

2-6 Cavill Avenue, Ashfield

Noise Impact Assessment

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1 INTRODUCTION

This report presents the noise impact assessment of the proposed residential development to be located at 2 – 6 Cavill Avenue, Ashfield. The report will present the results of noise monitoring conducted on site as well as an assessment of noise intrusion from traffic and rail noise surrounding the site and noise emissions from the site. A discussion of council and state requirements, applicable to the development, is also presented.

The assessment has been conducted based on the DA architectural plans prepared by PTW, dated 13th of November 2020.

2 SITE DESCRIPTION

The proposed development consists of two buildings with ten levels of residential apartments, a ground floor retail space, facing Liverpool Road, and three levels of basement carparking.

The site is located at 2-6 Cavill Avenue, Ashfield. It is bounded by Liverpool Road, a SEPP classified road, to the south and the inner west railway line to the north. Residential receivers adjoin the site on the west and north boundaries and are situated opposite the site to the east on Cavill Avenue. Commercial receivers are also located to the east and south west of the site along Liverpool Road. See Figure 2-1 for detailed map of the site location.

The land zoning for the site is classified as B4 Mixed Use under land zoning map 1 of the Ashfield local environmental plan 2013. Additionally the Ashfield development control plan 2016 (DCP) identifies the site as being part of the Ashfield Town Centre.

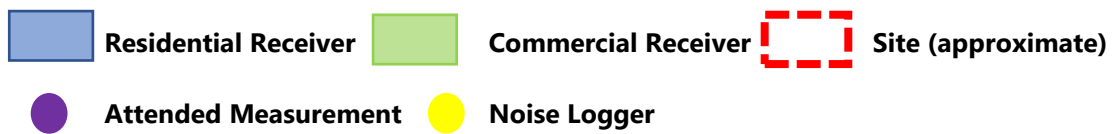


Figure 2-1: Site and Logger Location

3 EXISTING ACOUSTIC ENVIRONMENT

Acoustic monitoring was conducted at the north and south boundaries of the site to establish the background, traffic and rail noise levels, which will be used as a basis for this assessment. Additional attended noise measurements were conducted of rail and traffic noise and vibration measurements of rail pass-bys were taken. Raw data from the unattended monitoring has been included in Appendix A.

3.1 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-minute measurement interval is utilised. Over this period, noise levels are monitored on a continuous basis and statistical and integrating techniques are used to determine noise description parameters.

In analysing environmental noise, three-principle measurement parameters are used, namely L10, L90 and Leq.

The L10 and L90 measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L10 parameter is commonly used to measure noise produced by a particular intrusive noise source since it represents the average of the loudest noise levels produced by the source.

Conversely, the L90 level (which is commonly referred to as the background noise level) represents the noise level heard in the quieter periods during a measurement interval. The L90 parameter is used to set the allowable noise level for new, potentially intrusive noise sources since the disturbance caused by the new source will depend on how audible it is above the pre-existing noise environment, particularly during quiet periods, as represented by the L90 level.

The Leq parameter represents the average noise energy during a measurement period. This parameter is derived by integrating the noise levels measured over the 15-minute period. Leq is important in the assessment of environmental noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

3.2 MEASUREMENT EQUIPMENT

Unattended noise monitoring was conducted using two Acoustic Research Laboratories Pty Ltd noise monitors. The monitors were set to A-weighted fast response and were programmed to store 15-minute statistical noise levels throughout the monitoring period. The equipment was calibrated at the beginning and the end of each measurement, using a Rion NC-73 calibrator, no significant drift was detected.

Attended measurements were conducted using a Norsonics Nor140 sound level meter. The sound level meter was set to A-weighted fast response. The equipment was calibrated at the beginning and end of the measurements, using a Rion NC-73 calibrator, no significant drift was detected.

3.3 MEASUREMENT LOCATION

The unattended noise monitors were installed on the northern and southern boundaries of the site, refer to Figure 2-1.

- Monitor 1 – northern boundary adjacent to 15 The Avenue with full view of the rail line.
- Monitor 2 – southern boundary of 2 Cavill Avenue with full view of Liverpool Road

Attended noise measurements of traffic and rail were taken at the locations indicated in Figure 2-1.

3.4 MEASUREMENT PERIOD

Unattended noise monitoring was conducted from Tuesday the 18th of February 2020 to Monday the 2nd of March 2020.

Attended measurements were conducted on the 3rd of March 2020.

3.5 MEASURED BACKGROUND NOISE LEVELS

The background noise levels established from the unattended noise monitoring are detailed in the table below.

Unattended and attended noise measurements have been undertaken as per the procedures outlined in Fact Sheet A and B of the NSW EPA Noise Policy for Industry.

Weather affected data (rain fall and wind speeds above 5 m/s) has been excluded from the assessment as per Fact Sheet A and B. Where interval periods (day, evening and night) have 18%, 13% and 11% (respectively) weather affected data, these periods have been excluded from the assessment.

Table 1 – Summarised Rating Background Noise Level

Location	Time of Day	Rating Background Noise Level dB(A)$L_{90}(\text{period})$
Monitor 1	Day (7am-6pm)	40
	Evening (6pm-10pm)	39
	Night (10pm-7am)	33
Monitor 2	Day (7am-6pm)	59
	Evening (6pm-10pm)	57
	Night (10pm-7am)	43

3.6 MEASURED TRAFFIC NOISE LEVELS

The recorded noise levels listed in the table below were determined based on the measurements taken at the monitor 2 location. In determination of acoustic treatments, the measured noise level is adjusted for distance and orientation and barrier effects where applicable.

Table 2 – Measured Traffic Noise – Unattended Monitor

Location	Time of Day	Measured Noise Level dB(A)
Monitor 2	Day	70 $L_{eq}(15 \text{ hour})$
	Night	67 $L_{eq}(9 \text{ hour})$

Table 3 - Measured Traffic Noise – Attended Measurement

Location	Time of Day	Measured Noise Level dB(A)$L_{eq}(\text{period})$
Monitor 2	11:45 – 12:00	69 $L_{eq}(15 \text{ minute})$

3.7 MEASURED RAIL NOISE LEVELS

The recorded noise levels listed in the table below were determined based on the measurements taken at the monitor 1 location. In determination of acoustic treatments, the measured noise level is adjusted for distance and orientation and barrier effects where applicable.

Table 4 – Measured Rail Noise

Location	Time of Day	Rating Background Noise Level dB(A)
Monitor 1	Day	60 $L_{eq}(15 \text{ hour})$
	Night	57 $L_{eq}(9 \text{ hour})$

3.8 RAIL VIBRATION MEASUREMENTS

Rail noise measurements were conducted at the northern boundary of the site and in line with the internal façade of the building closest to the railway.

Attended train vibration measurements were conducted on the 3rd of March 2020. A Svantek 958 Vibration Analyser was used for the vibration measurements. The analyser was fitted with three Svantek SV80 accelerometers.

4 NOISE INTRUSION ASSESSMENT

4.1 ACOUSTIC CRITERIA

4.1.1 Inner West council – Ashfield Development Control Plan, 2016

The Ashfield DCP states the following in relation to the development site and residential flat buildings.

Chapter A Miscellaneous – Part 13 Development Near Rail Corridors states the following applicable acoustic design solutions.

Performance Criteria	Design Solution
Telecommunications	
<p>PC1. Site layout, building orientation and internal layout ensures development adjacent to or near rail corridors achieves an acceptable level of internal acoustic amenity, is not unreasonably affected by vibration and protects the safety and integrity of rail infrastructure from adjacent development.</p> <p>Note: this part of the DCP is to read in conjunction with State Environmental Planning Policy (Infrastructure) 2007 and Development Near Rail Corridors and Busy Roads – Interim Guideline (Department of Planning, 2008)</p>	<p>DS1.1 Development for the following purposes in or adjacent to a rail corridor is supported by an acoustic report prepared by a suitably qualified and experienced in accordance with the relevant provision of this DCP and the Development Near Rail Corridors and Busy Roads – Interim Guideline (Department of Planning, 2008):</p> <ul style="list-style-type: none"> • Residential accommodation • Place of public worship • Hospital • Educational establishment • Child care centre
	<p>DS1.2 Where for residential accommodation, development ensures that the following LAeq levels are not exceeded:</p> <ul style="list-style-type: none"> • In any bedroom in the building – 35 dB(A) at any time between 10:00pm and 7:00am • Anywhere else in the building (other than a garage, kitchen, bathroom or hallway) – 40 dB(A) at any time
	<p>DS1.3 The distance between noise sensitive rooms and the rail line is maximised.</p>
	<p>DS1.6 Windows facing the rail corridor are acoustically treated through double glazing or other measures</p>
	<p>DS1.7 Walls facing rail corridors are constructed from masonry and include insulation to reduce the impact of noise in internal living spaces</p>
	<p>DS1.8 Rooms facing rail corridor are mechanically ventilated</p>

4.1.2 State Environmental Planning Policy (SEPP Infrastructure) 2007

87 *Impact of rail noise or vibration on non-rail development*

- (1) *This clause applies to development for any of the following purposes that is on land in or adjacent to a rail corridor and that the consent authority considers is likely to be adversely affected by rail 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) *Before determining a development application for development to which this clause applies, the consent authority must take into consideration any guidelines that are issued by the Secretary for the purposes of this clause and published in the Gazette.*
- (3) *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 10.00 pm and 7.00 am,*
 - (b) *anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.*

102 *Impact of road noise or vibration on non-road development*

- (1) *This clause applies to development for any of the following purposes that is on land in or adjacent to a 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 RMS) 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) *Before determining a development application for development to which this clause applies, the consent authority must take into consideration any guidelines that are issued by the Secretary for the purposes of this clause and published in the Gazette.*
- (3) *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 10.00 pm and 7.00 am,
 - (b) anywhere else in the residential accommodation (other than a garage, kitchen, bathroom or hallway)—40 dB(A) at any time.
- (4) In this clause, freeway, tollway and transitway have the same meanings as they have in the Roads Act 1993.

4.1.3 NSW Department of Planning – Development near Rail Corridors or Busy Roads – Interim Guideline

The Interim Guideline then provides the time descriptors that are to be adopted in the assessment of road/rail noise (and not provided in SEPP Infrastructure. These are necessary in order to conduct an assessment of noise impacts.

Section 3.5 of the NSW Department of Planning's 'Development near Rail Corridors and Busy Roads (Interim Guideline)' states:

"The following provides an overall summary of the assessment procedure to meet the requirements of clauses 87 and 102 of the Infrastructure SEPP. The procedure covers noise at developments for both Road and Rail.

- *If the development is for the purpose of a building for residential use, the consent authority must be satisfied that appropriate measures will be taken to ensure that the following LAeq levels are not exceeded:*
 - *in any bedroom in the building: 35dB(A) at any time 10pm-7am*
 - *anywhere else in the building (other than a garage, kitchen, bathroom or hallway): 40dB(A) at any time."*

4.1.4 Summarised Noise Criteria

Internal noise levels will be assessed to the following criteria, derived from the relevant criteria discussed in section 5 of this report.

Table 5 – Internal Noise Level Criteria

Location	Criteria
Bedroom	35 dB(A) $L_{eq}(9hr)$
Living Areas	40 dB(A) $L_{eq}(15hr)$

4.2 PROJECT VIBRATION OBJECTIVES

A rail vibration assessment has been conducted based off the requirements of NSW Department of Planning's – 'Developments near Rail Corridors or Busy Roads – Interim Guideline'.

4.2.1 Tactile Vibration

Human comfort is normally assessed with reference to the British Standard BS 7385 Part 2 1993 or Australian Standard AS 2670.2 1990.

The Interim Guideline references the DECCW *Assessing Vibration- A technical guideline* which recommends that habitable rooms should comply with the criteria therein which is in line with the requirements of British Standard BS 6472:1992 "Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz)".

British Standard BS 6472:1992 "Evaluation of Human Exposure to Vibration in Buildings (1Hz to 80Hz)" is recommended by the RIC's and SRA's Interim Guidelines for Councils "Consideration of rail noise and vibration in the planning process" as this standard includes guidance for the assessment of human response to building vibration including intermittent vibrations such as that caused by trains.

Human response to vibration has been shown to be biased at particular frequencies, which are related to the orientation of the person. This standard provides curves of equal annoyance for various orientations. These curves are applied as correction filters such that an overall weighted acceleration level is obtained. As the orientation of the resident is unknown or varying the weighting filter used is based on the combined base curve as given in ISO 2631 & Australian Standard 2670 "Evaluation of Human Exposure to Vibration and Shock in Buildings (1 to 80Hz)" which represents the worst case of the X, Y and Z axes. Filtered measurements are made in all three co-ordinate axes and the highest value axis used.

This standard assesses the annoyance of intermittent vibration by using the Vibration Dose Value (VDV). Alternatively the VDV may be estimated by the eVDV which is derived by a simpler calculation using an empirical factor. The VDV or eVDV is calculated for the two periods of the day being the "Daytime" (6am-10pm) and "Night time" (10pm-6am). The overall value is then compared to the levels in [Table 6](#). For this project the aim will be for a low probability of adverse comment.

Table 6 - Vibration Dose Values ($\text{m/s}^{1.75}$) above which various degrees of adverse comment may be expected in residential buildings.

Place	Low Probability of adverse comment	Adverse comment possible	Adverse comment probable
Residential buildings 16hr day (Daytime)	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8hr night (Night time)	0.13	0.26	0.51

4.2.2 Structure Borne Noise

The Development Near rail Corridors and Busy Road – Interim Guideline only requires structure borne noise assessment to be conducted where buildings or adjacent lands are over railway tunnels. Section 3.6.2 of the interim guideline states the following.

Where buildings are constructed over or adjacent to land over tunnels, ground-born noise may be present without the normal masking effects of air born noise. In such cases, residential buildings should be designed so that the 95th percentile of train pass-bys complies with a ground-born L_{Amax} noise limit of 40 dB(A) (daytime and 35 dB(A) (night time) measured using the "slow" response time setting on a sound level meter.

4.3 TRAFFIC AND RAIL NOISE INTRUSION ASSESSMENT

The following noise intrusion assessment has been based on the DA architectural plans prepared by PTW, dated 13th of November 2020.

Internal noise levels will primarily be as a result of noise transfer through the windows and doors and roof, as these are relatively light building elements that offer less resistance to the transmission of sound.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the measured level and spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Calculations were performed taking into account the orientation of windows, barrier effects (where applicable), the total area of glazing, facade transmission loss and the likely room sound absorption characteristics. In this way the likely interior noise levels can be predicted. In all cases, the selected material type (refer below) reduces internal noise levels to within the nominated criteria for the various space types.

4.3.1 Recommended Glazing

The following table and mark ups in Appendix B list the recommended glazing assemblies for this project to achieve the internal noise level requirements. All external windows and doors listed are required to be fitted with Q-Ion type acoustic seals. (**Mohair/ Mohair-fin Seals are unacceptable**). The glazing thicknesses recommended are those needed to satisfy acoustic requirements and do not take into account other requirements such as structural, safety or other considerations. These additional considerations may require the glazing thickness to be increased beyond the acoustic requirement. In such cases, thicker glazing is acoustically acceptable.

In addition to meeting the minimum glazing thickness requirements given, the design of the window mullions, perimeter seals and the installation of the windows/doors in the building openings shall not reduce the R_w rating of the glazing assembly below the values nominated in the tables above. **Note: Mohair/ Mohair-fin type seals will not be acceptable for the windows requiring acoustic seals.**

The window/door suppliers should provide evidence that the systems proposed have been tested in a registered laboratory with the recommended glass thicknesses and comply with the minimum listed STC requirements. Also, the glazing installer should certify that the window/doors have been constructed and installed in a manner equivalent to the tested samples.

Table 7 - Minimum STC of Glazing (with Acoustic Seals)

Glazing Thickness	Acoustic Seals	Minimum Rw of Installed Window
6mm	Yes	29
6.38mm Laminated	Yes	31
10mm	Yes	33
10.38 Laminated	Yes	35
6/12/10.38 laminated	Yes	40

All recommendations contained within this report regarding noise intrusion (façade, etc) are for the purposes of gaining authority approvals only. All façade treatments must be reviewed at Construction Certificate stage when layouts and building internal design scheme has been finalised.

4.3.2 External Walls

External walls of masonry construction do not require any acoustic upgrading. There should not be vents on the internal skin of external walls. All penetrations in the internal skin of external walls should be acoustically sealed.

4.3.3 Roof / Ceiling Construction

The concrete slab roof does not require any acoustic upgrading in order to meet internal noise goal criteria.

4.3.4 Ventilation

In order to achieve acceptable internal noise levels windows need to be closed on all outward facing facades, i.e. facades that do not face the internal courtyard.

On these façades it is required that an alternative outside air supply system or air conditioning be installed to meet AS 1668.2 requirements.

Windows facing the internal courtyard (ie not street or side frontages) may be left open and satisfy internal acoustic criteria.

Any mechanical ventilation system that is installed should be acoustically designed such that the acoustic performance of the recommended constructions are not reduced by any duct or pipe penetrating the wall/ceiling/roof.

Noise emitted to the property boundaries by any ventilation system shall comply with EPA or Local Council guidelines.

4.4 RAIL VIBRATION ASSESSMENT

The following assessment of rail vibration and structure borne noise has been conducted to determine compliance with the criteria outlined in section 4.2. The assessment is based on attended vibration measurements conducted on the 3rd March 2020.

4.4.1 Rail Vibration

The measured vibration levels, duration of train pass-by and the number of rail movements per hour were used to determine the overall vibration dose (VDV) at the proposed development for both daytime and night time periods. The results are presented in the table below.

Table 8 - Vibration Dose Values

Time Period	Calculated VDV m/s^{1.75}	Criteria VDV m/s^{1.75}	Compliance
Day (7am – 10pm)	<0.07	0.2 to 0.4	Yes
Night (10pm -7am)	<0.05	0.13	Yes

In the event the future train use increases, say by 10%, predicted eVDV will not increase significantly (no more than approximately 0.001 more than the levels predicted in the table above) and will not impact recommended vibration isolation treatments.

4.4.2 Structure Borne Noise Generated by Train Movements

Vibration measurements were also carried out at locations of the proposed habitable spaces that face away from rail corridor. The structure borne noise generated by the vibration has been predicted below based on the measured vibration level from 1Hz to 10KHz.

Table 9 –Predicted Structure Borne Noise dB(A) L_{Max}

Location	Predicted Structure Borne Noise Level	Criteria	Compliance
Northern Facade	<35dB(A)L _{max}	35 dB(A) L _{max}	Yes

5 NOISE EMISSION ASSESSMENT

5.1 INNER WEST COUNCIL – ASHFIELD DEVELOPMENT CONTROL PLAN, 2016

The Ashfield DCP states the following in relation to the development site and residential flat buildings.

Chapter D – Precinct Guidelines, Part 1 – Ashfield Town Centre states the following applicable acoustic design solutions

Performance Criteria	Design Solution
Controls for Special areas – 2-6 Cavill Avenue Ashfield for the area identified on Map 9. Added 5 April 2019	
PC15. Ensure adequate amenity for residents of 8 Cavill Avenue Ashfield.	DS15.1 Any buildings along the northern portion of the land adjacent 8 Cavill Avenue of the site must: <ul style="list-style-type: none">• Where affected by State Environmental Planning Policy No65 comply with the minimum separation distance stipulated in the Apartment Design Guideline for apartment buildings, and• All other structures shall ensure there is an adequate separation distance that provides adequate amenity for apartments at 8 Cavill Avenue, including an attractive outlook with landscaping and• Any driveway or carparking area along the northern part of the site shall have noise mitigation measures to reduce noise impacts for apartments at 8 Cavill Avenue including use of noise attenuating walls.

5.2 EPA - NOISE POLICY FOR INDUSTRY (NPI)

EPA Noise Policy for Industry is used to assess noise emissions from the site. Noise sources covered by this code include mechanical services noise (the identified potential noise emission source from the site). Both the Intrusiveness and the Project Amenity criteria (as set out below) must be complied with.

5.2.1 NPI - Intrusiveness Noise Goals

Intrusiveness criteria permit noise generation to be no more than 5dB(A) above existing background noise levels. The criteria are as follows:

Table 10 – EPA Project Noise Trigger Level, Intrusiveness

Location	Time of Day	Background noise Level - dB(A)L₉₀	Project Noise Trigger Level dB(A)L_{eq(15min)} (Background + 5dB)
Residences Surrounding the Site	Day Time (7am - 6pm)	40	45
	Evening (6pm - 10pm)	39	44
	Night (10pm - 7am)	33	38

5.2.2 NPI – Project Amenity Goals

Project amenity criteria are determined based on the land use in the area (residential/commercial/industrial). The residential land use is then further categorised into rural, sub-urban and urban areas. For the purpose of this assessment the existing residential dwellings will be considered suburban.

Table 11 - EPA Project Noise Trigger Level, Amenity

Noise Receiver	Time of Day	Amenity Noise Level – dB(A)L_{Aeq(15min)}	Amenity Project Noise Trigger Level – dB(A)L_{Aeq(15min)}
Existing Residential (Suburban)	Daytime	55	53
	Evening	45	43
	Night	40	38
Commercial	When in Use	65	63

5.2.3 Sleep Arousal Assessment

Potential sleep arousal impacts should be considered for noise generated after 10pm. Sleep arousal is a function of both the noise level and the duration of the noise. As recommended in the NPI, to assess potential sleep arousal impacts, a two-stage test is carried out:

- Step 1 – Section 2.5 *Maximum noise level event assessment* from the NPI states the following:
Where the subject development/premises night-time noise levels at a residential location exceed:
 - $L_{Aeq,15min}$ 40dB(A) or the prevailing RBL plus 5 dB, whichever is the greater, and/or
 - L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 dB, whichever is greater,*a detailed maximum noise level event assessment should be undertaken.*

Based on the above the following noise objectives apply:

Table 12 - Sleep Arousal Criteria (Maximum/ L_{Max} Noise Events)

Location	Rating Background Level dB(A)L_{90}	Rating Background Level + 15dB(A)	Governing Criteria dB(A)$L_{(Max)}$
Residences Surrounding the Site	33	48	52

- Step 2 - If there are noise events that could exceed the average/maximum criteria detailed in the tables above, then an assessment of sleep arousal impact is required to be carried out taking into account the level and frequency of noise events during the night, existing noise sources, etc. This test takes into account the noise level and number of occurrences of each event with the potential to create a noise disturbance. As is recommended in the explanatory notes of the EPA Noise Policy for Industry, this more detailed sleep arousal test is conducted using the guidelines in the EPA Road Noise Policy. Most relevantly, the Road Noise Policy states:

For the research on sleep disturbance to date it can be concluded that:

- *Maximum internal noise levels below 50-55dB(A) are unlikely to awaken people from sleep.*
- *One to two noise events per night with maximum internal noise levels of 65-70dB(A) are not likely to affect health and wellbeing significantly.*

5.3 NOISE EMISSION OBJECTIVES

The main noise emitted from the proposed development will be from mechanical plant servicing the building. Though specific mechanical plant is not typically selected at this stage, the external noise emission criteria have been set up in this section of the report to ensure that the acoustic amenity of nearby residents is not adversely affected after the development is completed.

The nearest potentially affected residential receivers are the residential buildings surrounding the site, situated along The Avenue and Cavill Avenue. Ensuring that mechanical plant noise emissions are compliant at these locations will ensure that the plant is compliant for any local receivers.

The following table summarises the noise emission objectives

Table 13 – Noise Emission Objectives

Location	Time of Day	Project Noise Trigger Level dB(A)$L_{eq}(15min)$
Residences Surrounding the Site	Day Time (7am - 6pm)	45
	Evening (6pm - 10pm)	43
	Night (10pm - 7am)	38
Commercial Receivers	When in use	63

Table 14 – Sleep Disturbance Assessment Criteria

Location	Noise Trigger Level dB(A)$L_{eq}(15min)$	Maximum Noise Trigger Level dB(A)L_{max}
Residences Surrounding the Site	40	52

6 CONCLUSION

This report presents an acoustic assessment for the proposed residential development to be located at 2-6 Cavill Avenue, Ashfield. Relevant acoustic criteria applicable to the site has been presented and a noise intrusion analysis has been conducted based on the DA architectural plans prepared by PTW, dated 13th of November 2020.

External noise emission objectives have been set based on the requirements of the Ashfield development control plan 2016 and the NSW EPA noise policy for industry.

Detailed acoustic control measures for the plant servicing the proposed development will be determined at CC stage.

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

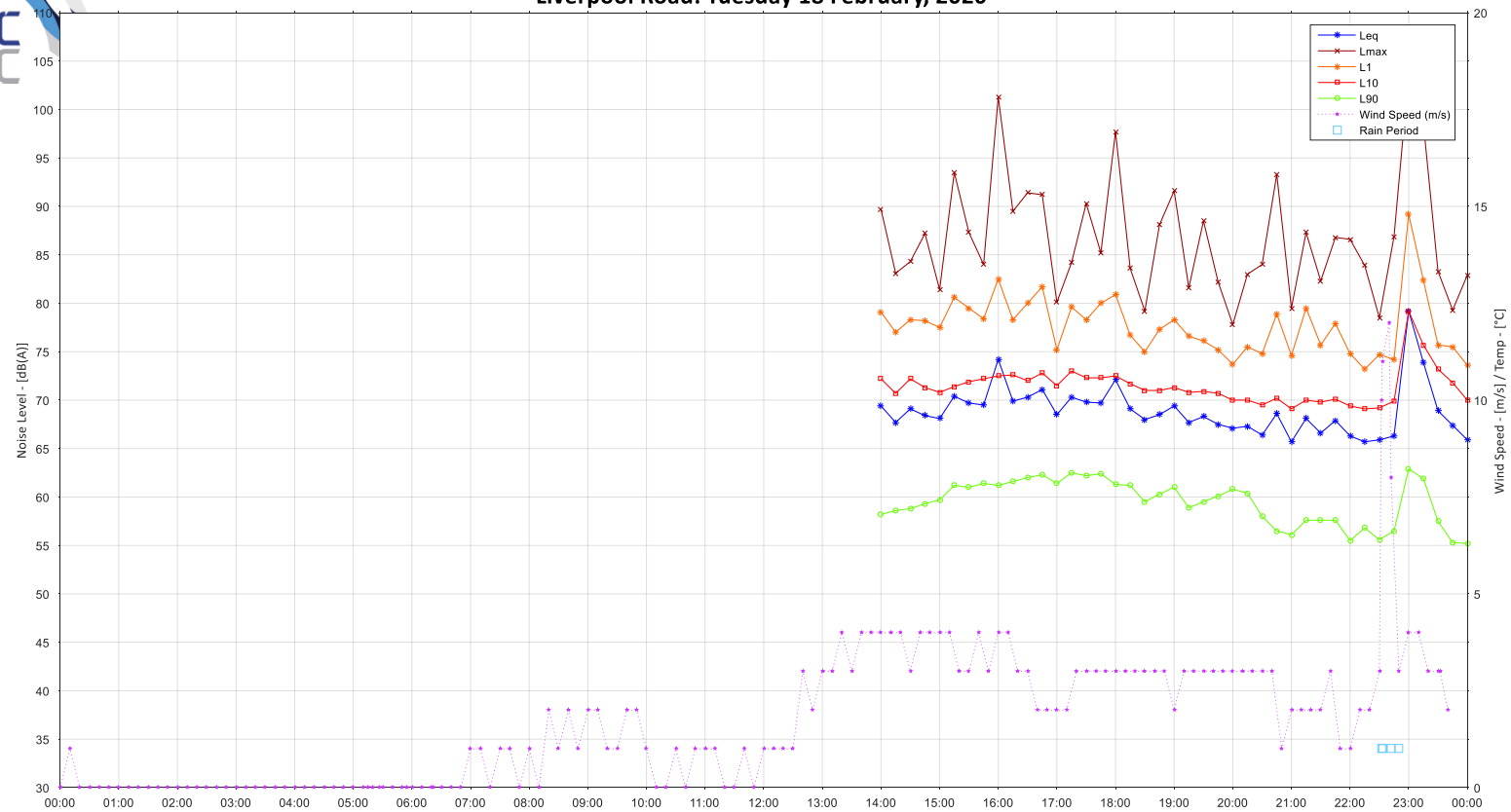
Yours faithfully,

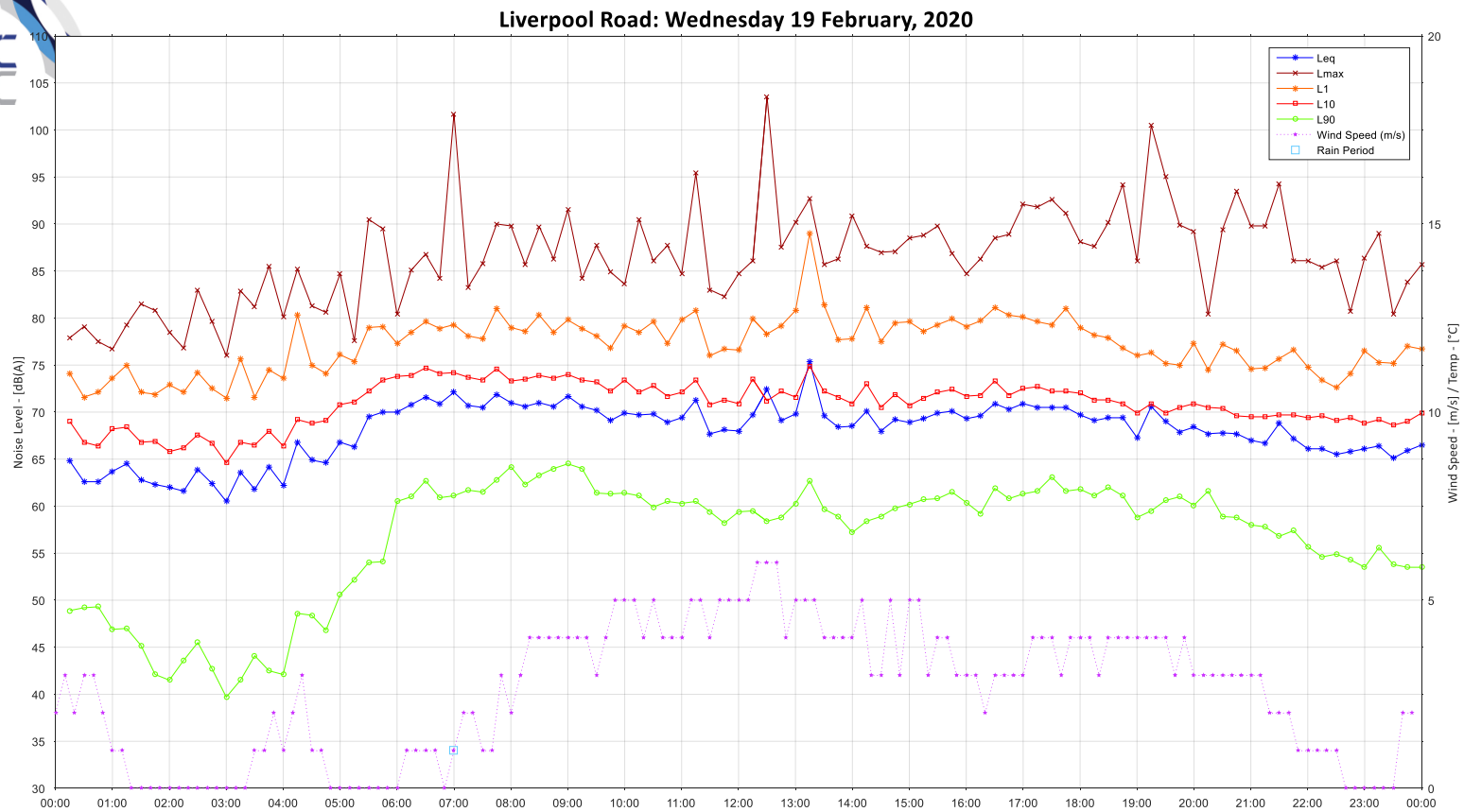
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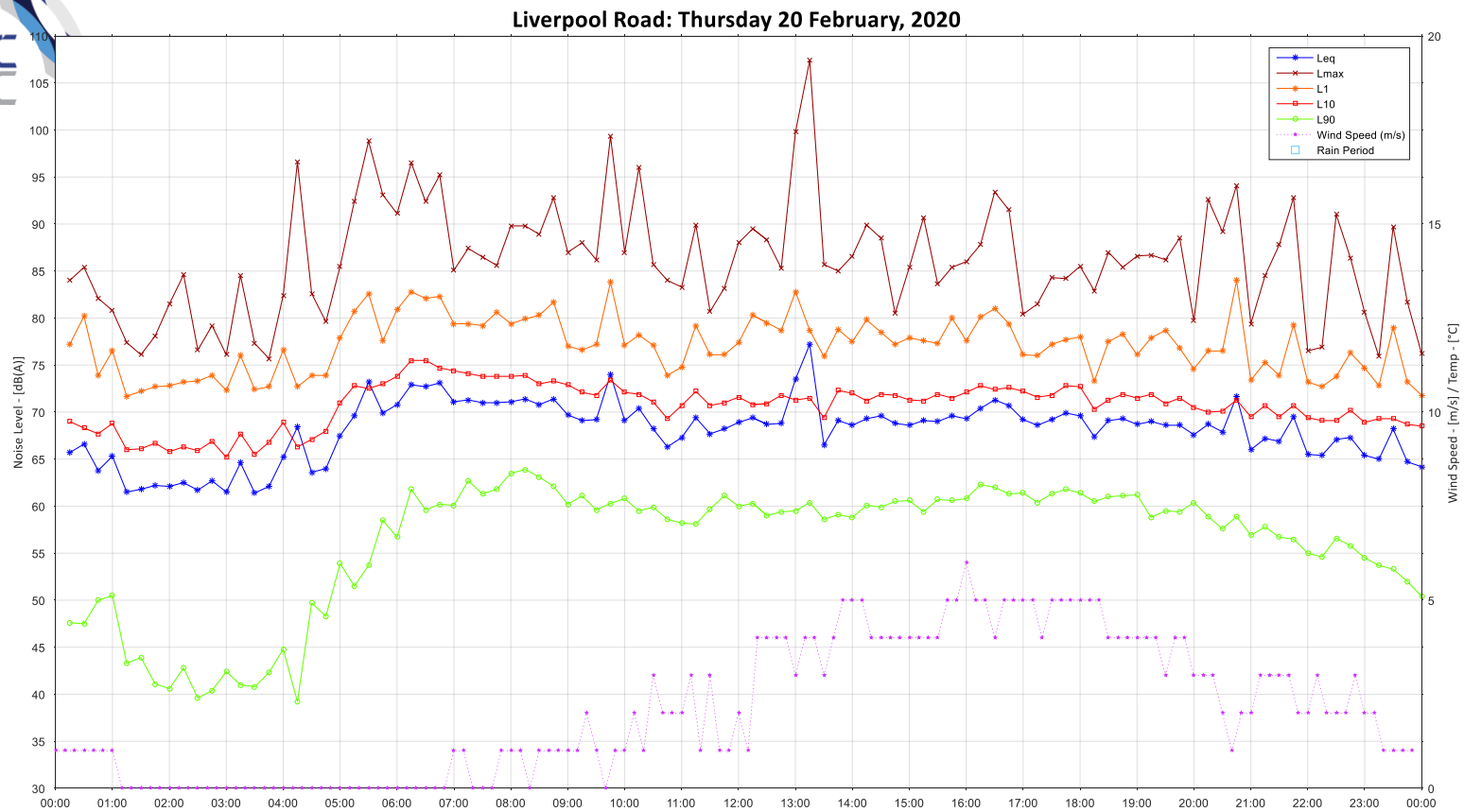
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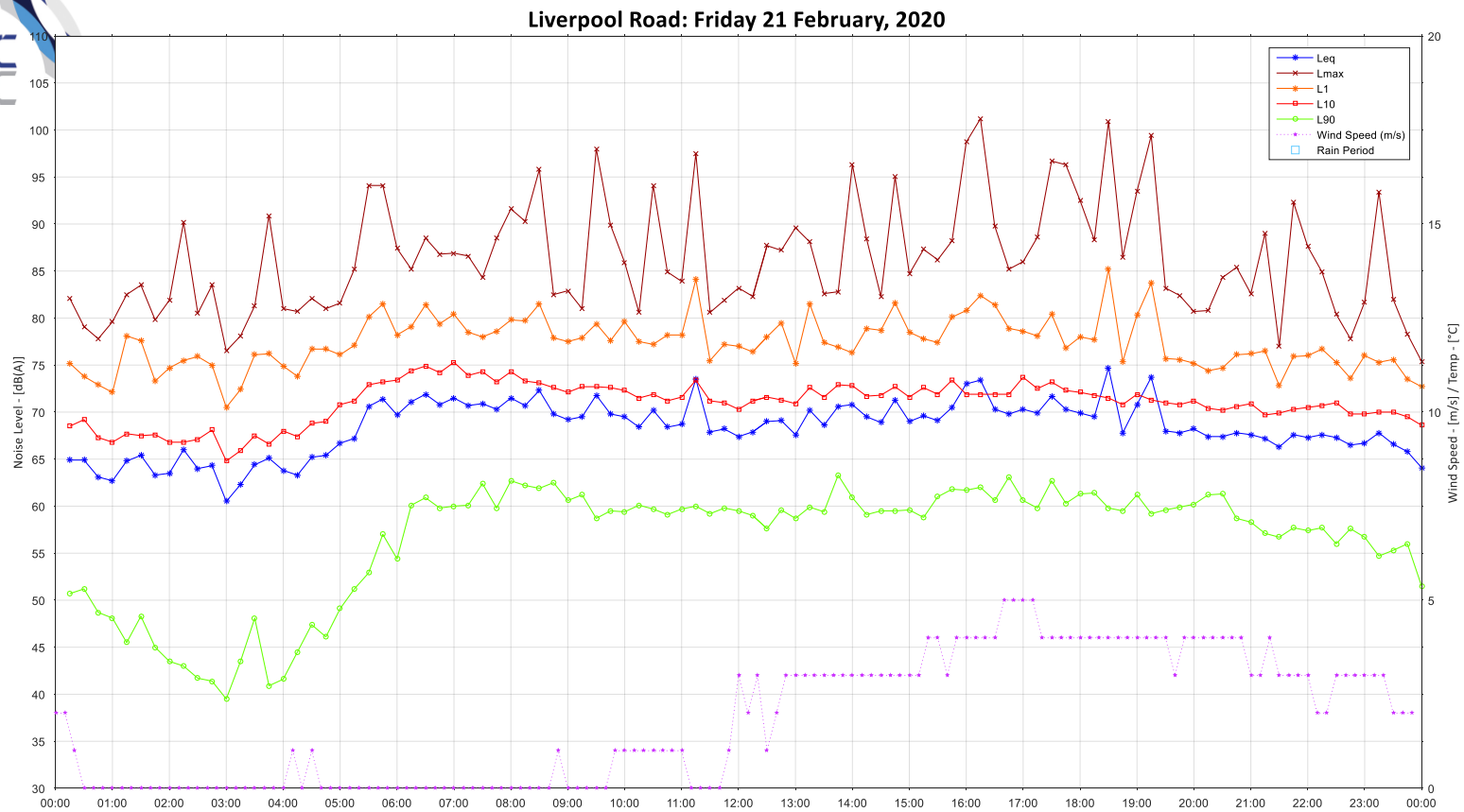
APPENIX A: RAW LOGGING DATA

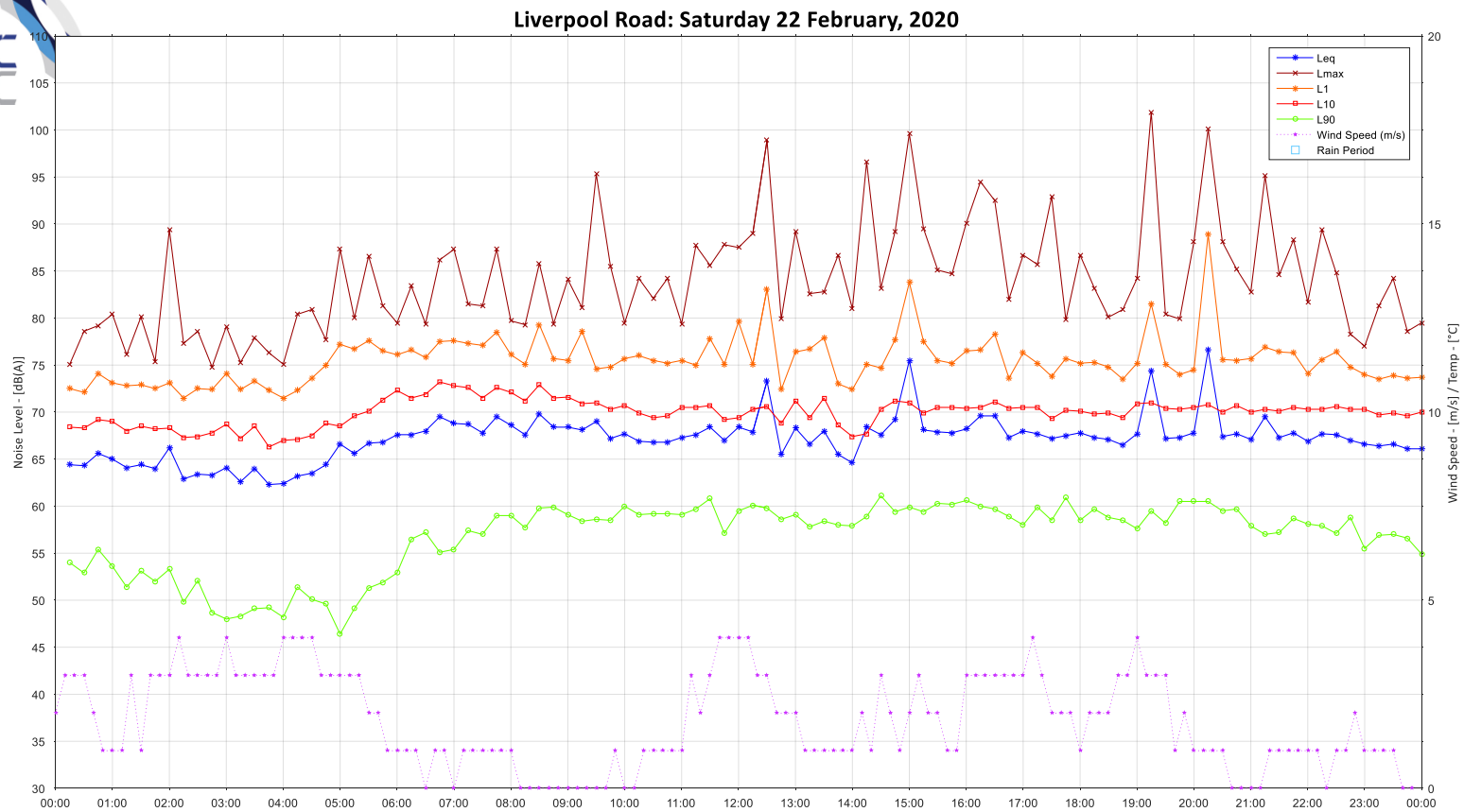
Liverpool Road: Tuesday 18 February, 2020

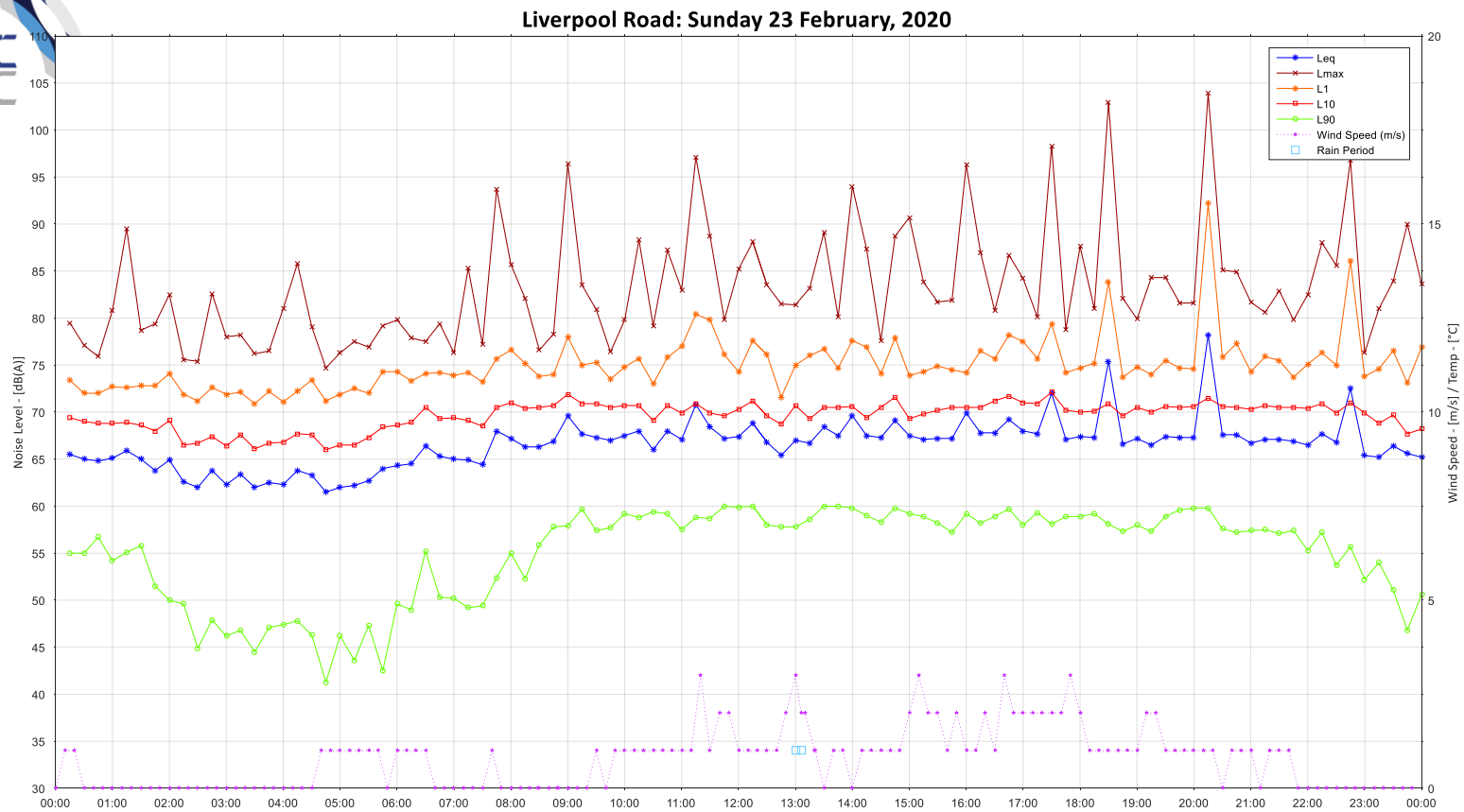


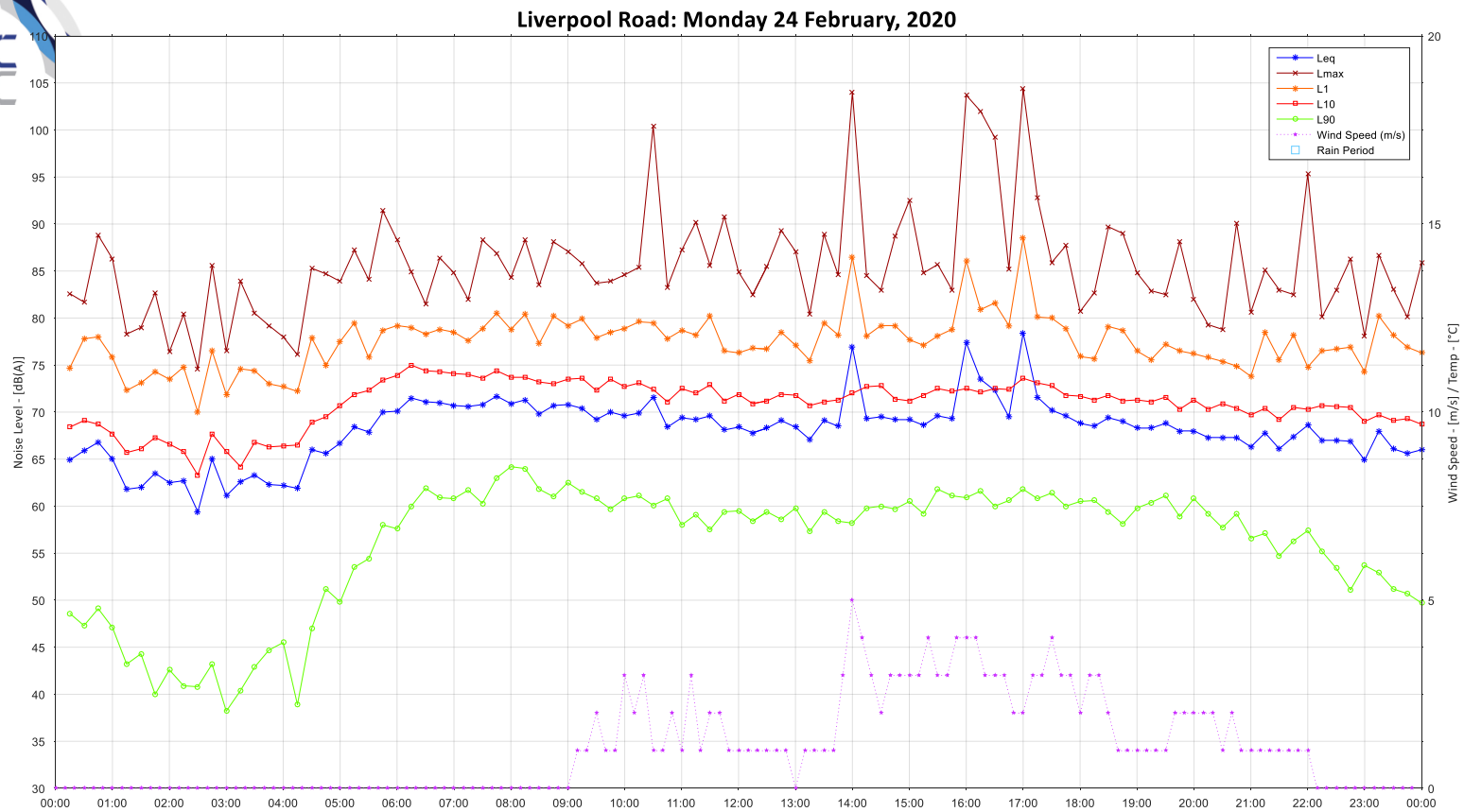


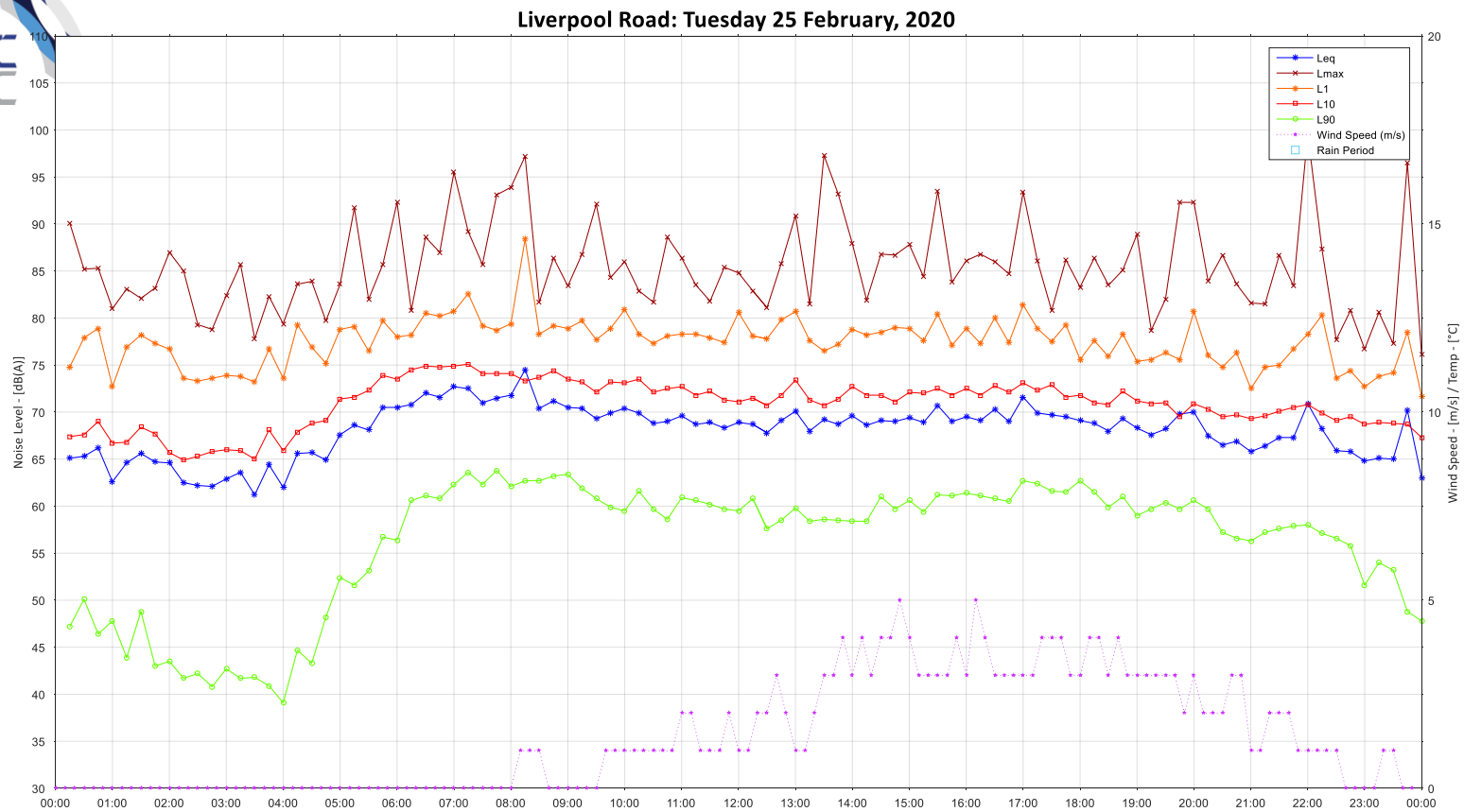


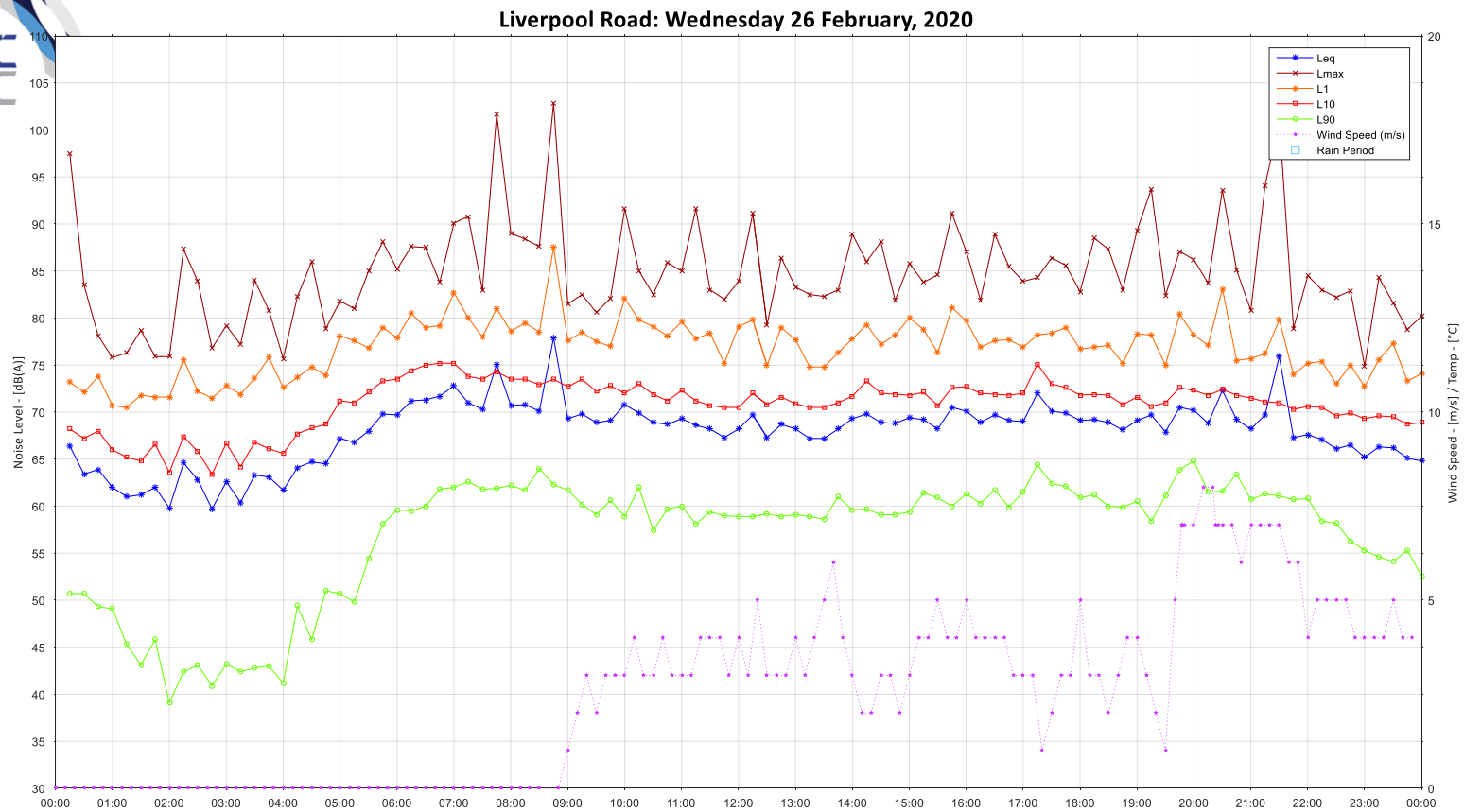


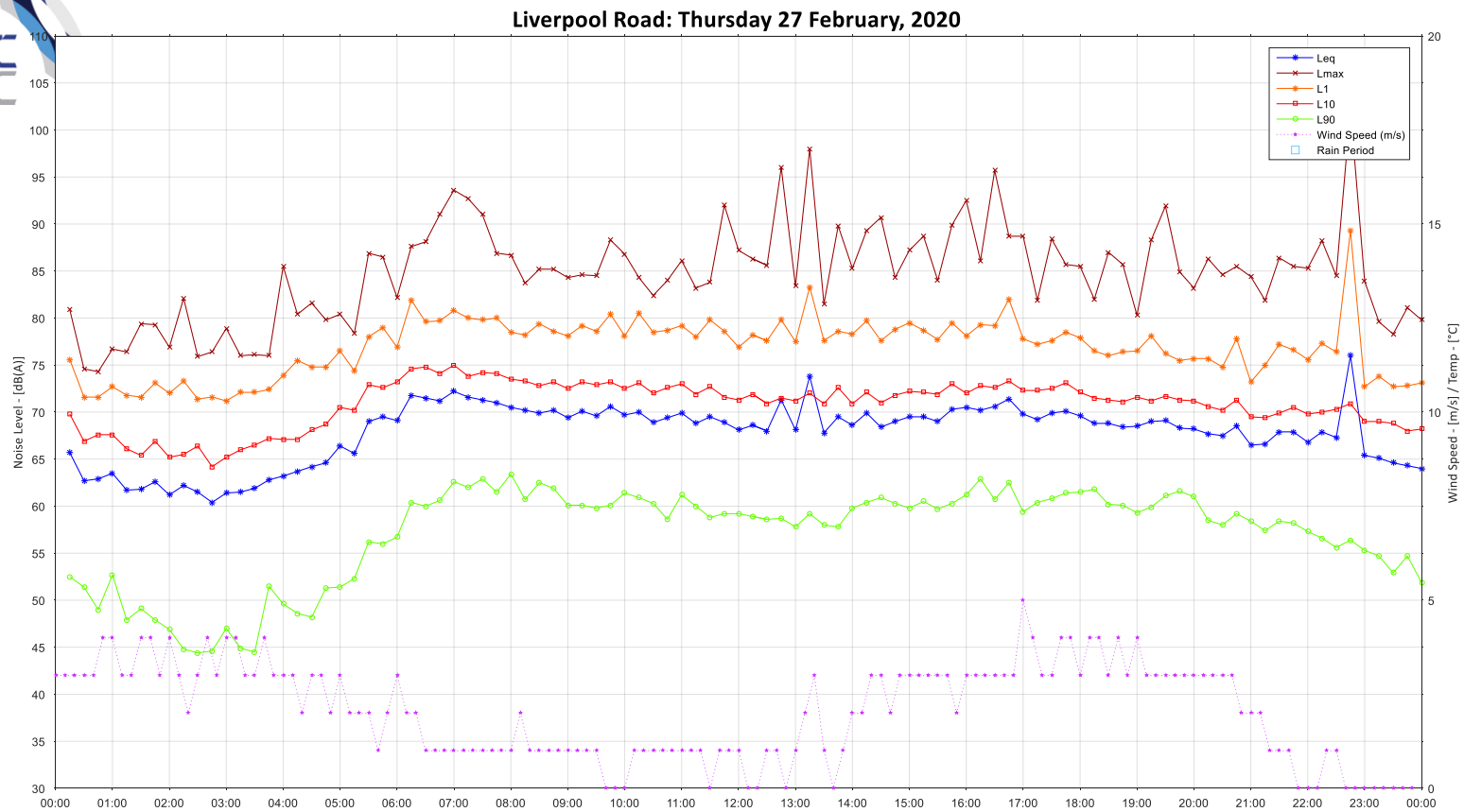


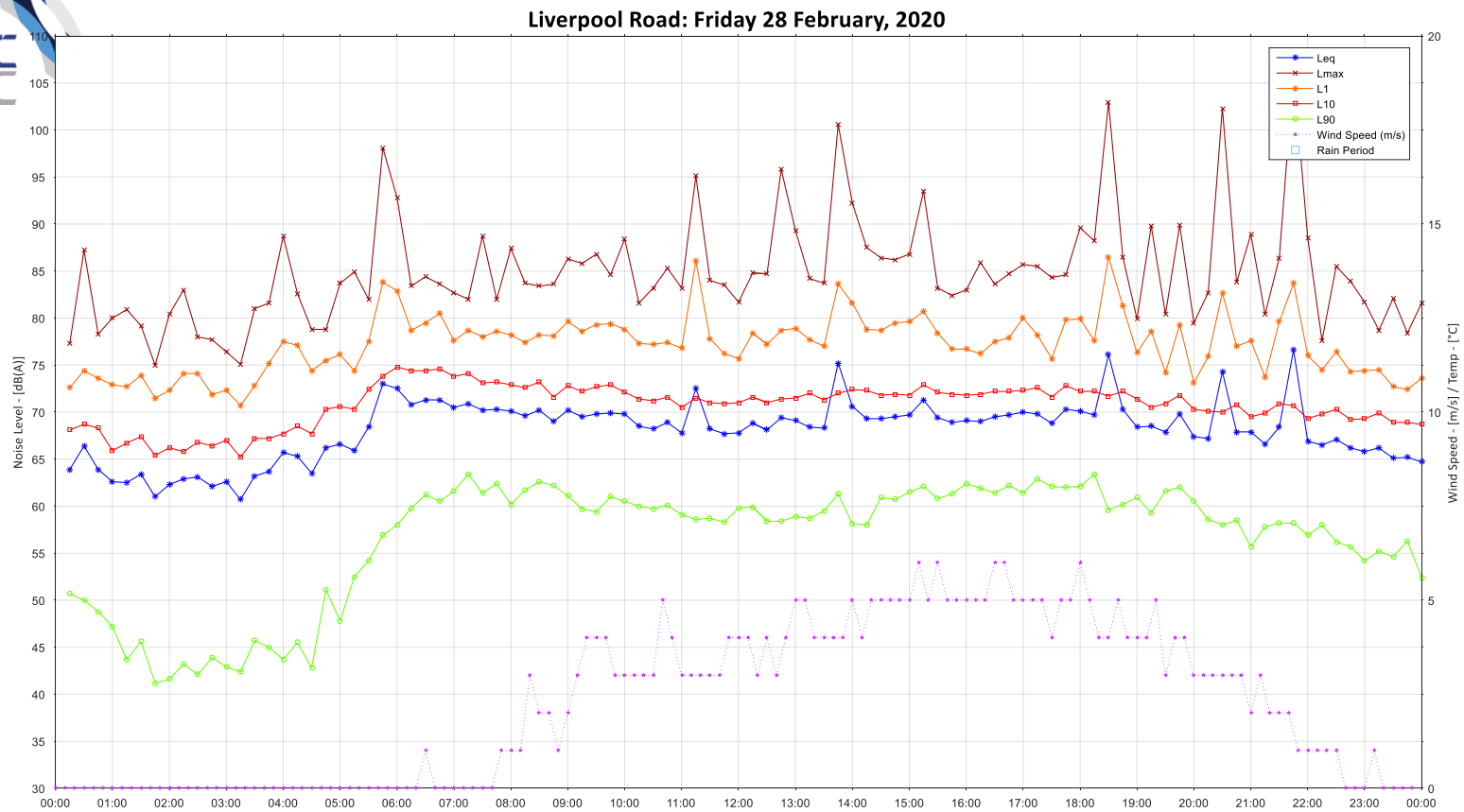


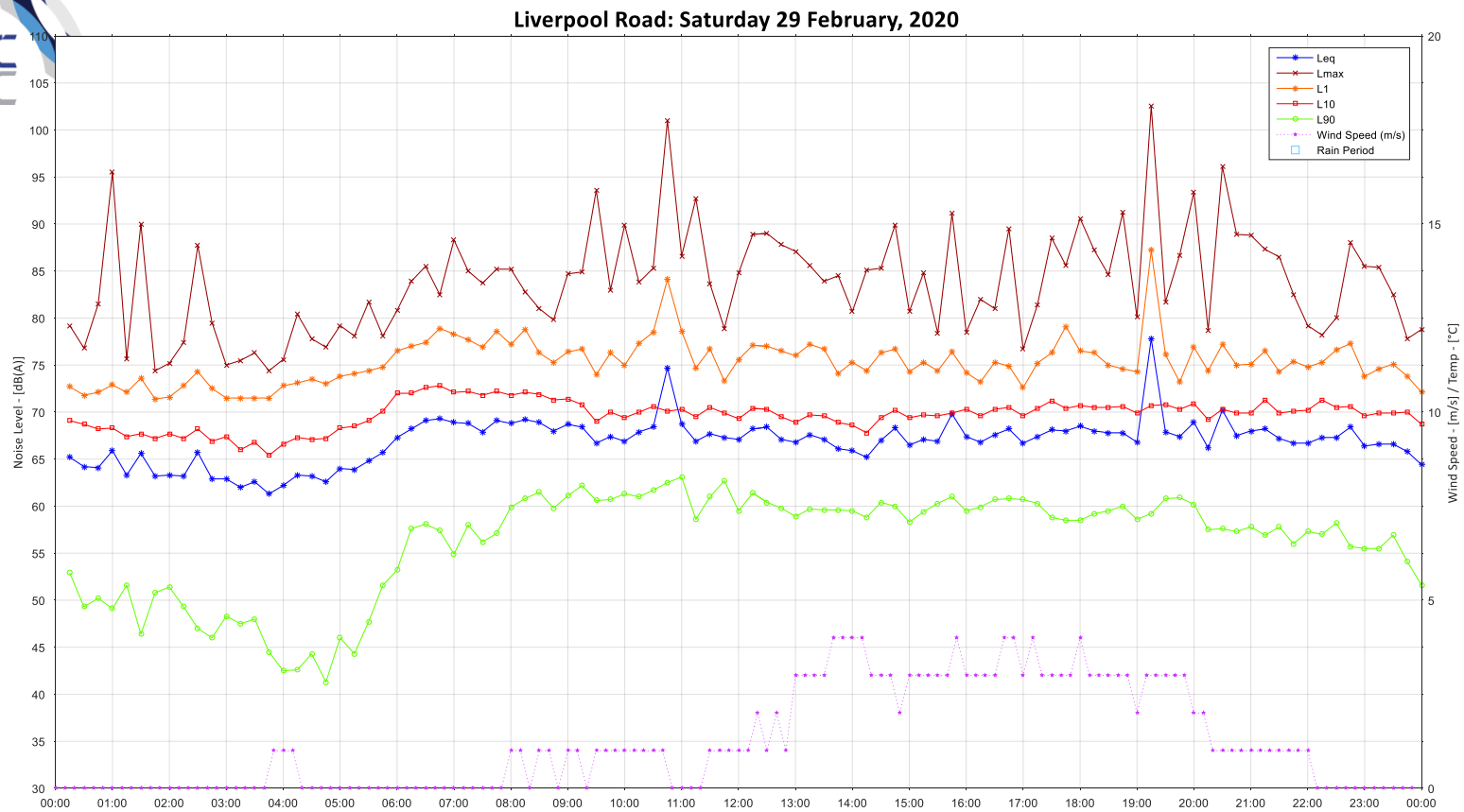




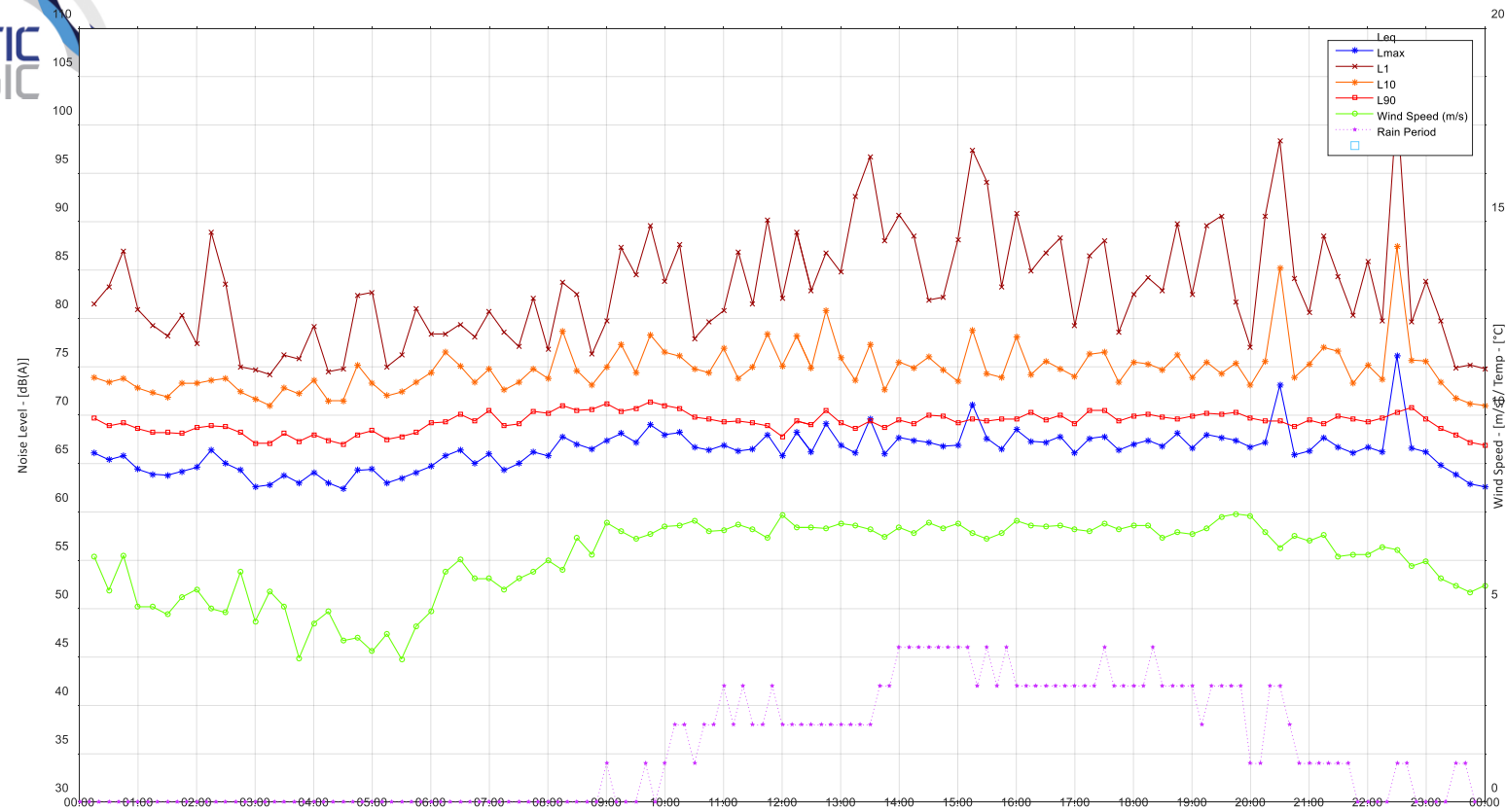


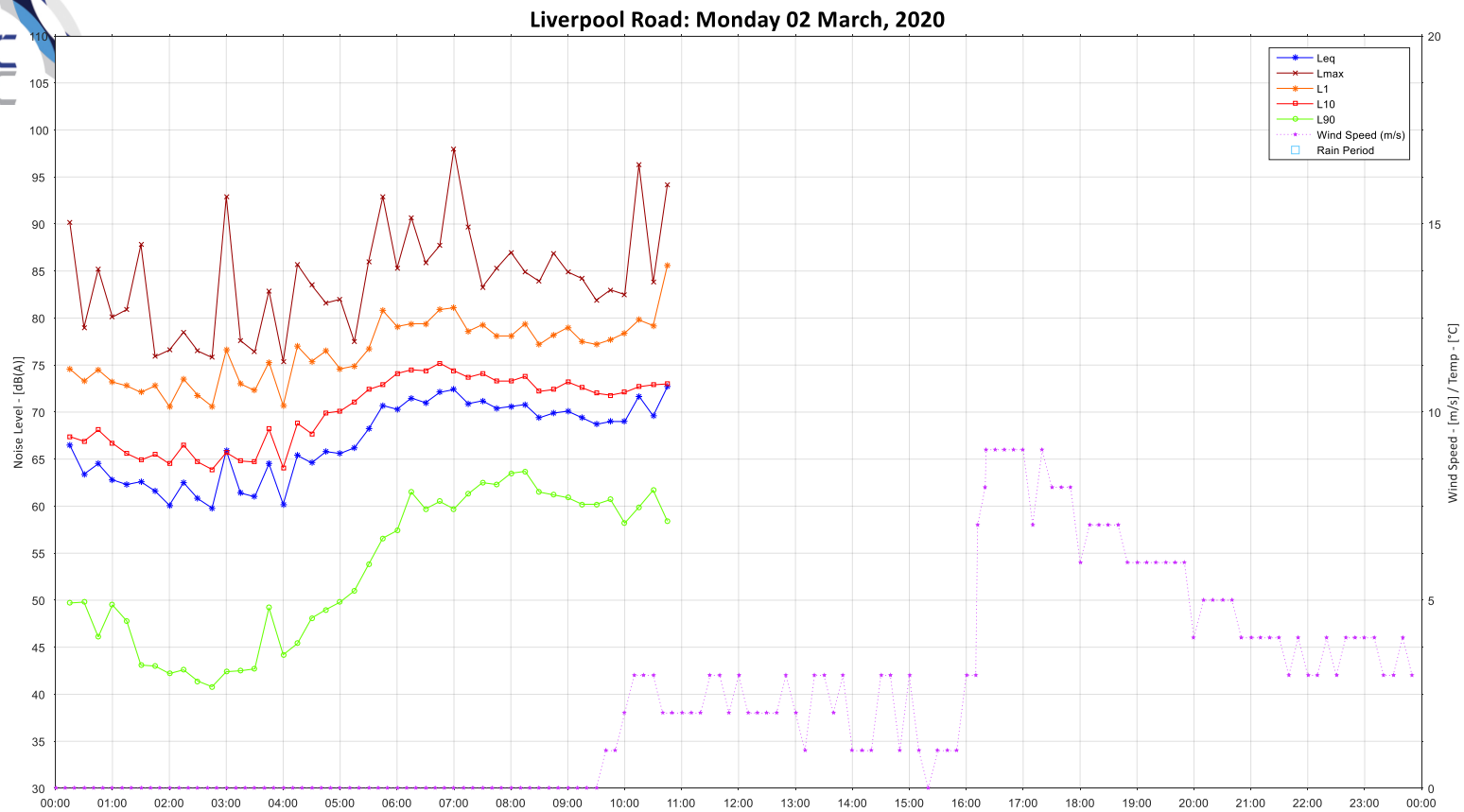




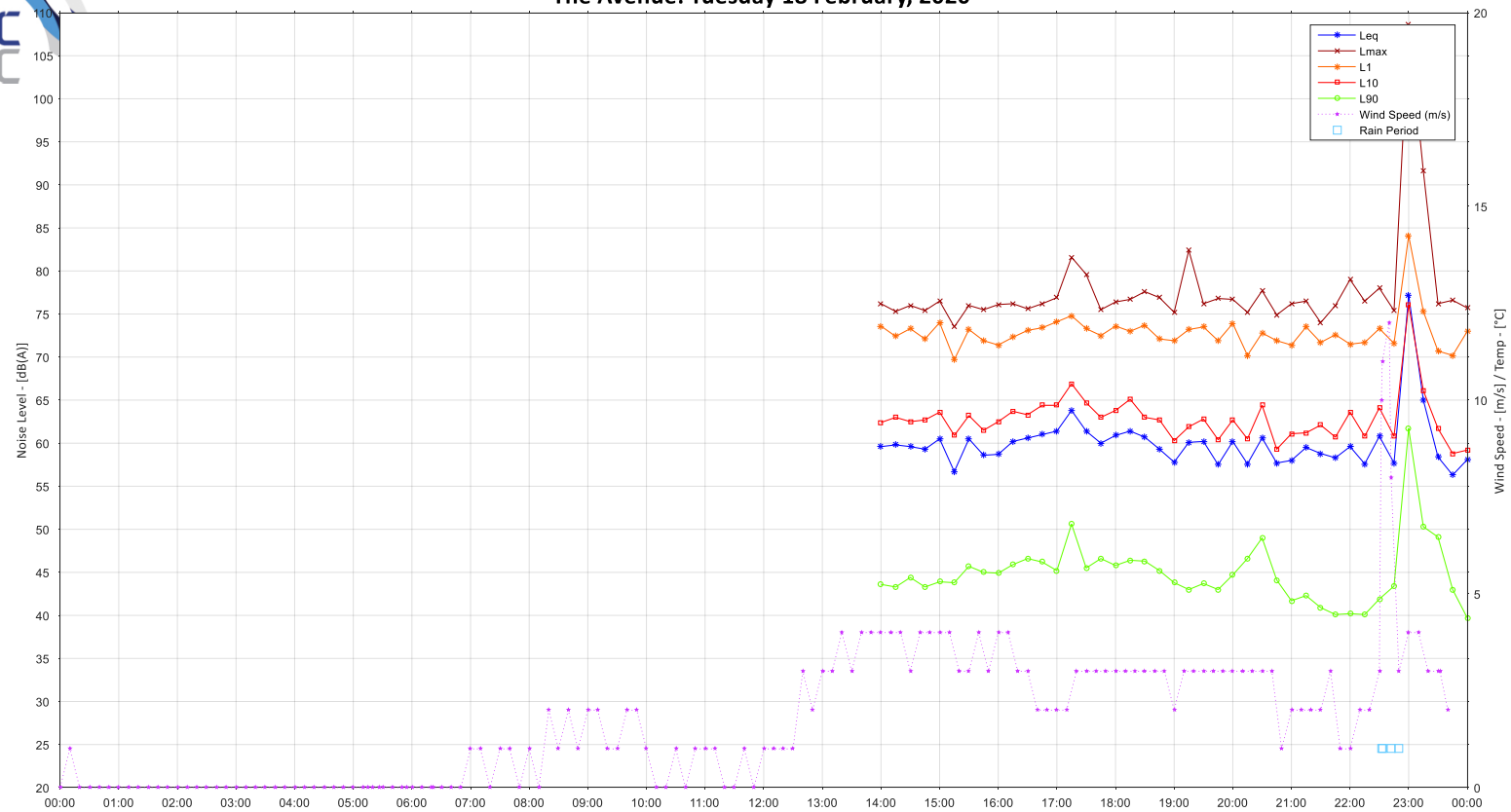


Liverpool Road: Sunday 01 March, 2020

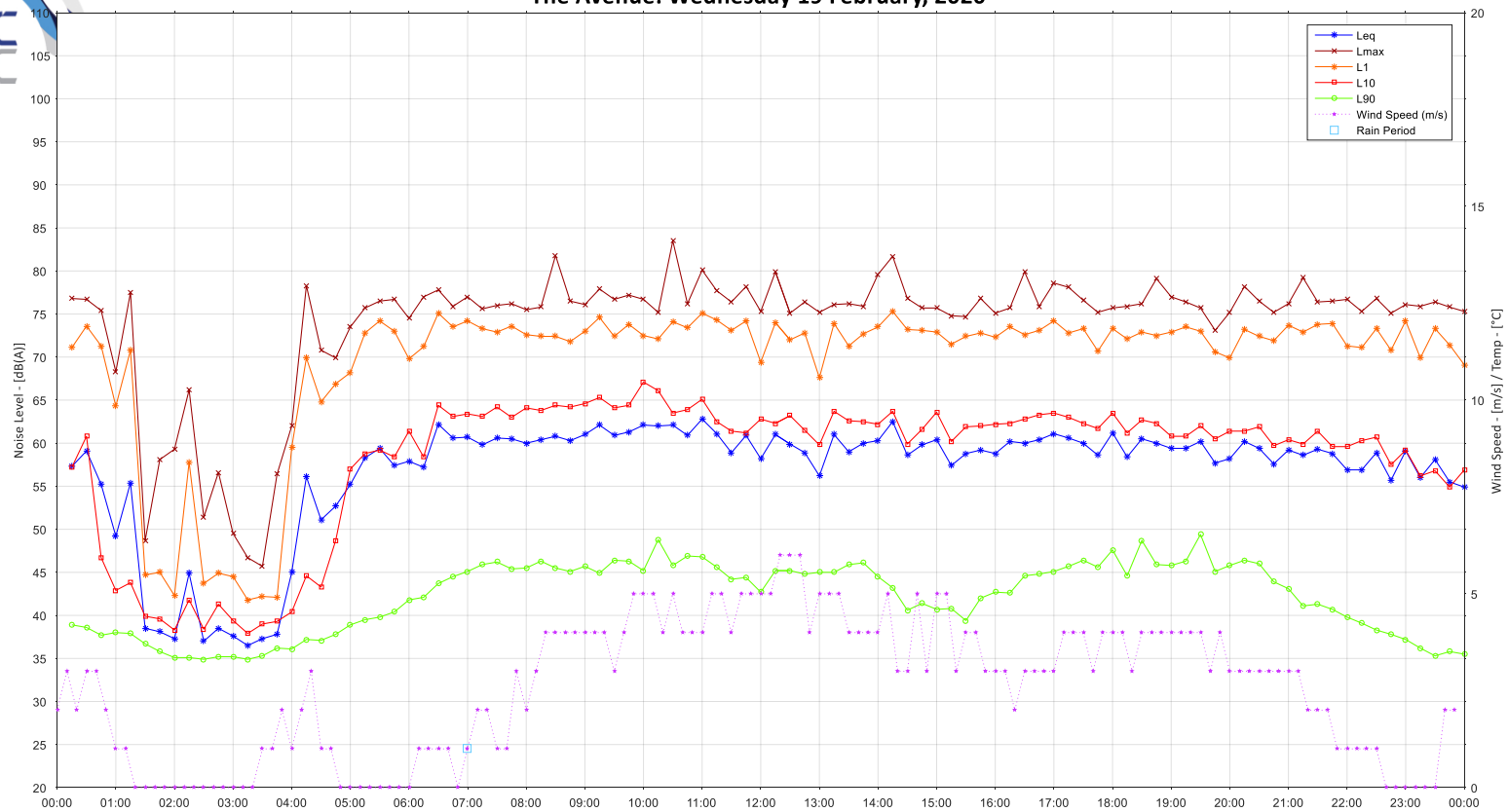


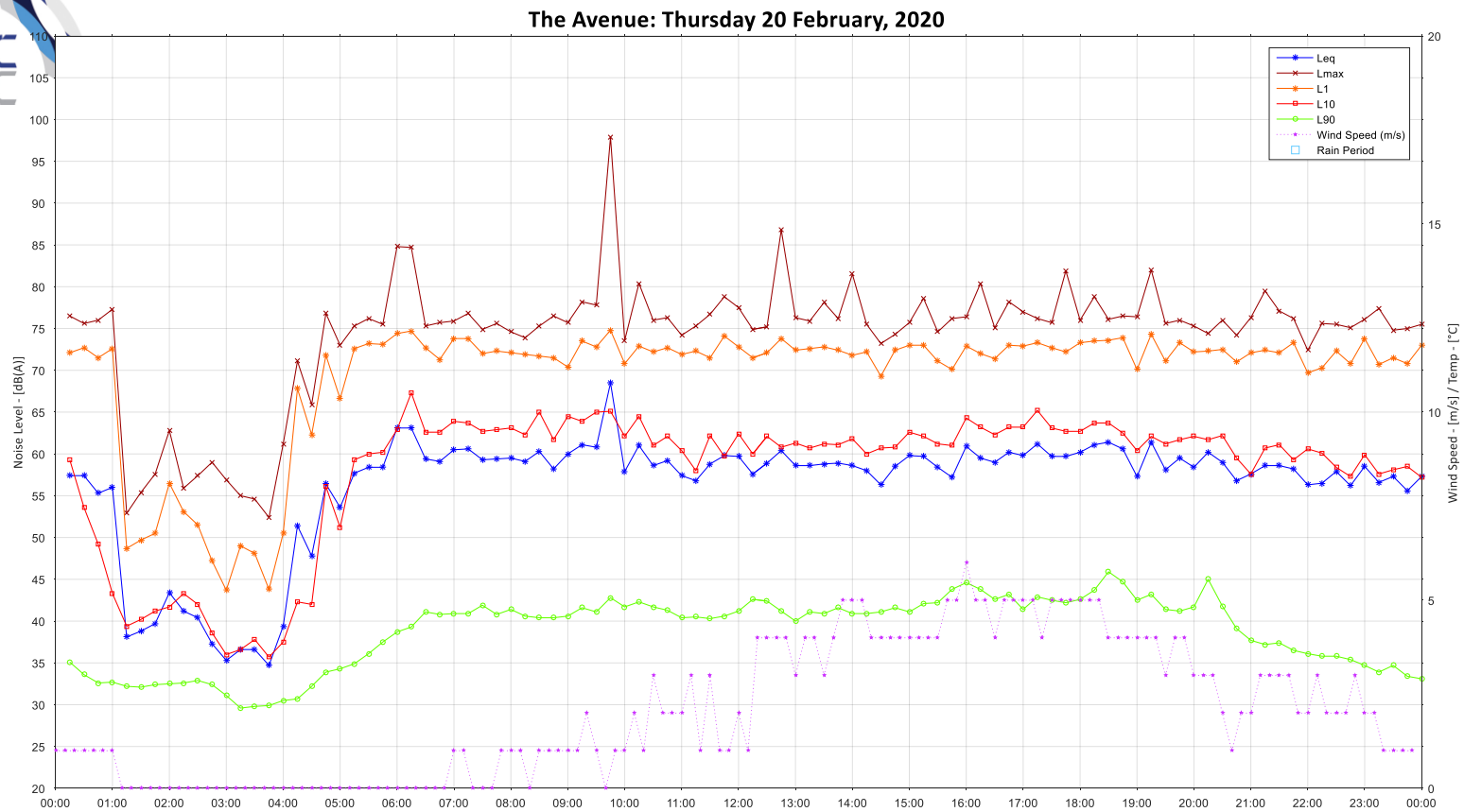


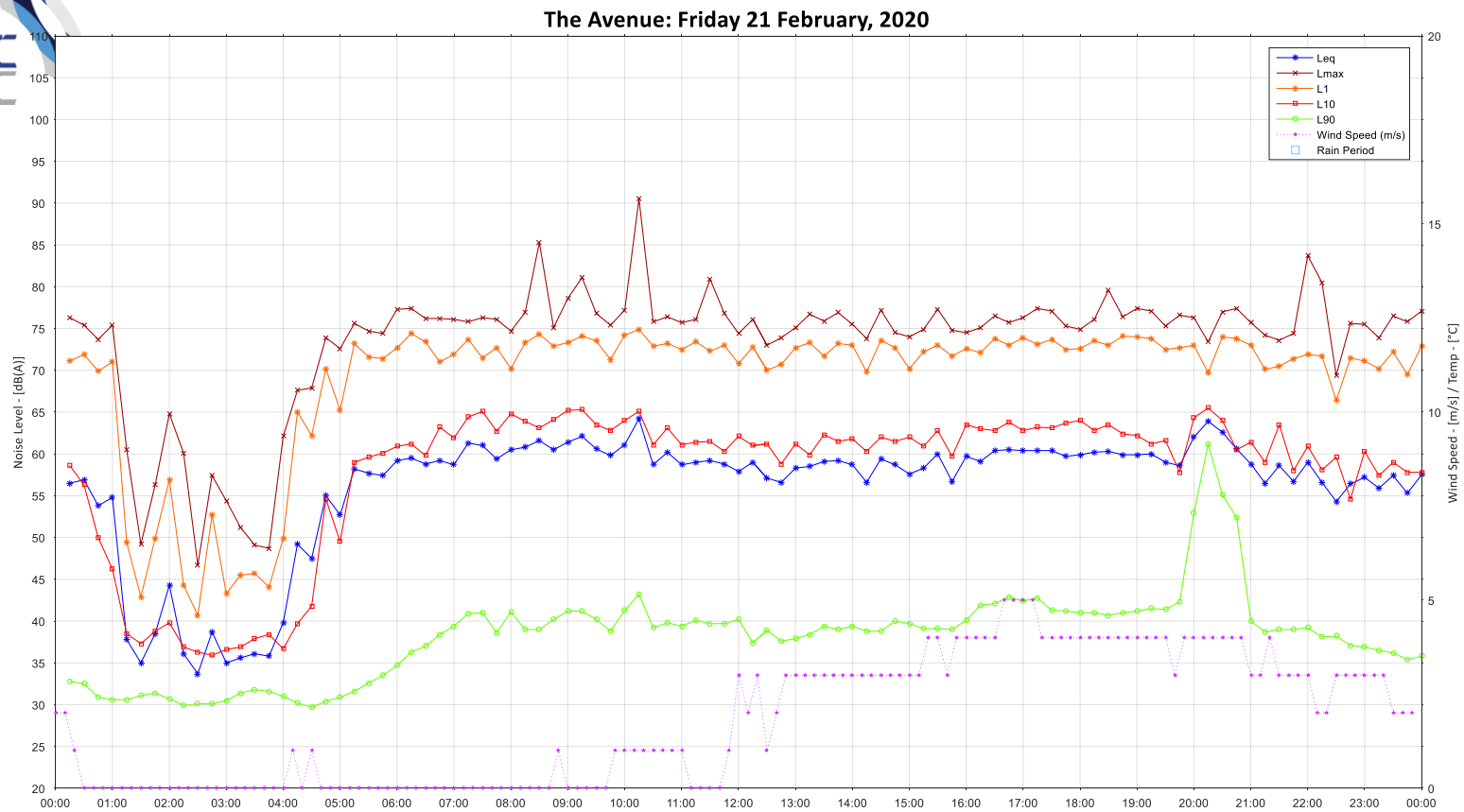
The Avenue: Tuesday 18 February, 2020



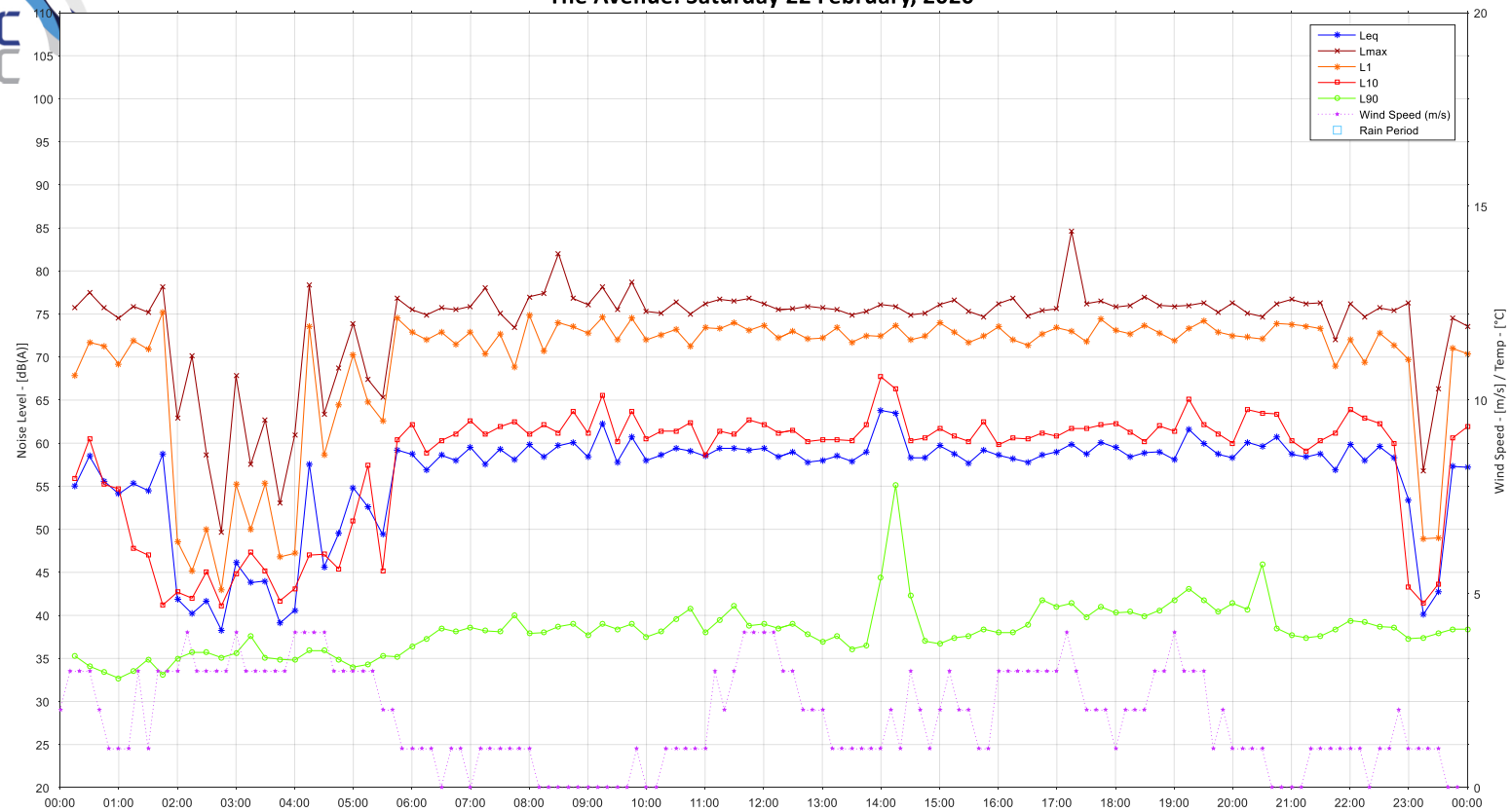
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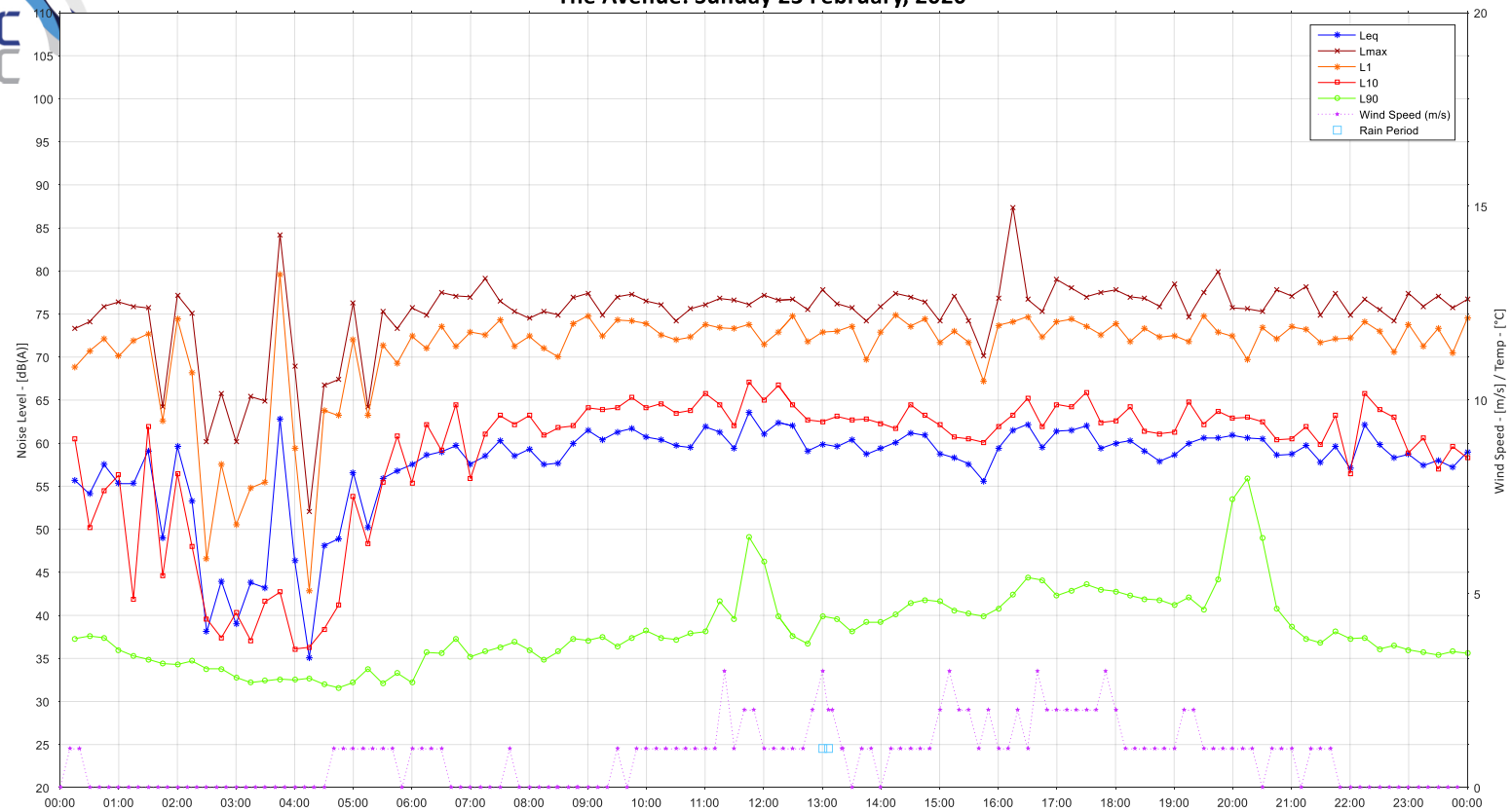




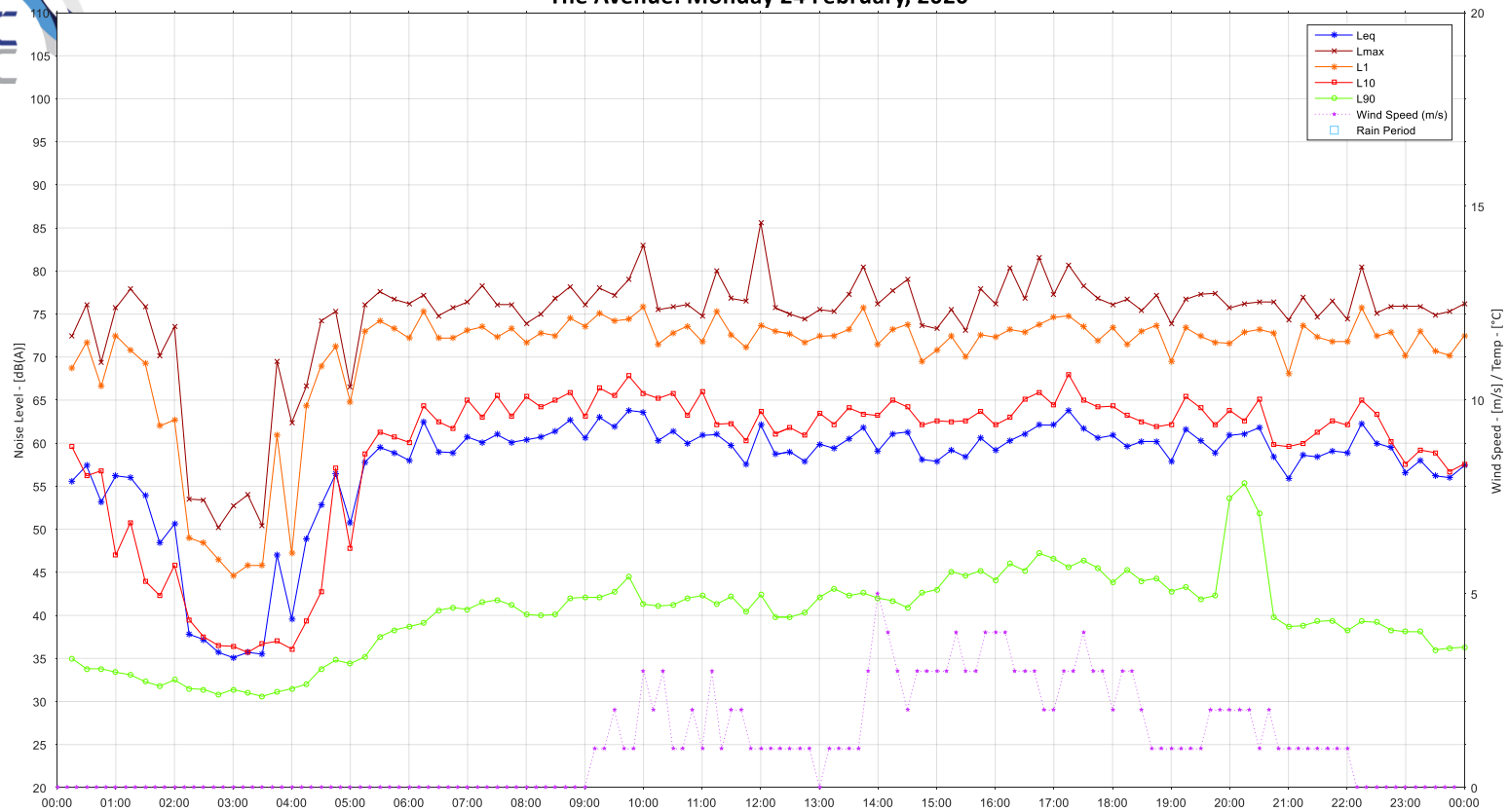
The Avenue: Saturday 22 February, 2020



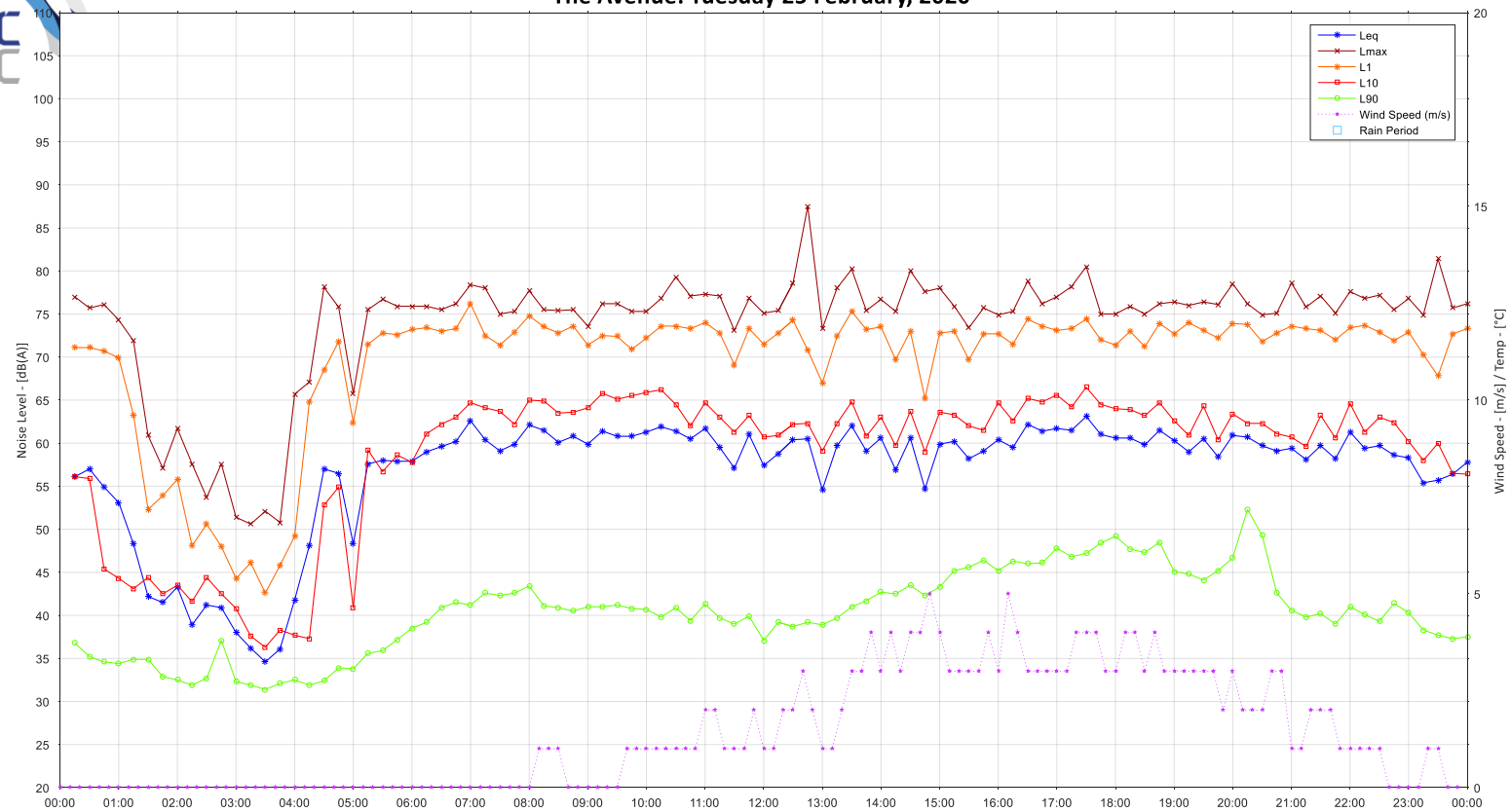
The Avenue: Sunday 23 February, 2020



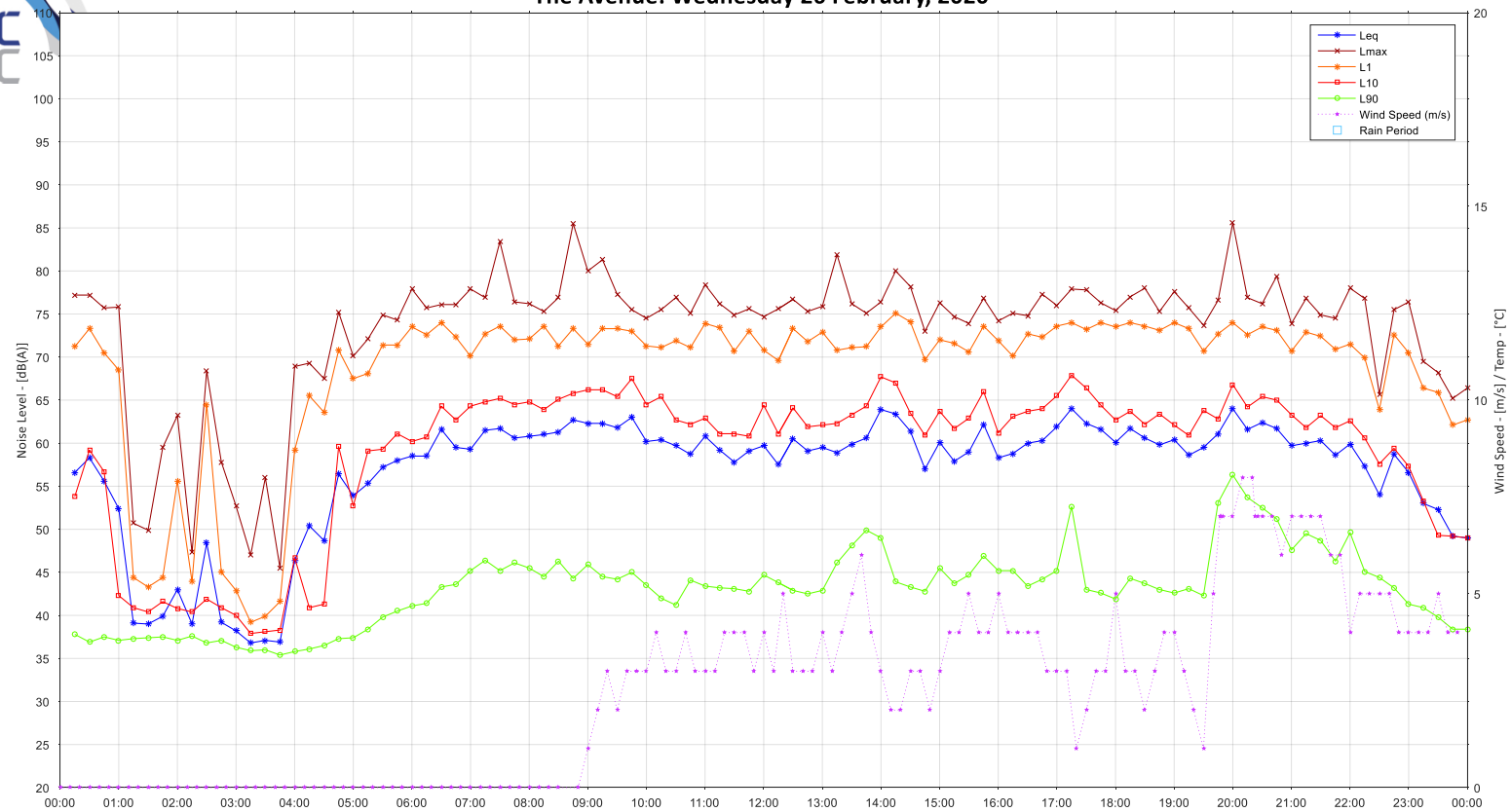
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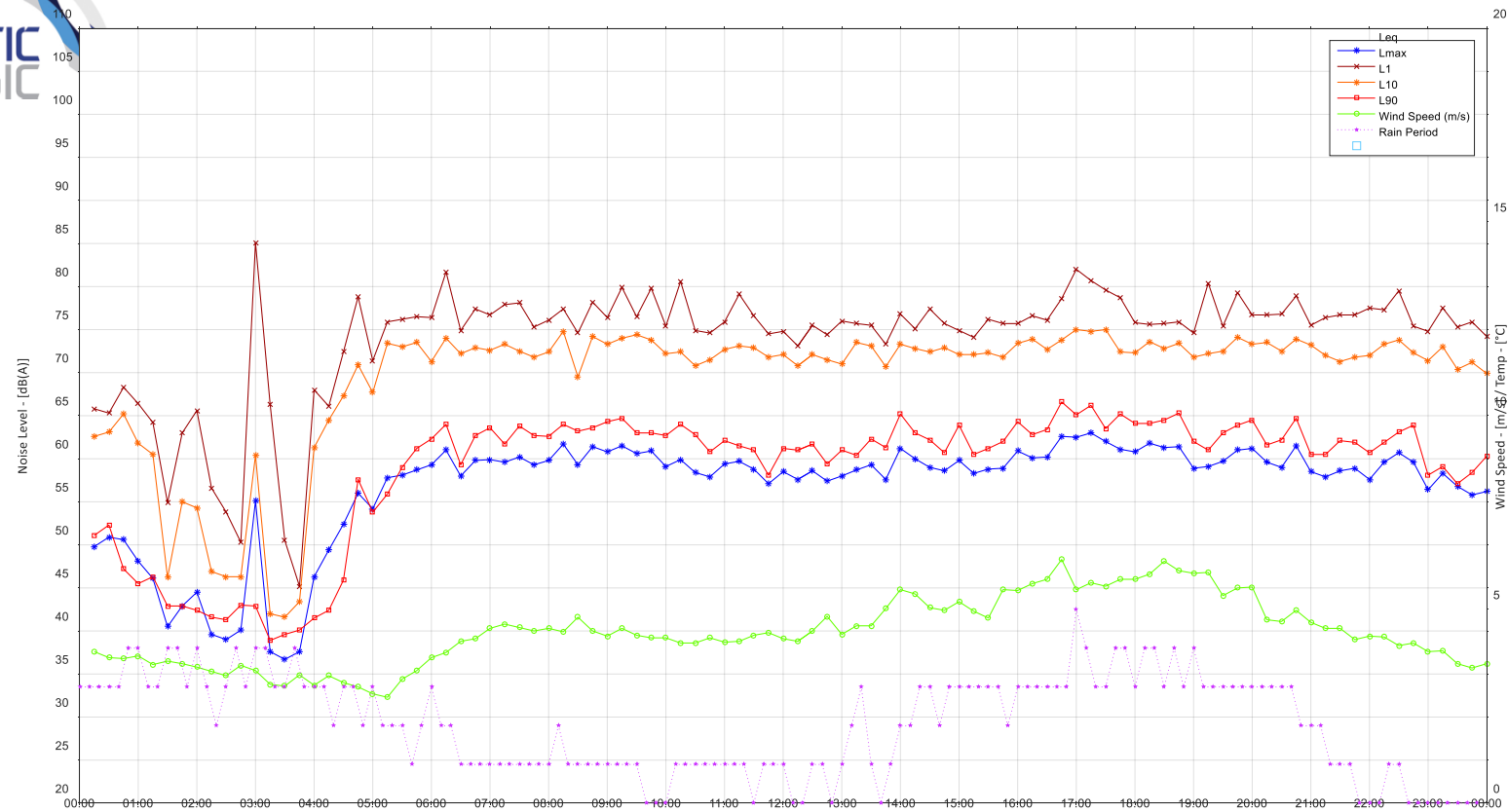
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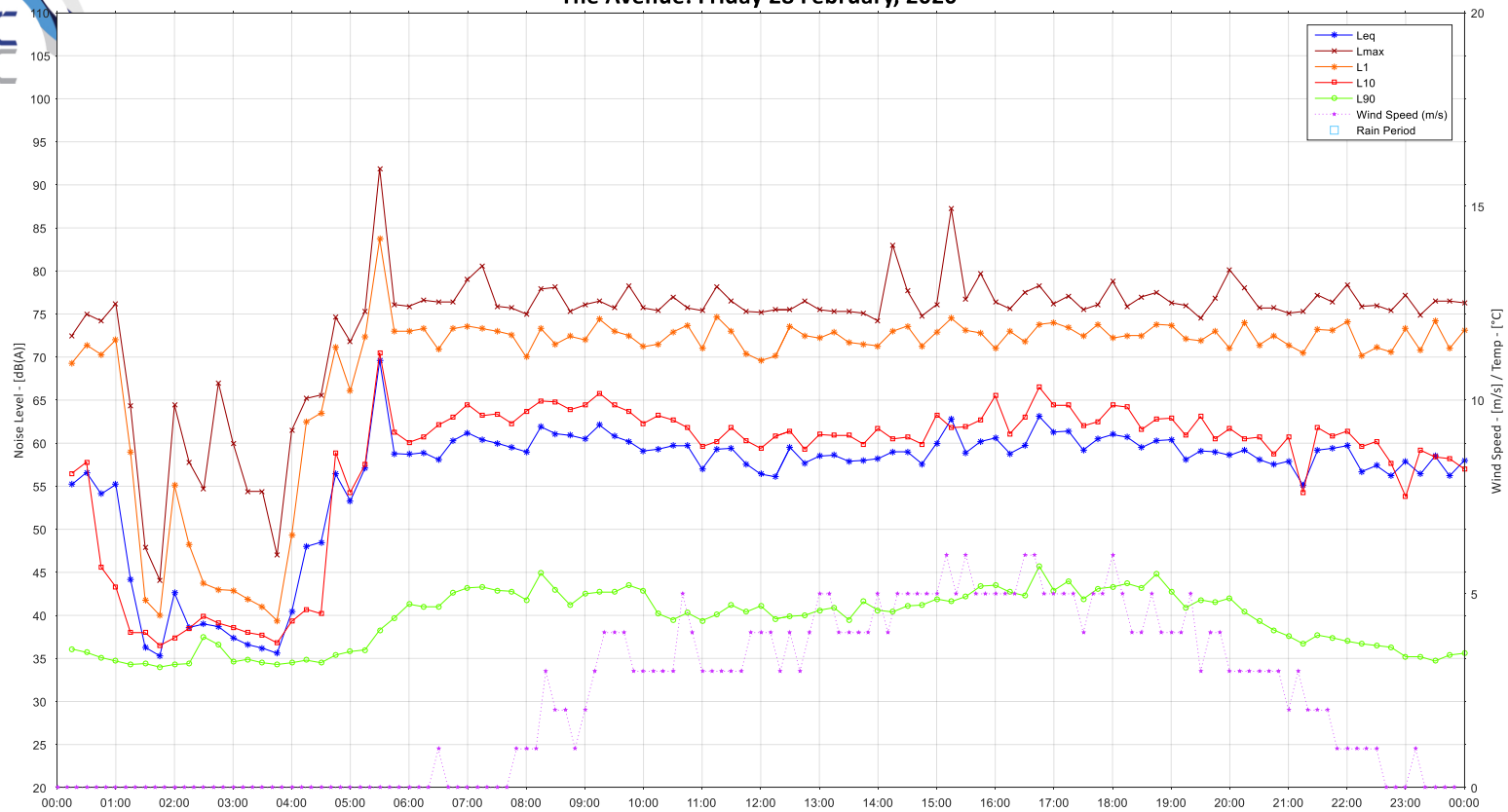
The Avenue: Wednesday 26 February, 2020



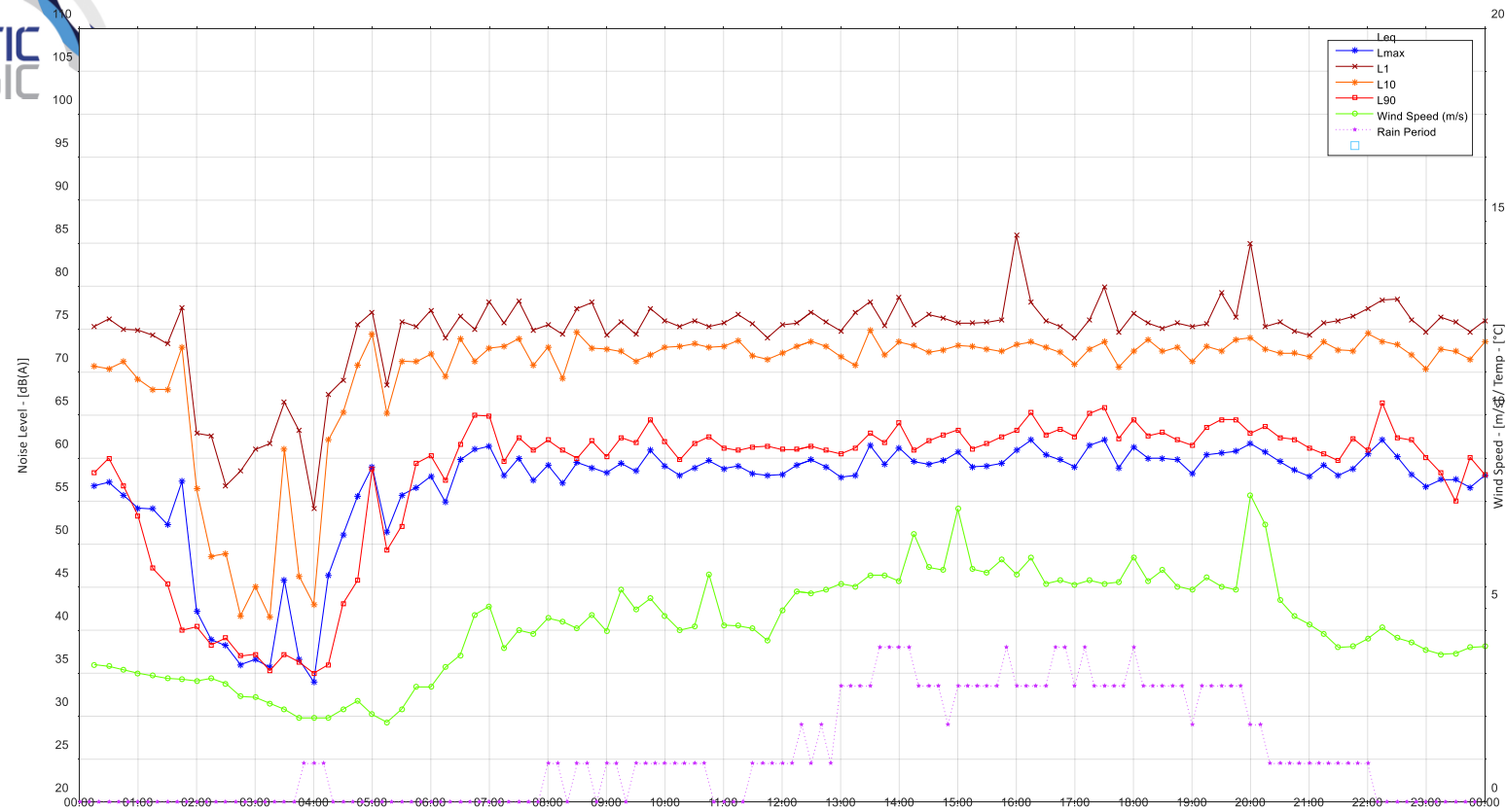
The Avenue: Thursday 27 February, 2020



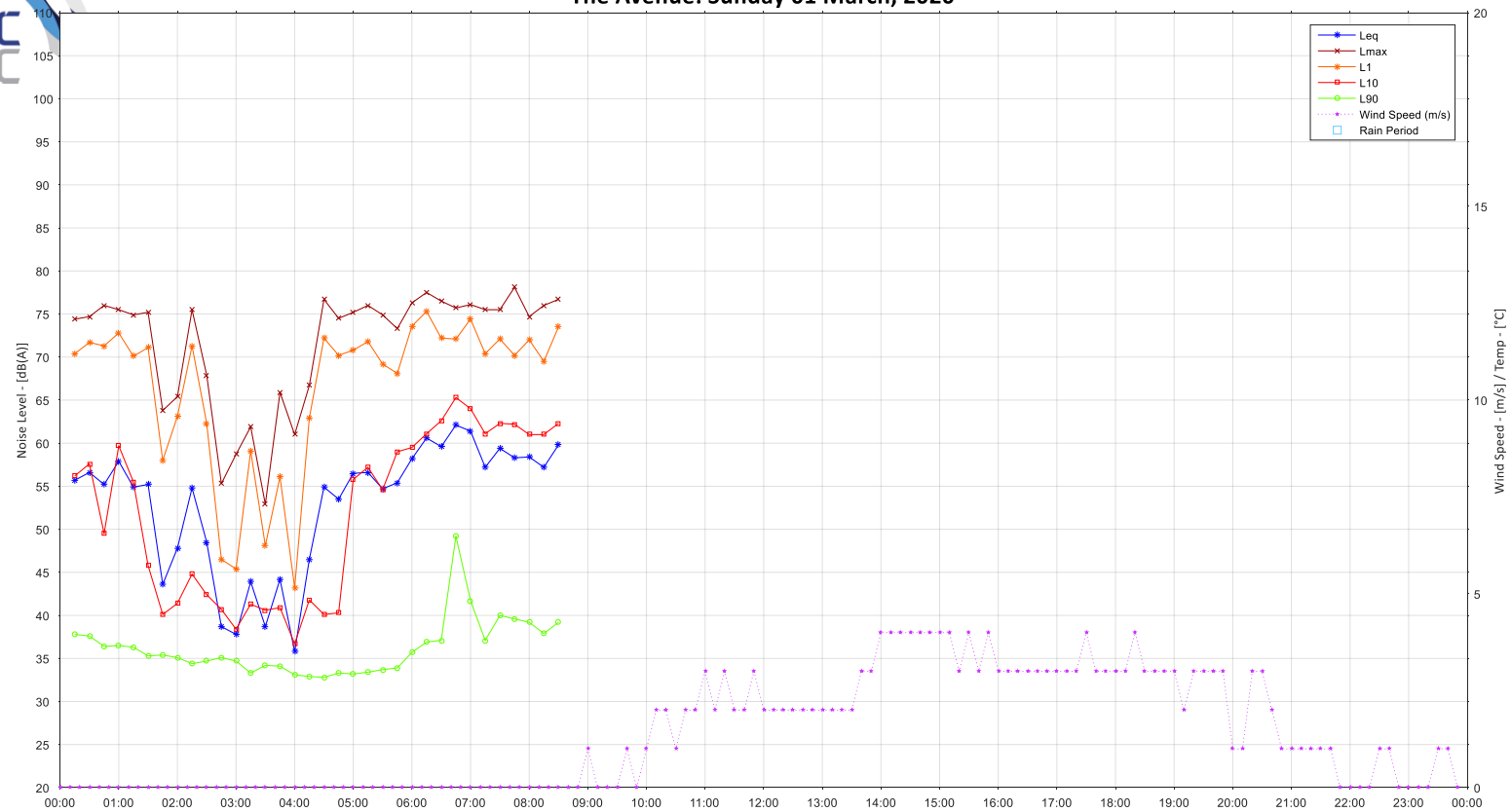
The Avenue: Friday 28 February, 2020



The Avenue: Saturday 29 February, 2020



The Avenue: Sunday 01 March, 2020



APPENDIX B: GLAZING MARK UP

MASTER WATER AND GAS METER

AIR INTAKE FROM GROUND FLOOR

AIR INTAKE FROM UNDERSIDE
OF LEVEL 1 OUTDOOR TERRACE

OSD UNDER

AIR INTAKE PLENUM

THOMAS STREET

FIRE BOOSTER

AIR INTAKE LOUVER

62 CARPARK SPACES
(RESIDENTIAL PARKING)

EXHAUST AIR PLENUM

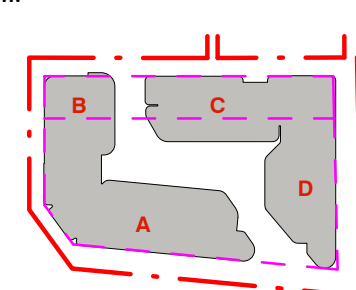
SUBSTATION ABOVE

1 GROUND FLOOR
1 : 200 @A1

- 6mm
- 6.38mm laminated
- 10mm
- 10.38mm laminated
- 6/12/10.38mm lam

Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020

Key Plan:



Client



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NSW Nominated Architects
S Parsons Architect No.6098
D Jones Architect No.4778

PTW

0 1 2 5 10 15m

Project Project Number
2-6 CAVILL AVENUE
ASHFIELD

Status
DEVELOPMENT APPLICATION

Title
DA DRAWINGS
GROUND FLOOR PLAN

Drawing Number
DA-100

Revision
A

THOMAS STREET

LIVERPOOL ROAD

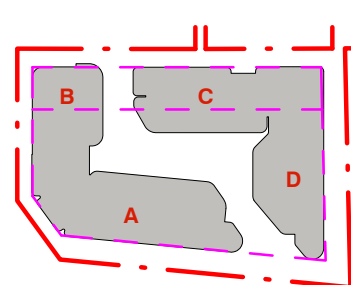
CAVILL AVENUE SUBSTATION KIOSK

- 6mm
- 6.38mm laminated
- 10mm
- 10.38mm laminated
- 6/12/10.38mm lam

1 LEVEL 01
1 : 200 @A1

Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020

Key Plan:



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D Jones Architect No.4778

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Project Project Number
**2-6 CAVILL AVENUE
ASHFIELD**

Status
DEVELOPMENT APPLICATION

Title
DA DRAWINGS
LEVEL 01 PLAN

Drawing Number
DA-101

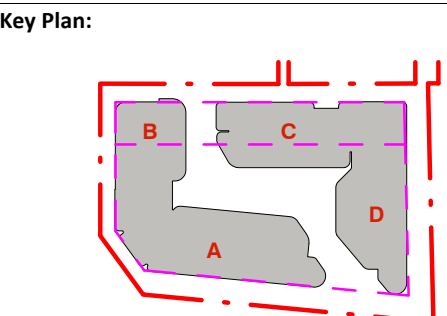
Revision
A



- 6mm
- 6.38mm laminated
- 10mm
- 10.38mm laminated
- 6/12/10.38mm lam

1 LEVEL 02
1 : 200 @A1

Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020



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D Jones Architect No.4778

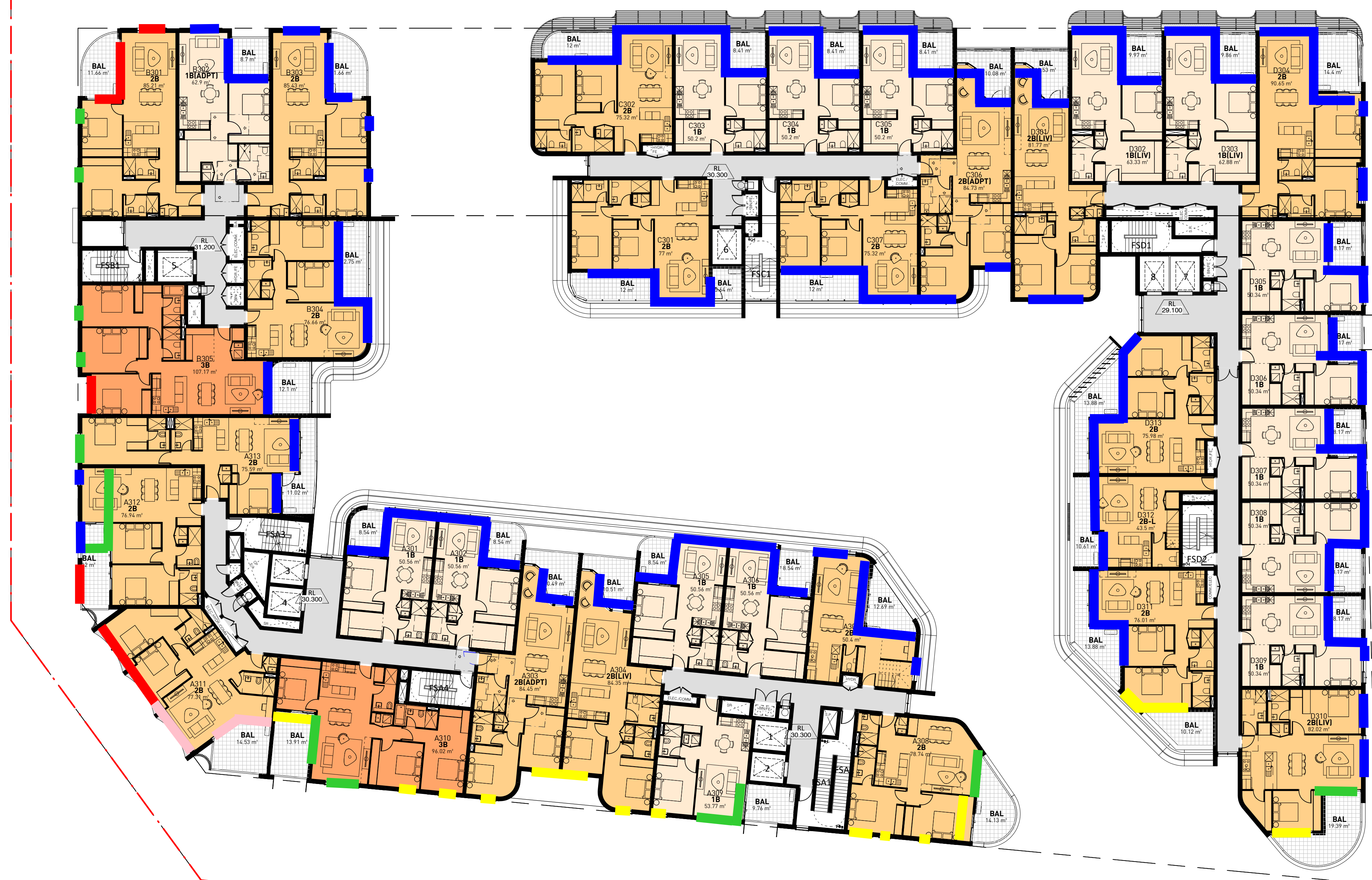


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Project					
Project Number					
2-6 CAVILL AVENUE					
ASHFIELD					
Status					
DEVELOPMENT APPLICATION					

Title
DA DRAWINGS
LEVEL 02 PLAN

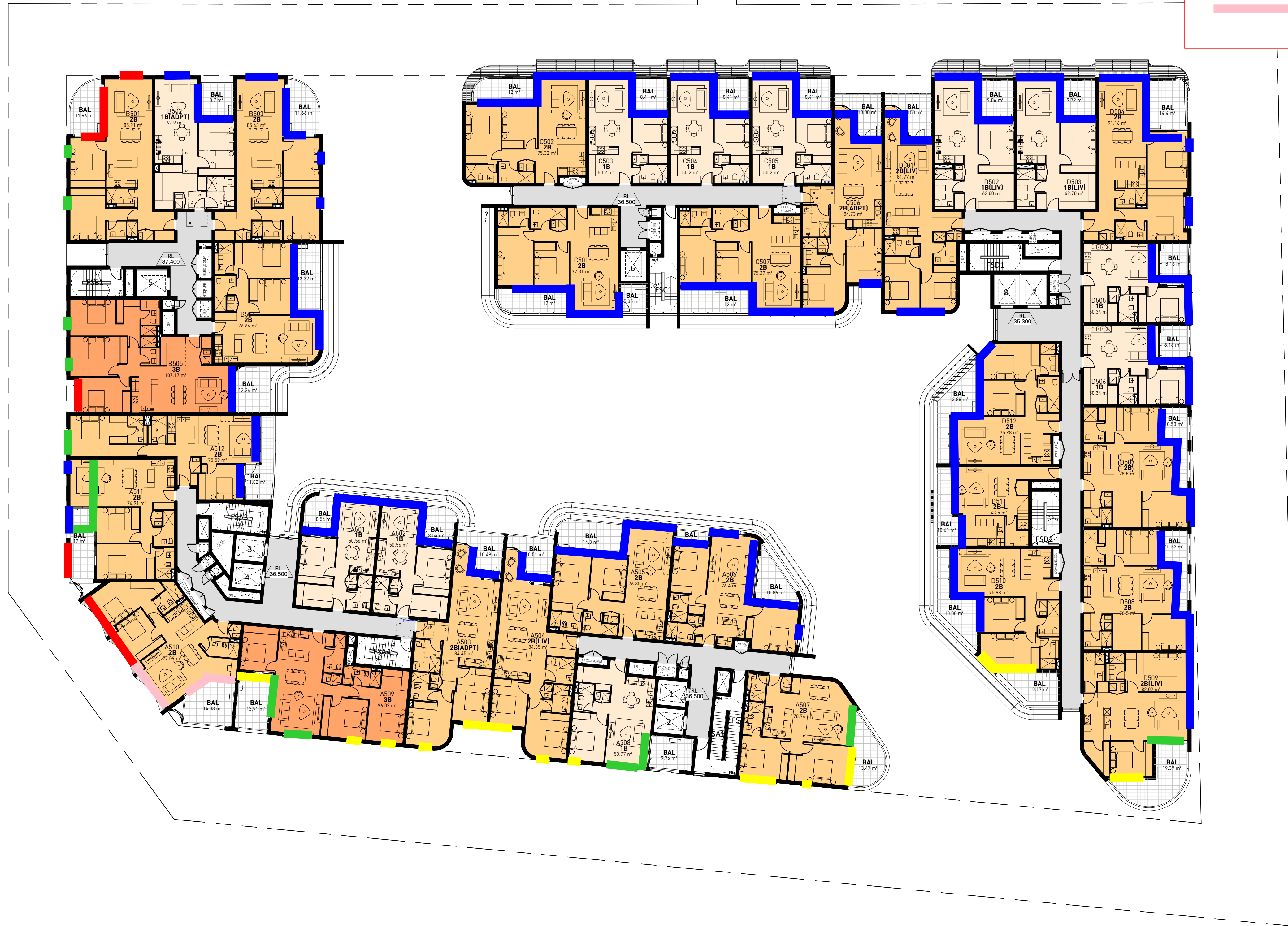
Drawing Number
DA-102

Revision
A



A1

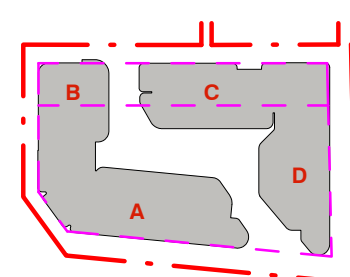
1 LEVEL 05
1 : 200



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- 10mm
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- 6/12/10.38mm lam

Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020

Key Plan:



Client



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Project Project Number					
2-6 CAVILL AVENUE					
ASHFIELD					
Status					
DEVELOPMENT APPLICATION					

Title
DA DRAWINGS
LEVEL 05 PLAN

Drawing Number
DA-105

Revision
A

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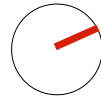
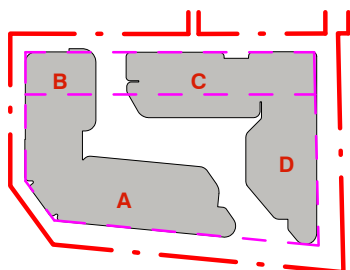
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1 ARCH_L06
1 : 200

Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020

Key Plan:



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D Jones Architect No.4778



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Project Project Number
2-6 CAVILL AVENUE
ASHFIELD

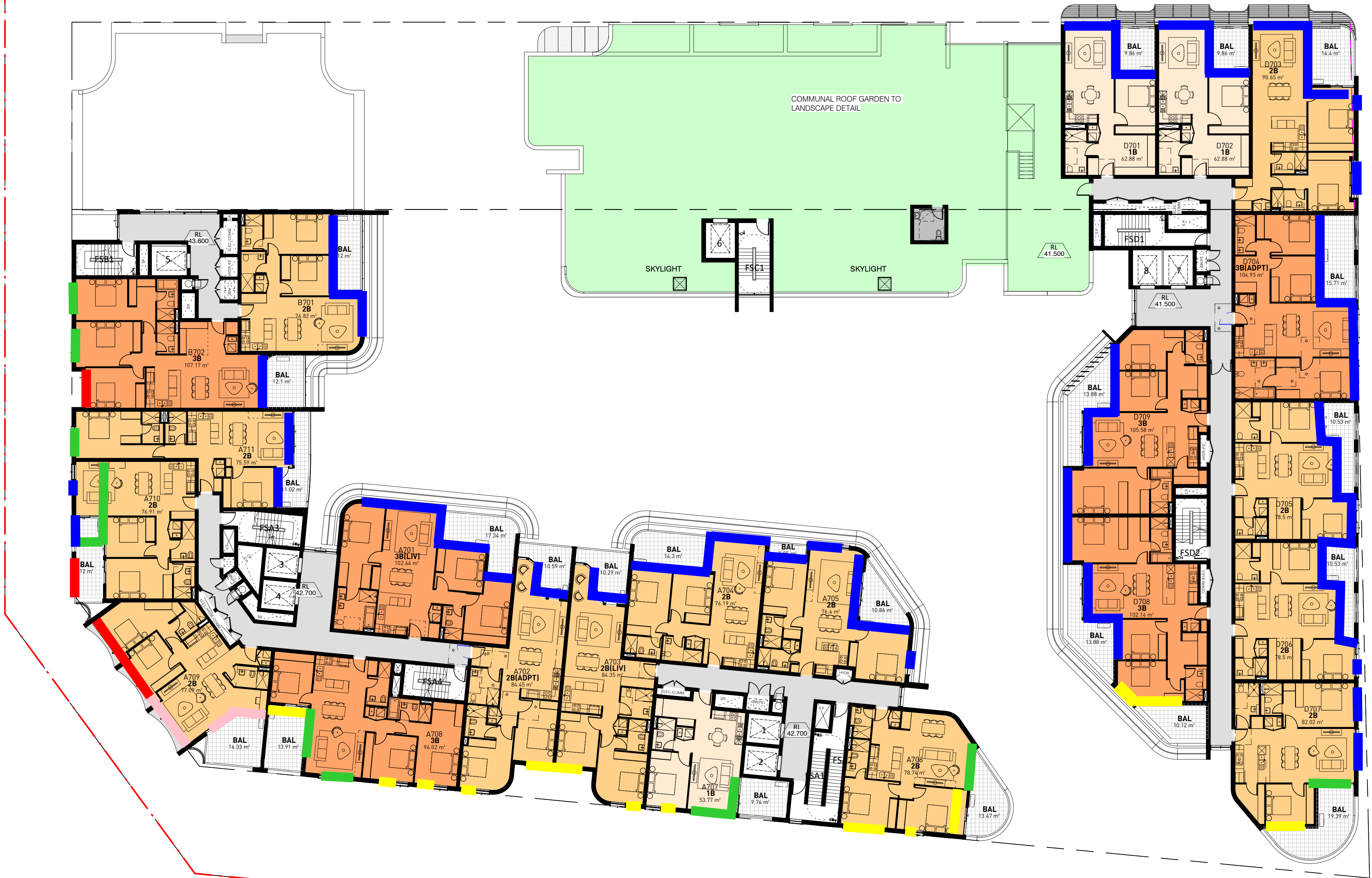
Status
DEVELOPMENT APPLICATION

Title
DA DRAWINGS
LEVEL 06 PLAN

Drawing Number
DA-106

Revision
A

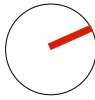
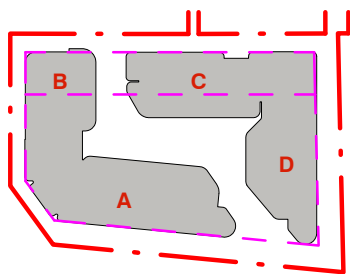
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- 6/12/10.38mm lam



1 LEVEL 07
1 : 200 @A1

Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020

Key Plan:



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Project					
Project Number					
2-6 CAVILL AVENUE					
ASHFIELD					
Status					
DEVELOPMENT APPLICATION					

Title
DA DRAWINGS
LEVEL 07 PLAN

Drawing Number	Revision
DA-107	A

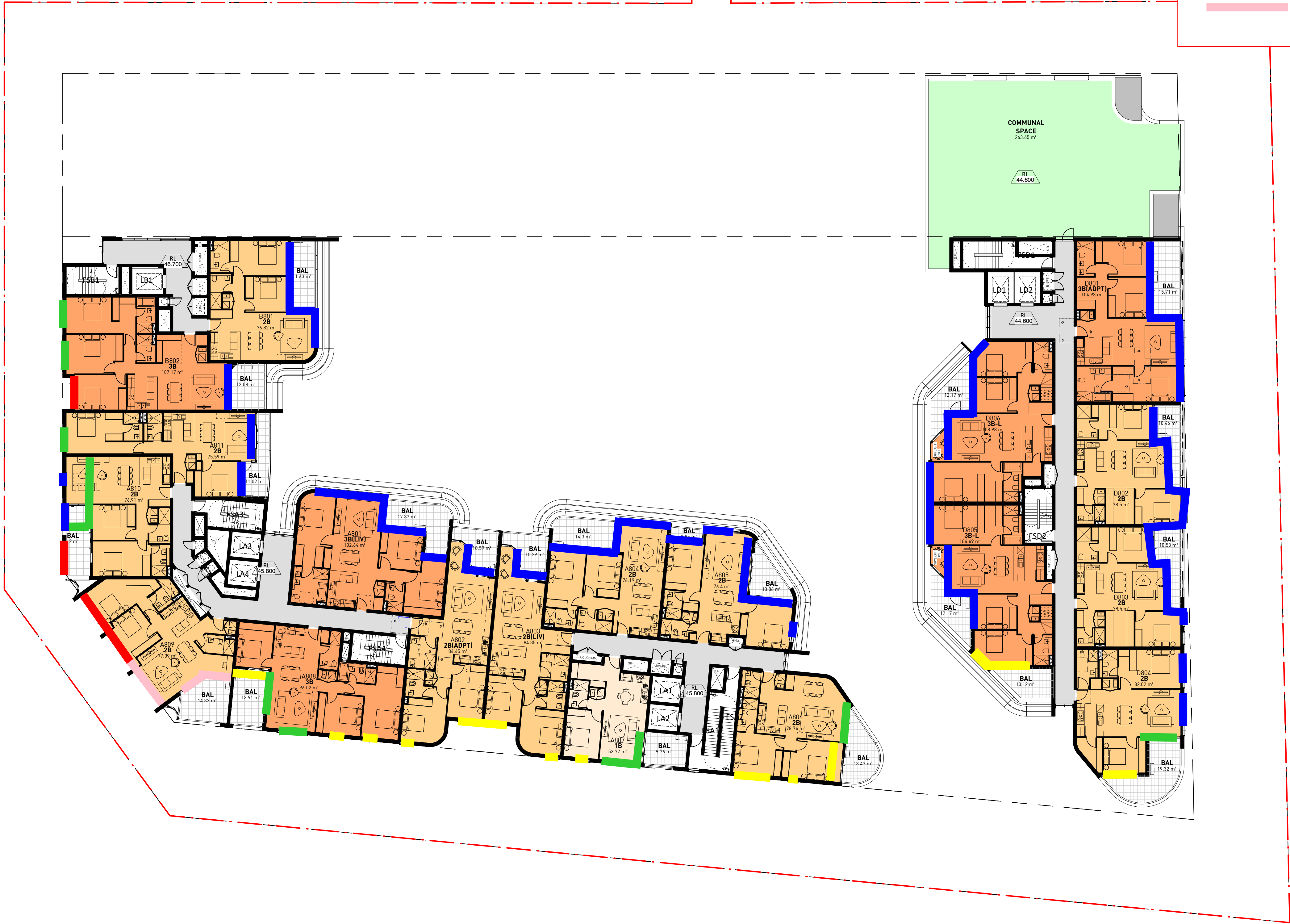
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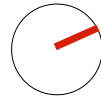
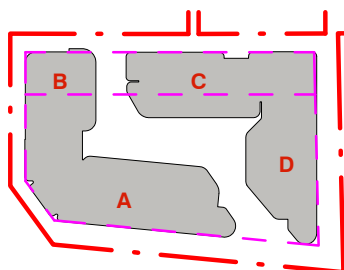
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1 LEVEL 08
1 : 200 @A1

Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020

Key Plan:



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0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Project																Project Number																2-6 CAVILL AVENUE ASHFIELD																Status																DEVELOPMENT APPLICATION																																				

Title
DA DRAWINGS
LEVEL 08 PLAN

Drawing Number
DA-108

Revision
A

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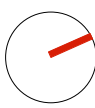
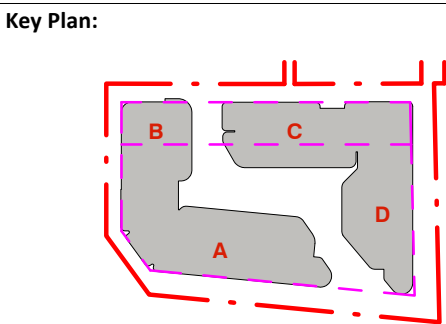
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6/12/10.38mm laminated



1 LEVEL 09
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Rv	Amendment	By	Ck	Date
A	Issue for Coordination			13/11/2020



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0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Project Project Number															
2-6 CAVILL AVENUE															
ASHFIELD															
Status															
DEVELOPMENT APPLICATION															

Title	
DA DRAWINGS	
LEVEL 09 PLAN	
Drawing Number	Revision
DA-109	A