

SummitCare Monterey - 119 Barton Street, Monterey

Noise Impact Assessment

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Attention To	Monterey Equity Pty Ltd

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1 INTRODUCTION

Acoustic Logic (AL) have been engaged to conduct an acoustic assessment of potential noise impacts associated with the proposed aged-care development located at 119 Barton St, Monterey.

This document addresses noise impacts associated with the following:

- Noise intrusion from traffic movements.
- Noise emissions from mechanical plant to service the project site (in principle).

ALC have utilised the following documents and regulations in the noise assessment of the development;

- *Rockdale Council Development Control Plan 2011*;
- Australian Standard AS2107:2016 – *Recommended Design Sound Levels and Reverberation Times for Building Interiors*; and
- NSW Department of Environment and Heritage, Environmental Protection Agency document – *Noise Policy for Industry (NPI) 2017*

This assessment has been conducted based on the architectural drawings provided by *Boffa Robertson Group* for this project (Project Number 2014).

Table 1-1– Architectural Sheet Information

Drawing Owner	Drawing No.	Drawing Title	Issue	Date
Boffa Robertson Group	DA04	BASEMENT FLOOR PLAN	5	August 2020
	DA05	GROUND FLOOR PLAN OPTION		
	DA06	FIRST FLOOR PLAN		
	DA07	SECOND FLOOR PLAN		

2 SITE DESCRIPTION

The proposed development comprises the following;

- 43 space basement level carpark with driveway from Barton Street;
- A total of 137 units spread over ground floor to level two.

Acoustic Investigation has been carried out by this office in regards to the existing properties and noise impacts surrounding the proposed development, which is detailed below:

- **R1: Residential Receiver 1** – Existing two-story residential dwellings to the north at 107-115 Barton Street, Monterey.
- **R2: Residential Receiver 2** – Existing single and two-story residential dwellings to the east at 121 Barton Street, Monterey.
- **R3: Residential Receiver 3** – Existing two-story residential dwellings to the south at 15-27 Scarborough Street, Monterey.
- **R4: Residential Receiver 4** – Existing two-story residential dwellings to the west at 2-10 Jones Avenue, Monterey.

A site map, measurement description and surrounding receivers are presented below.



Figure 1: Site Map
(Source: NSW SIX Maps)



3 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 15-20 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 L_{10} , L_{90} and L_{eq} . The L_{10} and L_{90} measurement parameters are statistical levels that represent the average maximum and average minimum noise levels respectively, over the measurement intervals.

The L_{10} 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 L_{90} 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 L_{90} 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 L_{90} level.

The L_{eq} 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. L_{eq} 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.

The L_{max} parameter represents the loudest noise event during a measurement period.

4 AMBIENT NOISE SURVEY

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

Appendices in this report present results of unattended noise monitoring conducted at the project site. Weather affected data was excluded from the assessment. The processed RBL (lowest 10th percentile noise levels during operation time period) are presented in Table 2.

4.1.1 Measurement Position

One unattended noise monitor was placed at the front of the site closest to the worst affected receivers. Refer to Figure 1 for a detailed location.

4.1.2 Measurement Period

Unattended noise monitoring was conducted from Thursday 1st of October to Monday 12th of October 2020 to ensure that the subsequent calculations adhered to the NSW EPA Noise Policy for Industry (NPI) 2017 guidelines.

Attended noise measurements were undertaken between the hours of 10:30am and 11:00am on Thursday 1st of October 2020.

4.1.3 Measurement Equipment

Equipment used consisted of an Acoustic Research Laboratories Pty Ltd noise logger. The logger was set to A-weighted fast response and was programmed to store 15-minute statistical noise levels throughout the monitoring period. The monitor was calibrated at the start and end of the monitoring period using a Rion NC-73 calibrator. No significant drift was noted. Noise logger data is provided in Appendix 1.

4.1.4 Summarised Rating Background Noise Levels

Summarised rating background noise levels for the project site and immediate surroundings are presented below. Weather affected data has been excluded where required by Fact Sheets A and B of NSW EPA Noise Policy for Industry guidelines.

Table 4-1 – Measured Noise Levels

Time of day	Rating Background Noise Level dB(A)_{L90(Period)}
Day (7am – 6pm)	37
Evening (6pm – 10pm)	38
Night (10pm – 7am)	30*

*NPI notes that the minimum rating background noise level is 30dBA during the night time period

5 NOISE INTRUSION ASSESSMENT

The major external noise sources intruding into the proposed development will be vehicle movements from Barton Street. Noise intrusion into the development will be addressed in accordance with the requirements of the *Rockdale Council Development Control Plan 2011*;

5.1 ACOUSTIC CRITERIA

5.1.1 *Rockdale Council Development Control Plan 2011*;

Part 4 Section 4.4.6 addresses acoustic privacy in regards to noise intrusion into the development.

4. *External walls facing potential sources of noise are to be constructed of materials with good sound insulating quality and have no large openings that would transmit noise.*
5. *The building plan, walls, windows, doors and roof are to be designed to reduce intrusive noise levels from potential sources of noise emanating from adjacent non-residential uses, such as:*
 - a) *having a thinner building width fronting the noise source and containing non-habitable spaces;*
 - b) *orientating noise sensitive rooms, including living, dining and bedrooms, away from the noise source.*

Where new windows face potential sources of noise, they are required to be fitted with noise attenuating glass to minimise the impact of background noise from non-compatible development.

As the *Rockdale Council Development Control Plan 2011* does not provide any quantitative criteria for noise intrusion into an aged-care facility, the AS2107:2016 '*Recommended design sound levels and reverberation times for building interiors*' will be adopted for the purpose of this assessment

5.1.2 Australian and New Zealand AS/NZS 2107:2016 'Recommended design sound levels and reverberation times for building interiors'

AS2107:2016: Recommended design sound levels and reverberation times for building interiors specifies allowable internal noise levels for internal spaces within industrial buildings. Table 1, in Section 5 of AS2107:2016, gives the following maximum internal noise levels for aged-care facilities near major roads.

Table 5-1 – Recommended Design Sound Levels

Space /Activity Type	Recommended Design Sound Levels
Common Areas (e.g. foyer, lobby)	45-50 dB(A) _{Leq(when in use)}
Living Areas (e.g. common lounges)	35-45 dB(A) _{Leq(when in use)}
Sleeping areas (night time)	35-40 dB(A) _{Leq(night time)}
Work areas (e.g. concierge, administration)	35-45 dB(A) _{Leq(when in use)}

5.1.3 Summarised External Noise Intrusion Criteria

The internal noise criteria adopted for each internal space is therefore summarised below based on the relevant State, Council and Australian Standard requirements.

Table 5-2 – Adopted Internal Noise Levels

Space / Activity Type	Required Internal Noise Level
Common Areas (e.g. foyer, lobby)	50 dB(A) _{Leq(when in use)}
Living Areas (e.g. common lounges)	45 dB(A) _{Leq(when in use)}
Sleeping areas (night time)	40 dB(A) _{Leq(night time)}
Work areas (e.g. concierge, administration)	45 dB(A) _{Leq(when in use)}

5.2 EXTERNAL NOISE MEASUREMENTS

This section of the report details noise measurements conducted at the site to establish surrounding environmental noise levels impacting the development.

5.2.1 Measurement Equipment

Attended short term measurements of traffic noise were undertaken by this office to supplement the unattended noise monitoring. Measurements were conducted using a Norsonic 140 Sound Analyser. The analyser was set to fast response and calibrated before and after the measurements using a Norsonic Sound Calibrator type 1251. No significant drift was noted.

Unattended noise monitoring was conducting using one Acoustic Research Laboratories Pty Ltd noise logger. The logger was programmed to continuously store statistical noise levels as well as audio files 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. All measurements were taken on A-weighted fast response mode.

5.2.2 Measurement Location

Attended measurements were taken at 119 Barton Street, Monterey. The Sound level meter had an unobstructed view of traffic and was approximately 1m from the kerb. Refer to Figure 1 for detailed location.

5.2.3 Measurement Period

Attended noise measurements were undertaken between the hours of 12:00pm and 12:30pm on Thursday 1st of October 2020.

5.2.4 Summarised External Noise Levels

The following noise levels for the site have been established based on short term attended measurements and long-term noise monitoring.

Table 5-3 – Measured Traffic Noise Levels

Location	Time of Day	Noise Level
119 Barton Street, Monterey (1m from Barton Street)	Daytime 7am – 10pm	73 dB(A) L_{eq}

Table 5-4 – Predicted Traffic Noise Levels

Location	Time of Day	Noise Level
At proposed northern façade units (20m from Barton Street)	Daytime 7am – 10pm	51 dB(A) L_{eq} (15hr),
	Night time 10pm-7am	43 dB(A) L_{eq} (9hr),

6 RECOMMENDED CONSTRUCTIONS

Assessment of façade requirements to achieve required indoor noise levels has been undertaken. Dimensions of rooms, setbacks from roadways, window openings and floor areas have been used.

6.1.1 Glazed Windows and Doors

The following constructions are recommended to comply with the project noise objectives. 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-Ion type acoustic seals. **(Mohair Seals are unacceptable).**

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. The recommended constructions are detailed in Table 6-1.

Table 6-1 – Glazing Thickness Requirement for New Elements

Site	Space	Glazing Construction	Acoustic Seals
SummitCare Monterey - 119 Barton Street, Monterey.	Units facing Barton Street	6mm Float	Yes
	Office and work areas facing Barton Street		
	All other spaces		

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 6-2 for all areas. Where nominated, 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 6-2 – Minimum R_w of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum R_w of Installed Window
6.38mm Float	29

Note: Façade constructions to be reviewed at CC stage based on construction drawings. The glazing types listed above are indicative and for authority approvals purposes only.

6.1.2 External Roof/Ceiling Construction

External roof construction will be constructed from lightweight elements, therefore; acoustic upgrading is required.

Table 6-3 – External Light Weight Roof Construction

Space	Internal Lining	Truss System	External Lining
Units facing Barton Street	1 x 10mm plasterboard	Minimum 100mm thick stud cavity with 90mm thick CSR Polymax insulation (R 2.5)	0.56mm metal deck roof
All other spaces			

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

*If these panels are to be separate then must be lapped and capped to create a continuous construction.

6.1.3 External Wall Construction

New external walls will be constructed from a combination of masonry and light weight elements. For external wall systems which are of masonry construction, no further acoustic upgrading. In the event that any penetrations are required thru the external skin, an acoustic sealant should be used to minimise all gaps.

For external wall constructions which are constructed from lightweight materials the following construction is recommended.

Table 6-3 – External Light Weight Wall Construction

Site	Space	Internal Lining	Studwork System	External Lining
SummitCare Monterey - 119 Barton Street, Monterey	All	1 x 10mm plasterboard	Minimum 90mm thick stud cavity with 75mm thick 11kg/m ³ glasswool insulation	1 x 9mm Fibre Cement sheet

6.1.4 Entry Doors

All doors shall have glazing thicknesses equal to those recommended in Section 6.1.1 and are to have Raven RP10 to the top and sides and Raven RP38 to the underside of a swing door.

Note that mohair seals in windows and doors are not acceptable where acoustic seals are required.

6.1.5 Mechanical Ventilation

AS2021:2015 requires the installation of ventilation or air conditioning system where aircraft noise exposure exceeds ANEF 25. As internal noise levels cannot be achieved with windows open it is required that an in **all areas** to have alternative outside air supply system or air conditioning be installed. These should be in accordance with AS1668.2 requirements.

Any mechanical ventilation system that is installed should be acoustically designed such that the acoustic performance of the recommended constructions is 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 Council requirements.

6.1.6 Plasterboard Corner Details

The recommended plasterboard ceiling/wall corner construction options over the rooms are shown below.

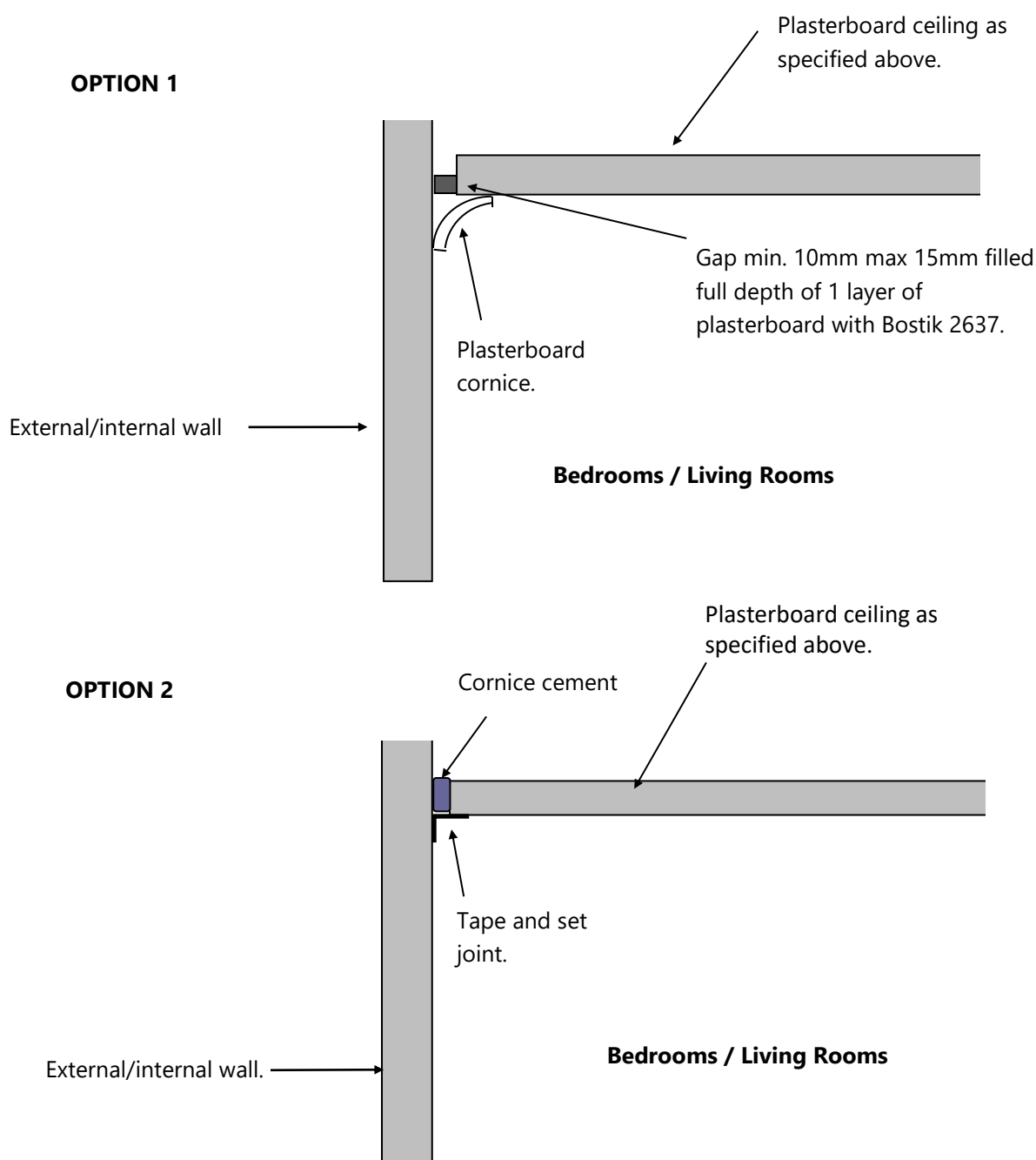


Figure 2 – Plasterboard Corner Options

7 NOISE EMISSION ASSESSMENT

7.1 NOISE EMISSION CRITERIA

7.1.1 *Rockdale Council Development Control Plan 2011*

The *Rockdale Council Development Control Plan 2011* does not provide any specific criteria for noise emissions from aged-care facilities, therefore the NSW Environmental Protection Authority's *Noise Policy for Industry 2017* will be adopted for this assessment.

7.1.2 *NSW EPA Noise Policy for Industry 2017*

The EPA NPfI has two criteria which both are required to be satisfied, namely Intrusiveness and amenity. The NPfI 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 urban criteria.

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

7.1.3 **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 Table 4-1 Noise emissions from the site should comply with the noise levels presented below when measured at nearby property boundary.

7.1.4 **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 Table 4-1, 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;

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

The amenity levels appropriate for the receivers surrounding the site are presented in Table 7-1.

Table 7-1 – EPA Amenity Noise Levels

Type of Receiver	Time of day	Recommended Noise Level dB(A) $L_{eq}(\text{period})$	Project Amenity Noise Level dB(A) $L_{eq}(15 \text{ minute})$
Residential – Suburban	Day	55	53
	Evening	45	43
	Night	40	38

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

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

7.1.5 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 7-2 – Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night) dB(A) L_{90}	Emergence Level
Residences Surrounding Site Night (10pm – 7am)	30* dB(A) L_{90}	40 dB(A) $L_{eq, 15min}$; 52 dB(A) L_{Fmax}

*NPI notes that the minimum rating background noise level is 30dBA during the night time period

7.2 SUMMARISED NOISE EMISSION CRITERIA

Table 7-3 – EPA NPI Noise Emission Criteria (Residents Surrounding Project Site)

Time Period	Rating Background Noise Level dB(A) L_{90}	Project Amenity Criteria dB(A) L_{eq}	Intrusiveness Criteria $L_{eq}(15min)$	NPI Criteria for Sleep Disturbance
Day	37	53	42	N/A
Evening	38	43	43	N/A
Night	30*	38	35	40dB(A) $L_{eq, 15min}$; 52 dB(A) L_{Fmax}

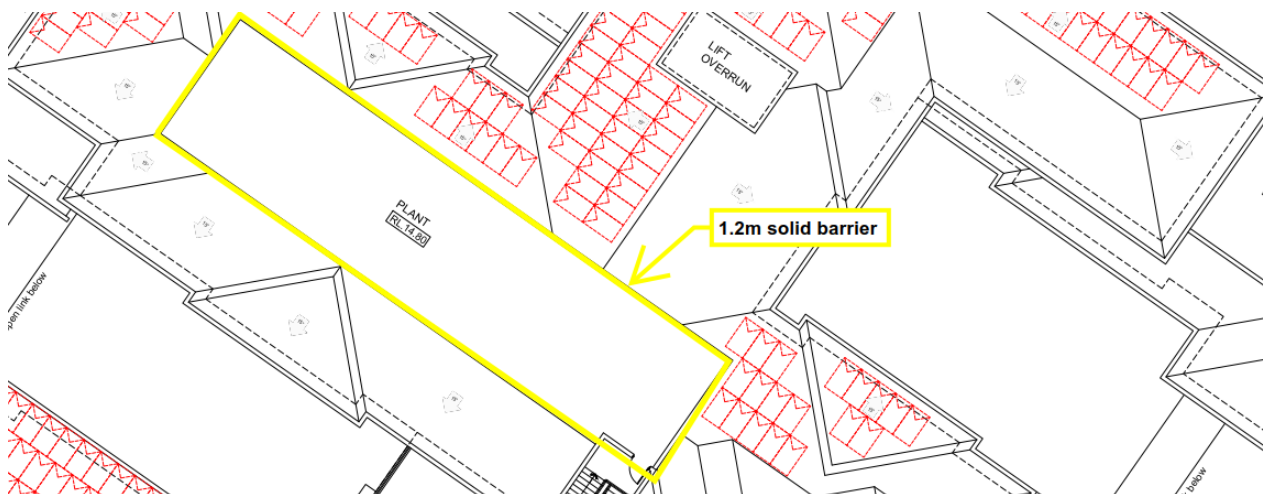
*NPI notes that the minimum rating background noise level is 30dBA during the night time period

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

7.3 MECHANICAL PLANT NOISE

As per the preliminary mechanical plans by Boffa Robertson Group dated 8th of November 2021 (job no. 2014. Revision C), a single rooftop plant area is proposed in the centre of the site.

Minor plant items are likely to be located internally and suitable acoustic treatment can be applied to minimise noise emissions within. Whilst major plant items located in the carpark and on the roof are not yet specified, an indicative review of the allowable noise generation assumes a 1.2m tall screen to the perimeter of the roof plant area shown below and noted on the current mechanical plans.



Assuming that the rooftop plant is no taller than the 1.2m barrier, noise emissions from rooftop mechanical services plant to the closest residential receiver will comply with the noise emission trigger levels bolded in Table 7-3. The maximum allowable cumulative noise level is 85 dB(A) L_{eq} . If the final plant selection exceeds the above cumulative noise levels, additional treatment will be required to either individual plant items or to the roof plant area as a whole.

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.

7.4 DRIVEWAY USAGE

Assessment of the driveway noise emissions has been undertaken based on the traffic and parking information provided in the proposed development's traffic report by The Transport Planning Partnership (ref: 20329, dated 4 December 2020). Calculations have been made to predict noise levels occurring at sensitive receivers during one hour peak traffic movements, which have been corrected to 15-minute periods utilising the NSW EPA Noise Policy for Industry project amenity noise level correction as shown in Section 7.1.4. The worst affected residential receivers have been identified as **R1** to the north and **R2** to the east.

Based on the provided traffic report, it is estimated that there will be up to 14 vehicles either entering or leaving the carpark during a peak 15-minute period, typically to occur during the day or evening period (7am – 10pm). It is noted that staff may possibly use the carpark prior to 7am and therefore 3 staff vehicles either entering or leaving the carpark during a 15-minute period has been considered to ensure this typical, albeit infrequent event will not disturb nearby receivers during this sensitive time period. The following assumptions were made for the purpose of this assessment:

- The sound power level of a car travelling at 10km/h (84 dB(A) L_{eq}) will be used to assess noise emissions from the carpark driveway.
- As per 5.2 of The Transport Planning Partnership (ref: 20329, dated 4 December 2020) the proposed development will generate approximately 55 vehicles per hour during peak periods.

The following noise levels have been predicted:

Table 7-4 - Predicted Noise Levels to Residential Receiver R1

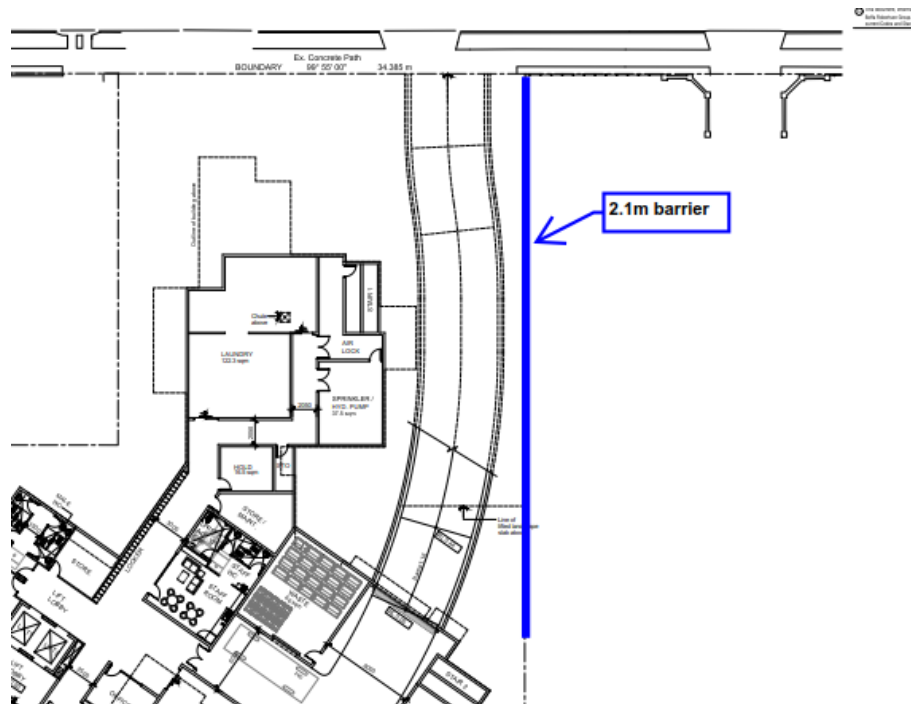
Time Period	Predicted Noise	Criteria	Complies?
Day (7am to 6pm)	41 dB(A) $L_{eq(15min)}$	42 dB(A) $L_{eq(15min)}$	Yes
Evening (6pm to 10pm)	41 dB(A) $L_{eq(15min)}$	43 dB(A) $L_{eq(15min)}$	Yes
Night (10pm to 7am)	35 dB(A) $L_{eq(15min)}$	35 dB(A) $L_{eq, (15min)}$	Yes

Table 7-5 - Predicted Noise Levels to Residential Receiver R2

Time Period	Predicted Noise	Criteria	Complies?
Day (7am to 6pm)	42 dB(A) $L_{eq(15min)}$	42 dB(A) $L_{eq(15min)}$	Yes
Evening (6pm to 10pm)	42 dB(A) $L_{eq(15min)}$	43 dB(A) $L_{eq(15min)}$	Yes
Night (10pm to 7am)	35 dB(A) $L_{eq(15min)}$	35 dB(A) $L_{eq, (15min)}$	Yes

7.4.1 Construction Recommendations

To adhere to the above predicted noise emission levels from carpark driveway usage and ensure compliance with the project noise trigger levels indicated in Table 7-3, a minimum 2.1m tall barrier must be installed along the eastern boundary of the site covering the full extent of the driveway, see below.



The barrier of 2.1m, may be constructed of lapped and capped timber, flexi-glass, 4mm Perspex, Colorbond, 9mm fibrous cement sheet or equivalent, installed with no gaps between the panels, and maximum of a 20mm gap at the bottom to allow water flow if required.

7.5 ANCILLIARY SPACES L2

The following building and management controls are recommended to control noise emissions from the use of level 2 multi-purpose and private function space

- Minimum 6.38mm laminated glazing with acoustic seals around perimeter is required for the whole project area, with minimum R_w of 31.
- Spaces only to be used between 7am and 10pm
- All doors and windows to be shut during any events involving music
- Any amplified music is to 70dB(A) within the space.

8 CONCLUSION

This report presents an acoustic assessment of noise impacts associated with the proposed residential development to be located at 119 Barton Street, Monterey. Based on the information provided above we conclude the following.

Provided that the treatments set out in section 6 of this report are employed, internal noise levels shall comply with the requirements below:

- *Rockdale Council Development Control Plan 2011; and*
- *Australian and New Zealand AS/NZS 2107:2016 'Recommended design sound levels and reverberation times for building interiors.'*

Provided that the treatments and management controls in Section 7 are employed, external noise emissions criteria will satisfy the requirements of the following documents:

- *Rockdale Council Development Control Plan 2011; and*
- *NSW Environmental Protection Authority (EPA) document – 'Noise Policy for Industry (NPfI) 2017'.*

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.

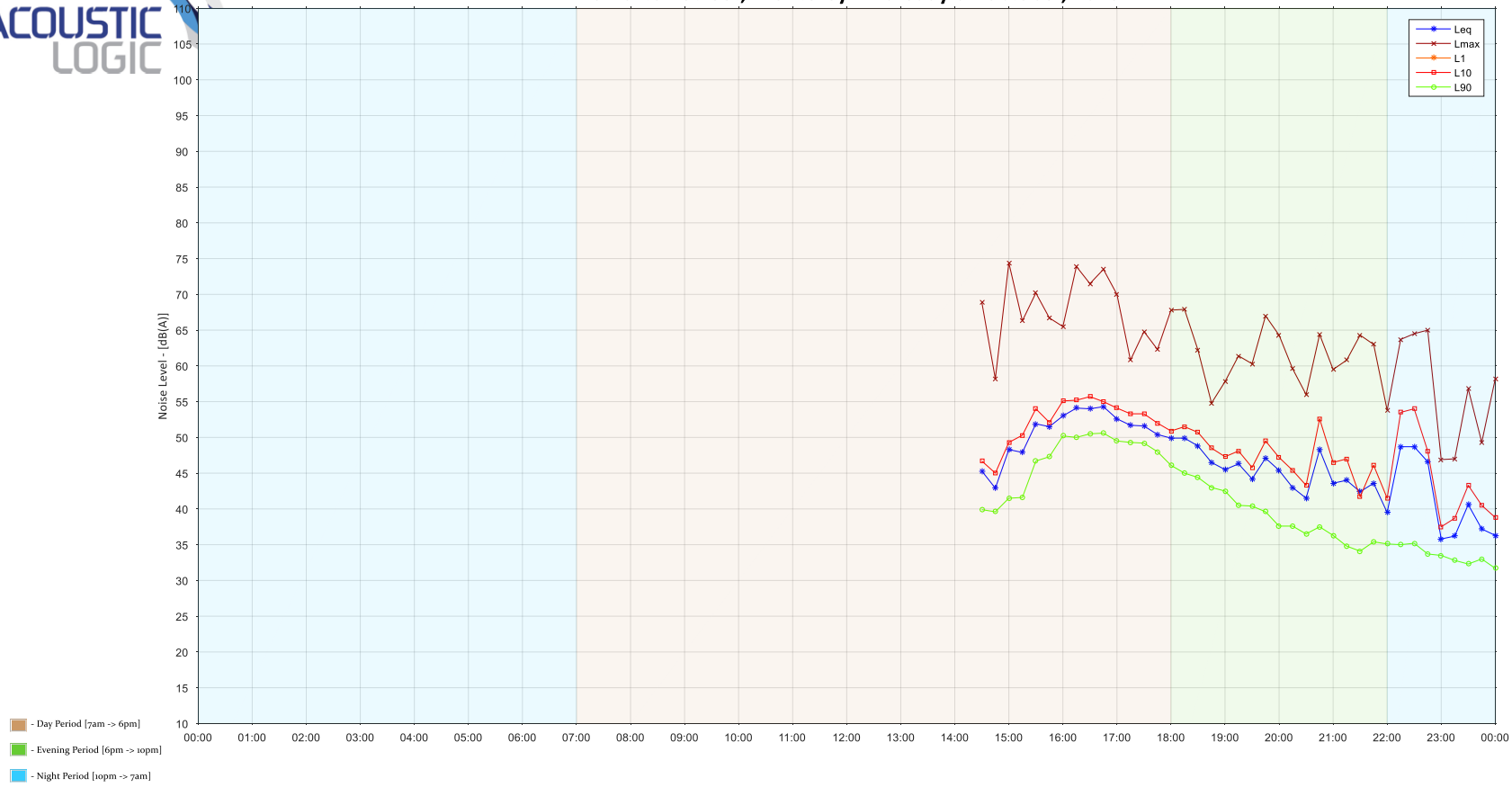
Yours faithfully,



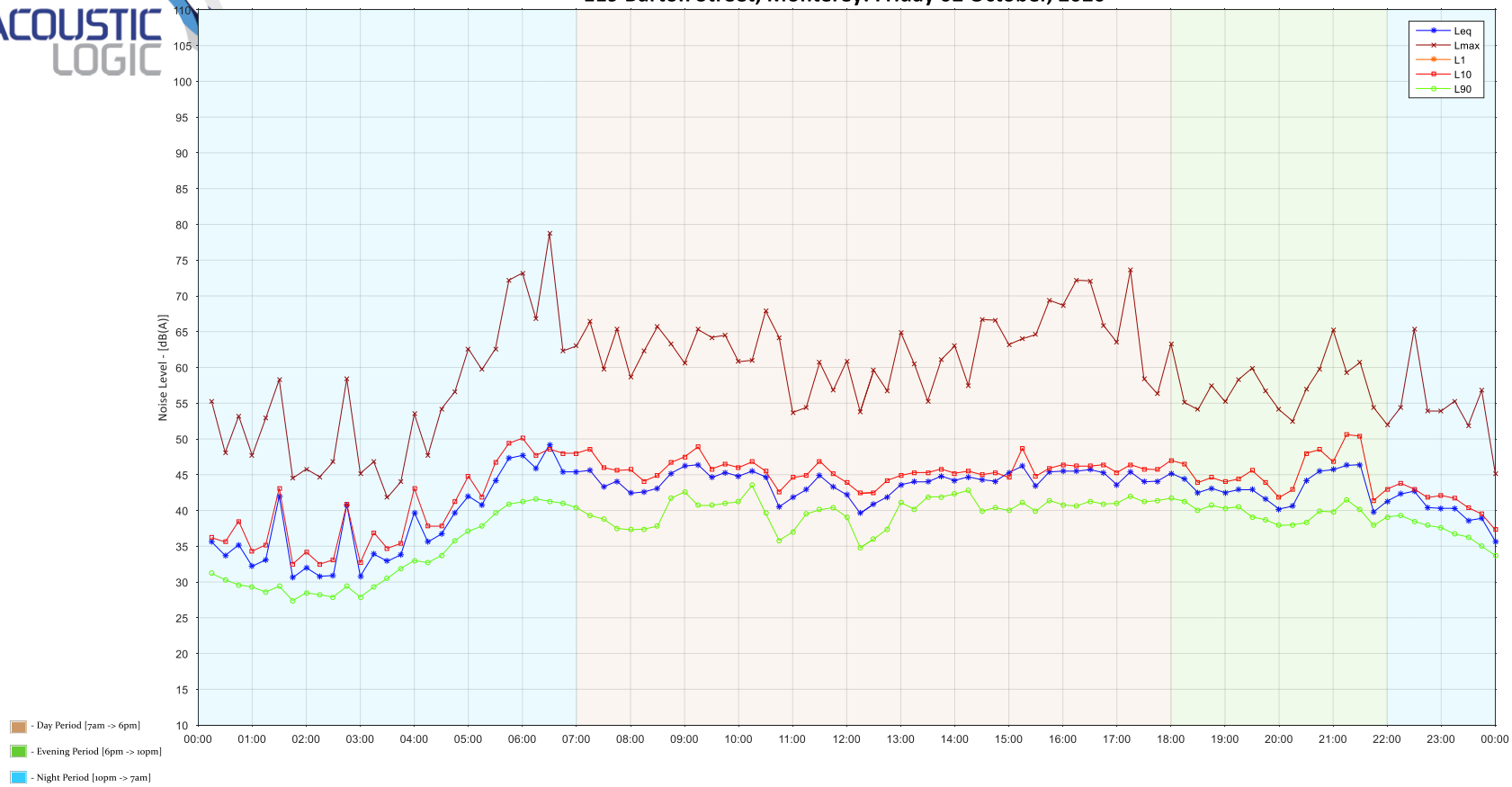
Acoustic Logic Pty Ltd
Lillian Lockett

APPENDIX ONE: UNATTENDED NOISE MONITORING DATA

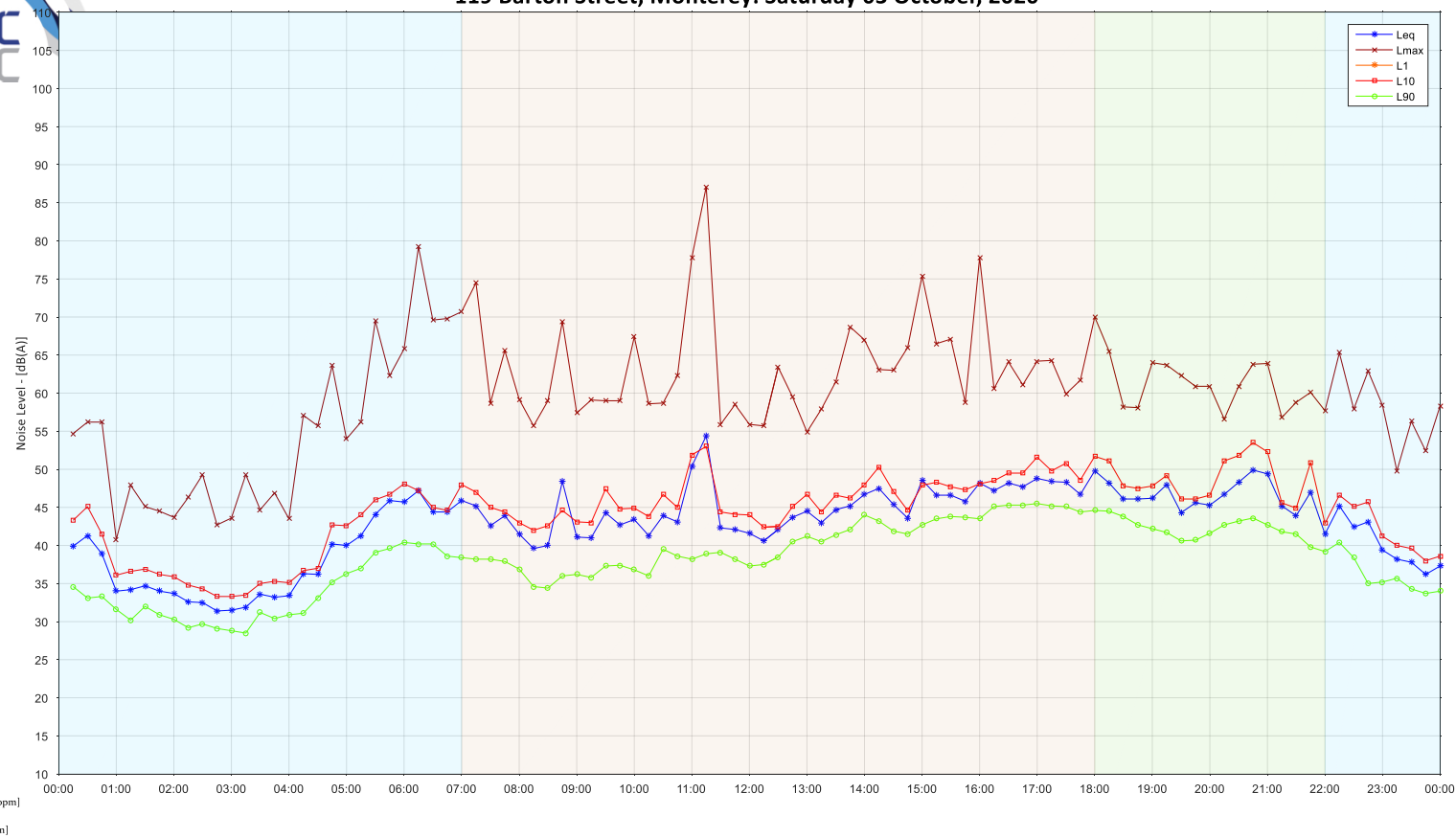
119 Barton Street, Monterey: Thursday 01 October, 2020



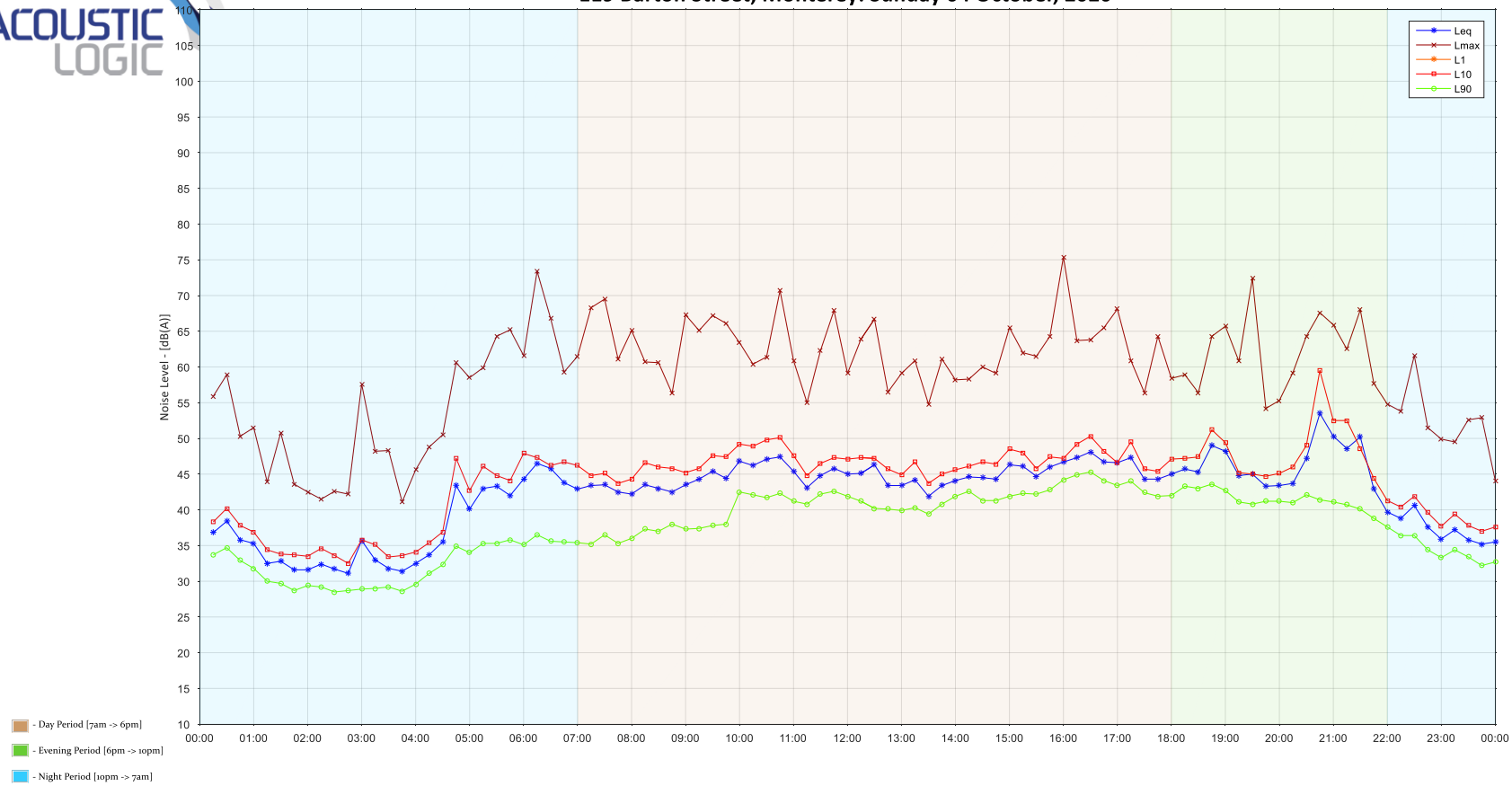
119 Barton Street, Monterey: Friday 02 October, 2020



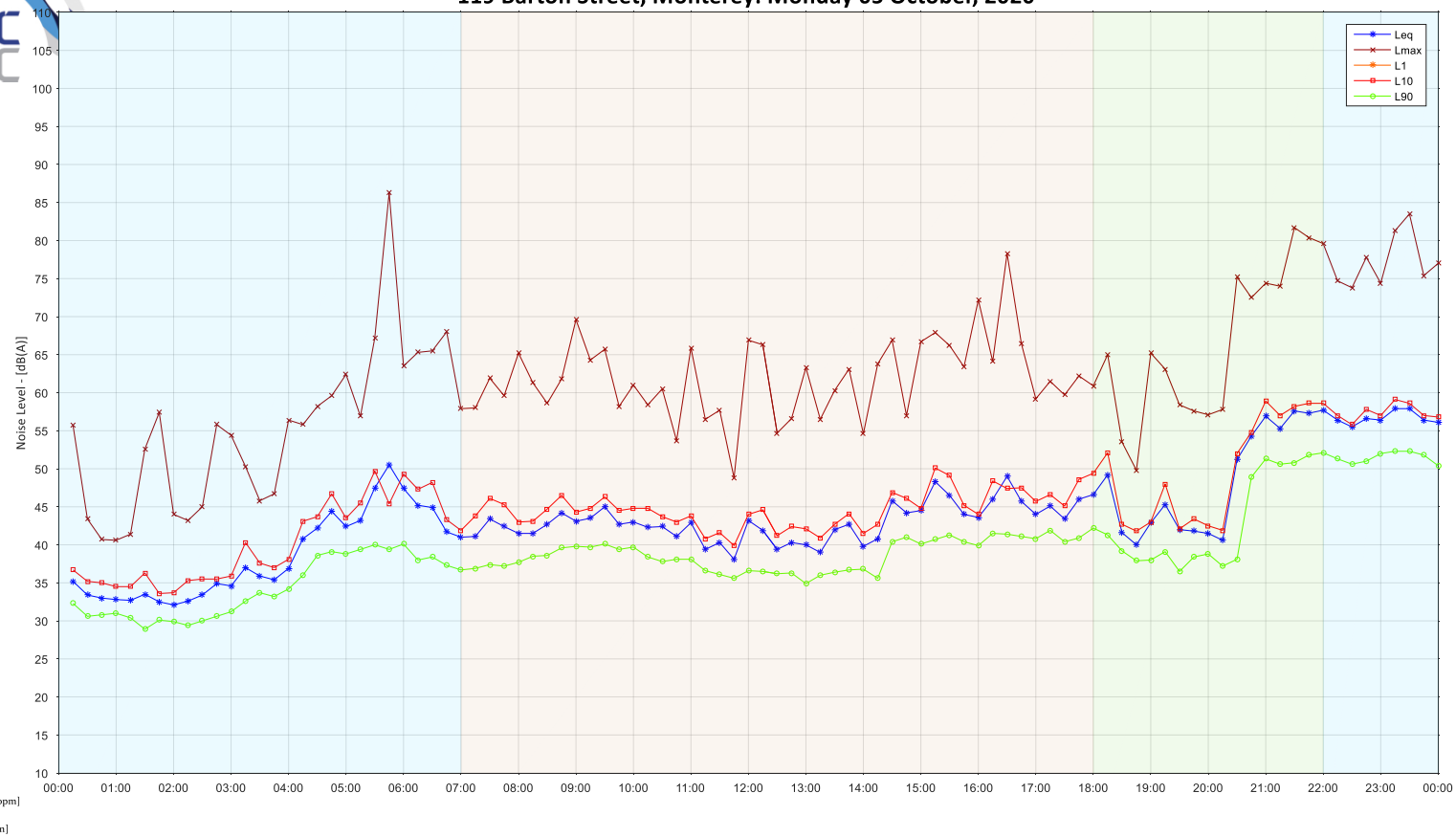
119 Barton Street, Monterey: Saturday 03 October, 2020



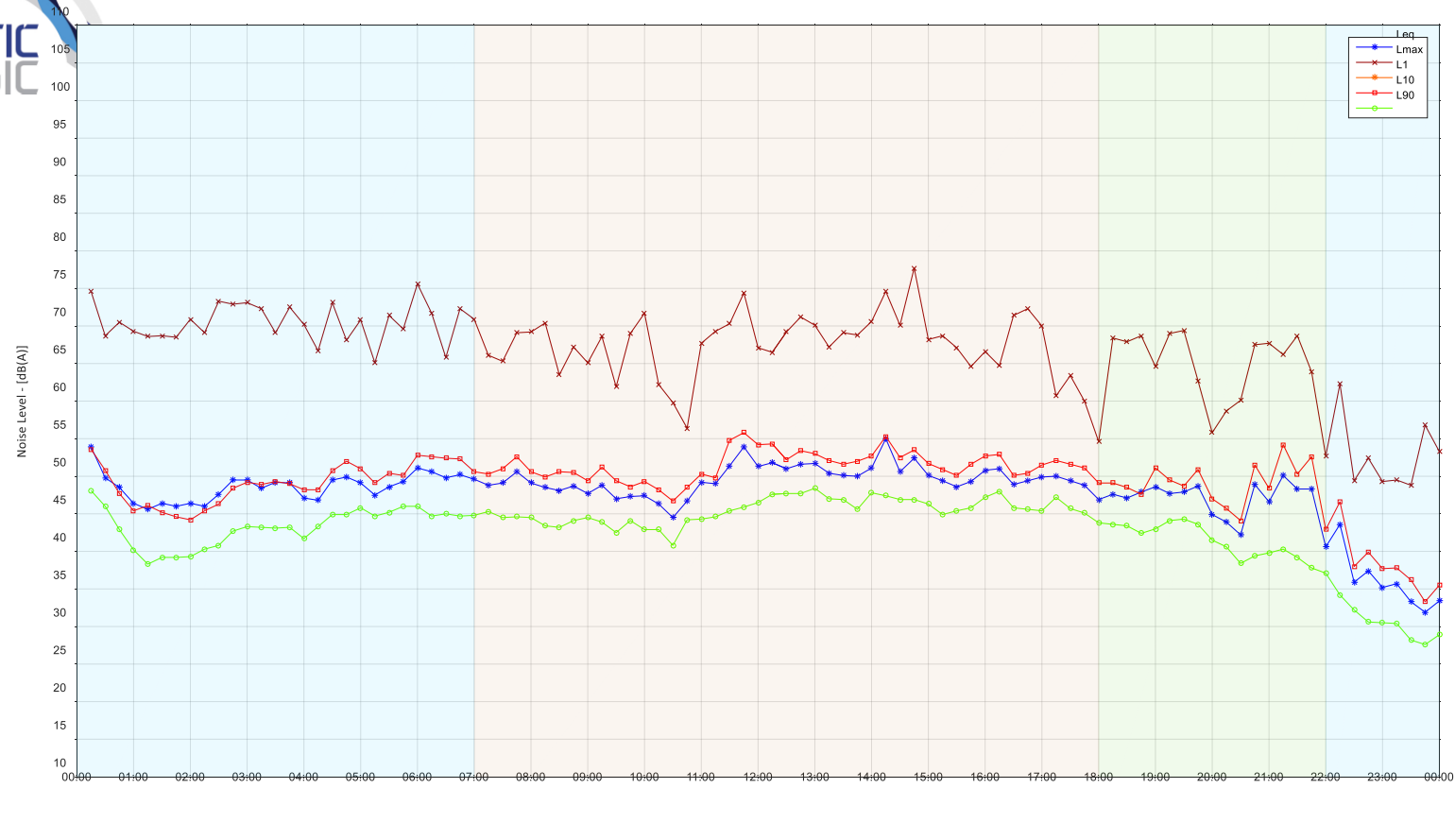
119 Barton Street, Monterey: Sunday 04 October, 2020



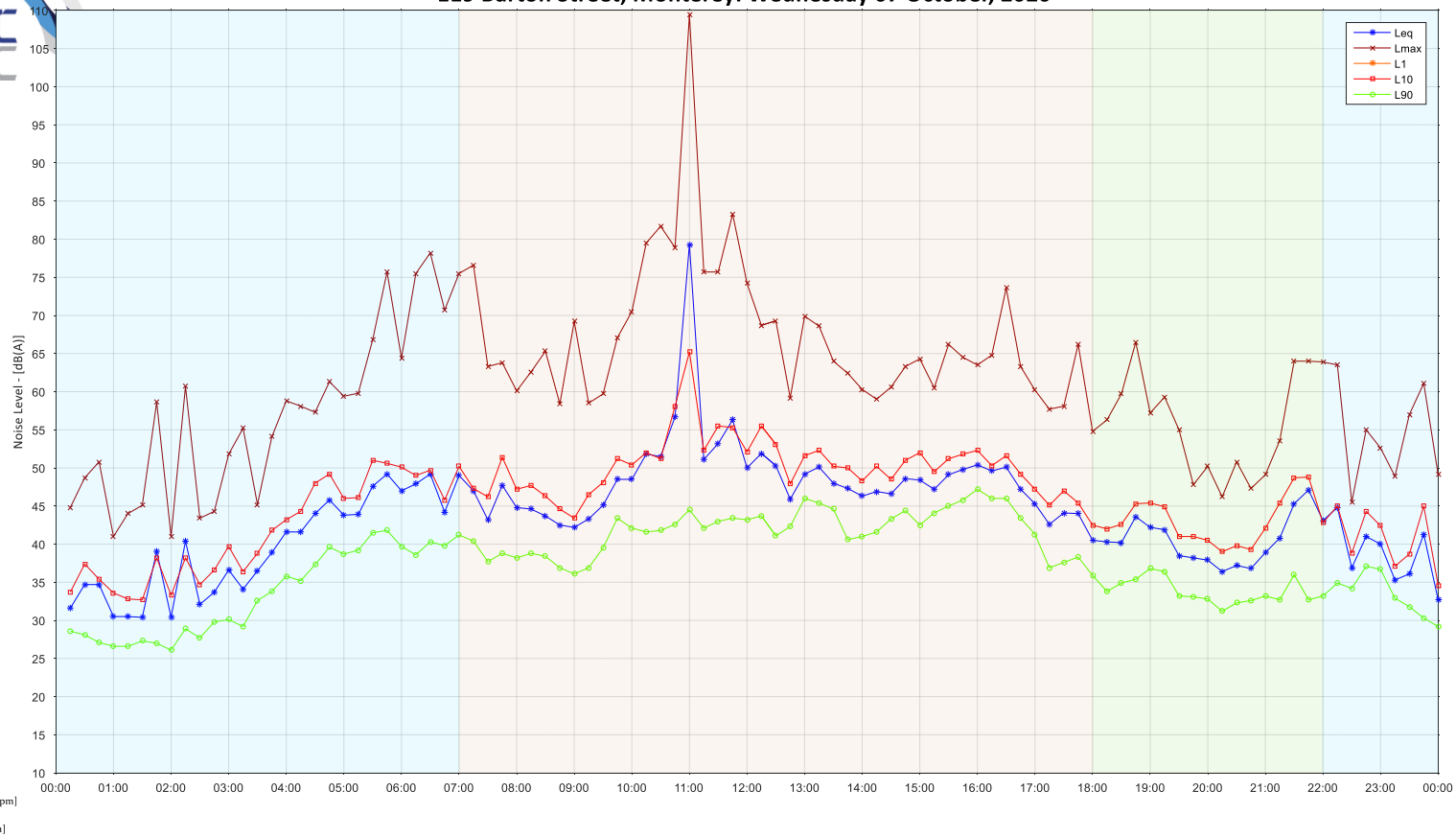
119 Barton Street, Monterey: Monday 05 October, 2020



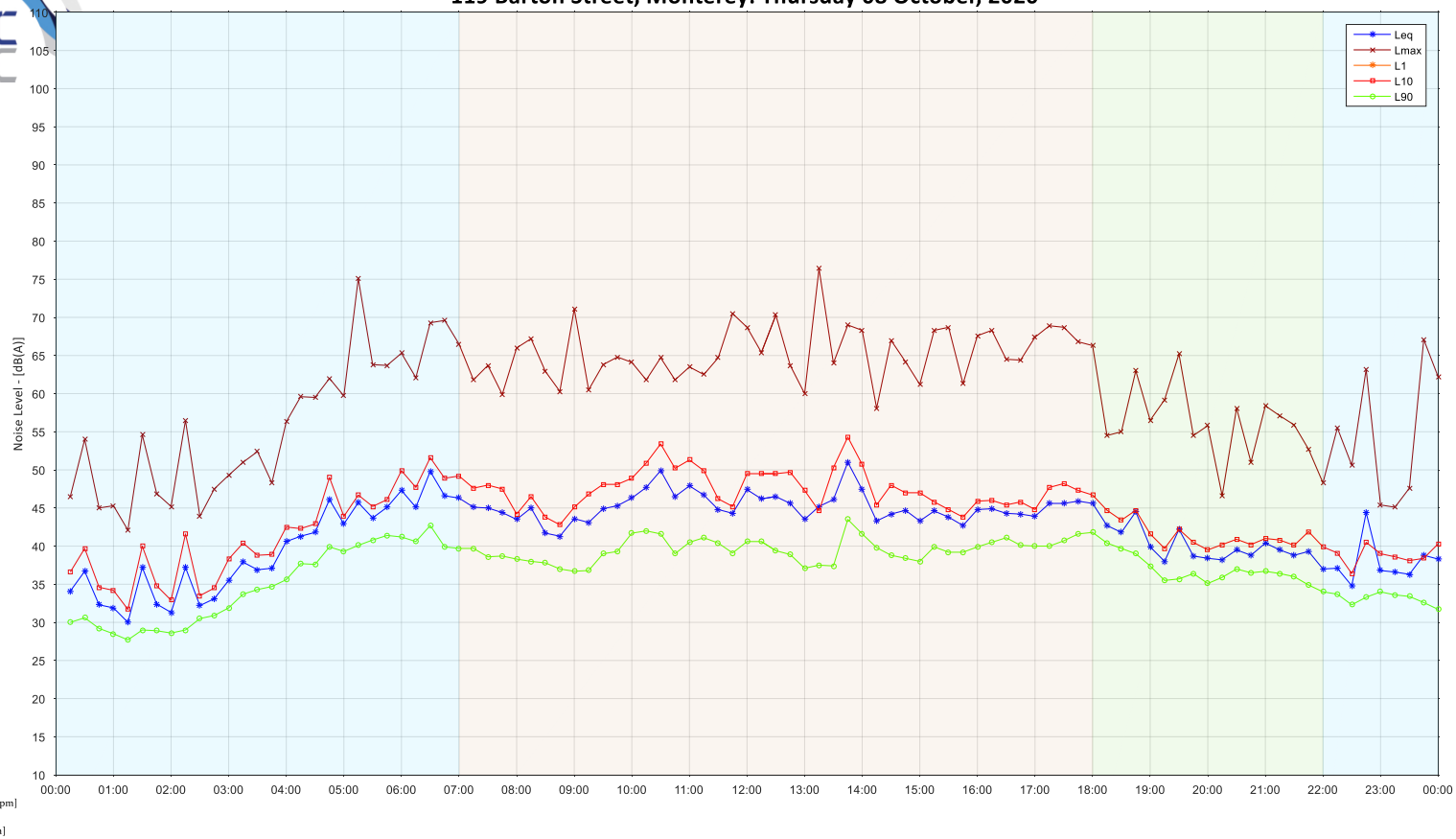
119 Barton Street, Monterey: Tuesday 06 October, 2020



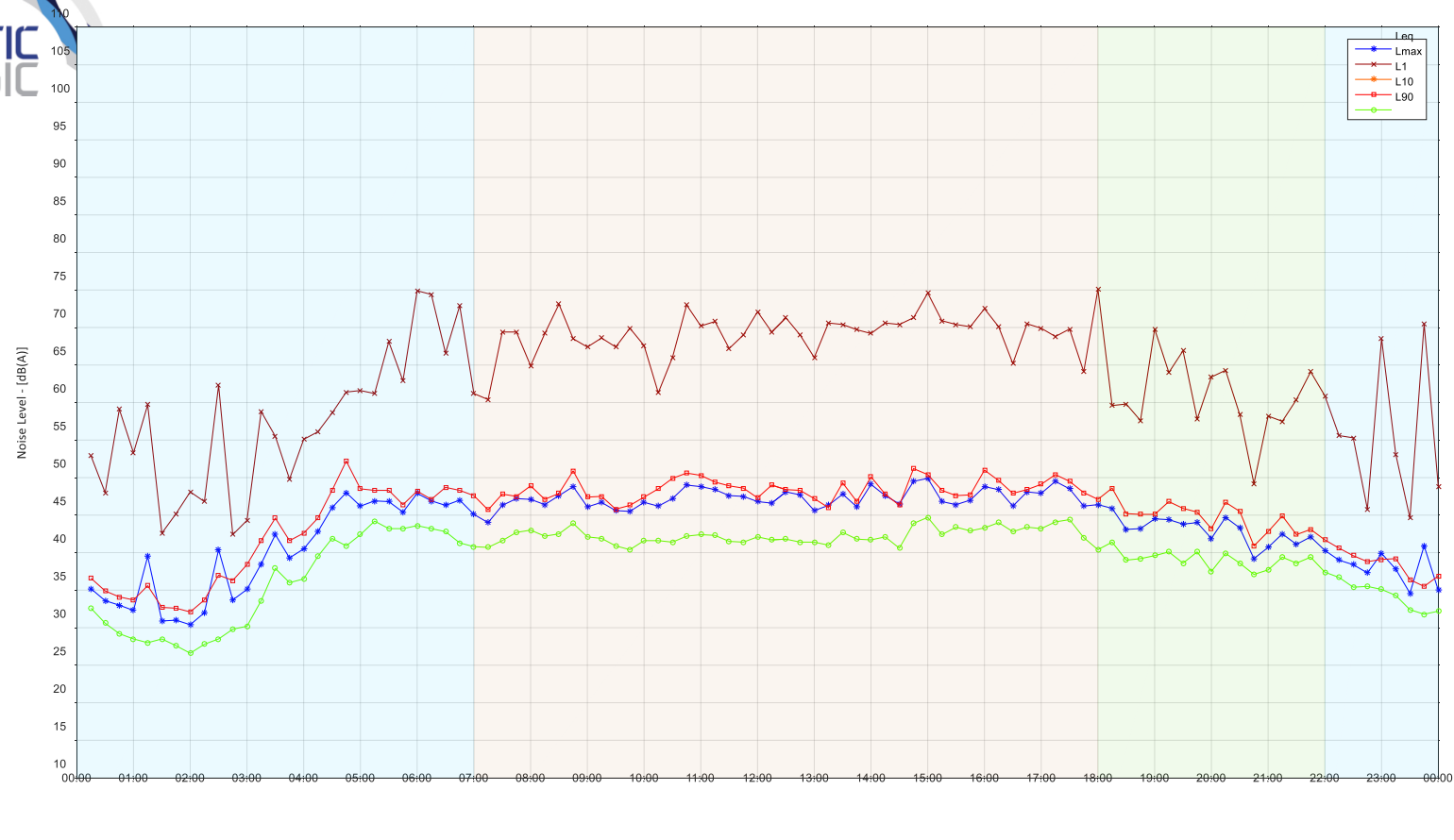
119 Barton Street, Monterey: Wednesday 07 October, 2020



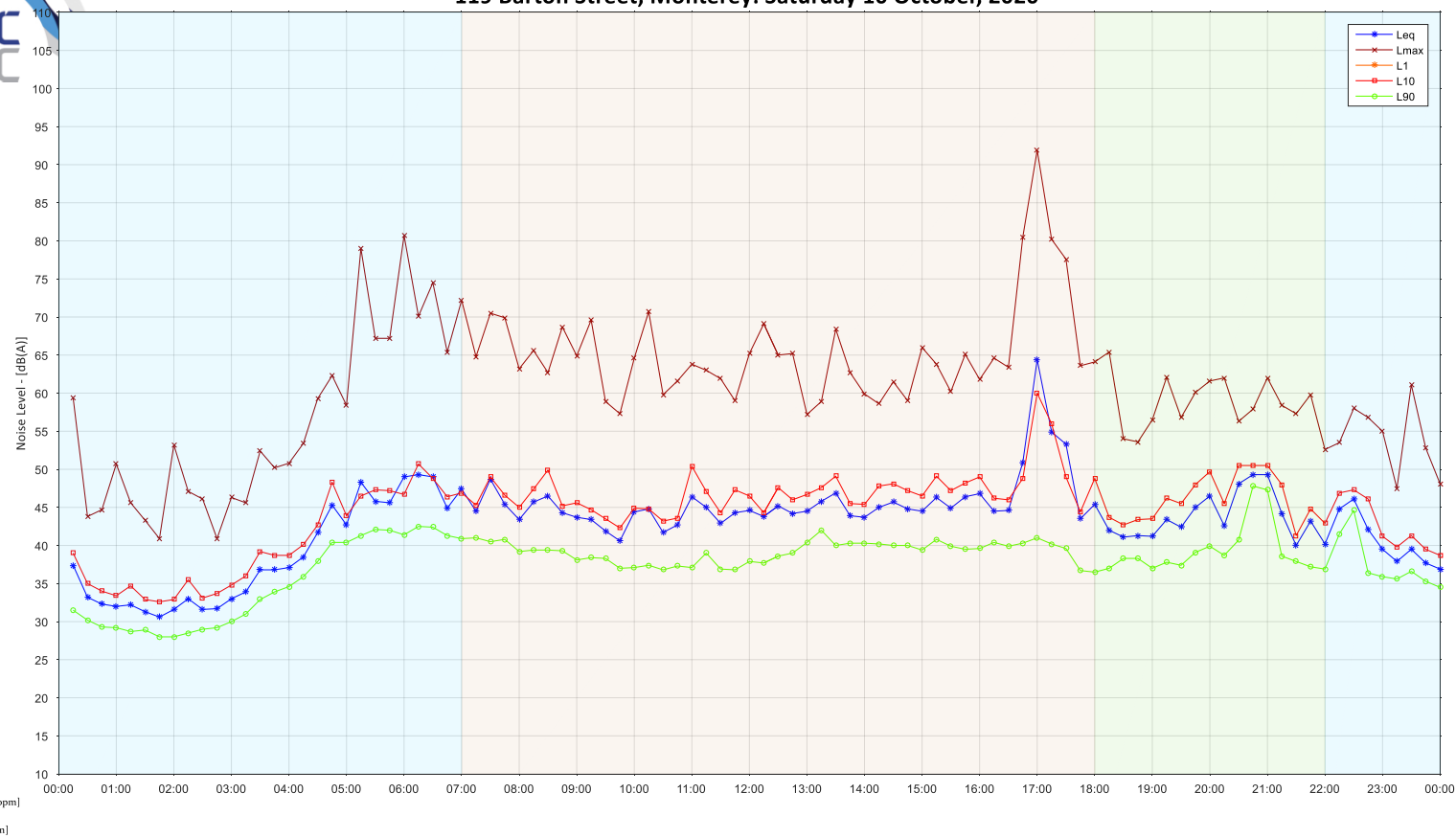
119 Barton Street, Monterey: Thursday 08 October, 2020



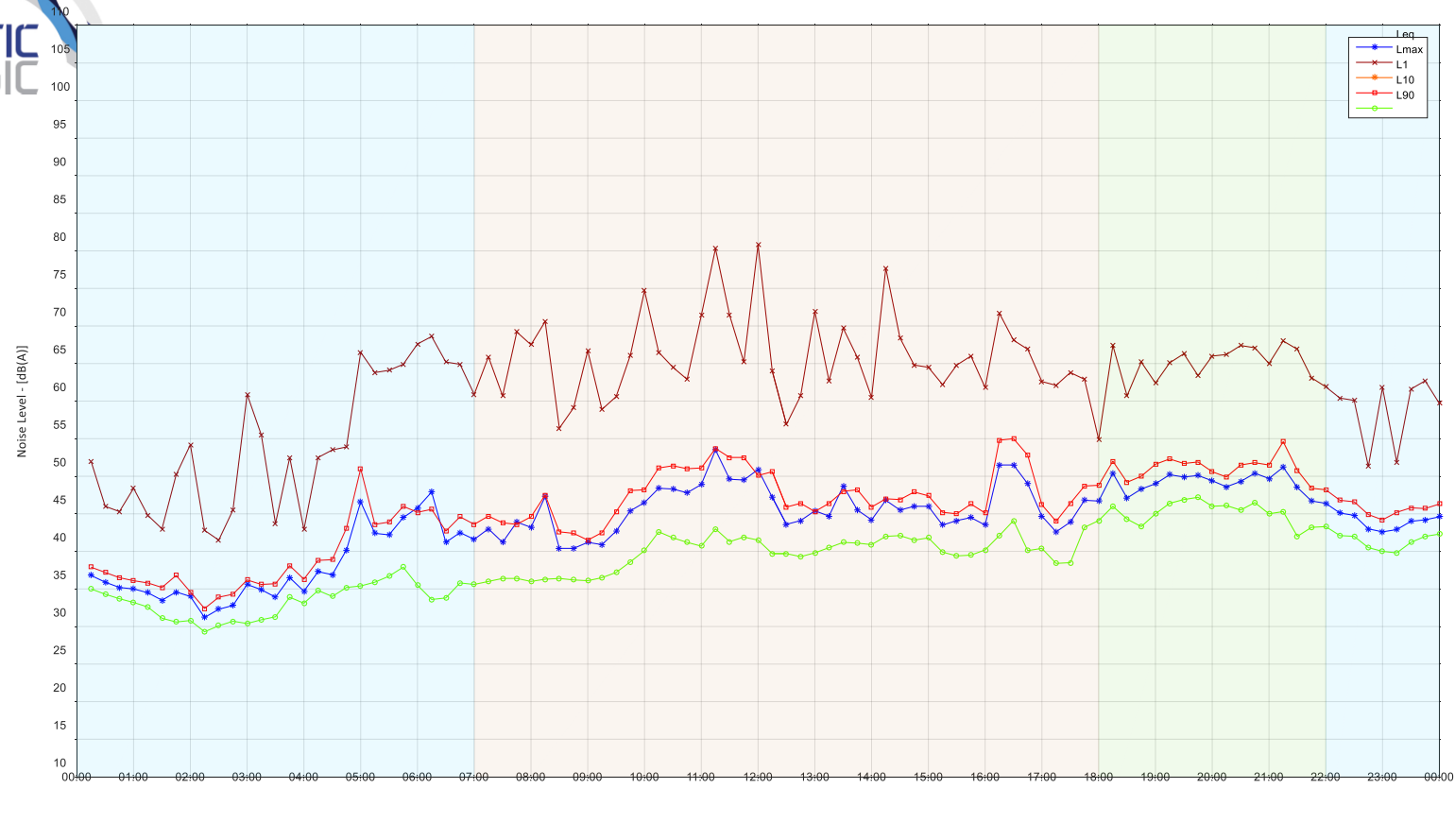
119 Barton Street, Monterey: Friday 09 October, 2020



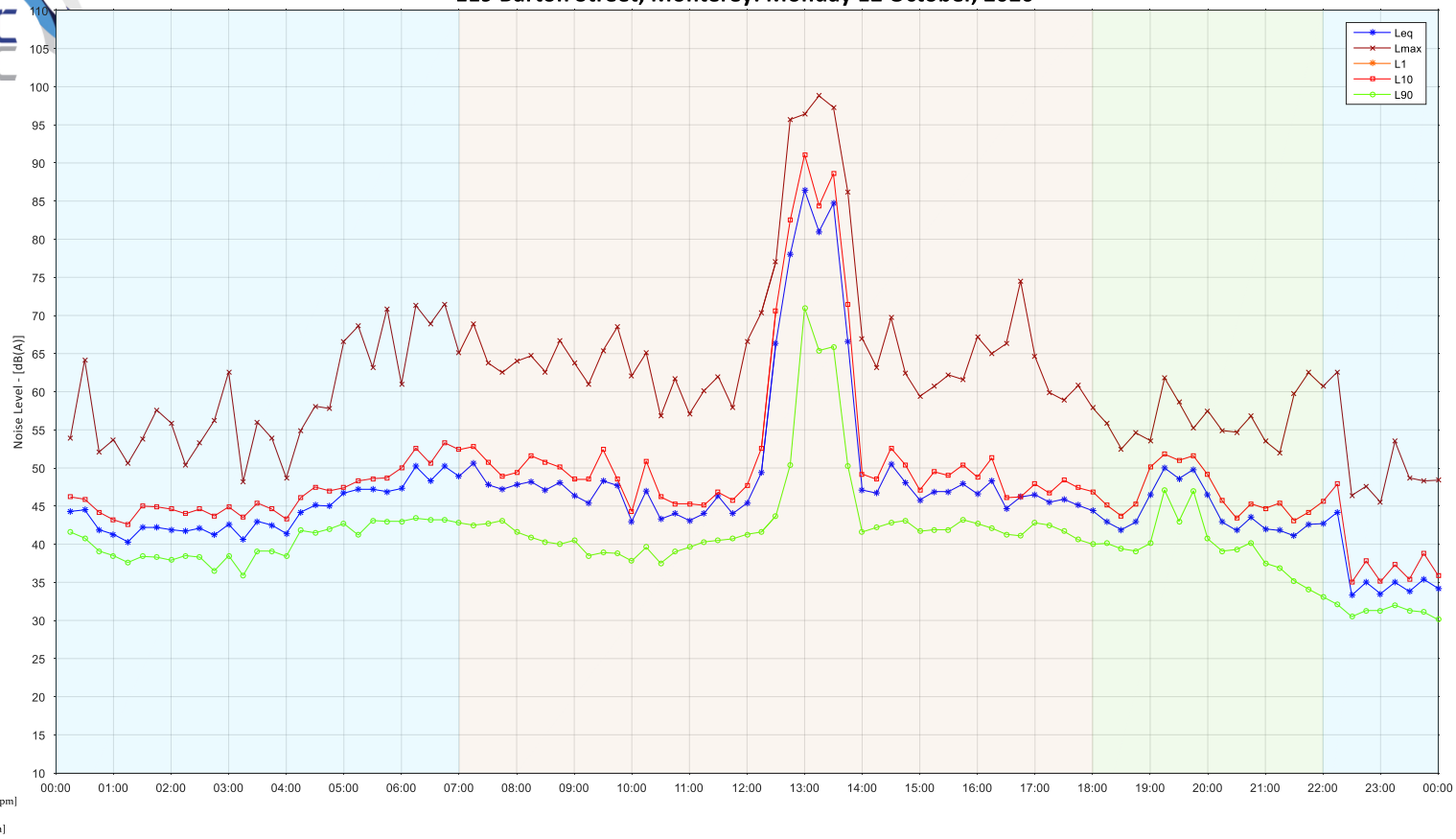
119 Barton Street, Monterey: Saturday 10 October, 2020



119 Barton Street, Monterey: Sunday 11 October, 2020



119 Barton Street, Monterey: Monday 12 October, 2020



119 Barton Street, Monterey: Tuesday 13 October, 2020

