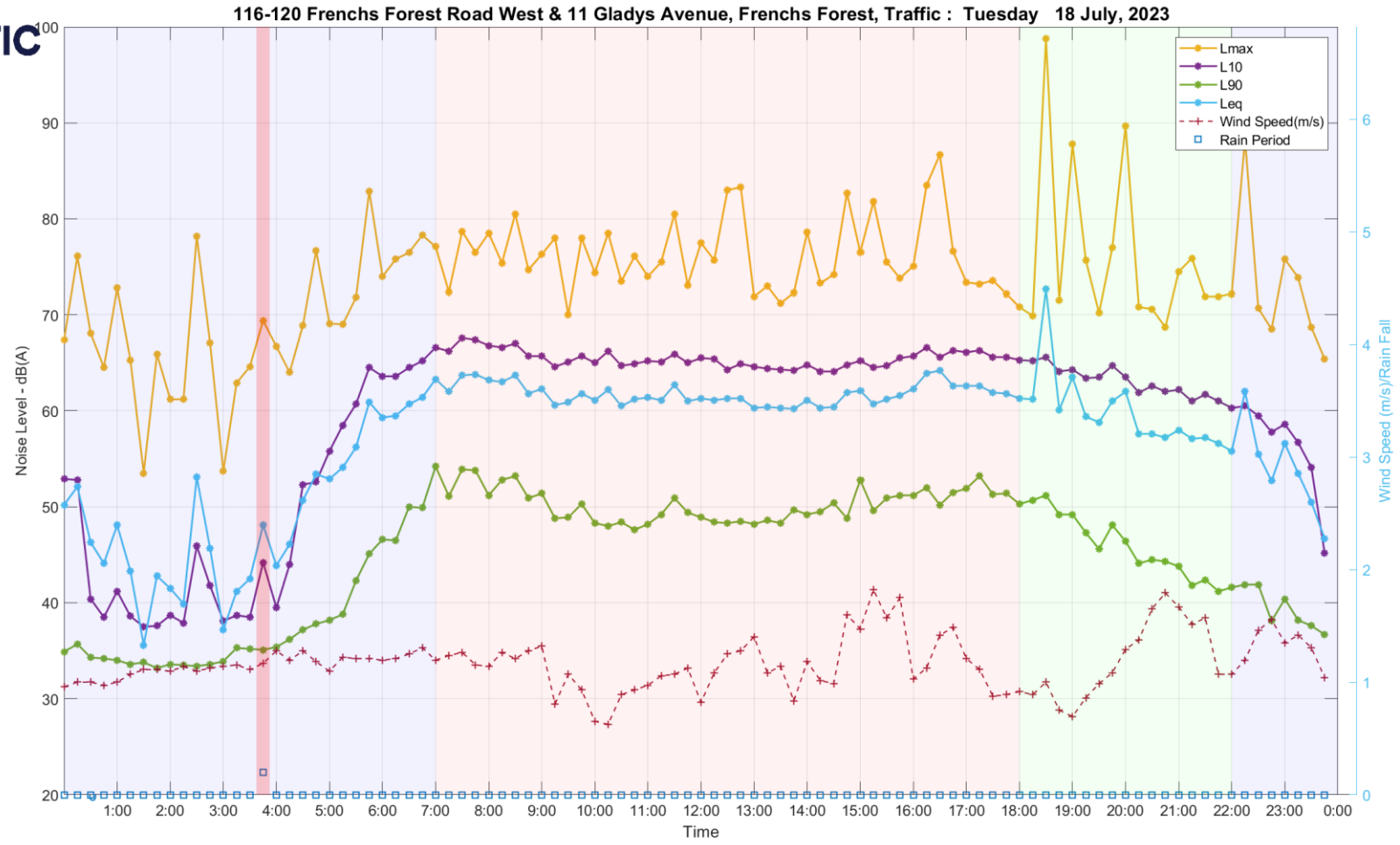
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Tuesday 18 July, 2023
Lmax
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L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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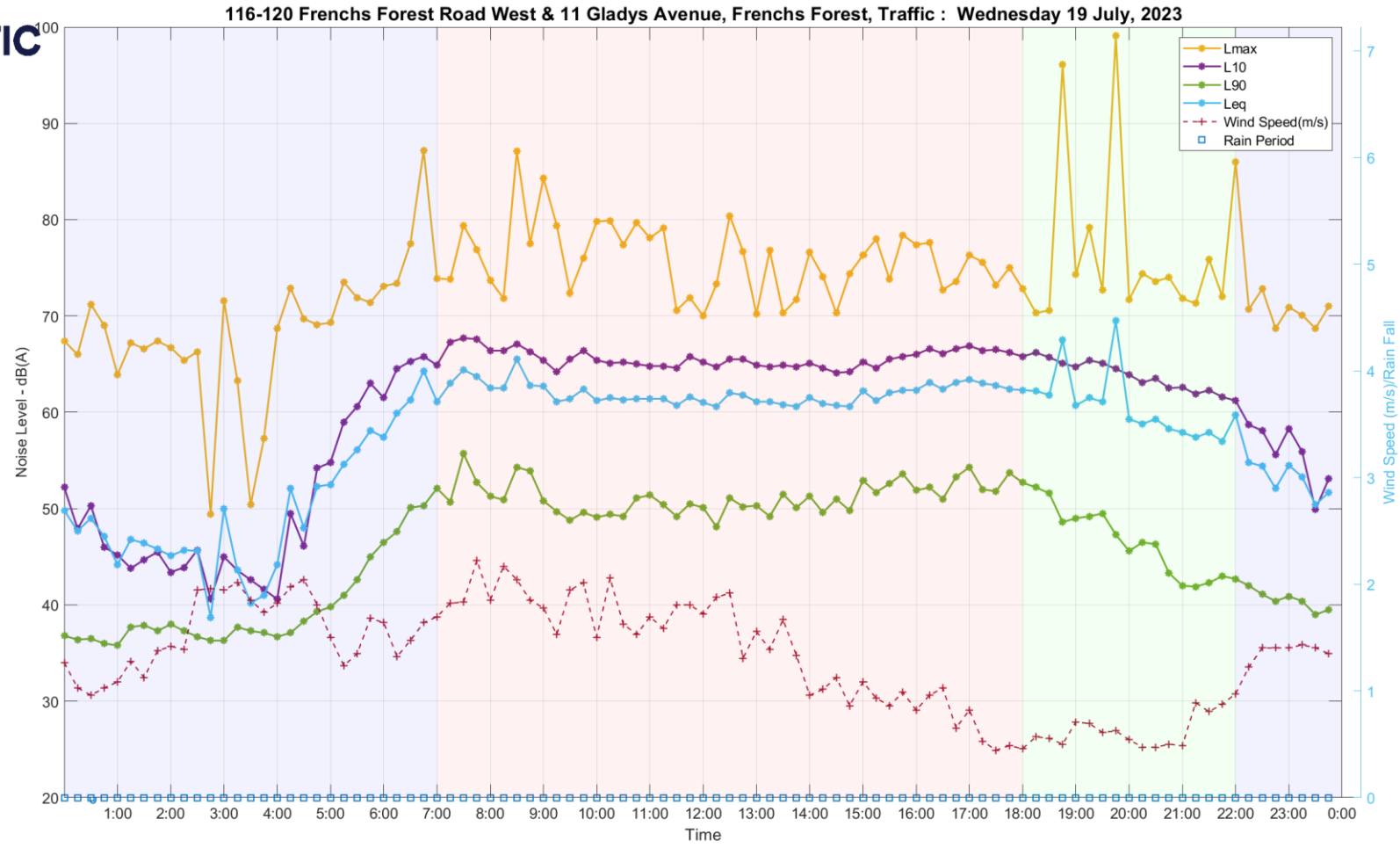
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Wednesday 19 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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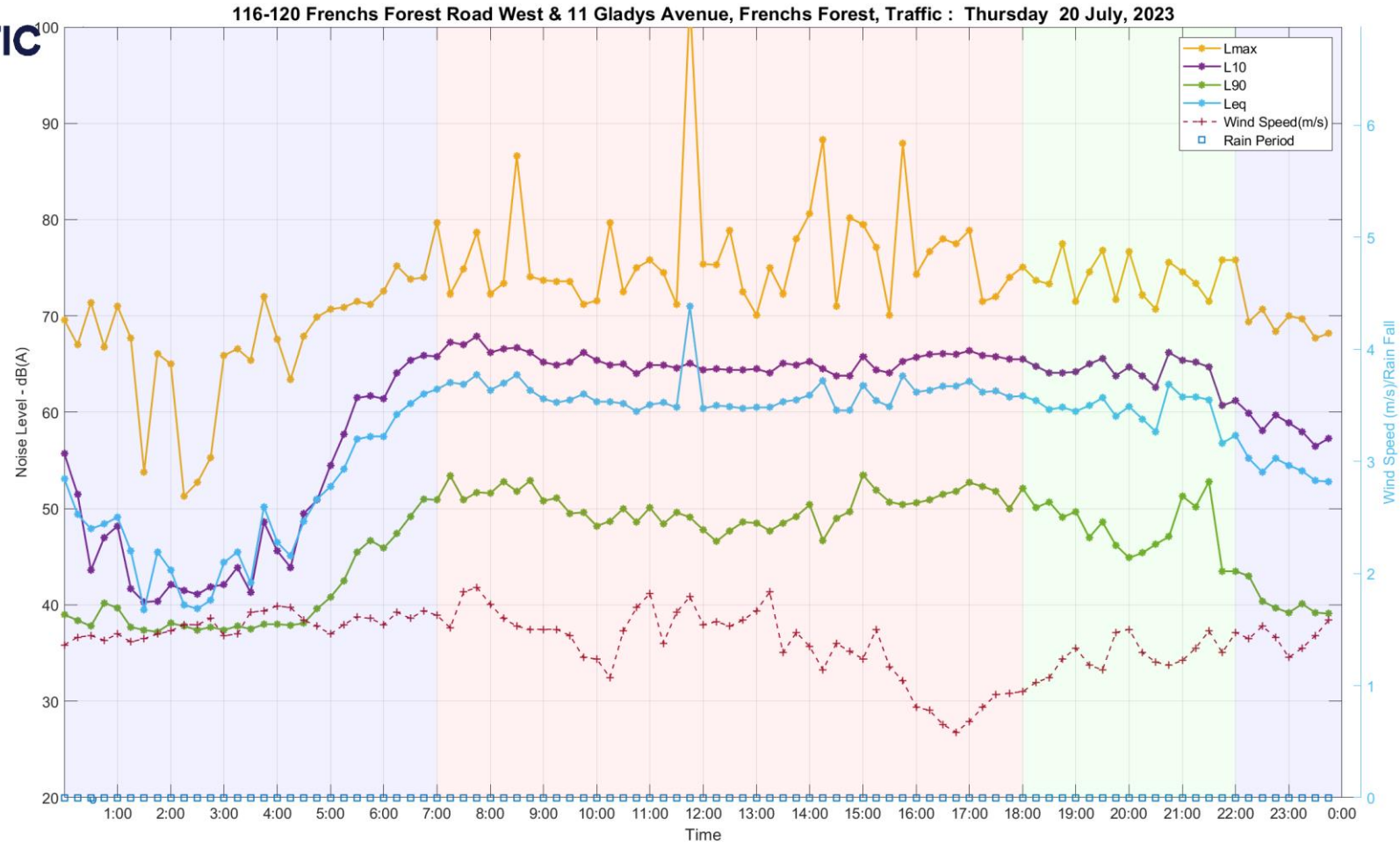
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Thursday 20 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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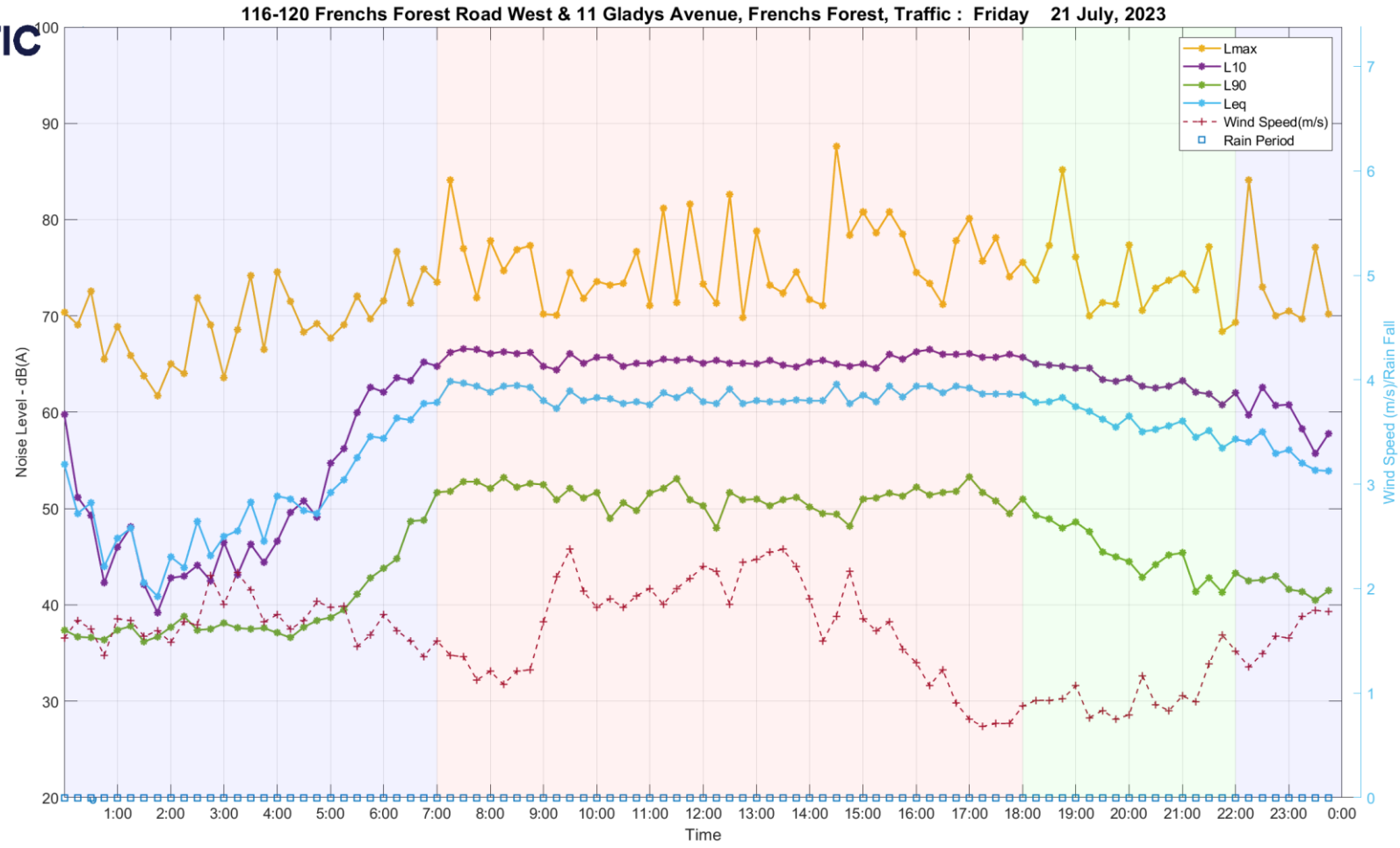
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Friday 21 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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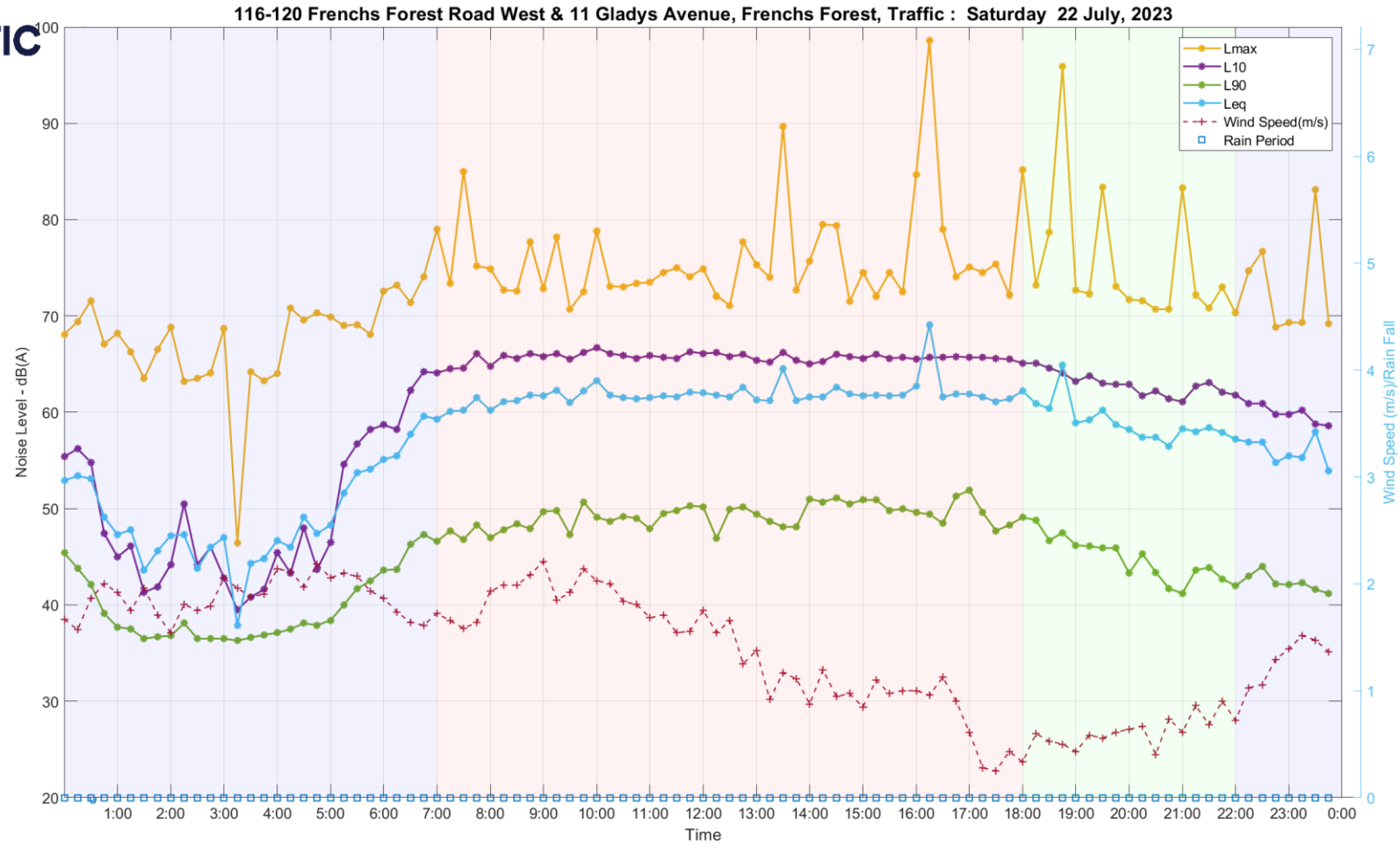
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Saturday 22 July, 2023
Lmax
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L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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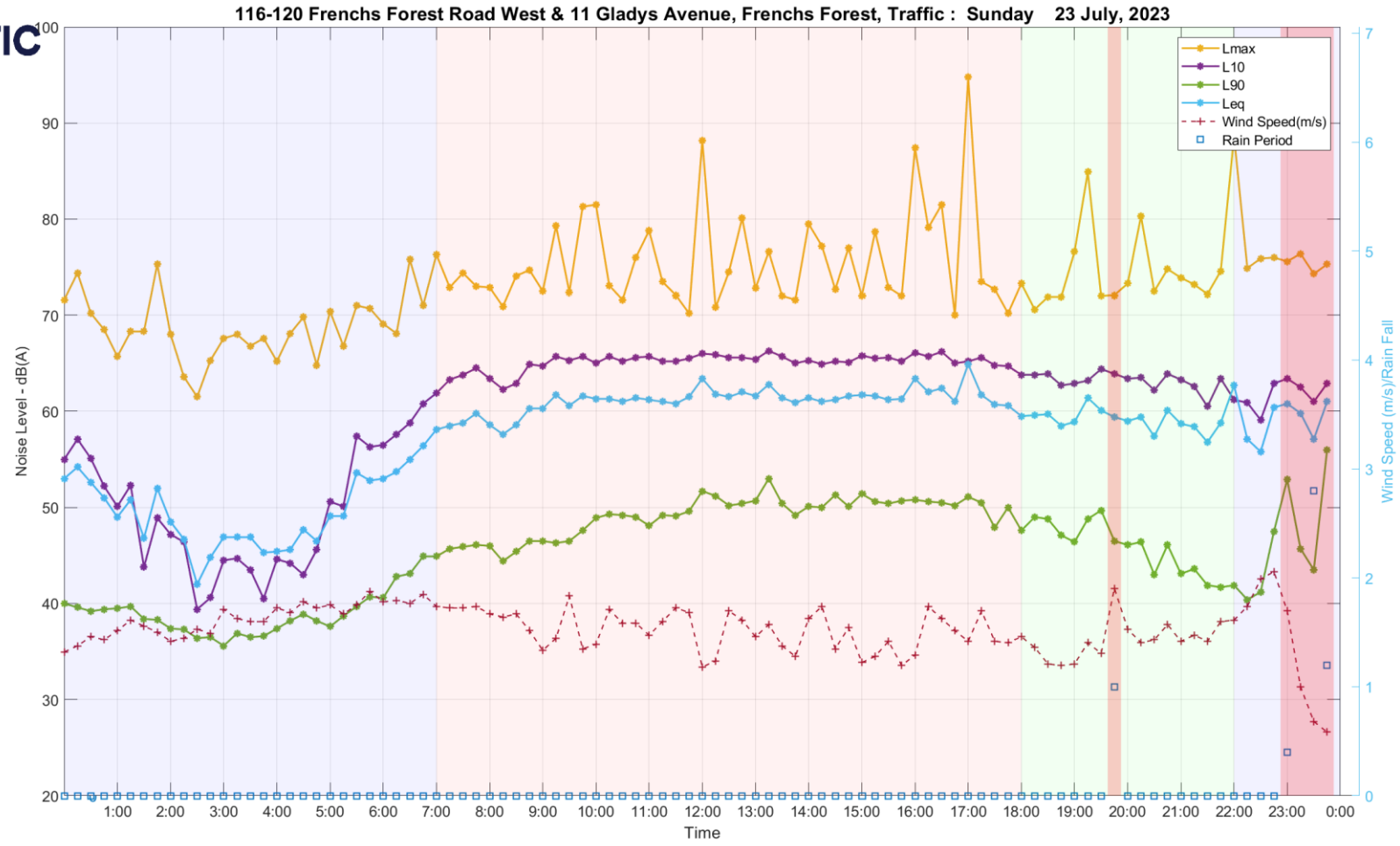
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Sunday 23 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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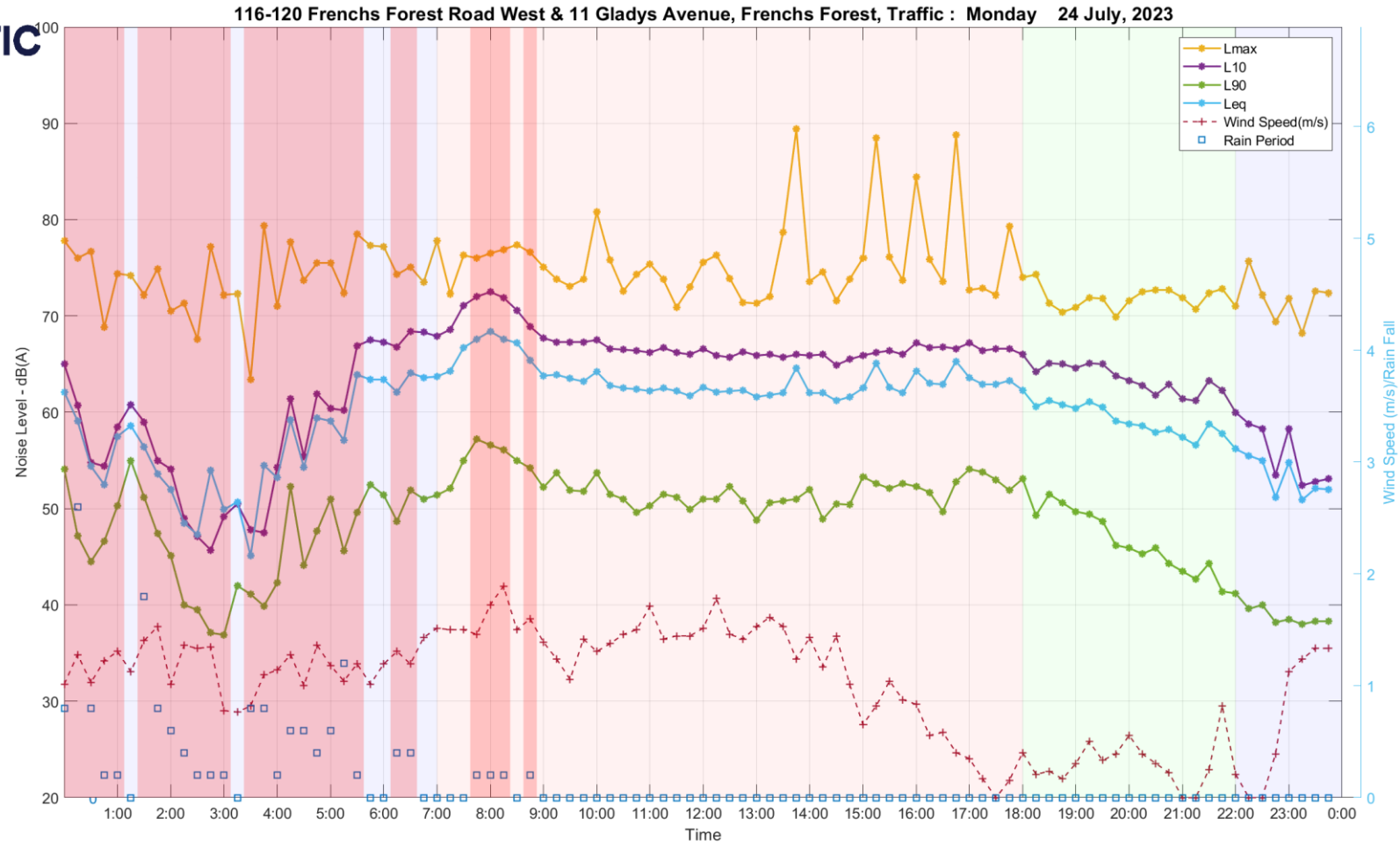
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, Traffic : Monday 24 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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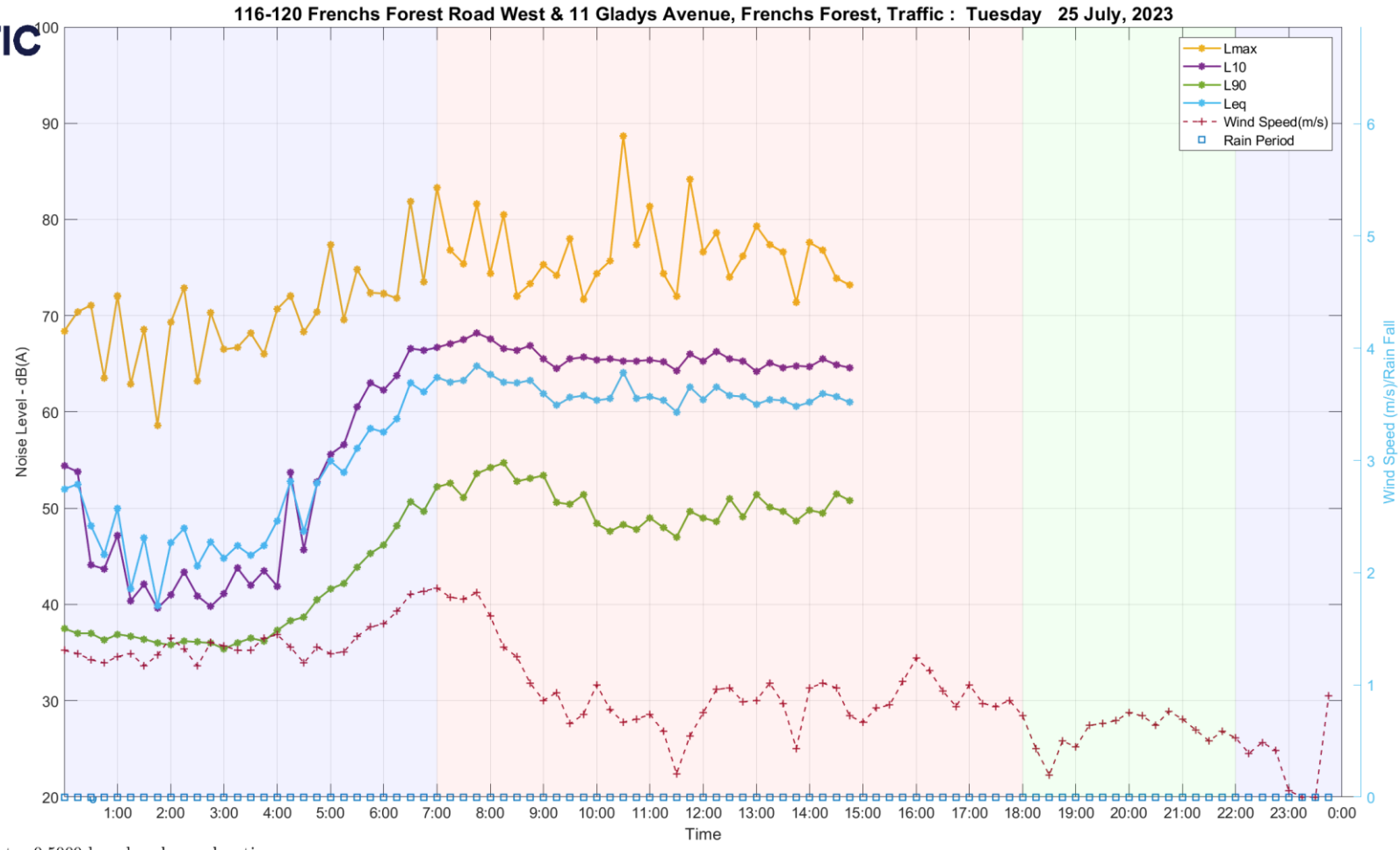
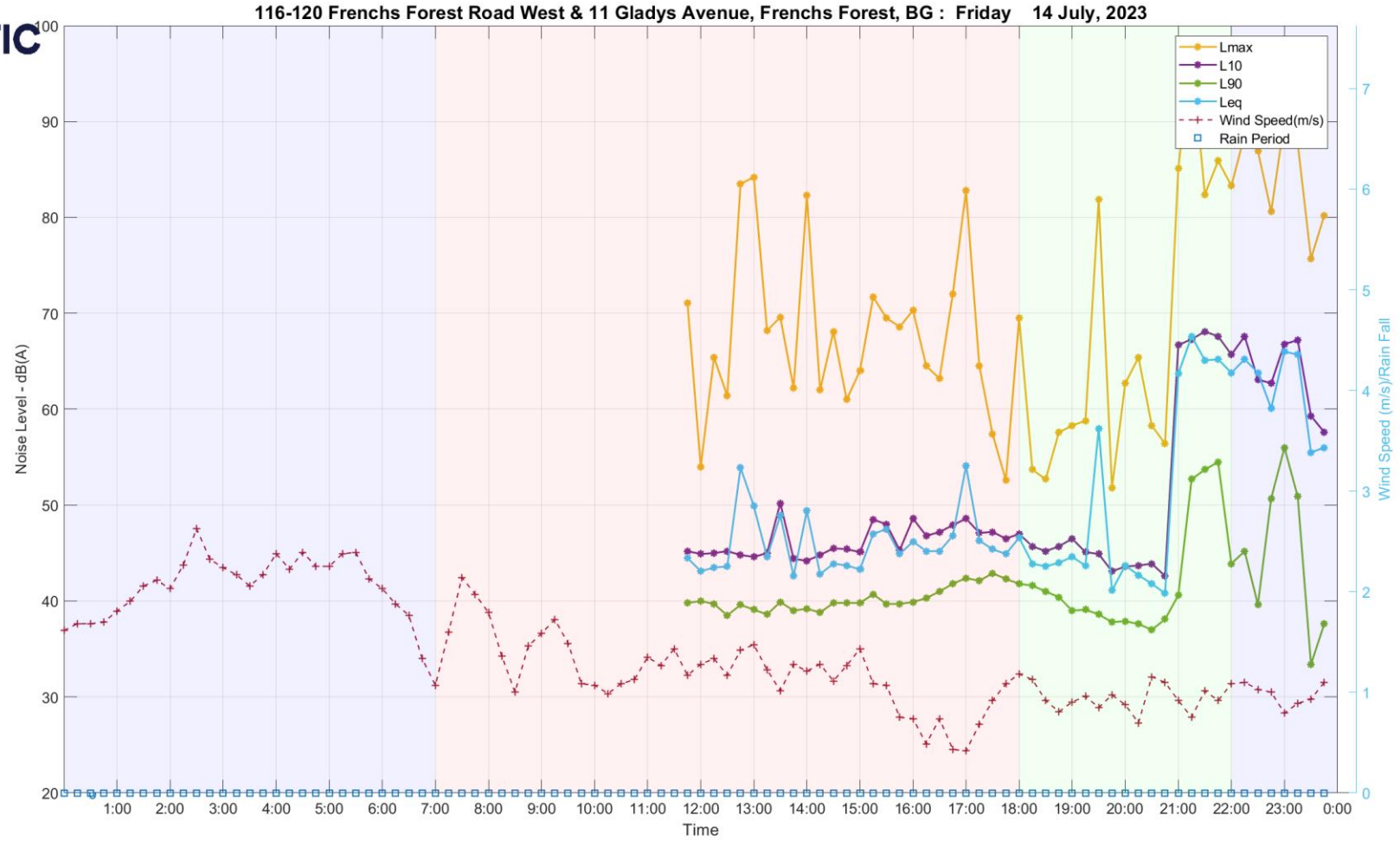


Wind Speed is corrected using factor 0.5000 based on logger location

NOISE MONITORING AT BACK OF SITE FACING R1


116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Friday 14 July, 2023
Lmax
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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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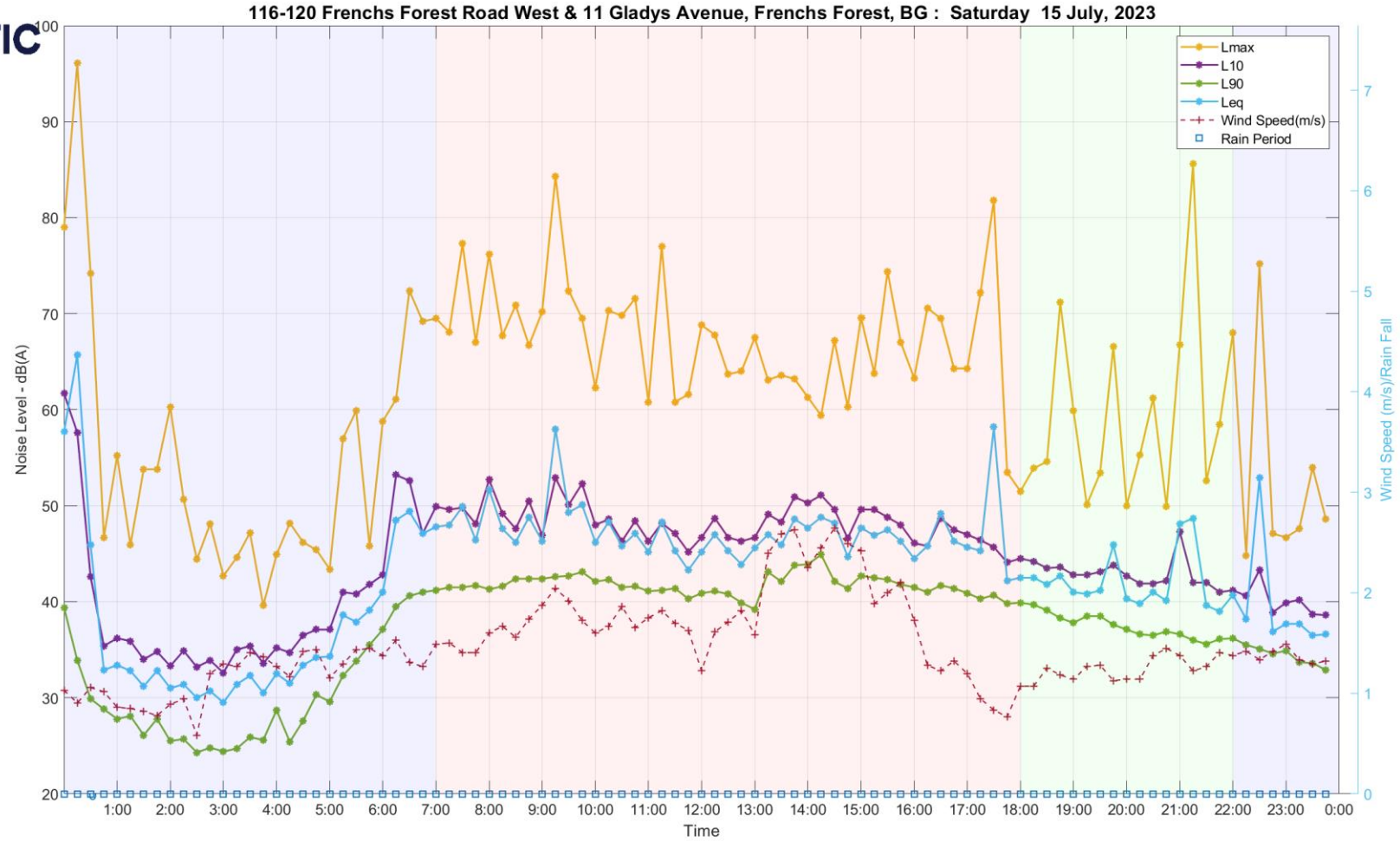
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Saturday 15 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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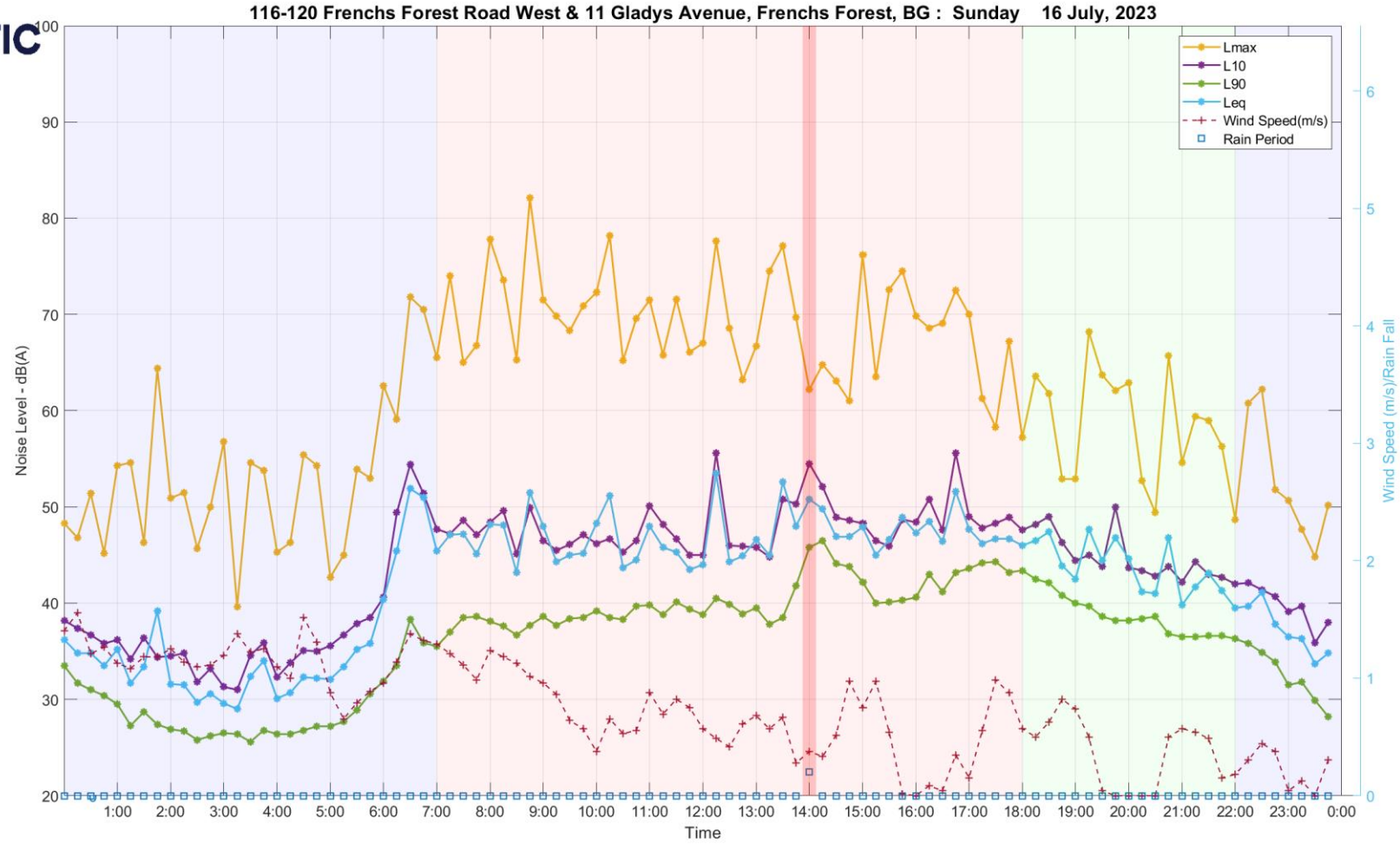
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Sunday 16 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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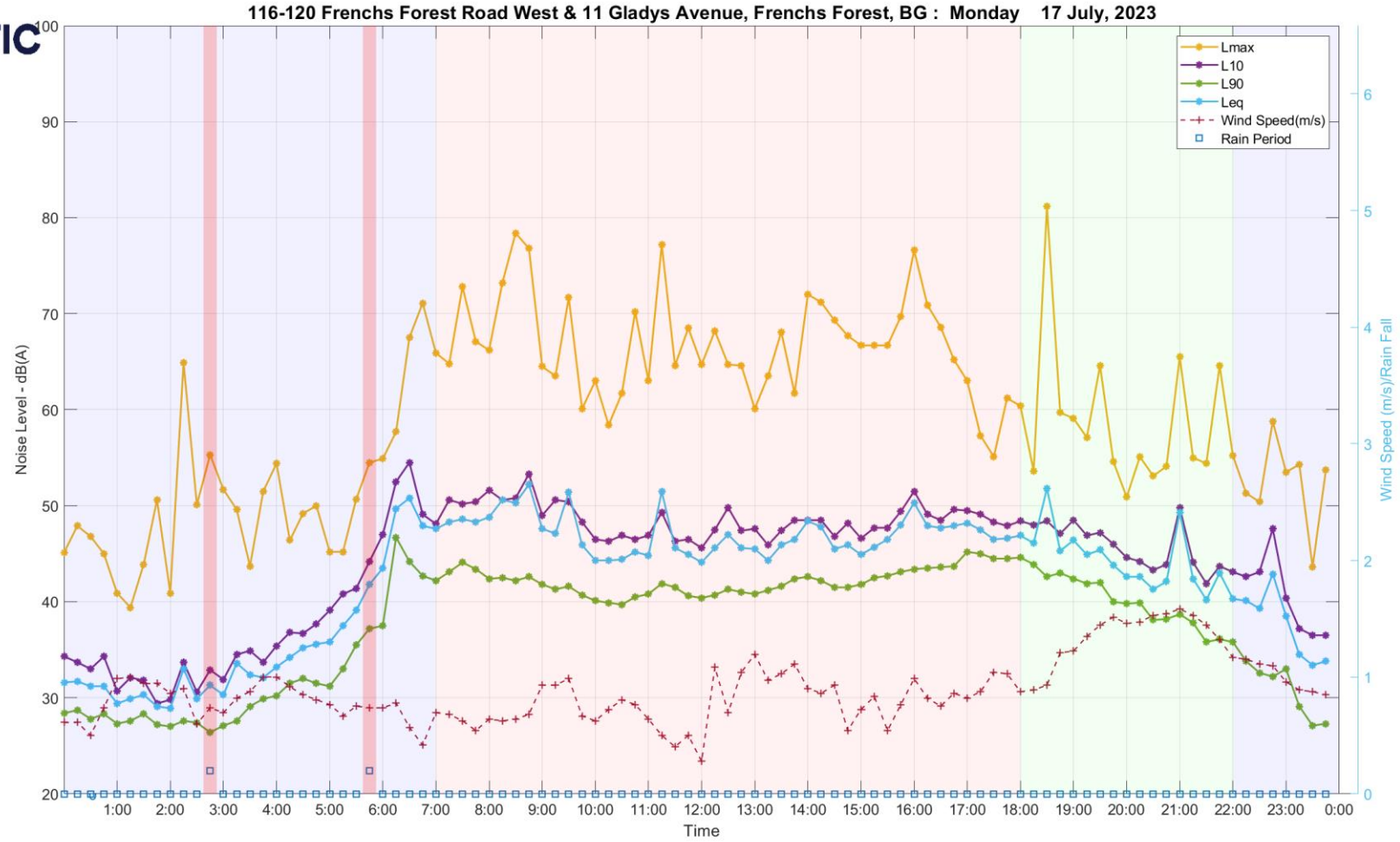
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Monday 17 July, 2023
Lmax
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L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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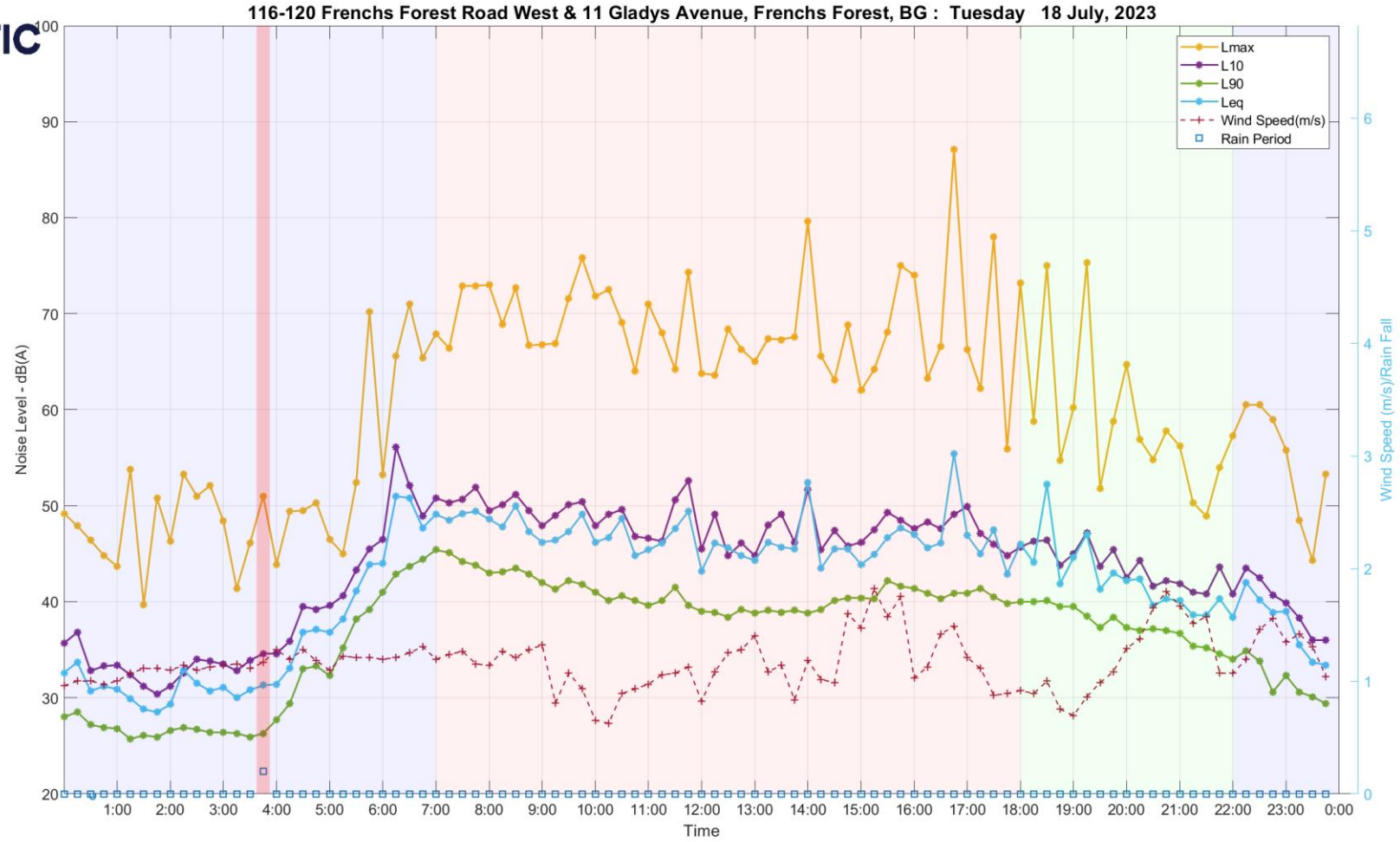
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Tuesday 18 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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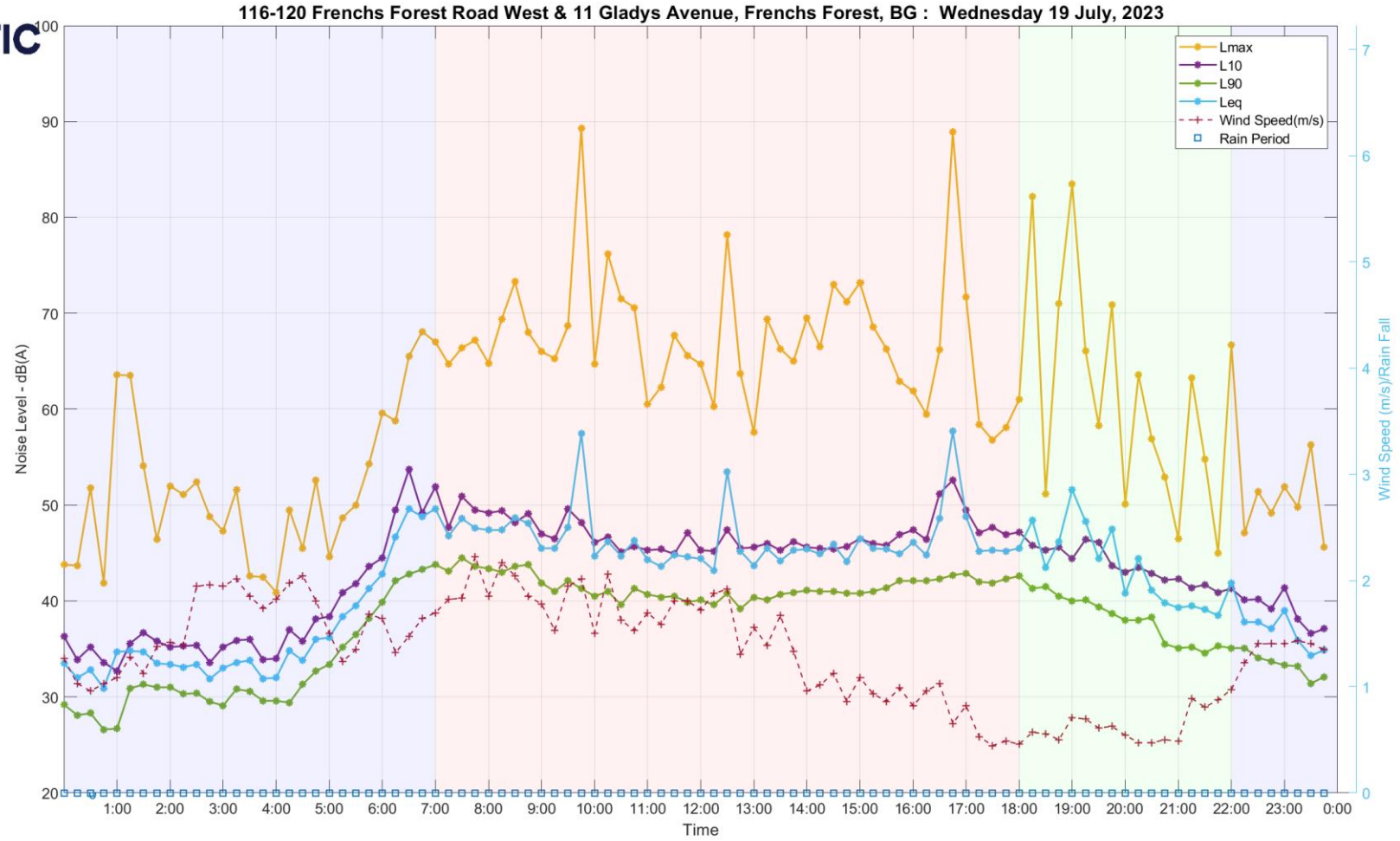
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Wednesday 19 July, 2023
Lmax
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L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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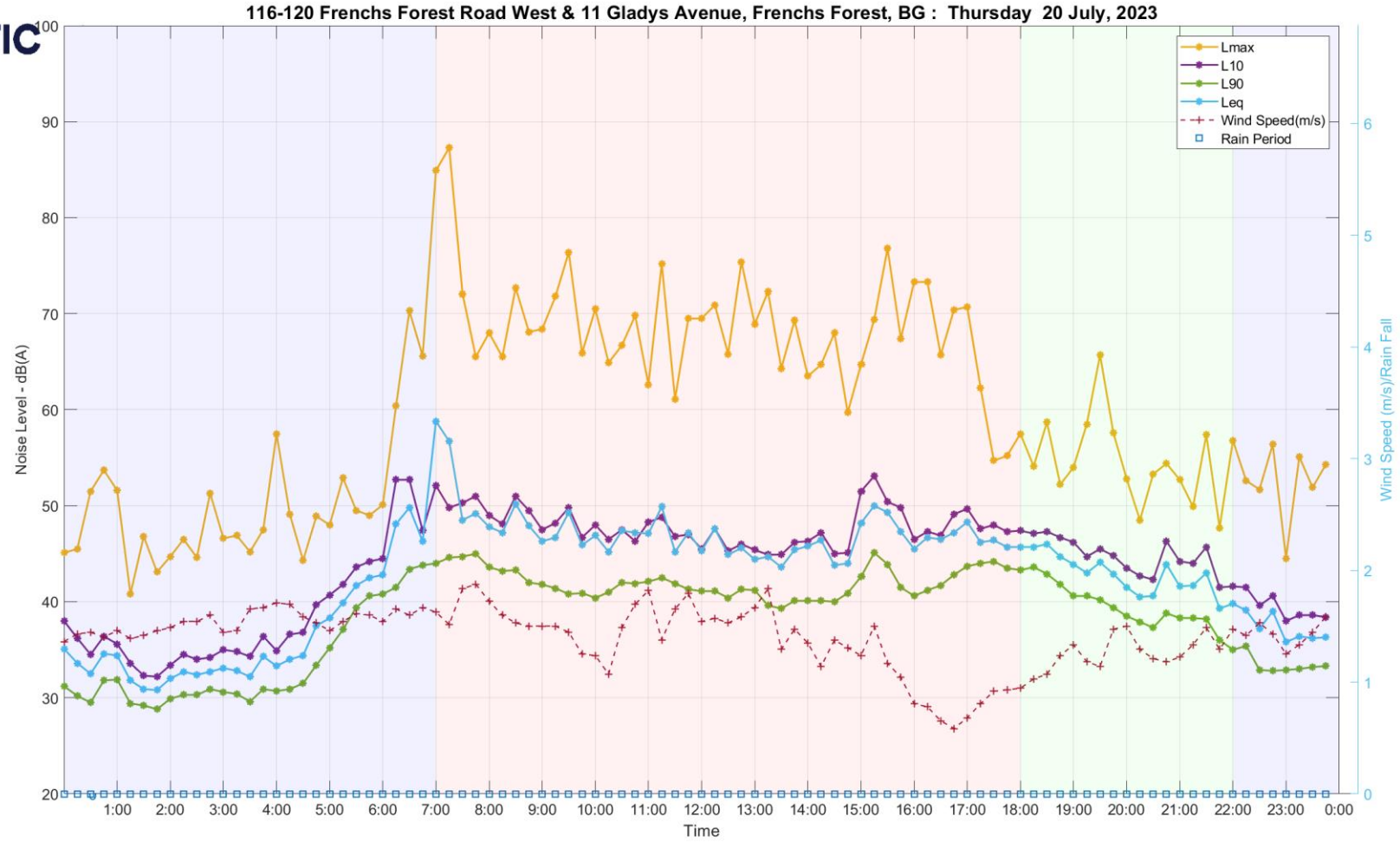
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Thursday 20 July, 2023
Lmax
L10
L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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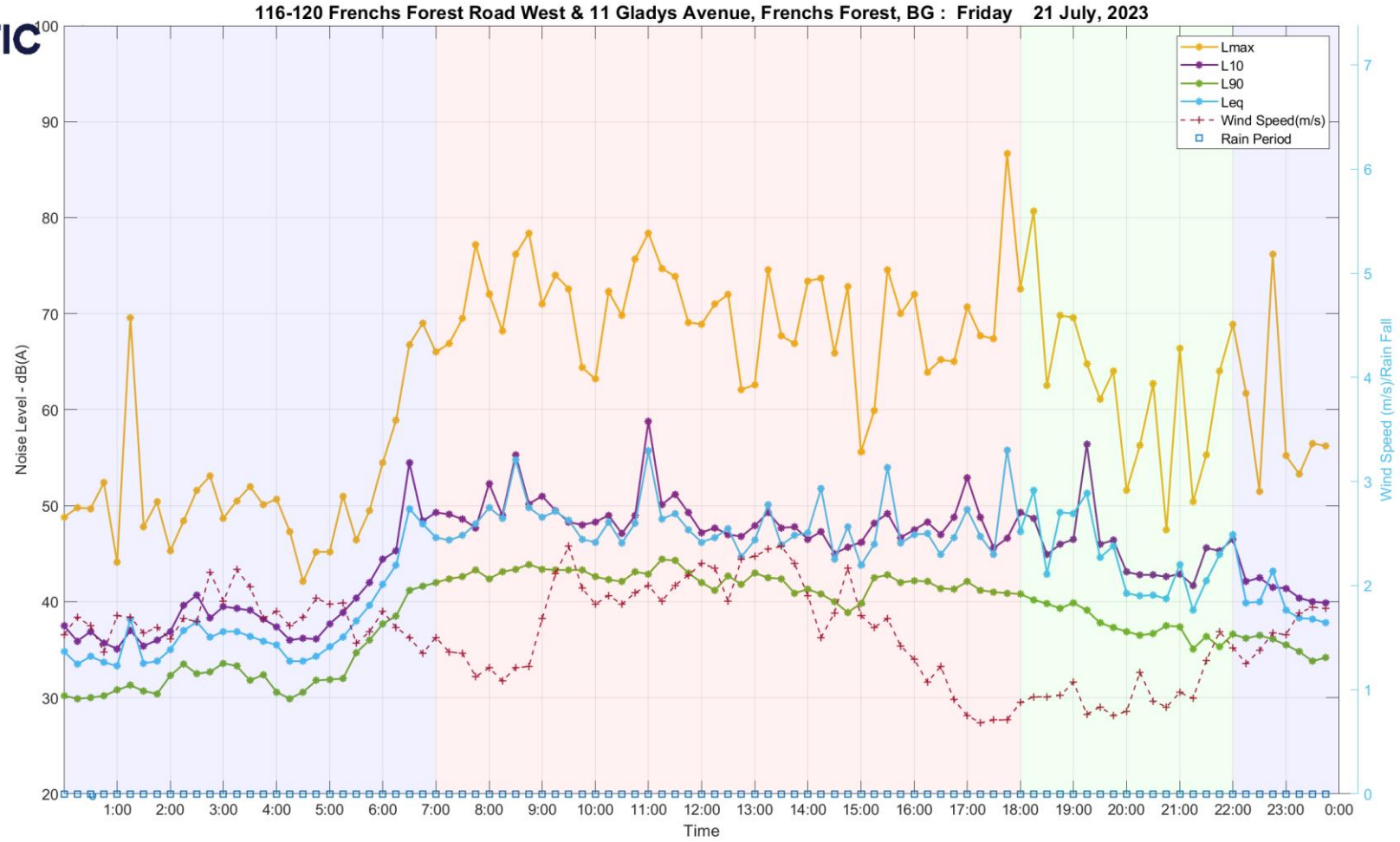
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Friday 21 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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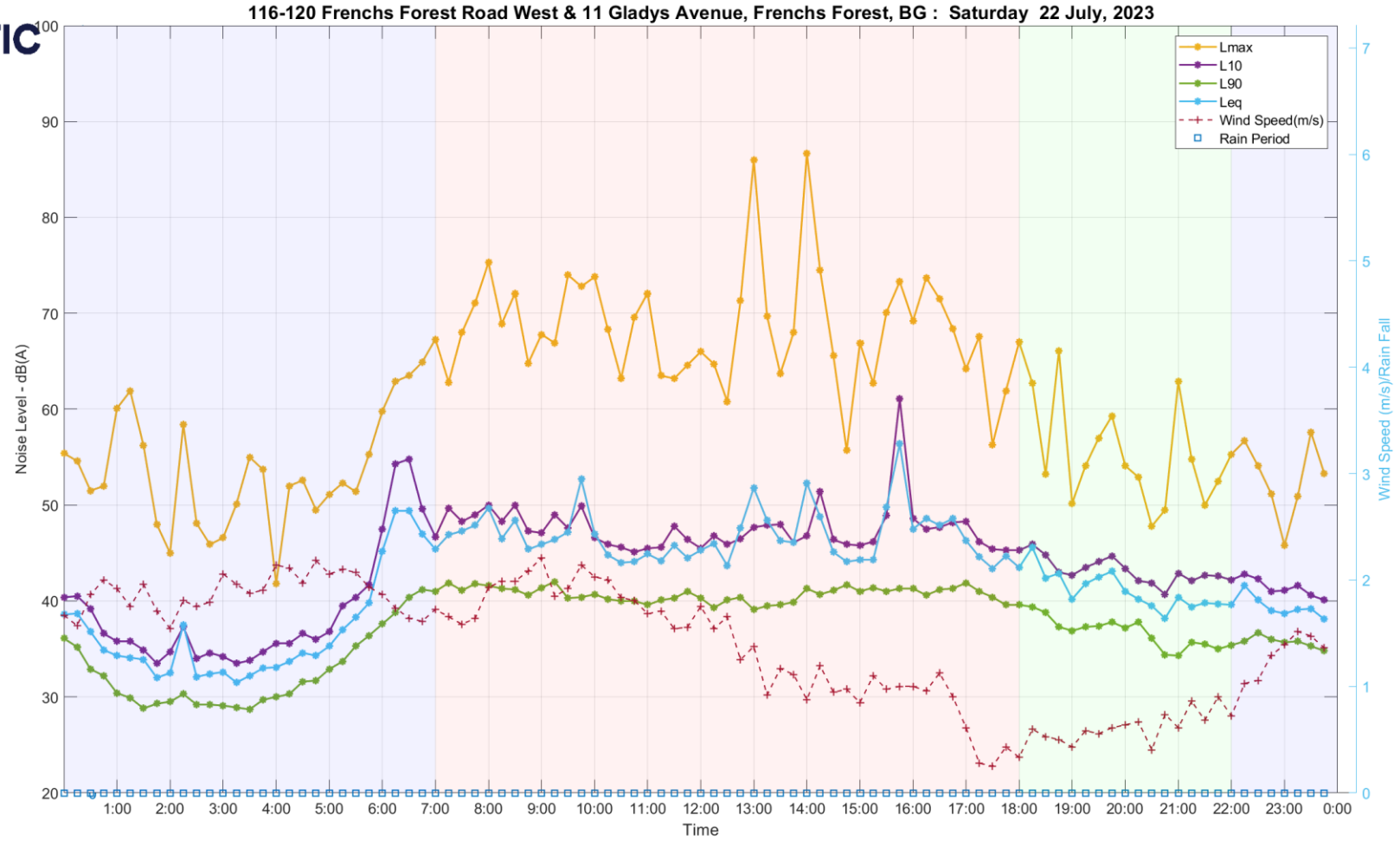
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Saturday 22 July, 2023
Lmax
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L90
Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
Time
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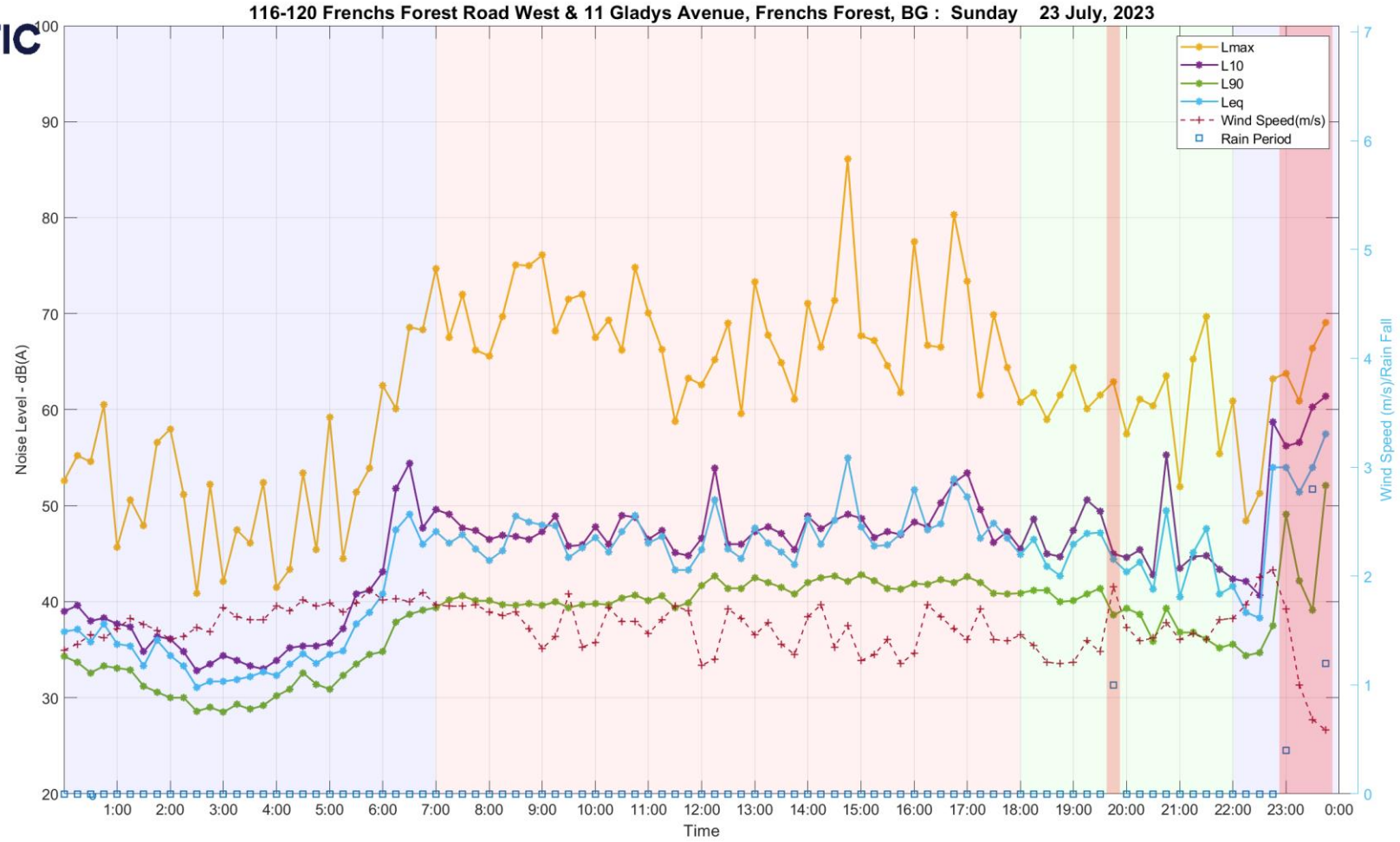
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Sunday 23 July, 2023
Lmax
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Leq
Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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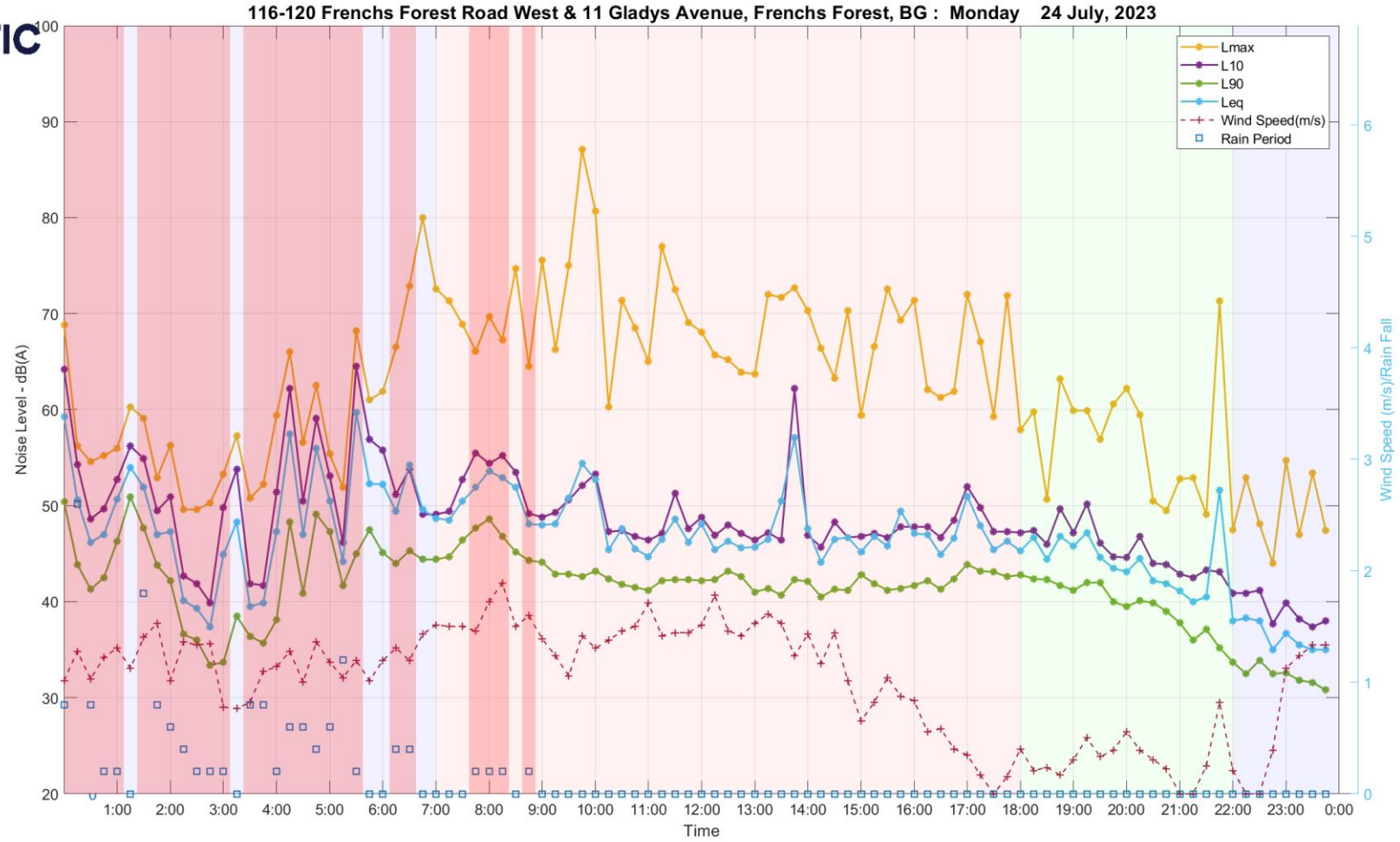
116-120 Frenchs Forest Road West & 11 Gladys Avenue, Frenchs Forest, BG : Monday 24 July, 2023
Lmax
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Wind Speed(m/s)
Rain Period
Noise Level - dB(A)
Wind Speed (m/s)/Rain Fall
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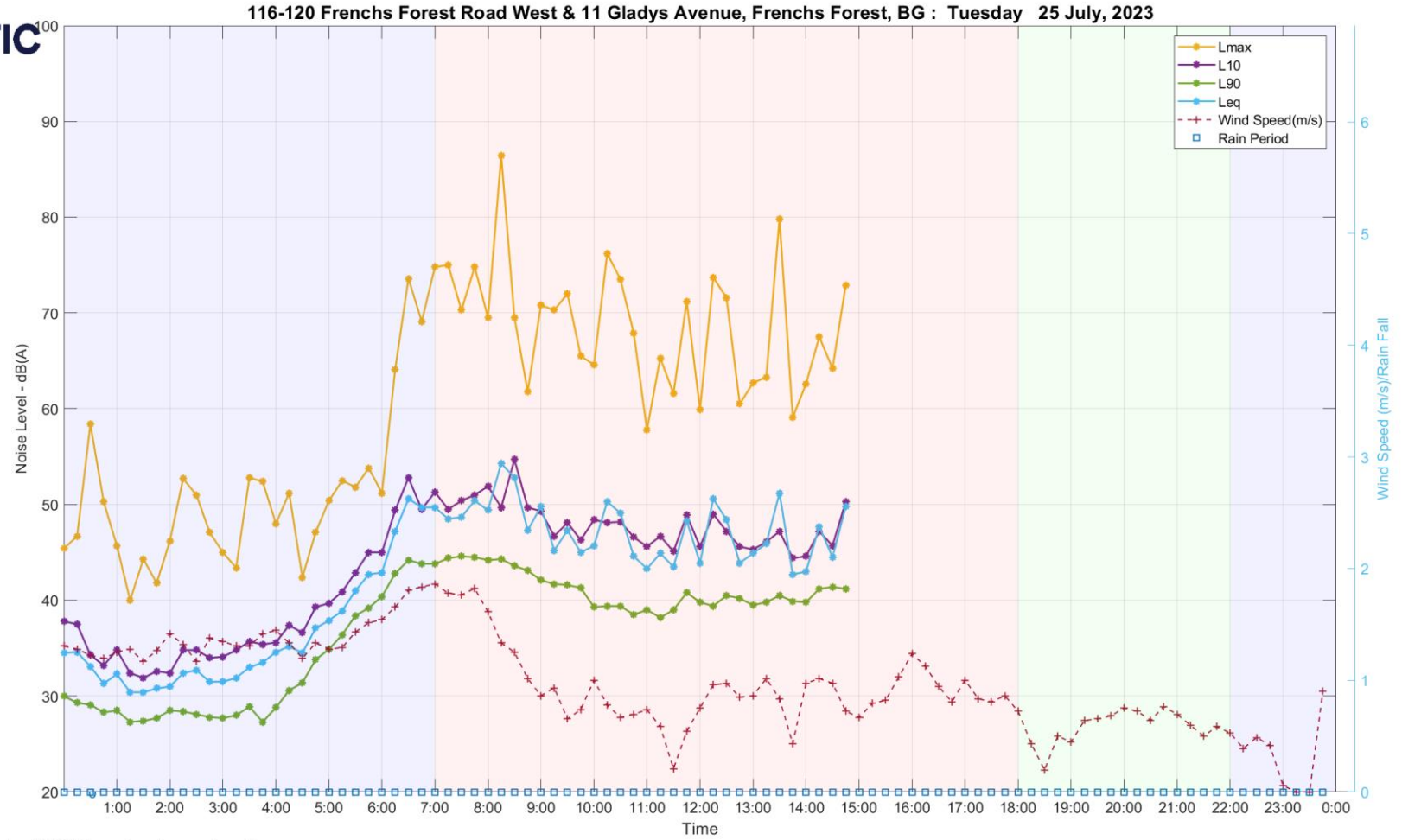
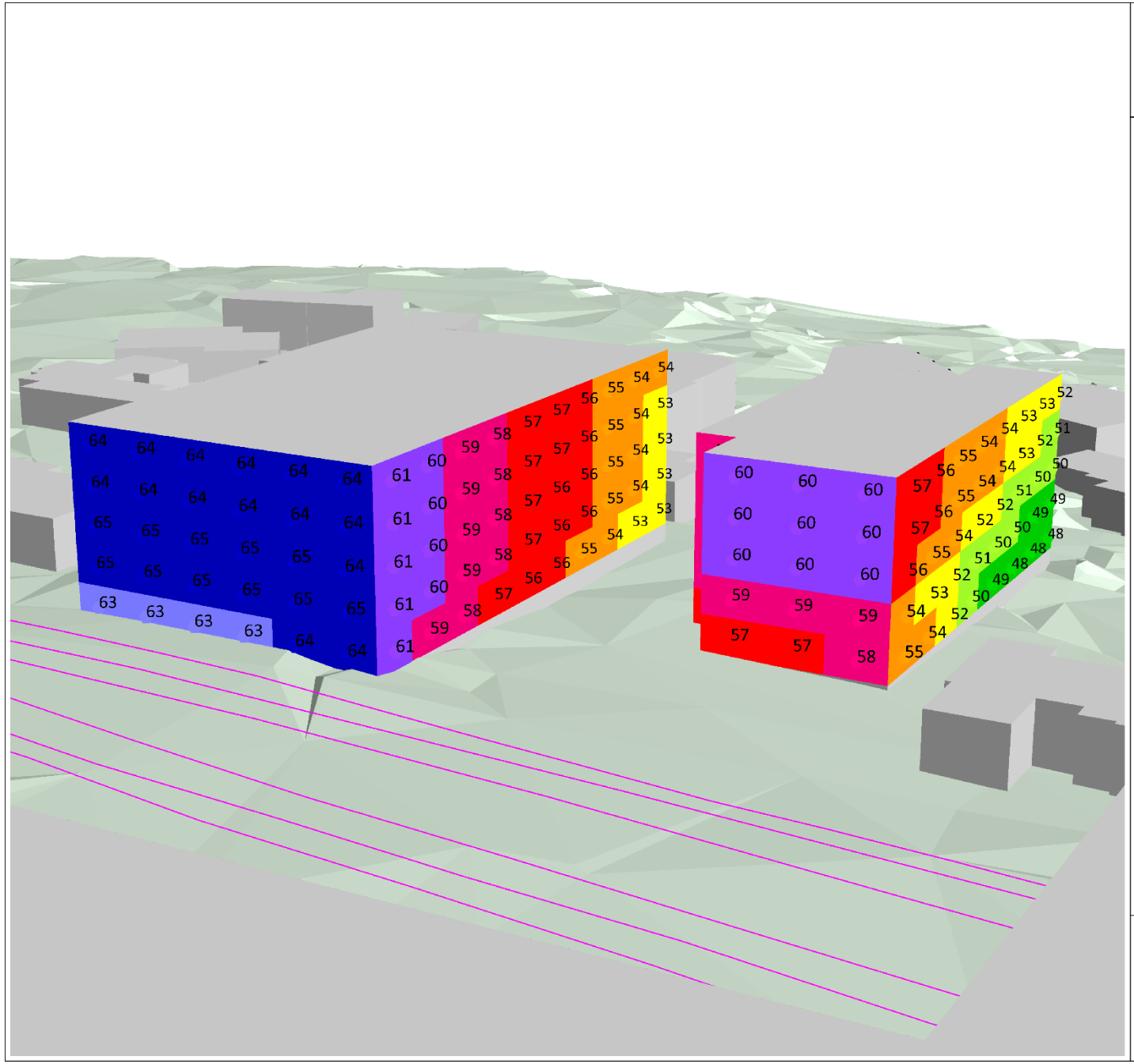


Wind Speed is corrected using factor 0.5000 based on logger location

APPENDIX B SOUNDPLAN FAÇADE NOISE LEVELS PREDICTION



116-120 Frenchs Forest Rd West & 11 Gladys Ave Frenchs Forest

Facade Noise Prediction

Daytime (7:00am - 10:00pm)

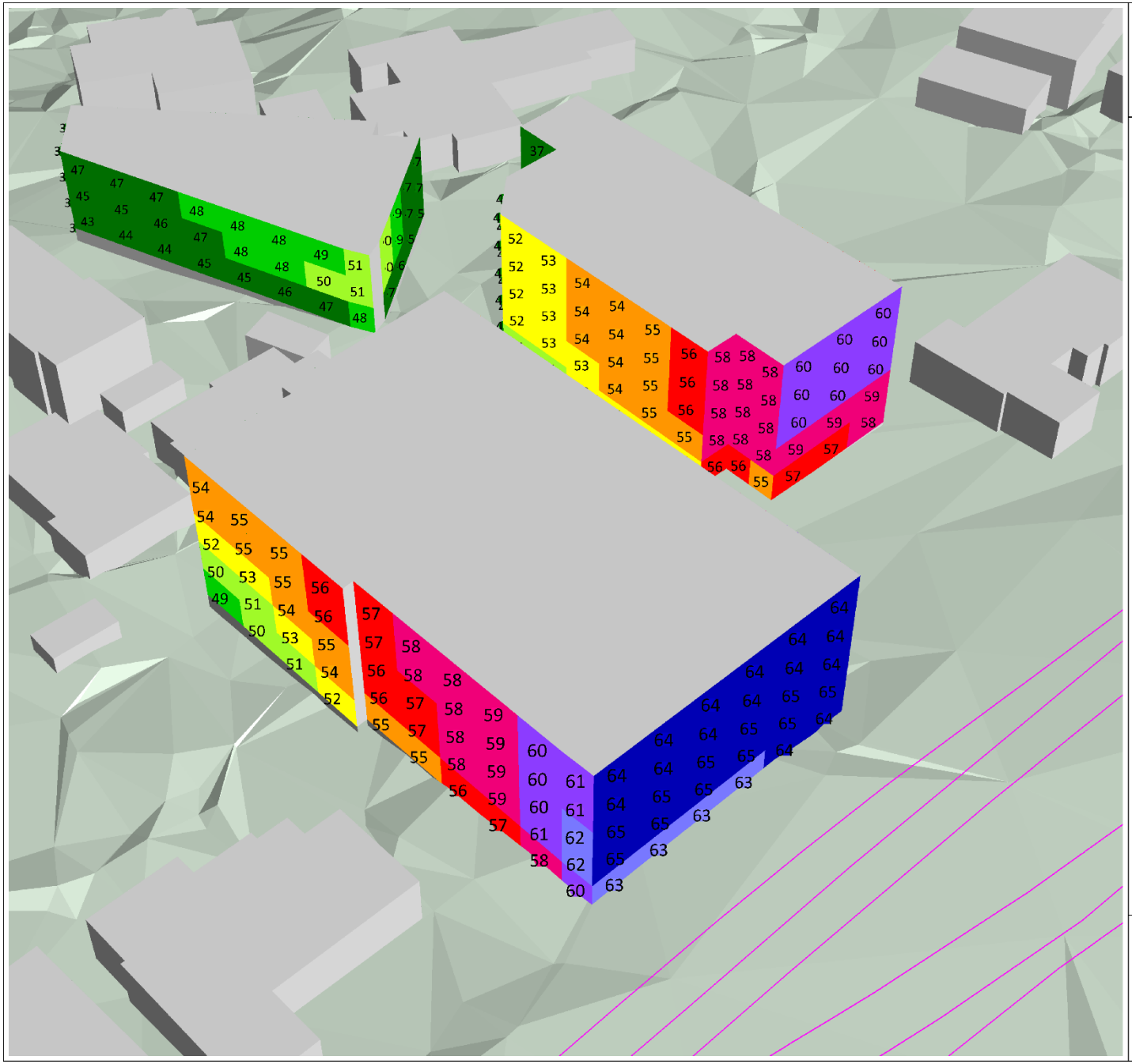
Buildings A & B
Southern & Eastern facades

Prepared by: P. Feng
Date: 5/09/2023

Noise Level
L_{eq}
in dB(A)

	< 48
	48 - 50
	50 - 52
	52 - 54
	54 - 56
	56 - 58
	58 - 60
	60 - 62
	62 - 64
	64 - 66
	66 - 68
	>= 68

ACOUSTIC LOGIC



116-120 Frenchs Forest Rd West & 11 Gladys Ave Frenchs Forest

Facade Noise Prediction

Daytime (7:00am - 10:00pm)

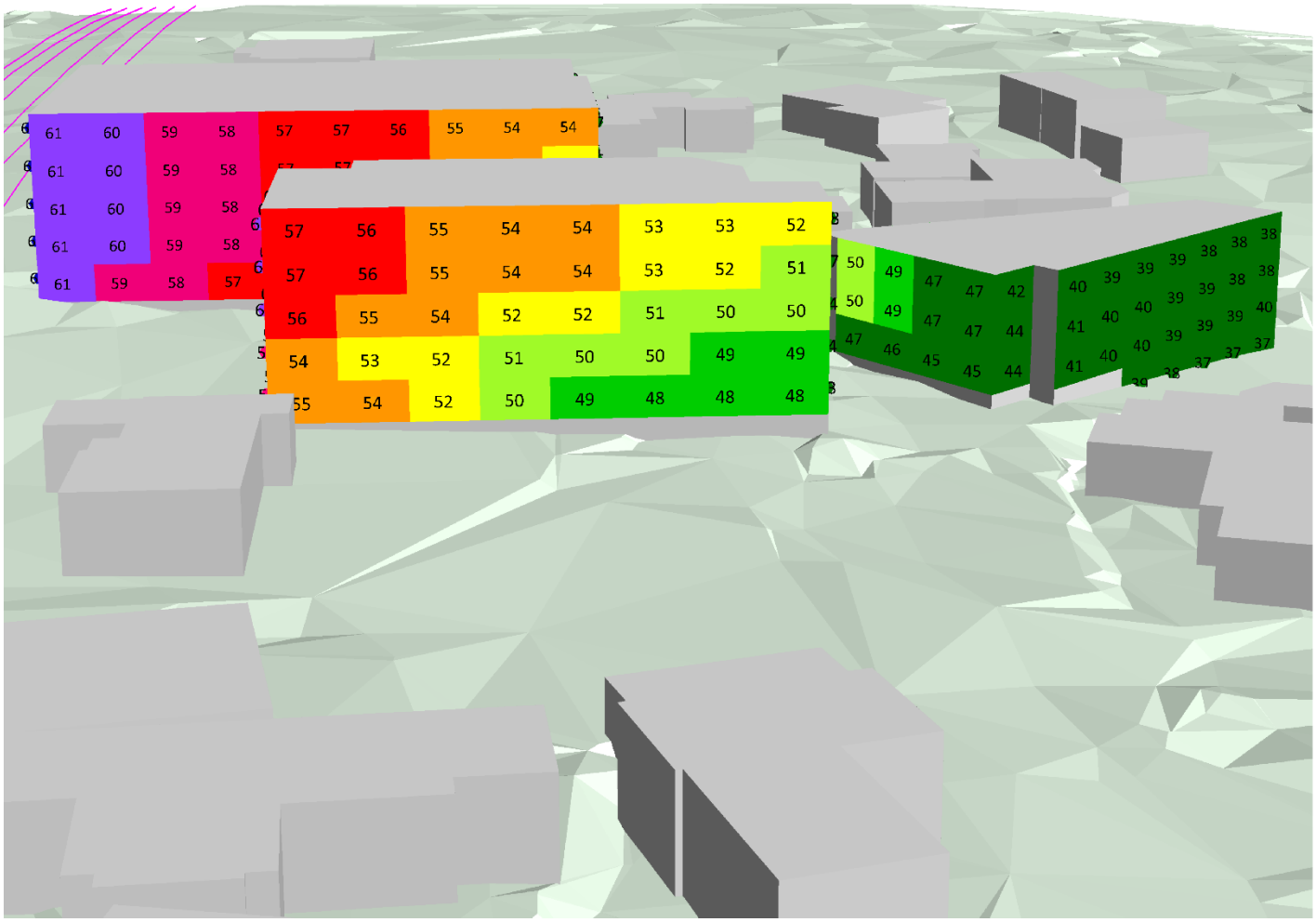
Buildings A, B & C
Southern and western facades

Prepared by: P. Feng
Date: 5/09/2023

Noise Level
L_{eq}
in dB(A)

< 48
48 - 50
50 - 52
52 - 54
54 - 56
56 - 58
58 - 60
60 - 62
62 - 64
64 - 66
66 - 68
>= 68

ACOUSTIC LOGIC



116-120 Frenchs Forest Rd West & 11 Gladys Ave Frenchs Forest

Facade Noise Prediction

Daytime (7:00am - 10:00pm)

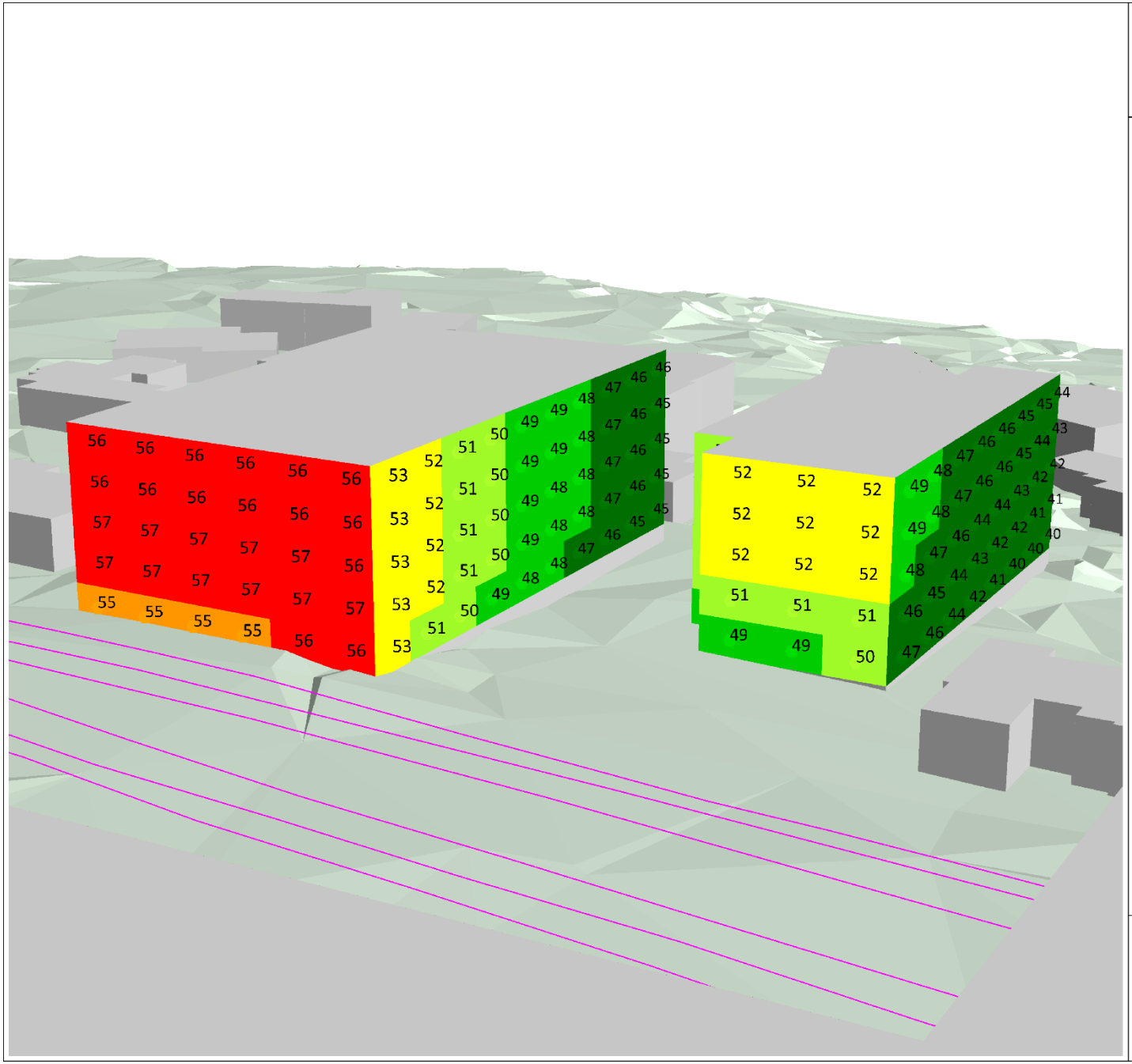
Buildings A, B & C
Eastern facades

Prepared by: P. Feng
Date: 5/09/2023

Noise Level
L_{eq}
in dB(A)

< 48
48 - 50
50 - 52
52 - 54
54 - 56
56 - 58
58 - 60
60 - 62
62 - 64
64 - 66
66 - 68
>= 68

ACOUSTIC LOGIC



116-120 Frenchs Forest Rd West & 11 Gladys Ave Frenchs Forest

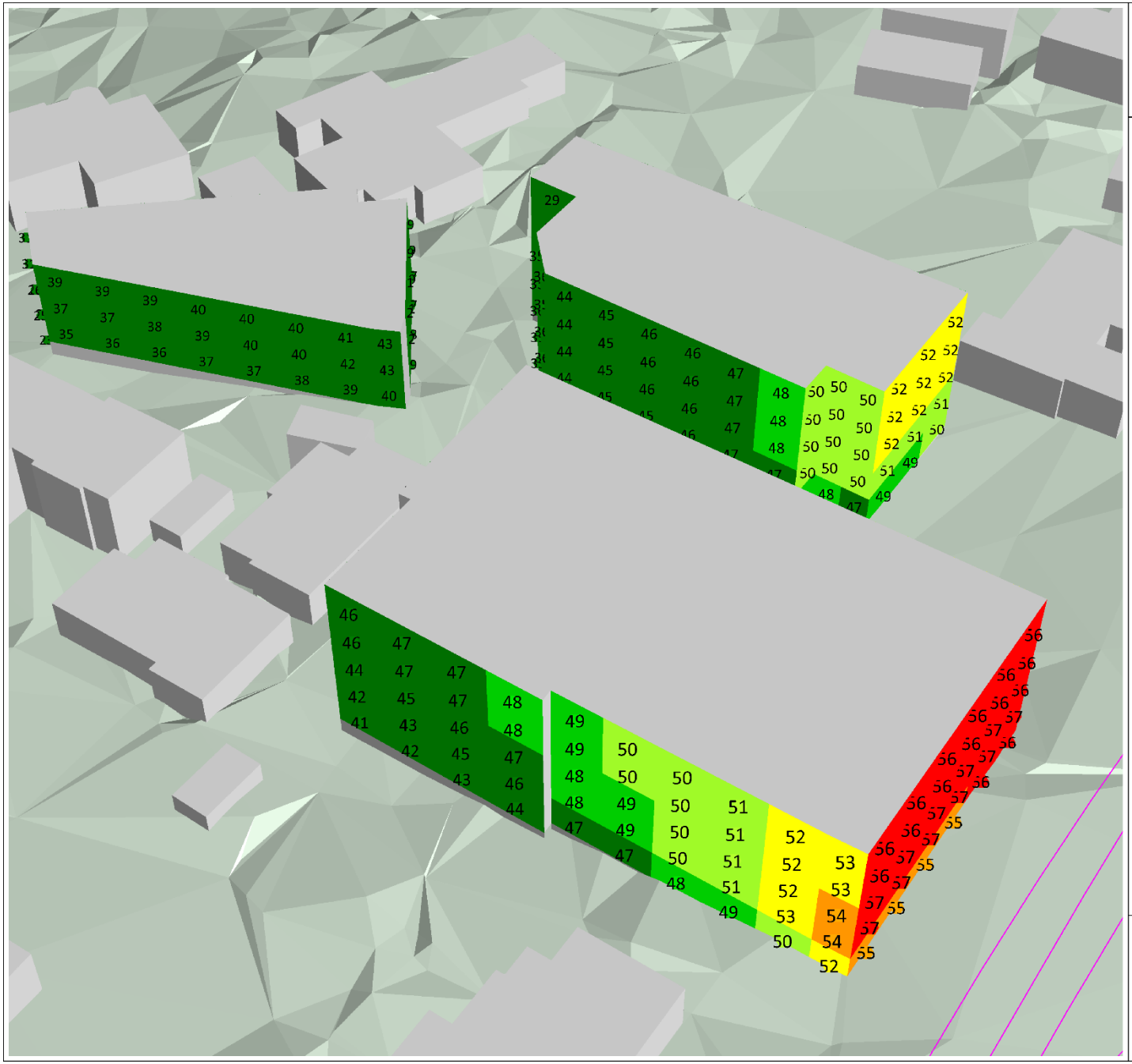
Facade Noise Prediction

Night time (10:00pm-7:00am)

Buildings A & B
Southern & Eastern facades

Prepared by: P. Feng
Date: 5/09/2023

ACOUSTIC LOGIC



116-120 Frenchs Forest Rd West & 11 Gladys Ave Frenchs Forest

Facade Noise Prediction

Night time (10:00pm - 7:00am)

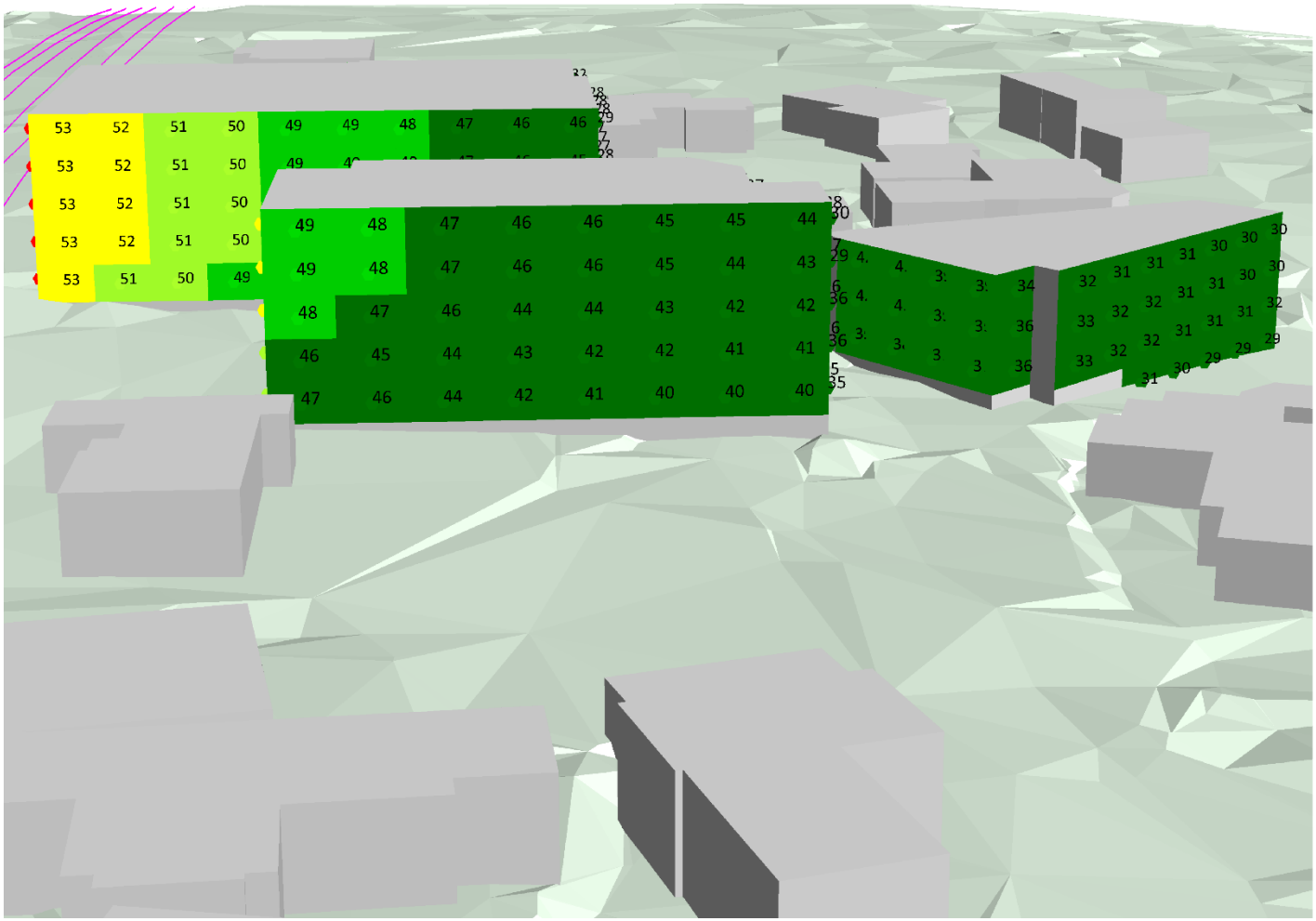
Buildings A, B & C
Southern and western facades

Prepared by: P. Feng
Date: 5/09/2023

Noise Level
L_{eq}
in dB(A)

< 48
48 - 50
50 - 52
52 - 54
54 - 56
56 - 58
58 - 60
60 - 62
62 - 64
64 - 66
66 - 68
>= 68

ACOUSTIC LOGIC



116-120 Frenchs Forest Rd West & 11 Gladys Ave Frenchs Forest

Facade Noise Prediction

Night time (10:00pm - 7:00am)

Buildings A, B & C
Eastern facades

Prepared by: P. Feng
Date: 5/09/2023

Noise Level
L_{eq}
in dB(A)

< 48
48 - 50
50 - 52
52 - 54
54 - 56
56 - 58
58 - 60
60 - 62
62 - 64
64 - 66
66 - 68
>= 68

ACOUSTIC LOGIC

APPENDIX C NATURAL VENTILATION MARK UP

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Architecture
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Urban Design
Project Management

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99 York Street
Sydney NSW 2000
Australia
+612 9299 0988
brewstermurray.com.au

Rev

Issue	Date	Description
-	12.03.2024	DA LODGEMENT

Client: Young Assets Holding Pty Ltd

Project: 116-120 Frenchs Forest Rd West &11 Gladys Ave Frenchs Forest

Drawing: GROUND FLOOR

North

Scale: 1 : 200@A1

Date: 2023

Job No.: 23_6514

Drawing No.: A104 / -

Issued for: FOR DA

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Urban Design
Project Management

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99 York Street
Sydney NSW 2000
Australia
+612 9299 0988
brewstermurray.com.au

Rev	Date	Description
-	12.03.2024	DA LODGEMENT

Client: Young Assets Holding Pty Ltd

Project: 116-120 Frenchs Forest Rd West &11 Gladys Ave Frenchs Forest

Drawing: LEVEL 1

North	Scale	Date	Job No.	Drawing No.
	1 : 200@A1	2023	23_6514	A105 / -

Issued for: FOR DA

Verify all dimensions before commencing work. Use figured dimensions.
Do not scale off drawing.This design is copyright and may not be reproduced without the written permission of the architect.

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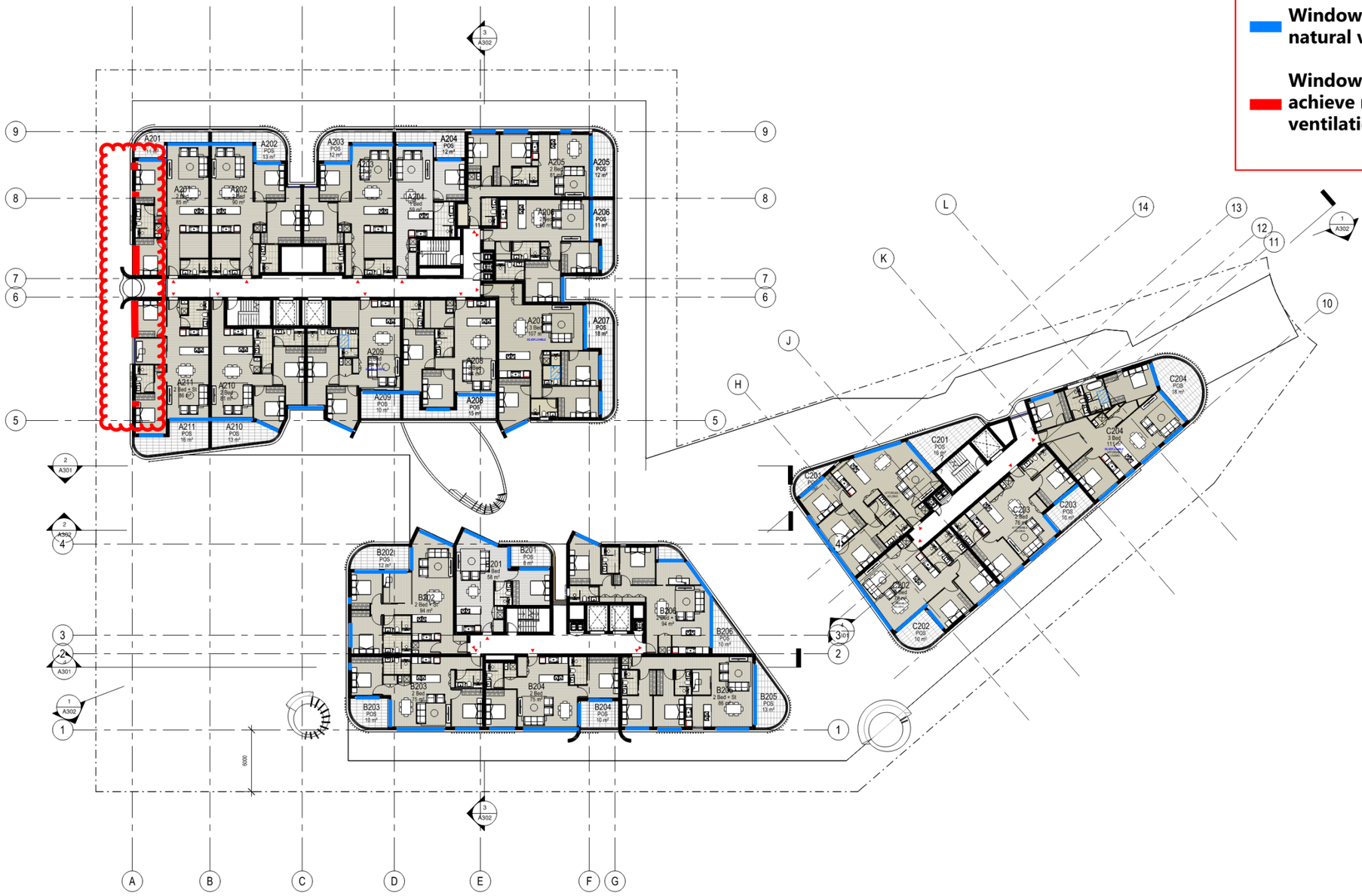

1 | LEVEL 2A
SCALE 1 : 200

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Rev	Date	Description
-	12.03.2024	DA LODGEMENT

Client: Young Assets Holding Pty Ltd

Project: 116-120 Frenchs Forest Rd West &11 Gladys Ave Frenchs Forest

Drawing: LEVEL 2-3

North

Scale: 1 : 200@A1

Date: 12/01/23

Job No.: 23_6514

Drawing No.: A106 / -

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