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19-21 The Corso, Manly

DA Acoustic Assessment (Alterations and Additions)

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1 INTRODUCTION

Acoustic Logic Consultancy (ALC) have been engaged to conduct an acoustic assessment of potential noise impacts associated with the alterations and additions to be undertaken at the residential development located at 19-21 The Corso, Manly.

The following noise sources have been addressed in this report:

- External noise impacts from The Corso roadway and surrounding commercial development including restaurants and bars; and
- Noise emissions from mechanical plant to service the project site.

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

- Northern Beaches Council – Manly Development Control Plan 2013;
- Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'*; and
- NSW Environmental Protection Authority (EPA) document – 'Noise Policy for Industry (NPfI) 2017'.

This assessment has been conducted using the NBRS Architecture architectural drawings, see details below.

Table 1 – Architectural Drawing List

Architect	Drawing Number	Drawing Title	Issue	Date
NBRS Architecture	17349-A-01	Site Context	C	3/28/2019
	17349-A-02	Site Analysis and Roof Plan	C	
	17349-A-03	Existing Floor Plans	B	
	17349-A-04	Existing Floor Plans	B	
	17349-A-05	Ground and First Floor Plan	C	
	17349-A-06	Second and Third Floor Plan	C	
	17349-A-07	Elevations	C	
	17349-A-08	Elevations	C	
	17349-A-09	Sections	C	
	17349-A-10	Street View – Market Place	C	
	17349-A-11	Shadow Diagrams	C	
	17349-A-12	Shadow Diagrams	C	
	17349-A-13	Materials & Finished	C	
	17349-A-14	Heritage Conservation	A	

2 SITE DESCRIPTION

The alterations and additions to the existing residential development located at 19-21 The Corso, Manly consists of new lobby areas for each floor, a new common stair case and lift and an additional apartment to be located on the third floor facing market place to the north-west.

Acoustic investigation has been carried out by this office in regards to the developments surrounding the residential development, which has been detailed below:

- The Corso located to the South-East.
- Market Place located to the North-East.
- Commercial receivers to the East.
- Commercial receivers to the West.

The Corso roadway carries a light volume of predominately passenger vehicles. Noise from The Corso plaza consists mostly of pedestrian and patron noise from the use of the plaza and the surrounding commercial tenancies, restaurants and bars.

The nearest residential and commercial noise receivers around the project site include:

- **Receiver 1:** Commercial receivers located at 25-27 The Corso to the East. Commercial receivers are multi storey.
- **Receiver 2:** Residential receiver located above a commercial receiver at 15A-17 The Corso to the West. Residential and commercial receivers are both single storey, two storey building total.
- **Receiver 3:** Residential receiver located above commercial receiver at 15 The Corso to the West. Residential and commercial receivers are both single storey, two storey building total.
- **Receiver 4:** Whistler Car park commercial receiver located at 5A Market Place to the North-West. Commercial receiver is multi storey.
- **Receiver 5:** Residential receivers located above commercial receivers at 38-40 The Corso to the South. Residential receivers are multi storey with single storey commercial receivers below.
- **Receiver 6:** St Matthews Anglican church commercial receiver located at 1 Darley Road to the South-East. Commercial receiver is multi storey.

A site map, measurement description and surrounding receivers are presented in Figure 1 below.

Figure 1: Site Survey and Monitoring Positions
Sourced from Six Maps NSW

Unattended Noise Monitor (Location #1)

Unattended Noise Monitor (Location #2)

Residential above Commercial Receivers

Commercial Receivers

3 EXISTING ACOUSTIC ENVIRONMENT

The acoustic environment is categorised by high background noise levels during the day, evening and night due to traffic movements along The Corso and operational noise from the surrounding commercial development, restaurants and bars.

Acoustic monitoring was conducted at the site to establish the background noise levels which will be used as basis for this assessment.

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 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.

3.2 BACKGROUND NOISE LEVELS

Background noise levels which will be used as a basis for this assessment are detailed in the following sections.

3.2.1 Measurement Equipment

Unattended background noise monitoring was conducting using one Acoustic Research Laboratories Pty Ltd noise logger. The loggers 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. All measurements were taken on A-weighted fast response mode.

3.2.2 Measurement Location

An unattended noise monitor was installed on the North-Western boundary of the project site. Refer to Figure 1 for a detailed monitoring location.

3.2.3 Measurement Period

Unattended noise monitoring was conducted from Thursday, 11th April 2019 to Thursday, 18th April 2019.

3.2.4 Measured Background Noise Levels

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

3.2.4.1 Unattended Background Noise Measurements

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

Appendix B provides the results of the unattended noise monitoring. Weather affected data was excluded from the assessment. The processed Rating Background Noise Levels (lowest 10th percentile noise levels during operation time period) are presented in Tables below.

Table 2 – Unattended Noise Monitor – Location 2 – Rating Background Noise Level

Date	Measured Rating Background Noise Level dB(A)$L_{90(Period)}$		
	Day (7am-6pm)	**Evening (6pm-10pm)**	**Night (10pm-7am Next Day)**
Thursday, 11th April 2019	-	51	45
Friday, 12th April 2019	53	53	46
Saturday, 13th April 2019	53	54	49
Sunday, 14th April 2019	52	53	44
Monday, 15th April 2019	54	49	45
Tuesday, 16th April 2019	53	51	45
Wednesday, 17th April 2019	54	53	45
Thursday, 18th April 2019	-	-	-
Median	**53**	**53**	**45**

3.2.4.2 Summarised Rating Background Noise Levels

Summarised rating background noise levels for each receiver are presented below.

Table 3 -Summarised Rating Background Noise Level

Location	Time of day	Rating Background Noise Level dB(A)$L_{90(Period)}$
19-21 The Corso, Manly	Day (7am-6pm)	53
	Evening (6pm-10pm)	53
	Night (10pm-7am)	45

4 EXTERNAL NOISE INTRUSION ASSESSMENT

Site investigation indicates that the major external noise sources around the project site include:

- Traffic noise impacts from The Corso; and
- Operational noise from surrounding commercial development, restaurants and bars.

4.1 NOISE INTRUSION CRITERIA

A noise intrusion assessment has been conducted based off the requirements of the following acoustic noise criteria/standards;

- Northern Beaches Council – Manly Development Control Plan 2013; and
- Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'*.

4.1.1 Northern Beaches Council – Manly Development Control Plan 2013

Manly DCP 2013 has no specific controls in relation to noise intrusion at the project site. Internal noise level criteria will be determined from Australian Standard AS2107:2016.

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

Australian Standard AS2107-2016: Recommended design sound levels and reverberation times for building interiors specifies allowable internal noise levels for internal spaces within residential and commercial buildings. Table 4 below presents the internal sound levels applicable to the project site.

Table 4 – Recommended Design Sound Levels

Space /Activity Type	Recommended Maximum Design Sound Level dB(A) $L_{eq(1\text{-}hour)}$
Residential – Living Areas	40dB(A)$L_{eq(1\text{-}hour)}$
Residential – Sleeping Areas (night time)	35dB(A)$L_{eq(1\text{-}hour)}$

4.1.3 Summary of Internal Noise Level Criteria

The governing project criteria is presented in the Table below based on requirements above.

Table 5 – Summary of Internal Noise Level Criteria

Space/Activity Type	Required Internal Noise Level dB(A)$L_{eq(1hour)}$
Residential Living Areas (7am – 10pm)	40dB(A)$L_{eq\ (1\text{-}hour)}$
Residential Sleeping Areas (night time) (10pm – 7am)	35dB(A)$L_{eq\ (1\text{-}hour)}$

4.2 EXTERNAL NOISE MEASUREMENTS

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

4.2.1.1 Measurement Equipment

Unattended noise monitoring was conducting using one Acoustic Research Laboratories Pty Ltd noise logger. The logger was 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. All measurements were taken on A-weighted fast response mode.

4.2.1.2 Measurement Location

An unattended noise monitor was installed along the south-east boundary of the project site with a 180° view of The Corso. The noise monitor was located approximately 7m from the kerb.

4.2.1.3 Measurement Period

Unattended noise monitoring was conducted from Thursday, 11th April 2019 to Thursday, 18th April 2019.

4.2.1.4 Summarised External Noise Levels

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

Table 6 – Measured External Noise Levels

Location	Time of Day	Noise Level dB(A)$L_{eq(1\text{-}hour)}$
19-21 The Corso, Manly (7m from Kerb)	Day time 7am-10pm	68
	Night time 10pm-7am	64

4.3 RECOMMENDED CONSTRUCTIONS

4.3.1 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-lon 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 listed in the table below.

Table 7– Recommended Glazing Construction Criteria

Façade	Room Type	Floor Level	Recommended Construction	Acoustic Seals
South-East (The Corso)	Living Room	All	10.38mm Laminated	Yes
North-West (Market Place)	Living Room		10.38mm Laminated	
	Bedroom		10.38mm Laminated	
East	Living Room		10.38mm Laminated	
	Bedroom		10.38mm Laminated	
West	Living Room		10.38mm Laminated	
	Bedroom		10.38mm Laminated	

Note: Alternative glazing proposals may be submitted during the CC stage of the project.

Any alternative glazing will need to be reviewed by the builder's acoustic consultant to ensure internal noise goals will be met.

Indicatively, if a small air gap IGU were used, 12.38mm / 12mm Air Gap / 6mm would be acceptable (subject to test data being submitted and reviewed by the builder's acoustic consultant.

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 8 below. 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 8 - Minimum R_w of Glazing (with Acoustic Seals)

Glazing Assembly	Minimum R_w of Installed Window
10.38mm Laminated	35

4.3.2 External Roof & Ceiling Construction

A roof/ceiling constructed from concrete/masonry elements will not require any further acoustic upgrading to achieve the acoustic requirements, however; a lightweight sheet metal external roof construction will require further acoustic upgrading to achieve the acoustic requirements. See table below for the recommended external lightweight roof and ceiling construction.

Table 9 – Lightweight External Roof and Ceiling Construction

Space	External Lining	Truss System	Internal Lining
All	0.5mm thick Sheet Metal + 6mm thick Fibre-Cement Sheeting	Minimum 250mm airgap with 75mm thick 11kg/m^3 glasswool insulation	1x13mm Plasterboard

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

4.3.3 External Walls

External walls constructed from concrete/masonry elements and will not require any further acoustic upgrading, however the external walls are to be constructed from a light weight stud system for Unit 11 and will therefore require further acoustic upgrading to achieve the acoustic requirements. See table below for the recommended external wall construction.

Table 10 – Lightweight External Wall Construction

Apartment	Space	External Lining	Stud System	Internal Lining
Unit 11	All	Architectural Cladding + 9mm Thick Fibre-Cement Sheeting	92mm Steel Stud with 75mm thick 11kg/m^3 glasswool insulation	1x13mm Plasterboard

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

4.3.4 Ventilation Requirements

With respect to natural ventilation of the dwelling, the NSW Department of Planning document "Development near Busy Roads and Rail Corridors - Interim Guideline" recommends that:

> *"If internal noise levels with windows or doors open exceed the criteria by more than 10dB(A), the design of the ventilation for these rooms should be such that occupants can leave windows closed, if they so desire, and also to meet the ventilation requirements of the Building Code of Australia."*

With windows open, the allowable internal noise goal is permitted to be 10dB(A) higher than when the windows are closed (i.e. – allowable level in bedrooms becomes 45dB(A), and 50dB(A) in living rooms). All windows on all facades must be closed in order to achieve the required internal noise levels.

Therefore, while windows on the façades can be openable, the ventilation requirements of the BCA should be able to be met with windows closed.

Should any supplementary fresh air (ventilation system or other) be required, it should be acoustically designed to ensure that the acoustic performance of the acoustic treatments outlined above are not reduced and does not exceed the Council criteria for noise emissions to nearby properties.

5 NOISE EMISSION ASSESSMENT

The noise emissions from the project site shall comply with the requirements of the following documents;

- Northern Beaches Council – Manly Development Control Plan 2013; and
- NSW Department of Environment and Heritage, *Environmental Protection Authority document – Noise Policy for Industry (NPI) 2017*.

5.1 NOISE EMISSION CRITERIA

5.1.1 Northern Beaches Council – Manly Development Control Plan 2013

3.4.2.3 Acoustical Privacy (Noise Nuisance)

See also Noise Guide for Local Government prepared by NSW Department of Environment, Climate Change and Water in 2010

a) Consideration must be given to the protection of acoustical privacy in the design and management of development;

b) Proposed development and activities likely to generate noise including certain outdoor living areas like communal areas in Boarding housed, outdoor open space, driveways, plant equipment including pool pumps and the like should be located in a manner which considers the acoustical privacy of neighbours including neighbouring bedrooms and living areas;

Although guidelines and general considerations for noise emissions are contained in the above document, there is no specific criteria for noise emissions from the development. On this basis, the NSW EPA Noise Policy for Industry will be referenced as a guide to limitations on future noise.

5.1.2 NSW Environmental Protection Authority (EPA) document – *'Noise Policy for Industry (NPfI)'*

The NPfI provides guidelines for assessing noise impacts from developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The NPfI has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion.

5.1.2.1 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 5 dB(A).

Table 11 – NPfI Intrusiveness Criteria

Receiver	Time of day	Background Noise Level dB(A)$L_{90(Period)}$	Intrusiveness Criteria (Background + 5dB(A)$L_{eq(15mins)}$)
Residential	Day (7am-6pm)	53	58
	Evening (6pm-10pm)	53	58
	Night (10pm-7am)	45	50

5.1.2.2 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 Noise Policy for Industry sets out acceptable noise levels for various land uses. Table 2.1 on page 16 of the policy has four categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

For the purposes of a conservative assessment, ALC will assess noise emissions in accordance with the 'Urban' category.

Table 12 – NPfI Project Amenity Criteria

Type of Receiver	Time of day	Recommended Project Acceptable Noise Level dB(A)$L_{eq(15mins)}$
Residential (Urban)	Day (7am-6pm)	58
	Evening (6pm-10pm)	48
	Night (10pm-7am)	43
Commercial	When in Use	63

*Correction of -5dB(A) & +3dB(A) has been applied in accordance with the *NPfI* procedures.

5.1.3 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:

- *$L_{Aeq,15min}$ 40 dB(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 the greater,*

a detailed maximum noise level even assessment should be undertaken.

Table 13 - Sleep Arousal Criteria for Residential Receivers

Receiver	Rating Background Noise Level (Night) dB(A)L_{90}	Emergence Level
Residential	45dB(A) L_{90}	50dB(A)$L_{eq,\ 15min}$; 60dB(A)L_{Fmax}

5.1.4 Summarised Plant Noise Emission Criteria

Summary for noise emission criteria for all plant associated with the development has been summarised below.

Table 14 – Summary of Noise Emission Criteria (Plant Noise)

Receiver	Time of day	Background Noise Level dB(A)$L_{90(Period)}$	Project Amenity Criteria dB(A)$L_{eq(15mins)}$	Intrusiveness Criteria (Background + 5dB(A)$L_{eq(15mins)}$)	NPfI Criteria for Sleep Disturbance
Residential	Day (7am-6pm)	53	58	58	N/A
	Evening (6pm-10pm)	53	48	58	N/A
	Night (10pm-7am)	45	43	50	50dB(A)$L_{eq,\ 15min}$; 60dB(A)L_{Fmax}
Commercial	When in Use	N/A	63	N/A	N/A

5.2 NOISE EMISSION ASSESSMENT

5.2.1 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 to the closest receiver should comply with the requirements above.

6 CONCLUSION

This report presents an acoustic assessment of noise impacts associated with the alterations and additions to the residential development located at 19-21 The Corso, Manly.

Internal noise criteria for external noise impacts have been formulated with reference to the following documents:

- Northern Beaches Council – Manly Development Control Plan 2013; and
- Australian and New Zealand AS/NZS 2107:2016 *'Recommended design sound levels and reverberation times for building interiors'*.

External noise emissions criteria have been setup in this report to satisfy the requirements from the following documents;

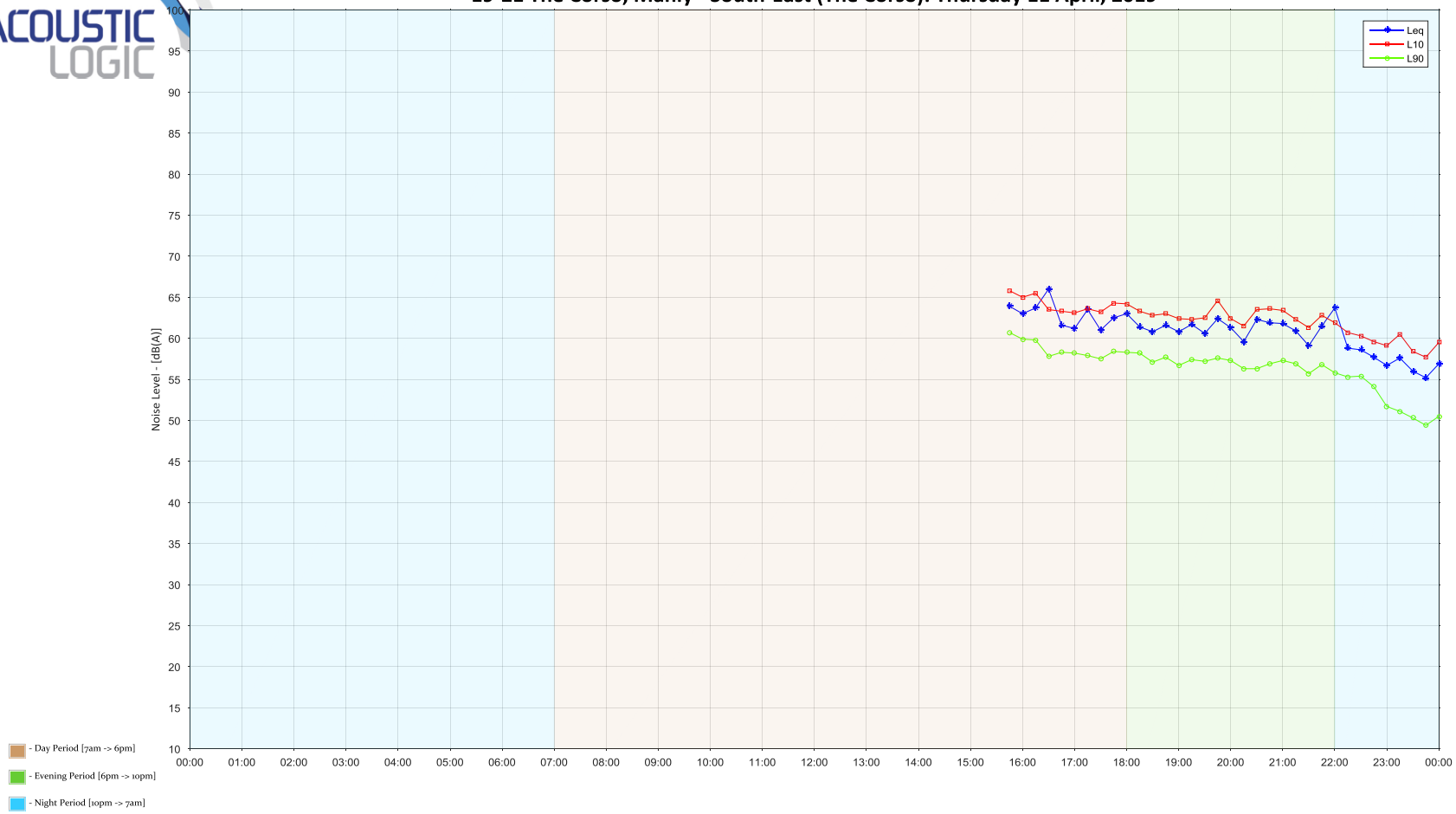
- Northern Beaches Council – Manly Development Control Plan 2013; and
- NSW Environmental Protection Authority (EPA) document – 'Noise Policy for Industry (NPfI) 2017'.

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

Yours faithfully,

Acoustic Logic Consultancy Pty Ltd
Shane Nichols

APPENDIX A – UNATTENDED NOISE MONITORING DATA – LOCATION #1 (THE CORSO)


19-21 The Corso, Manly - South-East (The Corso): Thursday 11 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - South-East (The Corso): Friday 12 April, 2019
Leq
L10
L90
Noise Level - [dB(A)]
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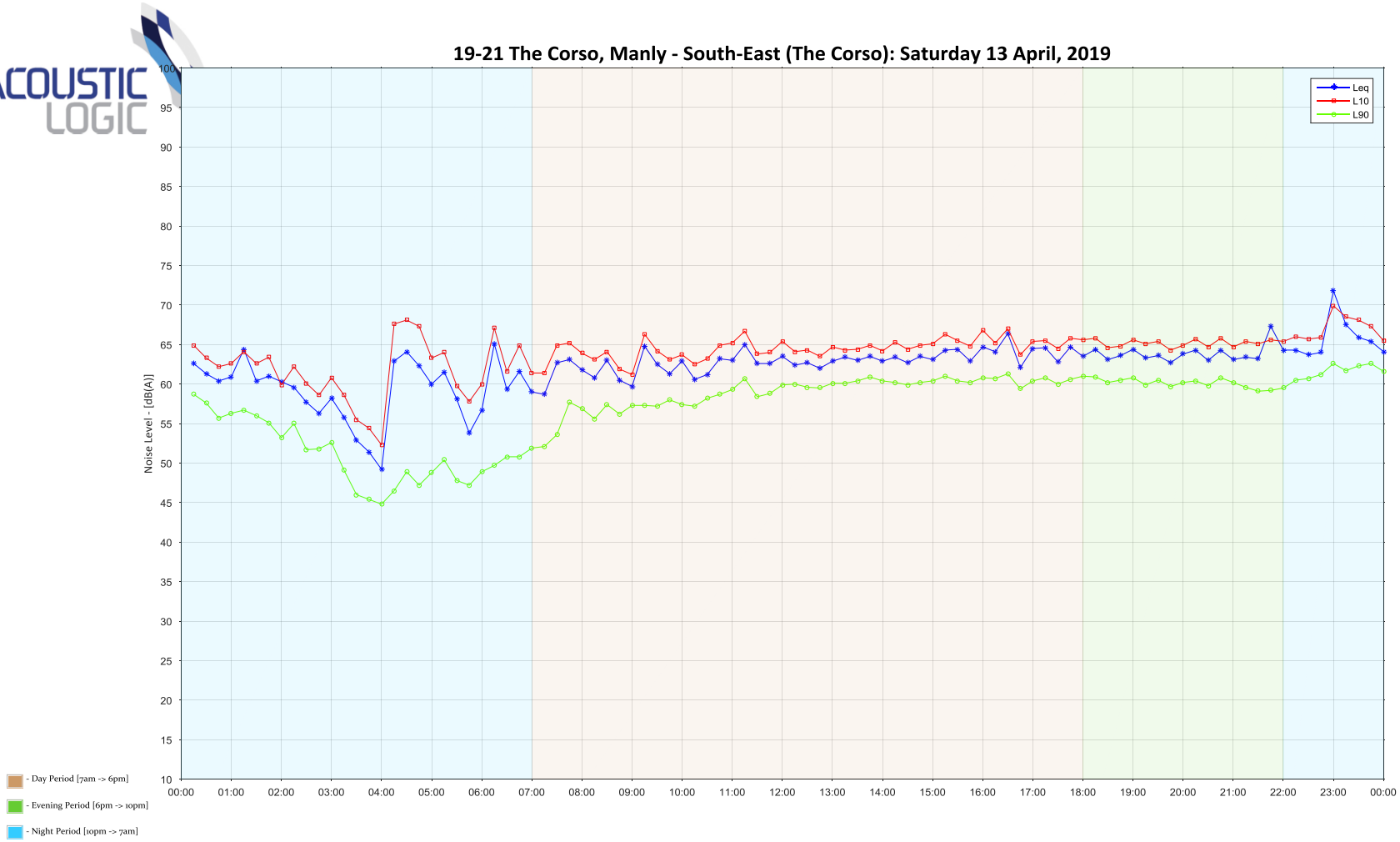
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - South-East (The Corso): Saturday 13 April, 2019
Noise Level - [dB(A)]
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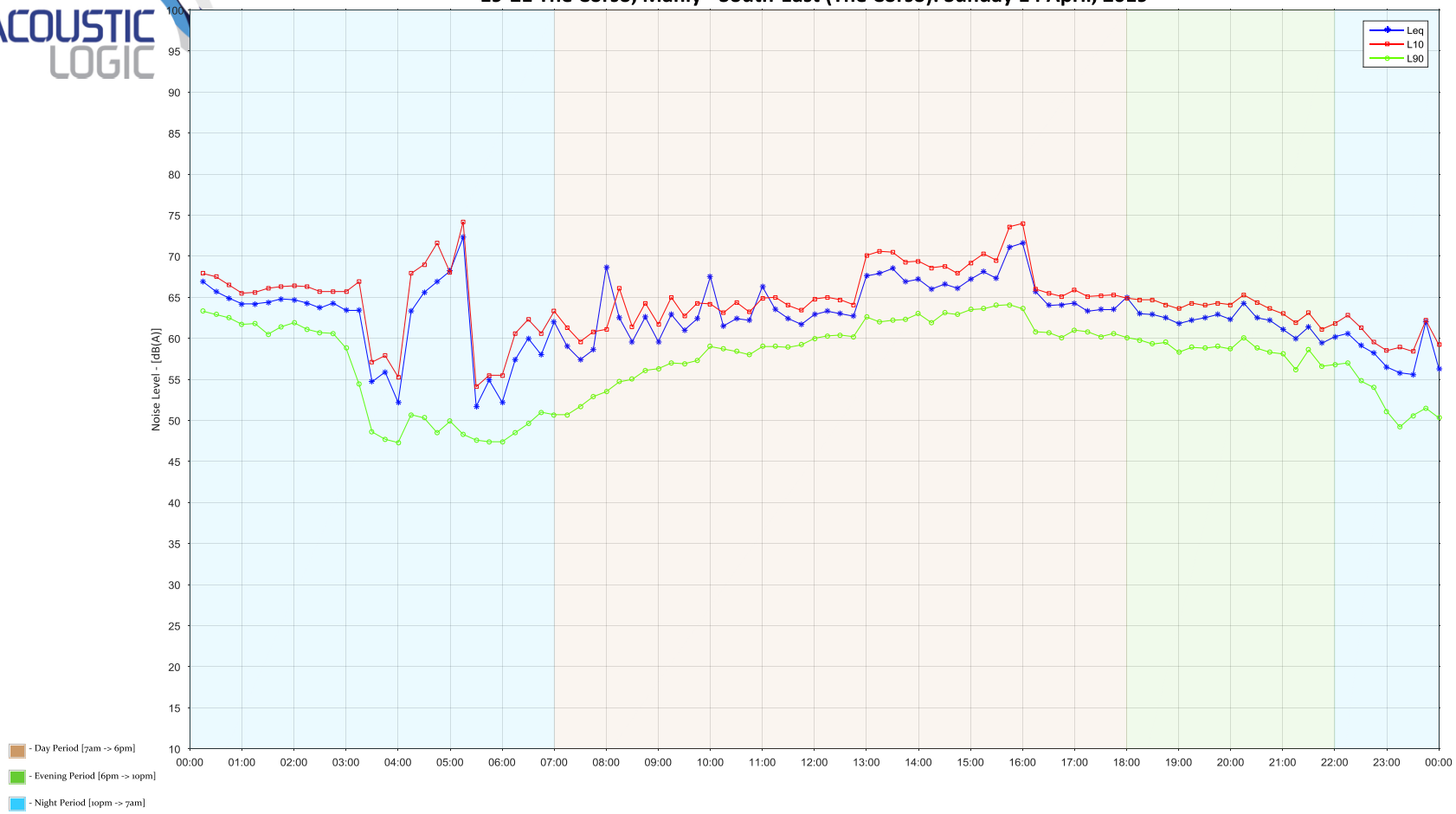
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - South-East (The Corso): Sunday 14 April, 2019
Leq
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Noise Level - [dB(A)]
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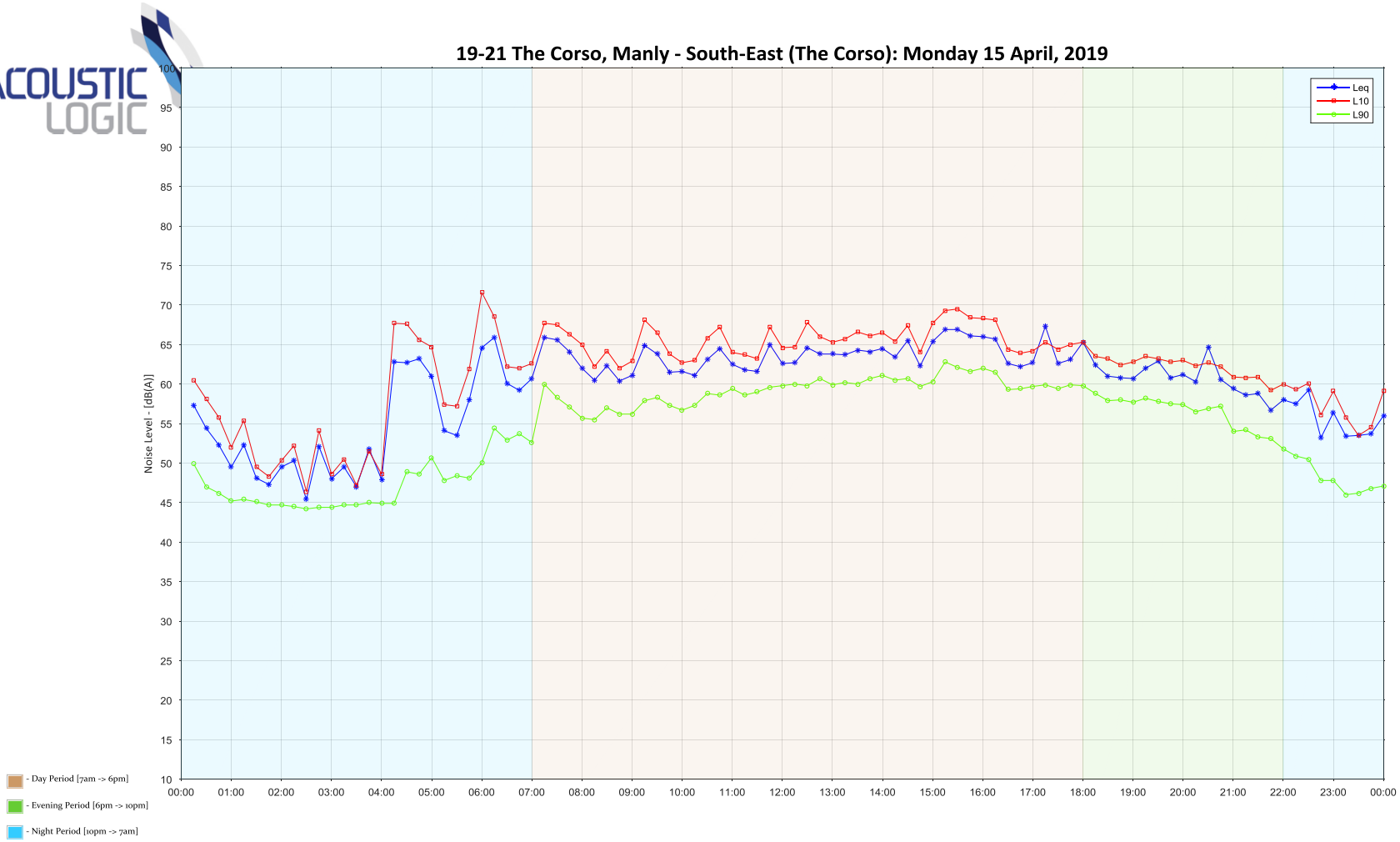
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - South-East (The Corso): Monday 15 April, 2019
Noise Level - [dB(A)]
Leq
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L90
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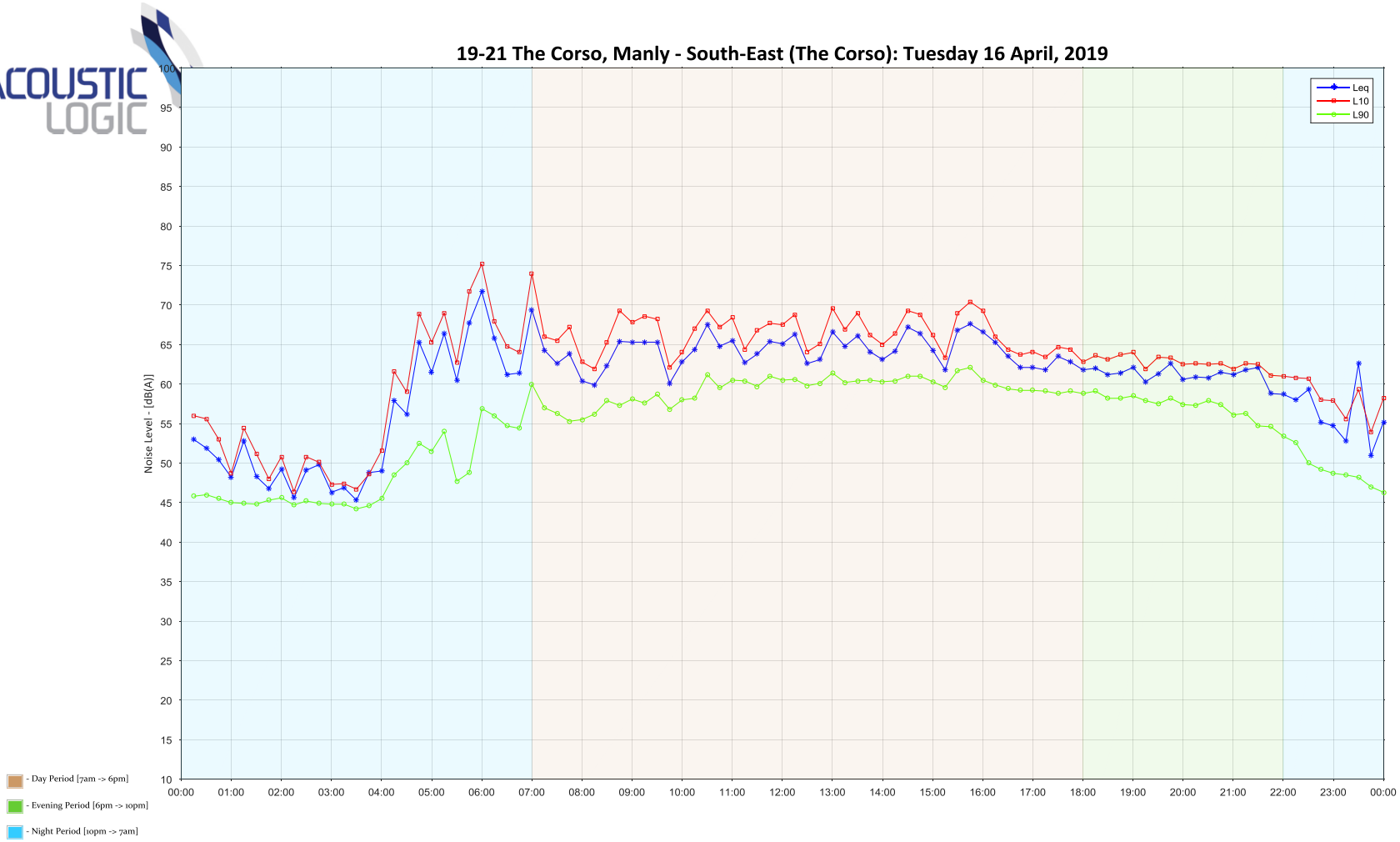
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]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Noise Level - [dB(A)]
Leq
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L90
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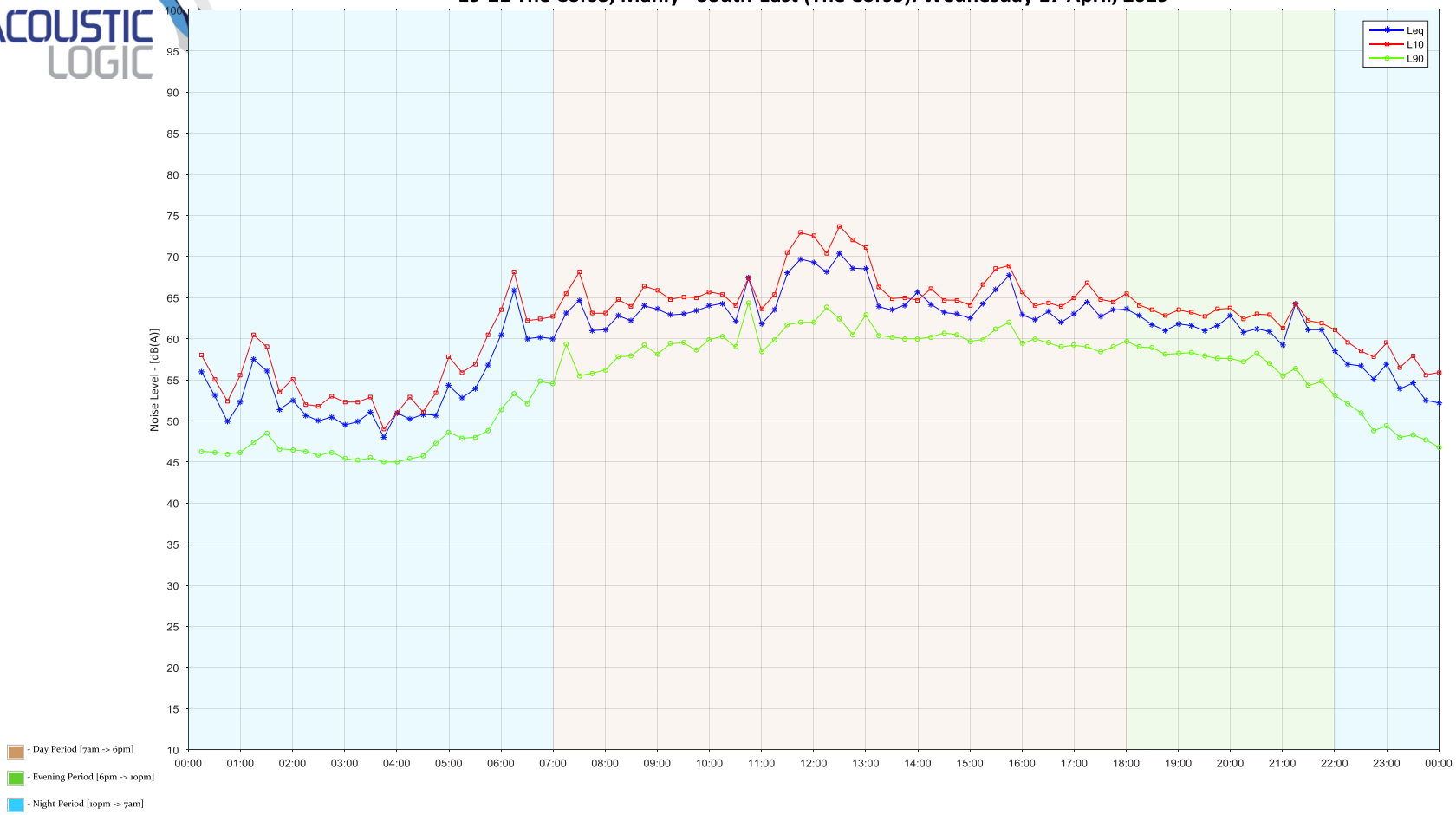
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - South-East (The Corso): Wednesday 17 April, 2019
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L90
Noise Level - [dB(A)]
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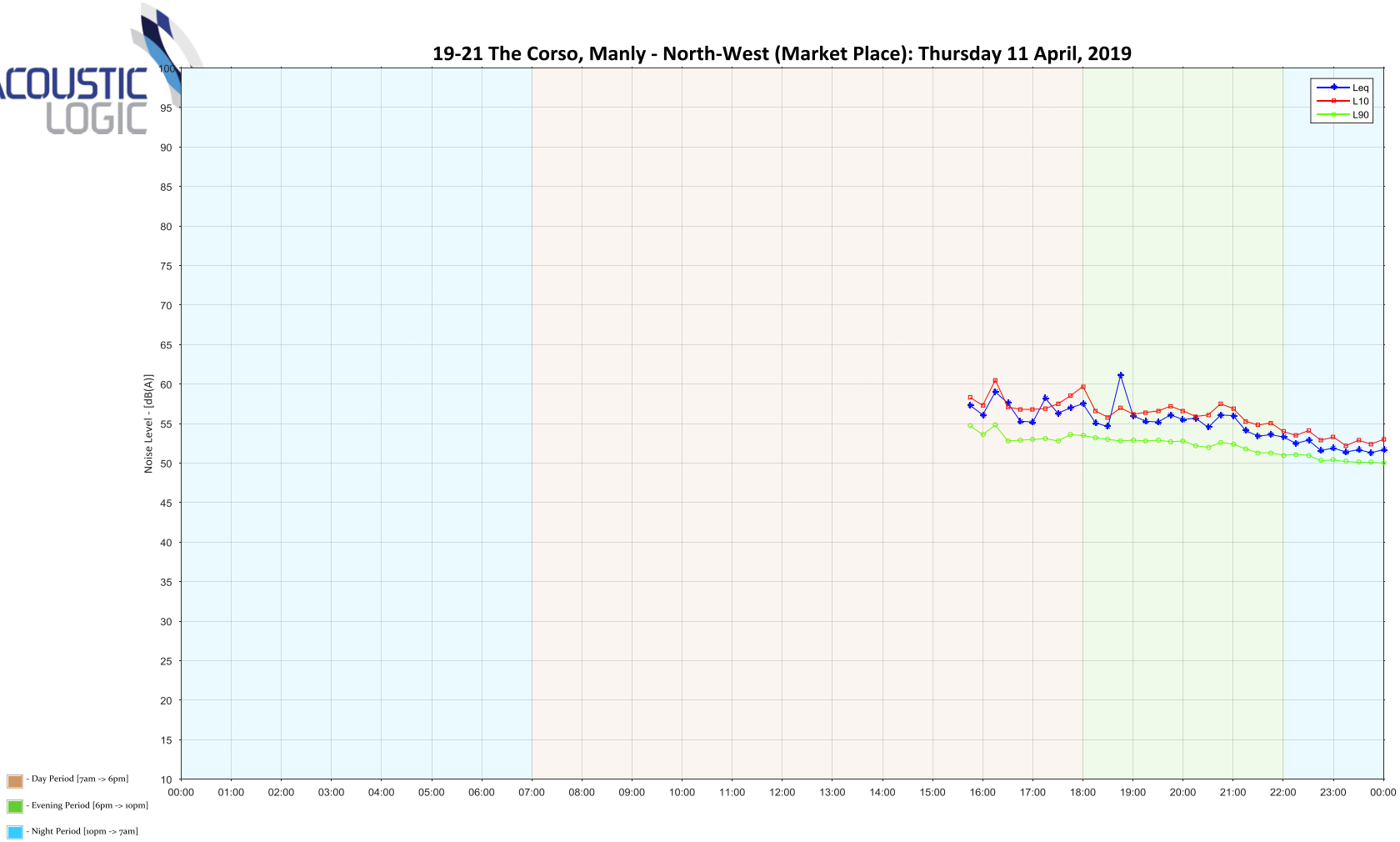
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - South-East (The Corso): Thursday 18 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]

APPENDIX B – UNATTENDED NOISE MONITORING DATA – LOCATION #2 (MARKET PLACE)


19-21 The Corso, Manly - North-West (Market Place): Thursday 11 April, 2019
Leq
L10
L90
Noise Level - [dB(A)]
100
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17:00
18:00
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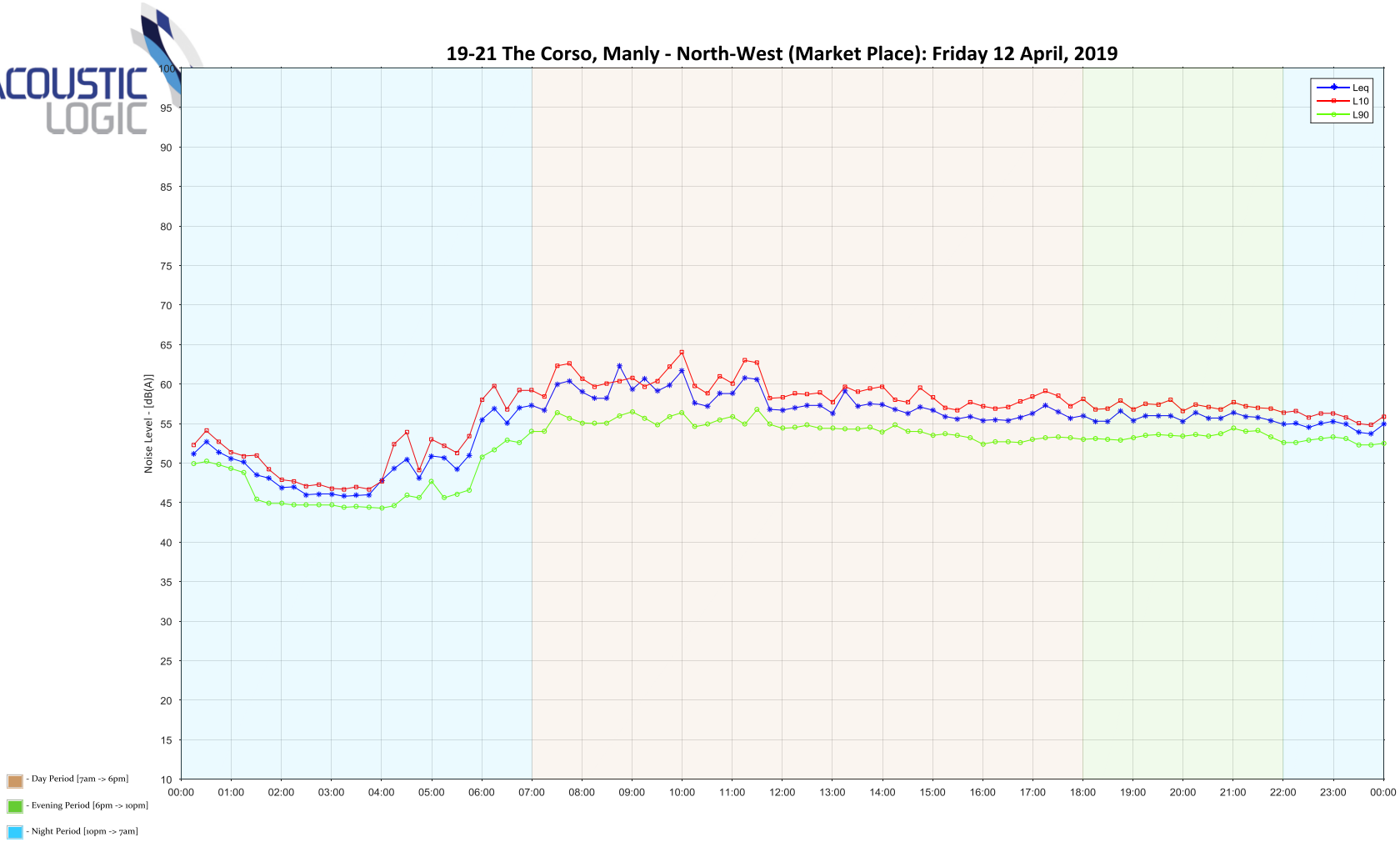
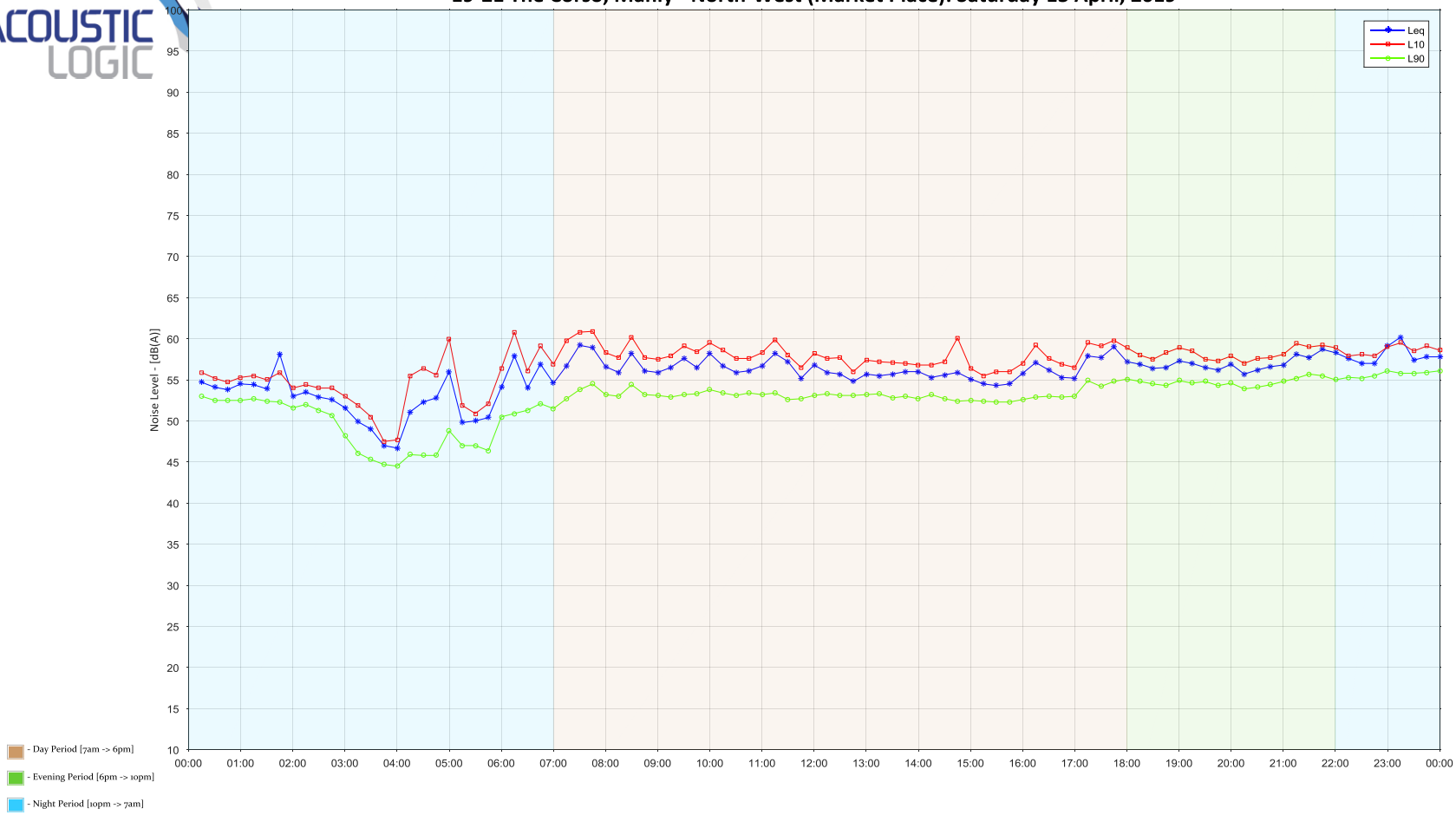
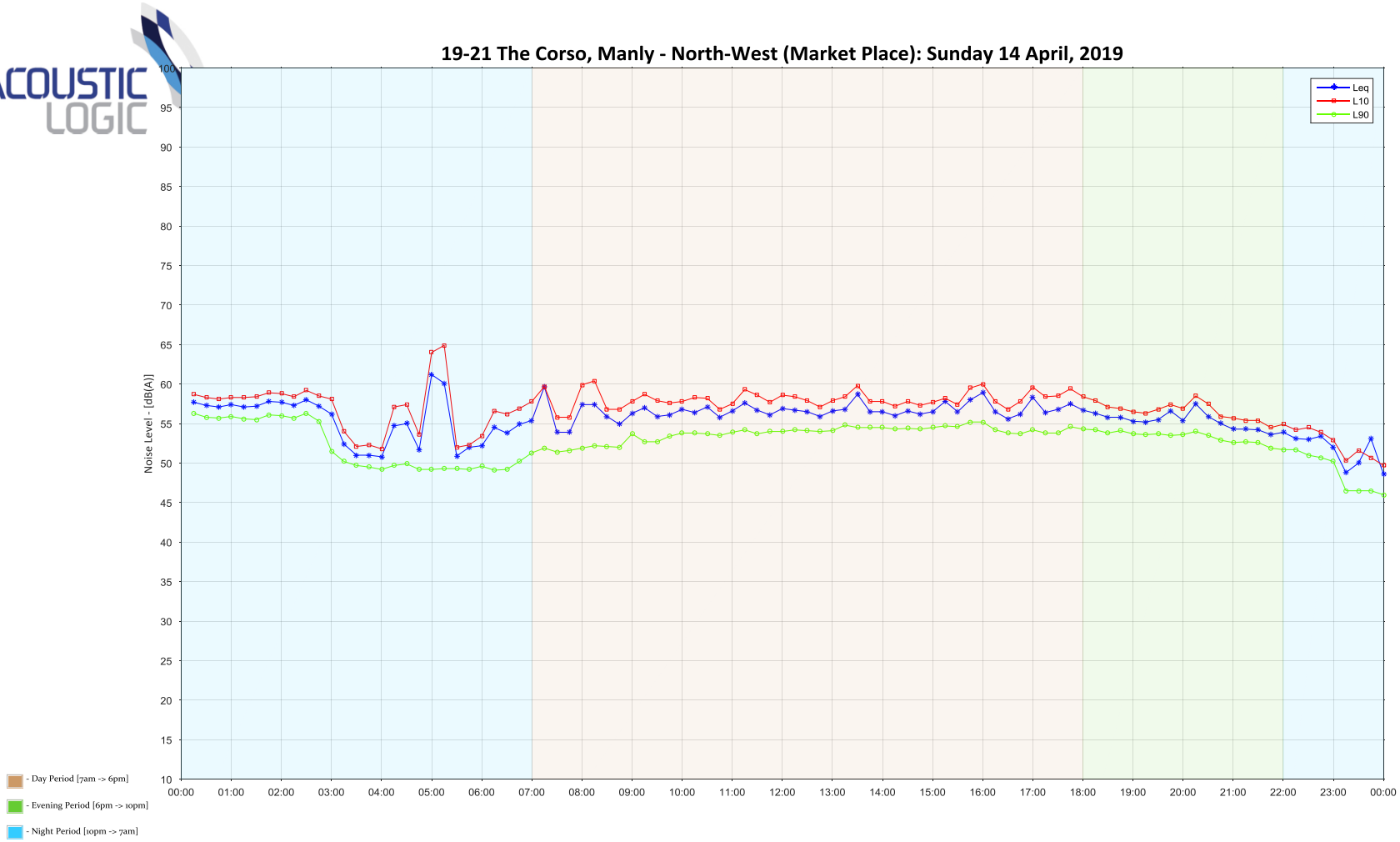
20:00
21:00
22:00
23:00
00:00
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - North-West (Market Place): Friday 12 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - North-West (Market Place): Saturday 13 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - North-West (Market Place): Sunday 14 April, 2019
Leq
L10
L90
Noise Level - [dB(A)]
100
95
90
85
80
75
70
65
60
55
50
45
40
35
30
25
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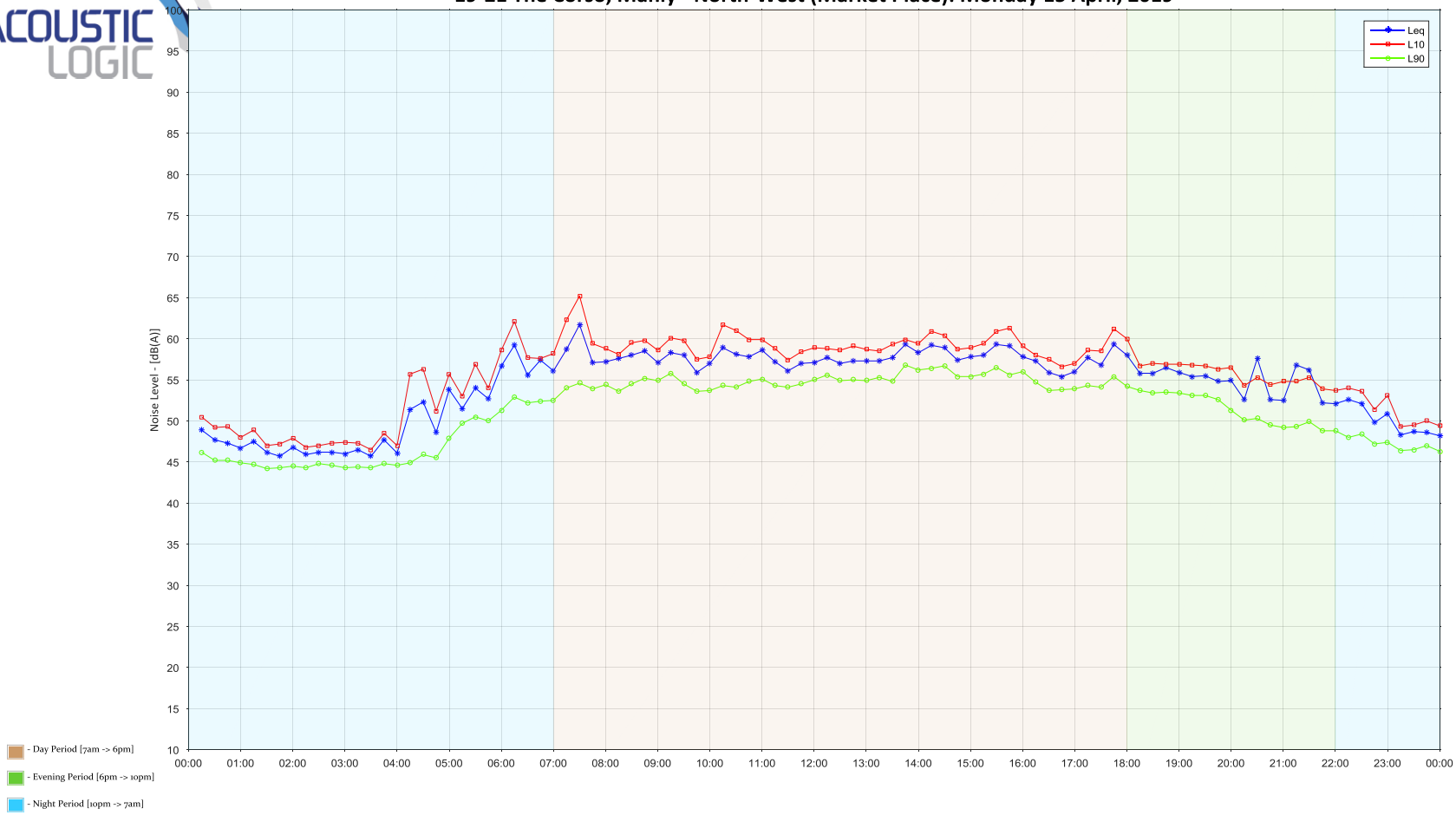
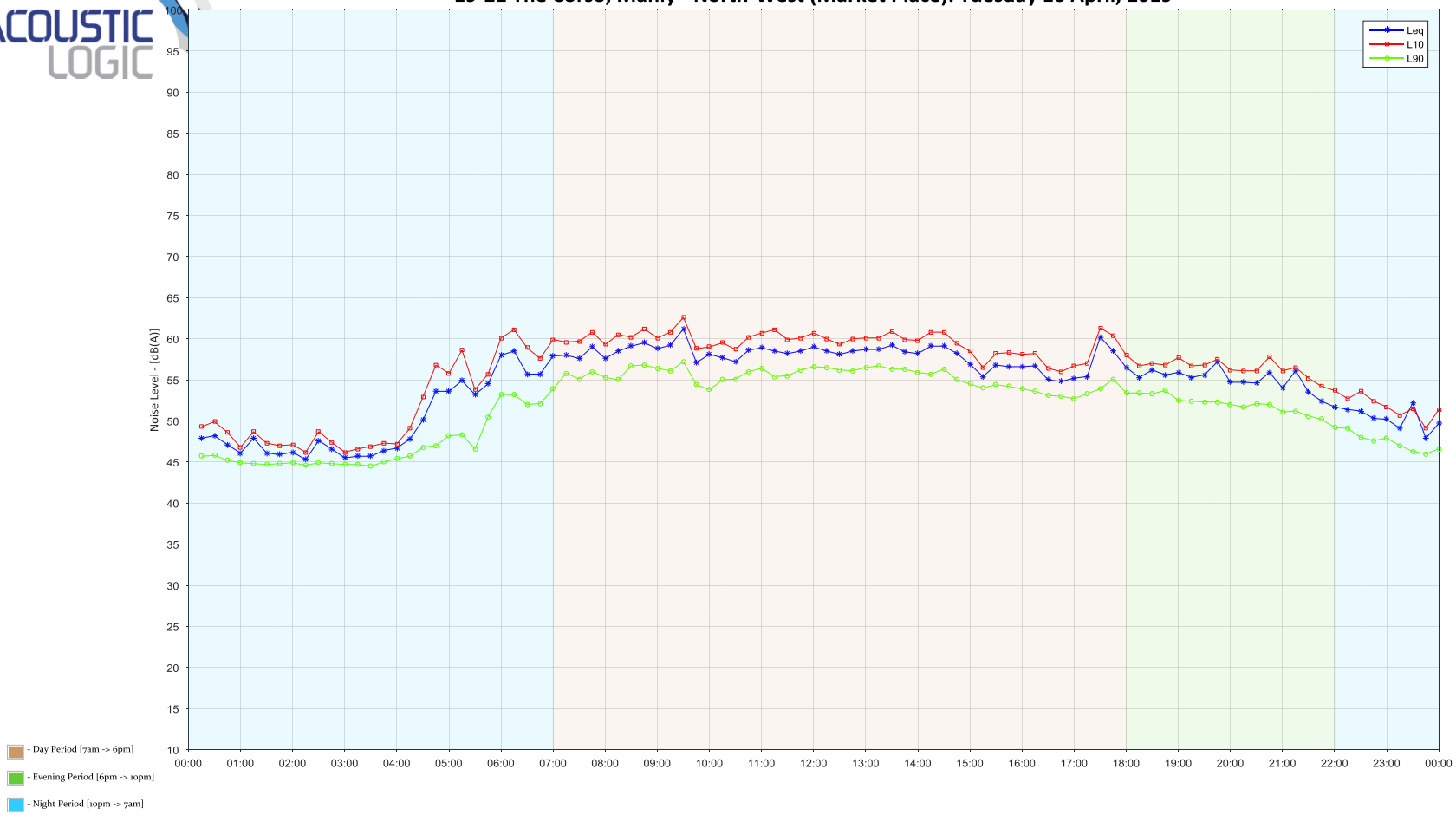
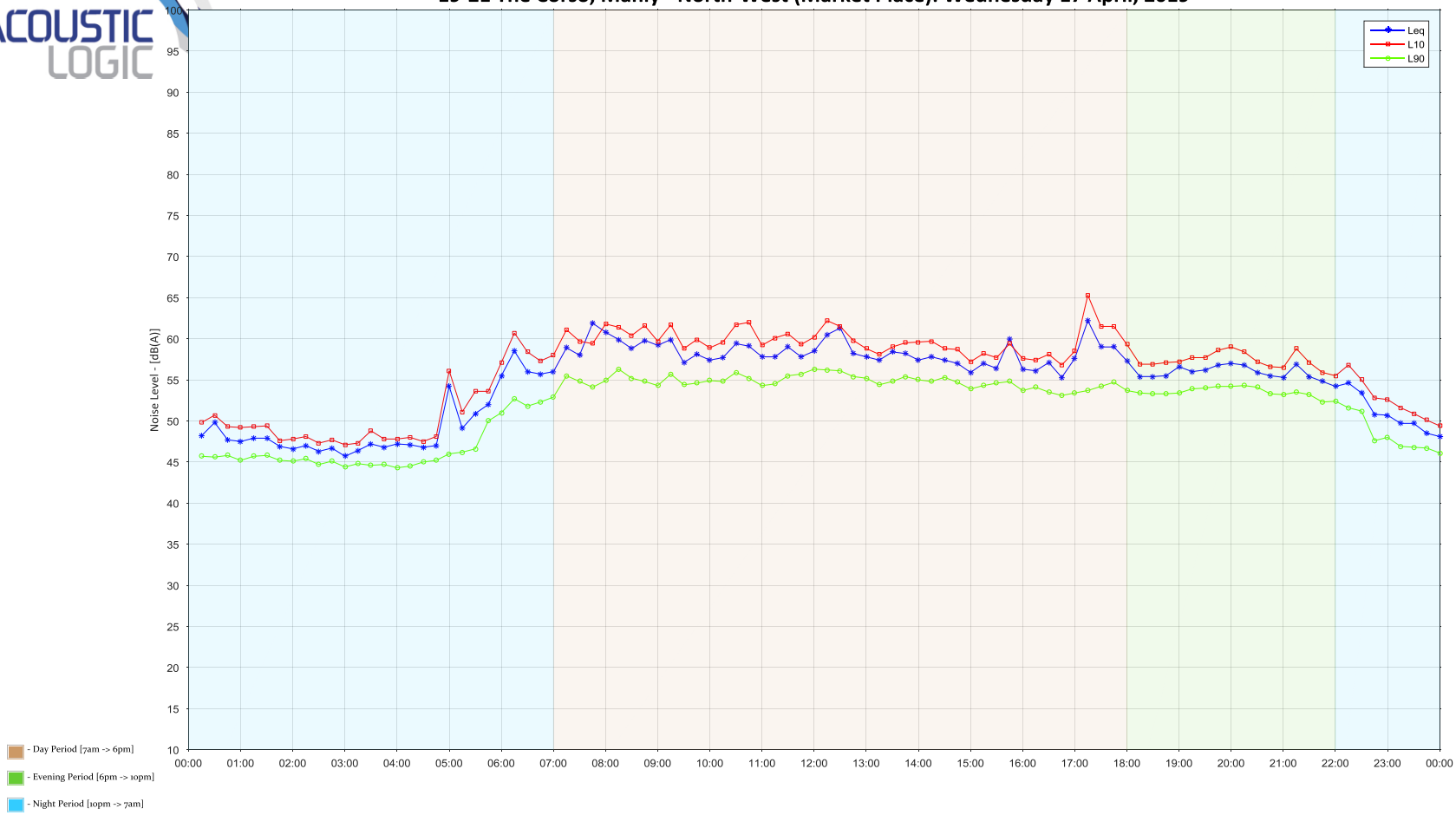
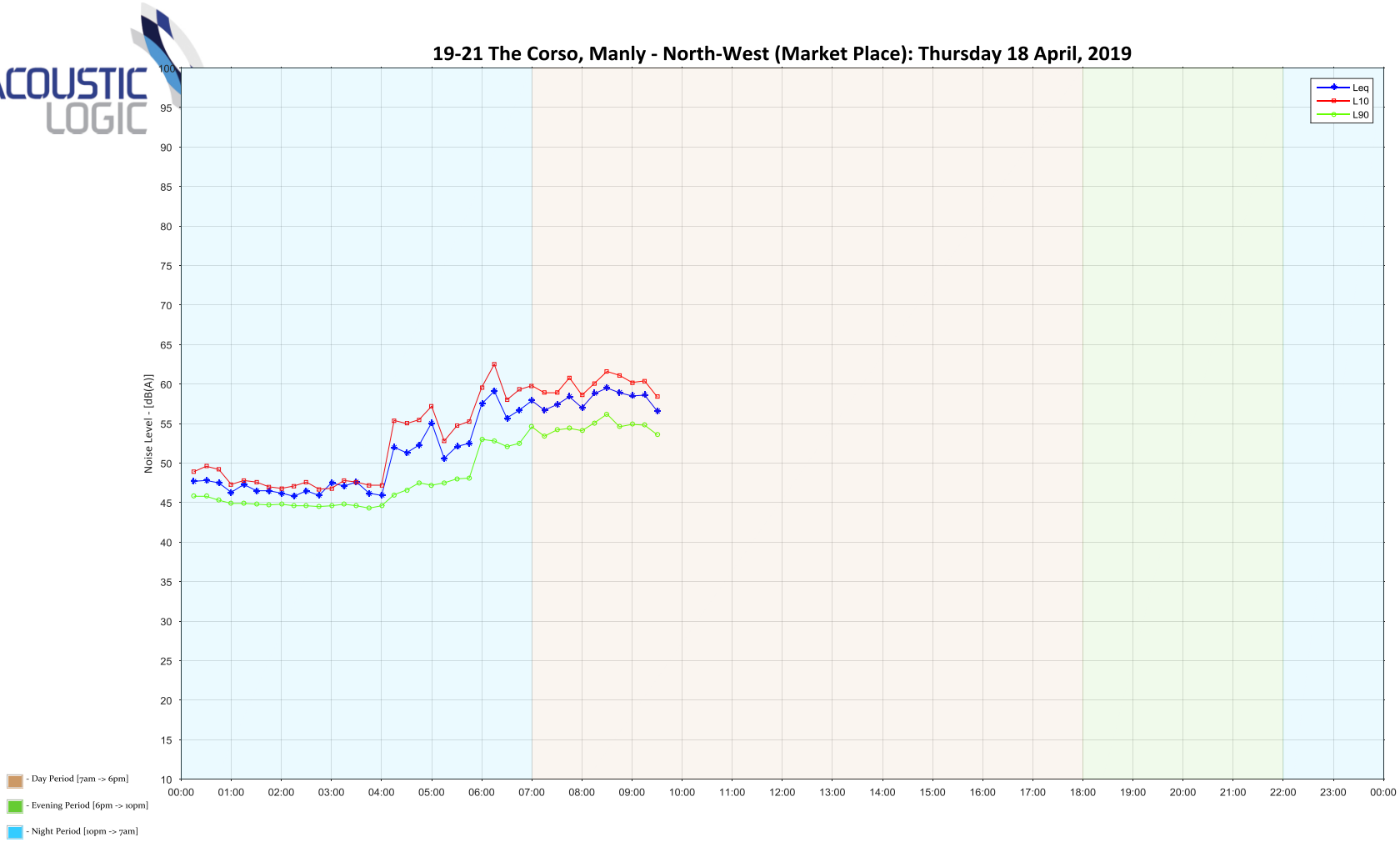
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - North-West (Market Place): Monday 15 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - North-West (Market Place): Tuesday 16 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - North-West (Market Place): Wednesday 17 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]


19-21 The Corso, Manly - North-West (Market Place): Thursday 18 April, 2019
Noise Level - [dB(A)]
Leq
L10
L90
- Day Period [7am -> 6pm]
- Evening Period [6pm -> 10pm]
- Night Period [10pm -> 7am]