Parramatta RSL Club, 2 Macquarie Street, Parramatta

Section 96 Noise Impact Assessment

SYDNEY
A: 9 Sarah St Mascot NSW 2020
T: (02) 8339 8000
F: (02) 8338 8399

SYDNEY MELBOURNE BRISBANE CANBERRA
LONDON DUBAI SINGAPORE GREECE

www.acousticlogic.com.au
ABN: 11 068 954 343

DOCUMENT CONTROL REGISTER

Project Number	20180003.1
Project Name	Parramatta RSL Club, 2 Macquarie Street, Parramatta
Document Title	Section 96 Noise Impact Assessment
Document Reference	20180003.1/0702A/R1/JL
Issue Type	Email
Attention To	Castle Hill RSL Club Ltd David O'Neil

Revision	Date	Document Reference	Prepared By	Checked By	Approved By
0	16/01/2018	20180003.1/1601A/R0/JL	JL		GW
1	7/02/2018	20180003.1/0702A/R1/JL	JL		

TABLE OF CONTENTS

1 INTRODUCTION

This report presents our assessment of noise impacts from the proposed New Hospitality Venue, Parramatta RSL as part of the Section 96 application.

The application seeks to increase the number of gaming machines within the development, and to extend the approved trading hours.

This report:

- Discusses the proposed function activities, outdoor seating, lounge, roof terrace and gaming activities within the project site. Assesses the predicted activities' impacts against criteria determined using the NSW Office of Liquor, Gaming and Racing (OLGR) and the measured existing background noise conditions

- Discusses and assesses the proposed plant noise impact upon the nearest residential buildings. The potential impacts are assessed against criteria determined using the NSW Industry Noise Policy and the measured existing ambient noise conditions

- Discusses the appropriate management and noise control measures that should be adopted to minimise adverse impacts during the operation of the proposed facility.

This assessment has been conducted based on the architectural drawings prepared by Paynter Dixon Constructions, project number CTL0303, dated 25/06/2014.

2 PROPOSED DEVELOPMENT

2.1 THE PROPOSAL

The proposed development includes a three level carpark, back of house area with loading dock, sports function room, outdoor and roof terrace (roof terrace has a retractable roof), gaming area, and lounge/dining area.

The Section 96 application seeks the following amendments to the conditions of consent issued by Parramatta City Council (DA/805/2013/B, dated 15/09/2016):

- To increase the number of gaming machines in the gaming area from 145 (as approved in condition 109) to 200, with further incremental increases being subject to a separate approval under the Gaming Machines Act 2001; and

- To extend the approved hours of operation (from those approved in condition 118) to 7am-4am Monday to Sunday seven days a week, with all outdoor areas not available to patrons between 1am-7am.

The proposed patron capacities of the various areas of the RSL are as follows:

- Sports Function Room: 300 patrons;
- Main Club Area (Dining and Lounge Area): 700 patrons;
- Gaming Area: 300 patrons;
- Roof Terrace: 475 patrons.

2.2 POTENTIALLY AFFECTED PROPERTIES

The land uses surrounding the proposed development are commercial buildings. The nearest potentially most affected residential properties are:

- Multi storey residential building to the south of the site along Macquarie Street.

If noise emissions comply at the above location, they will comply with the criteria at all other noise receiver locations. Refer to figure 1 below, which is an aerial photo of the site.

Figure 1 – Site Map and Noise Receiver Location

2.3 MAJOR NOISE ISSUES RELATED TO THE PROJECT SITE

Acoustic analysis has been carried out and the major noise sources related to the project site are below:

- Music noise impacts from function activities.
- Patron speech noise within the roof terrace and outdoor seating areas.
- Noise from gaming machines.
- Carpark noise emissions.
- Loading dock noise emissions.
- Plant noise.

3 BACKGROUND NOISE MONITORING

Attended and unattended background noise monitoring has been conducted in the vicinity of the site to characterise the existing noise environment. The measured background noise levels will be used to set noise objectives for the various noise sources.

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 15-20 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 traffic noise impact as it closely corresponds with human perception of a changing noise environment; such is the character of environmental noise.

3.2 NOISE MEASUREMENT POSITION AND EQUIPMENT USED

An unattended background noise monitoring was installed in Parramatta Park to the west of the site (refer to figure 1). The measured background noise level at this location will be representative of the noise level at the nearest noise-sensitive residential receivers to the south of the site.

The measurements were obtained using an Acoustic Research monitor set to A-weighted fast response mode. The monitor was calibrated before and after the measurements using a Rion Type NC-73 calibrator. No significant drift was recorded. Appendix 1 shows the measured noise levels.

An attended measurement was used to measure the background noise spectrum along Macquarie Street. The measurement was obtained using a Norsonic 140 Sound Level Analyser, set to fast response. The sound level meter was calibrated before and after the measurements using a Norsonic Type 4251 Sound Level Calibrator. No significant drift was recorded.

3.3 RATING BACKGROUND NOISE LEVELS

The background noise monitor was set to operate during night time (10pm-5am) to exclude the background noise interference from train and commercial premises around the logger location. The monitor was on site from 14th to the 21st December 2017.

The representative A-weighted background noise levels and the background spectrum obtained from for the monitored noise levels are given below. In all cases the typical minimum noise level was used to determine the rating background noise level. This will give the most conservative estimate of noise impact.

Table 1 – Rating Background Noise Level

LOCATION	PERIOD	NOISE LEVEL L_{A90}dB(A)
Nearest Residents to South	Day (7am-6pm)	52
	Evening (6pm-10pm)	49
	Night (10pm-7am)	42
	Before Midnight (7am-midnight)	49
	Midnight-1am	44
	1am-4am	42

Table 2 - Background Noise Spectrum

31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
62	62	60	57	54	56	51	43	39

4 NOISE EMISSION CRITERIA

This section examines the potential noise impacts from the proposed development. The main potential sources of noise are predominantly music related activities within the sports function room, patron speech within outdoor seating, activity noise from the gaming area and from mechanical plant serving the project building.

4.1 LICENSED PREMISES - NSW OFFICE OF LIQUOR, GAMING AND RACING (LG) NOISE CRITERIA

The LG provides guidelines for assessing patron/music noise emissions. The guidelines are as follows:

- *Before midnight, the L10 noise emissions should not exceed background noise level by more than 5 dB in the octave bands from 31.5Hz to 8k Hz at any residential premises.*
- *After midnight, the L10 noise emissions should not exceed background noise level in the octave bands from 31.5Hz to 8k Hz at any residential premises.*
- *After midnight, noise emissions are to be inaudible within any residential premises.*

The following assessment criteria have been determined based on the background noise levels measured. The most sensitive period will be after midnight, as operation of the licensed premises will cease at 4am.

Table 3 - LG Noise Objectives

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
7am – Midnight (BG 49+5dB(A))	57	57	55	52	49	51	46	38	34	**54**
Midnight – 1am (BG 44+0dB(A))	47	47	45	42	39	41	36	28	24	**44**
1am – 4am (BG 42+0dB(A))	45	45	43	40	37	39	34	26	22	**42**

4.2 PLANT NOISE – NSW INDUSTRIAL NOISE POLICY

The EPA Industrial Noise Policy provides guidelines for assessing noise impacts from industrial developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The EPA Industrial Noise Policy has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion. In addition, the EPA in its Environmental Noise Control Manual states that noise controls should be applied with the general intent to protect residences from sleep arousal.

4.2.1 Intrusiveness Criterion

The guideline is intended to limit the audibility of noise emissions at residential receivers and requires that noise emissions measured using the $L_{eq(15min)}$ descriptor not exceed the background noise level by more than 5 dB(A). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

4.2.2 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 EPA's Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Table below provides the recommended ambient noise levels for the urban residential receivers for the day, evening and night periods. For the purposes of this condition:

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

Table 4 - EPA Recommended Acceptable Noise Levels

Type of Receiver	Time of day	Recommended Acceptable Noise Level dB(A) L_{eq}
Residential - Urban	Day	60
	Evening	50
	Night	45
Commercial	When in use	65

4.2.3 Project Specific Plant Noise Objectives

Table below provides a summary of our recommended assessment criteria applicable to the nearest residential receiver. The intrusiveness and amenity criteria for this project have been determined using the EPA guidelines and measured background noise levels.

Table 5 – Plant Noise Objectives to Residential Receivers

Time of day	Measured Background Noise Level dB(A)L_{90}	Intrusiveness Criteria dB(A)$L_{eq(15min)}$	Amenity Criteria dB(A)$L_{eq(period)}$	
			Residential	Commercial
Day (7am-6pm)	52	57	60	65
Evening (6pm-10pm)	49	54	50	
Night (10pm-7am)	42	47	45	

4.3 SLEEP DISTURBANCE

Potential sleep arousal impacts should be considered for noise generated before 7am or after 10pm.

Short duration, intermittent noise events (such as vehicle engine starts) are typically assessed for potential sleep disturbance.

Potential impacts are assessed using the recommended procedure in the Application Notes to the EPA Industrial Noise Policy. The application notes recommend that the the $L_{1\ (1\ minute)}$ noise level of any specific noise source does not exceed the background noise level (L_{90}) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am. The L_1 noise level is the level exceeded for 1 per cent of the measurement period and approximates the typical maximum noise level from a particular source.

If the noise events are within this, then sleep arousal impacts are unlikely. The guideline level is set out below.

Table 6 – Sleep Arousal Criteria

Location	Background Noise Level (10pm-7am) dB(A)$_{L90}$	Emergence Level dB(A) $L_{1(1min)}$
Residents to the South of the Site, across Macquarie Street	42	57

5 NOISE EMISSION ASSESSMENT

The assessment will cover the following activities:

- Noise from Patrons/Music;
- Noise from Gaming Machines;
- Noise from the Loading Dock;
- Noise from the Car Park; and
- Noise from Mechanical Plant.

5.1 PATRON/MUSIC NOISE EMISSIONS

5.1.1 Music Noise

The assessment has been based on noise levels that occur during the worst-case situation. This event would correspond to maximum use periods e.g. Friday, Saturday nights.

Table 7 – Typical Worst Case Music Internal Noise Levels

Space	Music Type	Sound Pressure Level dB(A) L_{10}
Sports Function Room	DJ Music	Up to 95 before midnight
	DJ Music	Up to 85 after midnight
Lounge, Gaming and Roof Terrace	Background Music	Up to 70 dB(A)

Between 10pm and 4am the worst potentially affected receiver location is the residential building to the south of the site across Macquarie Street (refer to figure 1). To ensure compliance at all times physical and management controls will be required. These are outlined in section 6.

5.1.2 Patron Noise

The main noise source from the internal main club and roof terrace areas will be patron speech, with a sound power level of 78 dB(A)L_{10}.

Noise from patrons using the club and roof terrace area has been predicted at the nearest residences. The noise level predicted at each receiver is based on proposed number of people that may access the club with up to 1 in 2 people talking at any one time.

The noise emission levels were corrected for distance attenuation and the number of patrons to determine the resultant noise level. The L_{10} sound power level spectrum used in the calculations to predict the impact of patrons utilising the club and roof terrace area is presented below. Predicted noise levels have also taken into account the effect of noise attenuation treatments and recommendations presented in Section 6.

Table 8 – L_{10} Sound Power Level Spectrum of Single Patron

Noise Level dB – Frequency (Hz)									
31.5	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**A-wt**
58	58	73	72	76	73	70	62	58	**78**

5.1.3 Gaming Machine Noise

It is proposed that up to 200 gaming machines will be installed within the Gaming area, with further incremental increases in the future under a separate approval. The perimeter of gaming area will be open for ventilation.

The typical noise levels within the outdoor gaming areas have been measured at a similar Club facility during the evening time period (9pm to 10pm) by this office on 28th June 2012. Noise measurements were obtained using a Svan 958 Sound Analyser was used for the noise measurements. The analyser was set to fast response and calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was noted.

The measured typical Sound Pressure Level within main terrace opening areas with 90 gaming machines running and 20 patrons playing, patron's talk, music noise from gaming machines, etc. has been presented below.

Table 9 - Measured Sound Pressure Level within Open Roof of Gaming Area dB L_{10}

Item	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Open Roof of Gaming Area Noise	59	59	58	59	59	57	53	47	39

5.2 PREDICTED NOISE LEVELS

The activities noise to the nearest noise receivers have been predicted by taking account of the noise emission level, façade reductions, barrier effects, directivity and distance attenuations (as applicable). The predicted noise levels are presented below. The noise prediction assumes the recommendations in Section 6 have been implemented.

5.2.1 To Macquarie Street Residents – Before Midnight

Table 10 – Predicted Noise Level to Nearest Residential Receiver

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
7am – Midnight	44	44	46	41	43	41	38	30	27	**46**
Criteria	57	57	55	52	49	51	46	38	34	**54**
Comply	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

5.2.2 To Macquarie Street Residents – Midnight to 1am

Table 11 – Predicted Noise Level to Nearest Residential Receiver

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
Midnight – 1am	38	38	43	41	39	37	32	25	21	**42**
Criteria	47	47	45	42	39	41	36	28	24	**44**
Comply	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

5.2.3 To Macquarie Street Residents – 1am to 4am

Table 12 – Predicted Noise Level to Nearest Residential Receiver

Time	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	A-wt
1am – 4am	34	34	32	30	30	28	24	18	10	**33**
Criteria	45	45	43	40	37	39	34	26	22	**42**
Comply	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	**Yes**

The assessment indicates that provided the recommendations in Section 6 are implemented, noise emissions from even the loudest events expected would comply with LG guidelines and will not adversely impact sensitive receivers around the site.

5.3 PLANT NOISE

5.3.1 Noise Assessment Objectives

The EPA Industrial Noise Policy provides guidelines for assessing noise impacts from industrial developments. The recommended assessment objectives vary depending on the potentially affected receivers, the time of day, and the type of noise source. The EPA Industrial Noise Policy has two requirements which both have to be complied with, namely an amenity criterion and an intrusiveness criterion. In addition, the EPA in its Environmental Noise Control Manual states that noise controls should be applied with the general intent to protect residences from sleep arousal.

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). Where applicable, the intrusive noise level should be penalised (increased) to account for any annoying characteristics such as tonality.

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 Industrial noise policy sets out acceptable noise levels for various localities. Table 2.1 on page 16 of the policy indicates 4 categories to distinguish different residential areas. They are rural, suburban, urban and urban/industrial interface.

Table below provides the recommended ambient noise levels for the urban residential receivers for the day, evening and night periods. For the purposes of this condition:

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

Table 13 - EPA Recommended Acceptable Noise Levels

Type of Receiver	Time of day	Recommended Acceptable Noise Level dB(A) L_{eq}
Residential Urban	Day (7am-6pm)	60
	Evening (6pm-10pm)	50
	Night (10pm-7am)	45

Project Specific Plant Noise Objectives

Table below provides a summary of our recommended assessment criteria applicable to the nearest residential receiver. The intrusiveness and amenity criteria for this project have been determined using the EPA guidelines and measured background noise levels.

Table 14 – Plant Noise Objectives to Residential Receivers, dB(A)

Time of day	Measured Background Noise Level dB(A)L_{90}	Amenity Criteria dB(A)$L_{eq(period)}$	Intrusiveness Criteria dB(A)$L_{eq(15min)}$
Day (7am-6pm)	52	60	57
Evening (6pm-10pm)	49	50	54
Night (10pm-7am)	42	45	47

5.3.2 Noise Emissions Mechanical Plant

Detailed mechanical design is not available at this stage. Notwithstanding this, plant shall be treated to ensure that it fully complies with the assessment objectives presented in section 4. The specific requirements for this treatment would be determined once plant selections and detailed layouts have been determined.

5.4 LOADING DOCK NOISE

5.4.1 Noise Sources

The potential noise sources associated with the loading dock are listed in the Table below along with the noise emission levels. The emission levels have been obtained from noise monitoring carried out at similar retail loading dock facilities. Noise measurements were obtained using a Norsonics SA 110 with (serial number 24692) or CEL-593 Type 1 sound level analysers (serial number C1. T 116962), set to fast response. The sound level analysers were calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was recorded.

Assessment has been based on rigid trucks up to 8.8m in length and the loading dock operation during day and evening only.

Table 15 - Noise Source Emission Levels

Noise Source	Sound Power Level dB(A)	Type of Noise Source
Truck Idle	99	Quasi-Steady
Trucks Manoeuvring	103	Intermittent
Truck reversing alarm	108 including 5 dB(A) tonality correction	Intermittent
Truck Air Brakes	114	Intermittent
Dock Leveller	88	Intermittent
Loading Dock Door Operation	85	Intermittent
Waste Truck compacting load	103	Quasi-Steady

5.4.2 Predicted Noise Levels- Day/ Evening Hours

The noise levels at the existing residential receivers from activities and vehicles within the loading dock were calculated based on the noise emission levels presented in the table above. These levels were corrected for:

- Distance between the noise source and receiver, barrier or directivity effects (when present) and topography.
- Losses from the internal treatment and noise reduction from the doors (it has been assumed the truck will enter/leave and manoeuvre with the door open and all other operations carried out with the door closed).

A worst case 15 minute noise level based on the following for the receivers near the loading area entry doors:

- Long Rigid Truck arrives in a 15 minute period.
- Long Rigid Truck idling for 20 seconds upon arrival or departure.
- Loading/unloading of truck for the remainder of the 15 minute period.
- Garbage compacting for 5 minutes.

The predicted noise levels at the nearest residential receiver are summarised below:

Table 16 – Receiver Noise Assessment – Loading Dock – Day/Evening dB(A)L_{eq} (15min)

Noise Receiver	Time Period	Predicted Noise Level dB(A) $L_{eq(15min)}$	Criteria dB(A) $L_{eq(15min)}$	Compliance
Macquarie Street Residents	Day & Evening (7am-10pm)	48	Day - 57 Evening - 54	Yes

The noise assessment undertaken indicates that with the recommended controls presented in Section 6, noise emissions will comply with the noise emission requirements.

5.5 CARPARK NOISE

The project site includes 484 carpark spaces, with 64 of them being located on ground level. The potential noise source associated with the carpark is listed in the table below along with the noise emission levels. The emission levels have been obtained from noise monitoring carried out at similar facilities. Noise measurements were obtained using a Norsonics SA 110 with (serial number 24692) or CEL-593 Type 1 sound level analysers (serial number C1. T 116962), set to fast response. The sound level analysers were calibrated before and after the measurements using a Rion NC-73 calibrator. No significant drift was recorded.

Table 17 - Noise Source Emission Levels

Noise Source	Sound Power Level dB(A)	Type of Noise Source
Typical Car Manoeuvring	84	Quasi-Steady
Door Slamming	92	Instantaneous

Noise predictions were based on:

- Distance between the noise source and receiver, barrier or directivity effects (when present) and topography.
- Tabled noise emission levels.
- Worst case scenario of 242 cars exiting the car park in a one hour period during the day or evening period.
- Worst case scenario of 100 cars exiting the car park in a one hour period during the night time period.

The predicted noise levels at the nearest residential receiver are summarised below:

Table 18 – Carpark Noise Assessment

Noise Receiver	Time Period	Predicted Noise Level dB(A) $L_{eq(15min)}$	Criteria dB(A) $L_{eq(15min)}$	Compliance
Nearest Residential Along Macquarie Street	Day & Evening (7am-10pm)	46	Day – 57 Evening – 54	Yes
	Night (10pm-7am)	42	Night – 47	Yes

5.5.1 Sleep Disturbance

To minimise the potential for sleep arousal the $L_{1\ (1\ minute)}$ noise level of any specific noise source does not exceed the background noise level (L_{90}) by more than 15 dB(A) outside a resident's bedroom window between the hours of 10pm and 7am. The L_1 noise level is the level exceeded for 1 per cent of the measurement period and approximates the typical maximum noise level from a particular source.

The worst case scenario noise source is from a car door slamming at the ground floor car park during the night time period. Predicted noise levels from car doors slamming at the nearest residential receiver has been presented below.

Table 19 – Predicted Noise for Sleep Disturbance Assessment

Noise Receiver	Predicted Noise Level dB(A)$L_{1(1min)}$	Noise Level Criteria dB(A)$L_{1(1min)}$	Comply?
Nearest Façade of Residential Along Macquarie Street	57	BG + 15 = 57	Yes

The assessment indicates that noise from the car park will comply with the sleep disturbance criteria. Therefore, sleep awakenings are unlikely at the nearest residents and no further analysis is required.

6 RECOMMENDATIONS

The following building and management controls are recommended to ensure that overall noise emissions comply with the nominated noise objectives.

6.1 RECOMMENDED CONTROLS/ACOUSTIC TREATMENTS

- Glazing for RSL: All external glazing for the RSL is to be minimum 10.38mm laminated glazing with acoustic seals around perimeter (R_w 35).
- External doors of RSL: All external doors shall be equal to 10.38mm laminated glazing with full perimeter acoustic seals.
- Roof/Ceiling of RSL: minimum 1 layer 16mm plasterboard ceiling with 250mm gap between the ceiling and metal deck roof. Install 75mm thick 11kg/m^3 glasswool insulation into the ceiling cavity. All penetrations and junctions shall be acoustically sealed.
- The outdoor dining areas and roof terrace area are not to be used after 1am.
- RSL to cease operation at 4am.

6.1.1 Sports Function Room

- The external walls of the Sports Function Room shall be constructed by minimum 92mm steel stud with one layer of 9mm FC sheet or 16mm thick plaster board on each side of the wall and install 75mm thick 11kg/m^3 glasswool insulation into the wall cavity (R_w 45).
- The proposed concrete slab above the Sports Function Room will be acoustically acceptable and will not require any additional treatment.
- The maximum music noise levels that shall be played within the sports function room are not to exceed the levels presented in the table below.

Table 20 – Maximum Internal Noise Level in Function Centre, dBL_{10}

	OCTAVE BAND CENTRE FREQUENCY (Hz)									
	31.5	63	125	250	500	1000	2000	4000	8000	**A-wt**
Before Midnight	100	100	102	96	91	88	87	83	82	**95**
Midnight- 4am	90	90	92	85	80	78	77	73	72	**85**

6.1.2 Outdoor Seating Areas

- Only background music up to 70dB(A)L_{10} at 1m from the speaker(s) is permitted in the outdoor seating areas.
- Outdoor seating areas are to cease operating after 1am.

6.1.3 Roof Terrace

- Only background music up to 70dB(A)L_{10} at 1m from the speaker(s) is permitted in the roof terrace area.

- The retractable roof of the roof terrace is to be closed after 6pm.

- Install an operable drop down 1mm thick plastic curtain along the western side of the roof terrace area (as shown in blue in the figure below) with all gaps around the perimeter of the curtain minimised. The curtain is to be lowered after midnight when the roof terrace is in use.

- The balustrade along the western façade of the roof terrace (as shown in red in the figure below) is to be minimum 1.5m high and is to be constructed of a solid imperforate material similar to concrete of fibre cement sheet.

- Maximum patron numbers in roof terrace area are not to exceed the following:

    - 7am-1am: 475 patrons;
    - After 1am: No patrons.

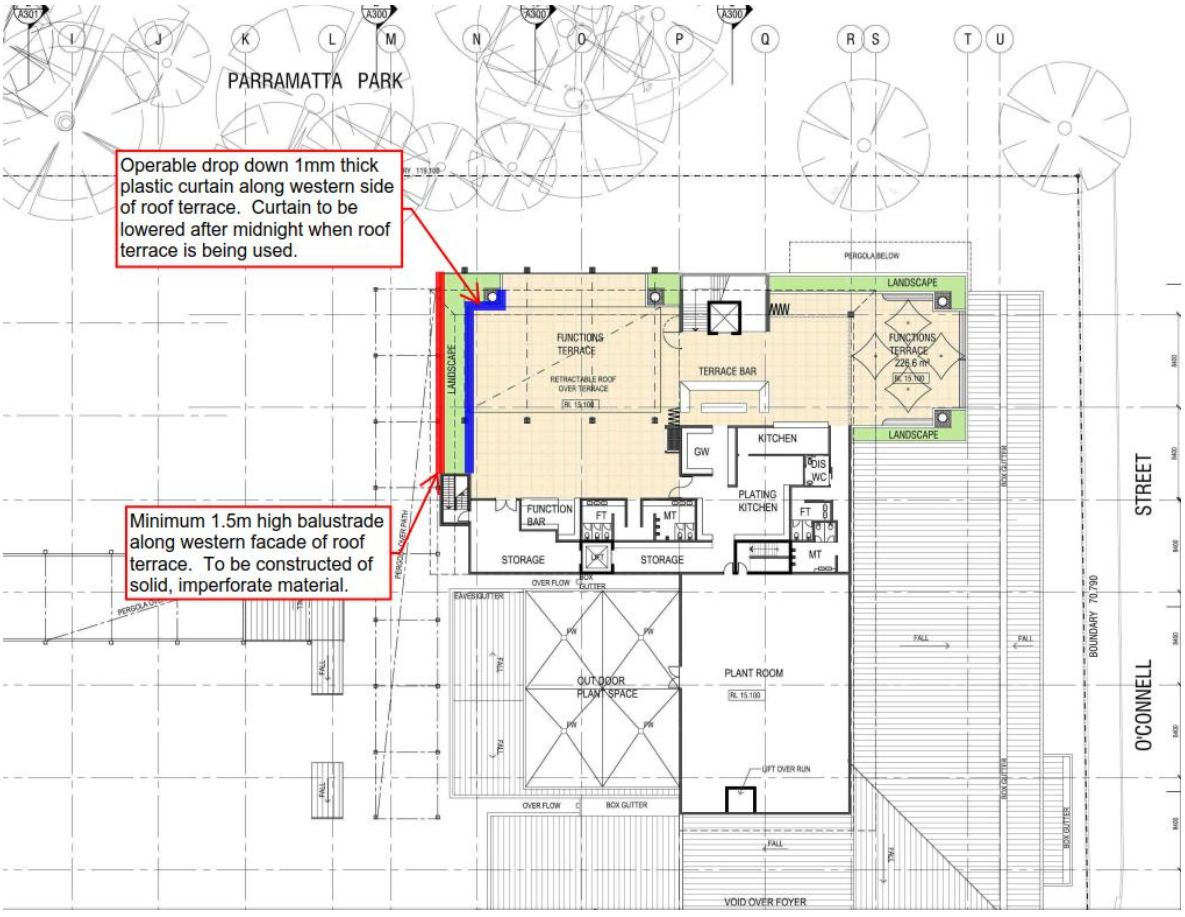


Figure 2 – Recommended Acoustic Treatments for Roof Terrace

6.1.4 Lounge/ Dining

- Only background music (spatially averaged internal noise level up to 70dB(A)$_{L10}$) is permitted within the Lounge/Dining areas of the RSL.

6.1.5 Loading Dock

- Trucks are to switch off their engines during idling.
- No operation during night time period (10pm-7am).
- No garbage compactor operating during night time period (10pm-7am).

6.1.6 Gaming Area

- A minimum 2.4m high solid, imperforate wall/screen is to be constructed along the western and southern façades of the gaming area as shown in the figure below. Screen may be constructed of material similar to 6mm fibre cement sheet.

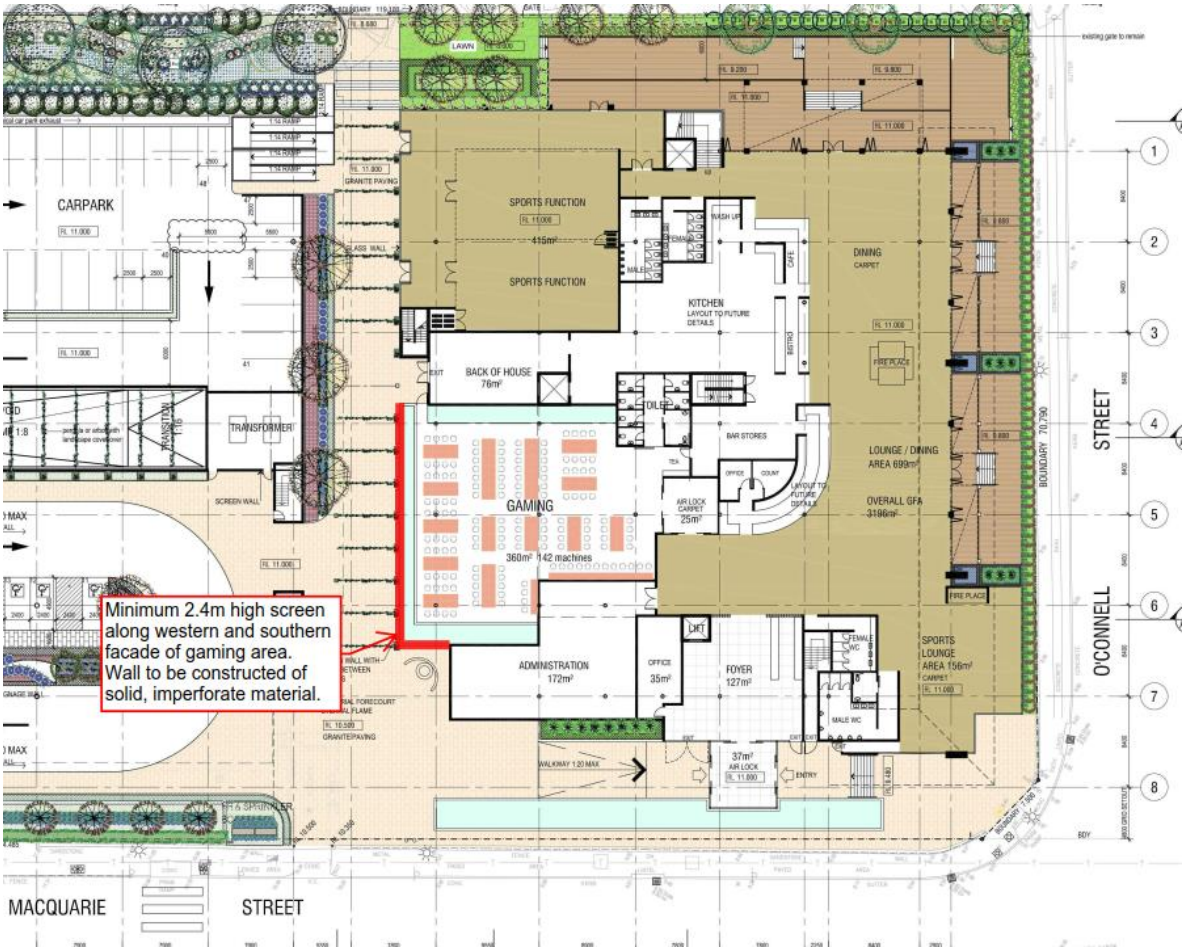


Figure 3 – Recommended Screen for Gaming Area

6.1.7 Mechanical Plant

Mechanical plant would consist of air conditioning units, general ventilation plant and refrigeration equipment.

- Mechanical plant selections had not been finalised at the time of this assessment. Notwithstanding this, plant shall be treated to ensure that noise emissions fully comply with the assessment objectives listed in Section 4. The specific requirements for this treatment would be determined once plant selections and detailed layouts are known (typically at CC stage).

The following indicative measures shall be adopted for mounting of mechanical plant:

- Isolation mounts and connections shall be adopted for all reciprocating and rotating equipment, pipe work and ductwork.

- Selection of suitable vibration system shall be made based on the design minimum isolation efficiency, floor static deflection, and plant/ equipment mass, rotational/ reciprocating speeds and power requirements etc.

- The method of vibration isolation shall be selected for each particular application. The following minimum isolation spring defections are applicable:

    - Air handling plant and Air Condensing Units - 25mm deflection

    - Small Fans - 10mm deflection

- Provide a minimum clearance of 50mm between vibrating equipment and nearby building structure and 25mm between the machine base and the top of a concrete. Provide flexible duct connections at all air handling plant and fans.

6.2 MANAGEMENT CONTROLS

The recommended management controls are:

- Tamper proof sound level limiting devices should be installed, set to limit the sound level in the sport function room to maximum 95dB(A)L_{10} before midnight, and maximum 85dB(A)L_{10} in function rooms after midnight.

- Management controls should be utilised to manage patron departure particularly at night and at closing times to ensure that patrons leave the development in a prompt and orderly manner. This would include the placement of security staff outside the building near closing time, and at other times as required, to direct and quickly disperse patrons away from the premises. Details refer to Evacuation Management Plan for the project site.

- Prominent notices shall be placed to remind patrons to minimise noise after midnight and when leaving the premise.

- All external doors and windows to sport function room are to remain closed during functions, except for patron ingress/egress.

- All garbage shall be retained within the premises and removed after 7am on the following day.

7 CONCLUSION

External noise emission from the proposed New Hospitality Venue, Parramatta RSL has been assessed based on the background noise measurements at the amenity of the project site and the requirements of NSW OLGR /NSW EPA Industry Noise Policy. Provided that the recommendations in Section 6 of this report are implemented, noise emissions to external receivers will comply with all acoustic requirements.

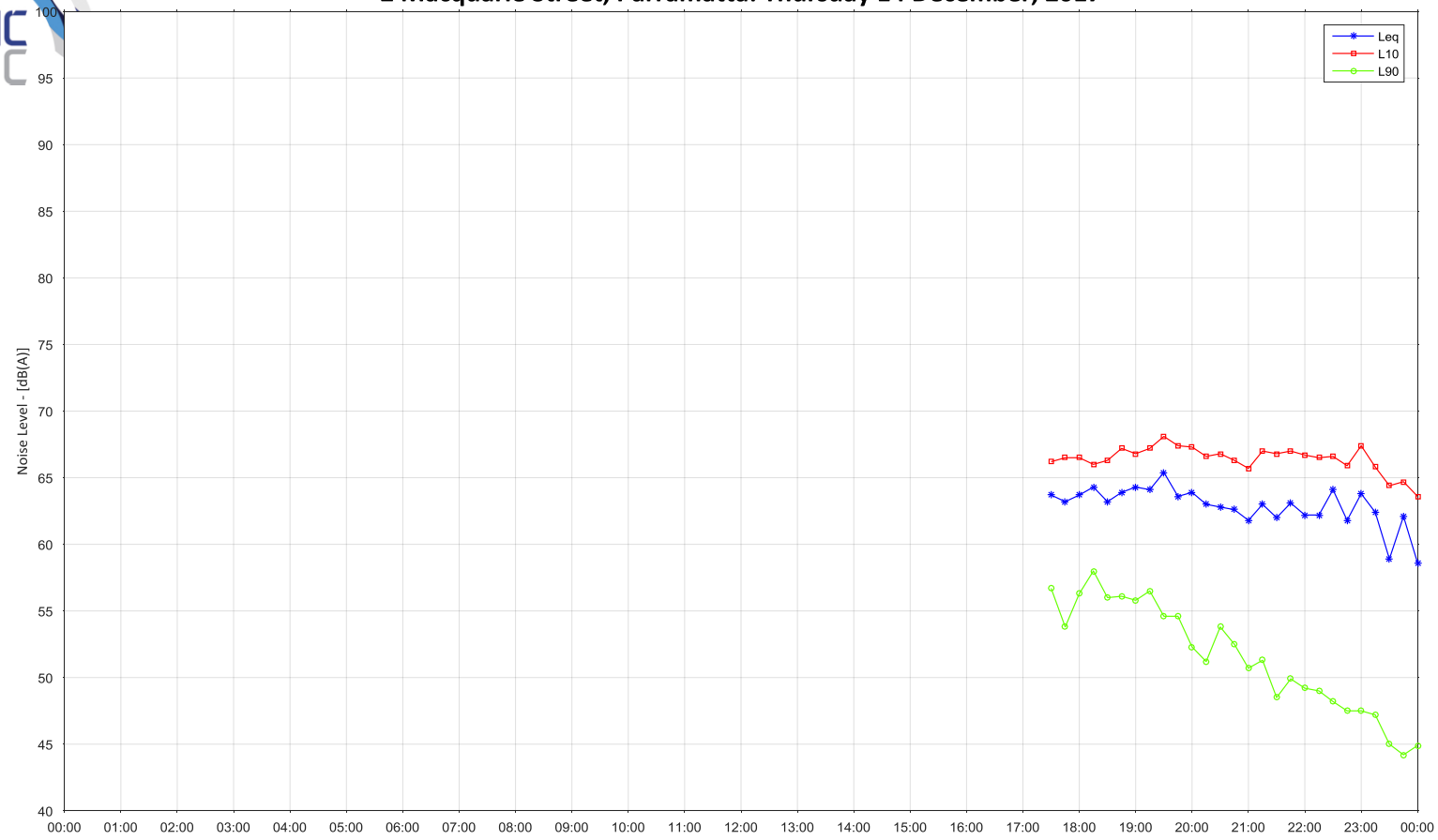
We trust this information is satisfactory. Please contact us should you have any further queries.

Yours faithfully,

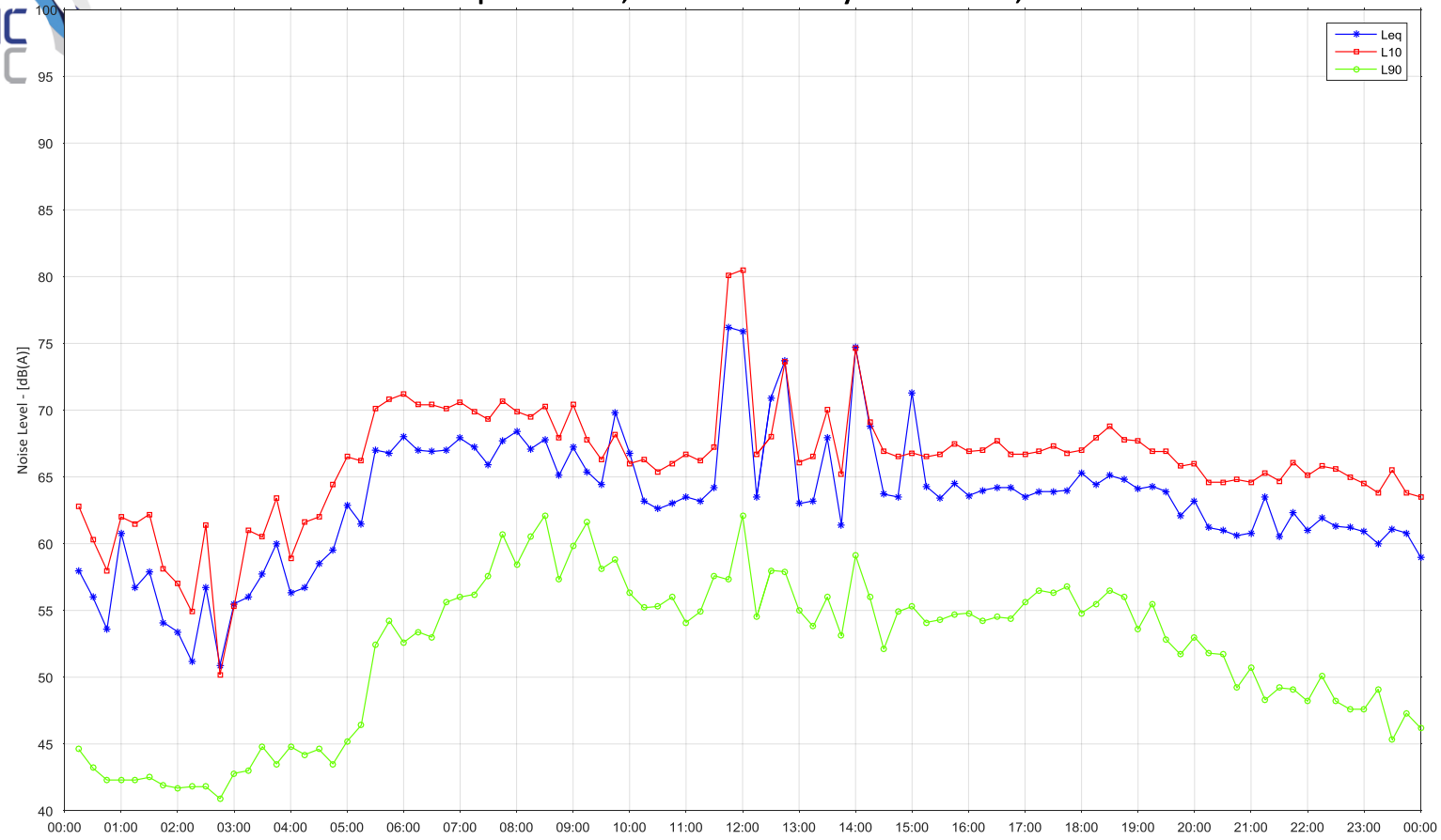
ACOUSTIC LOGIC CONSULTANCY PTY LTD
Justin Leong
Project Acoustic Engineer

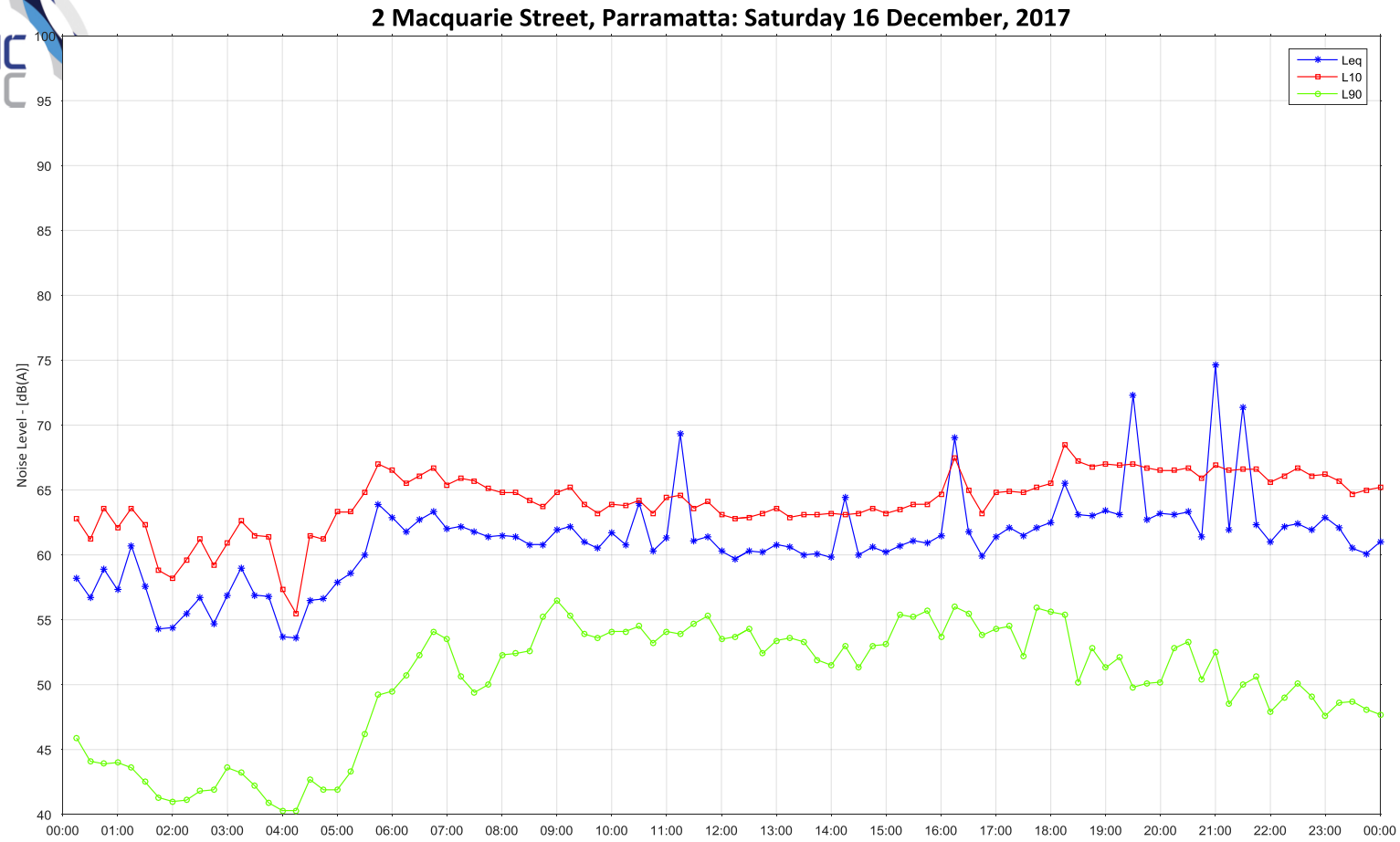
Appendix A Background Noise Monitor Data

2 Macquarie Street, Parramatta: Thursday 14 December, 2017

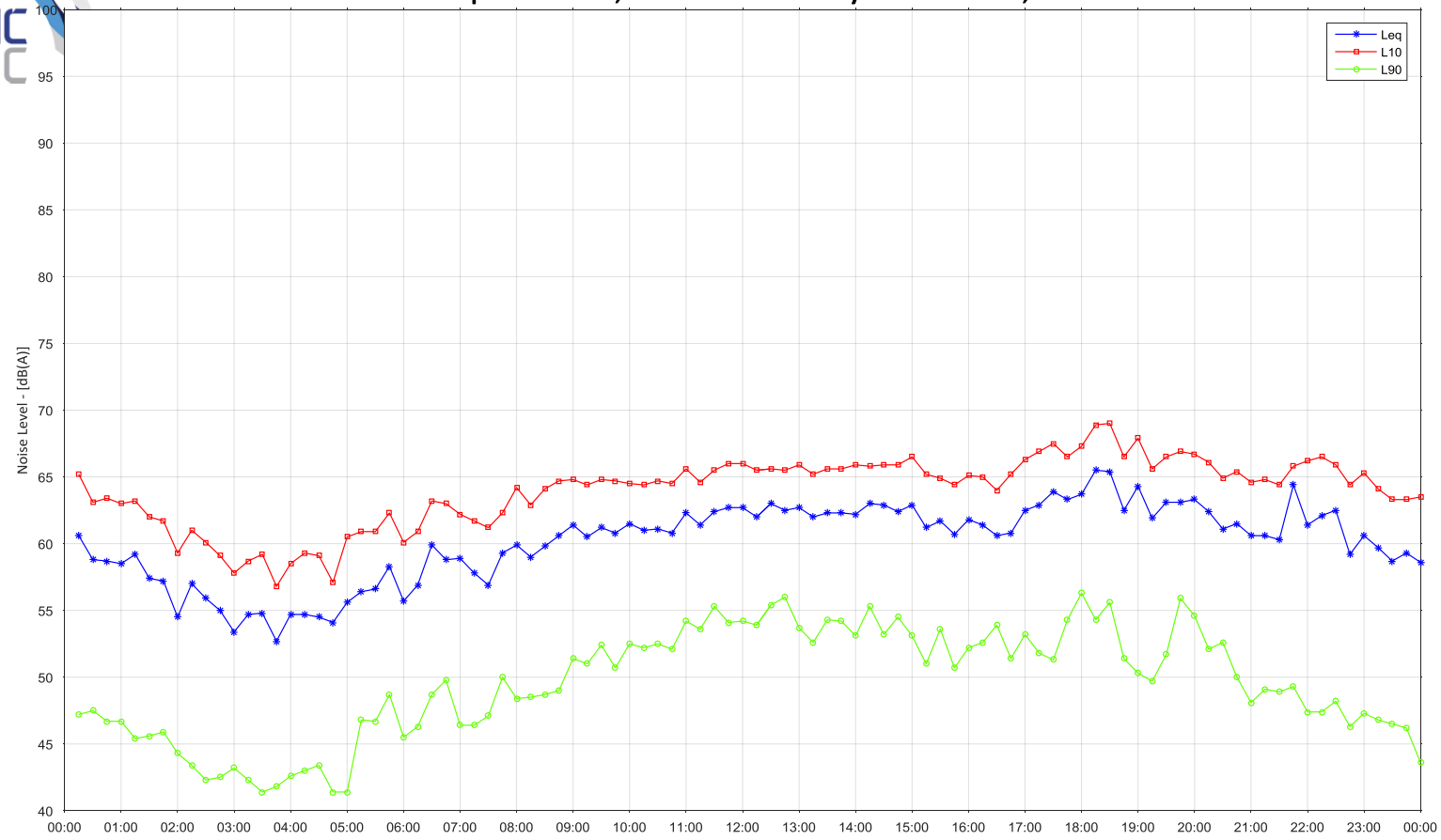


2 Macquarie Street, Parramatta: Friday 15 December, 2017

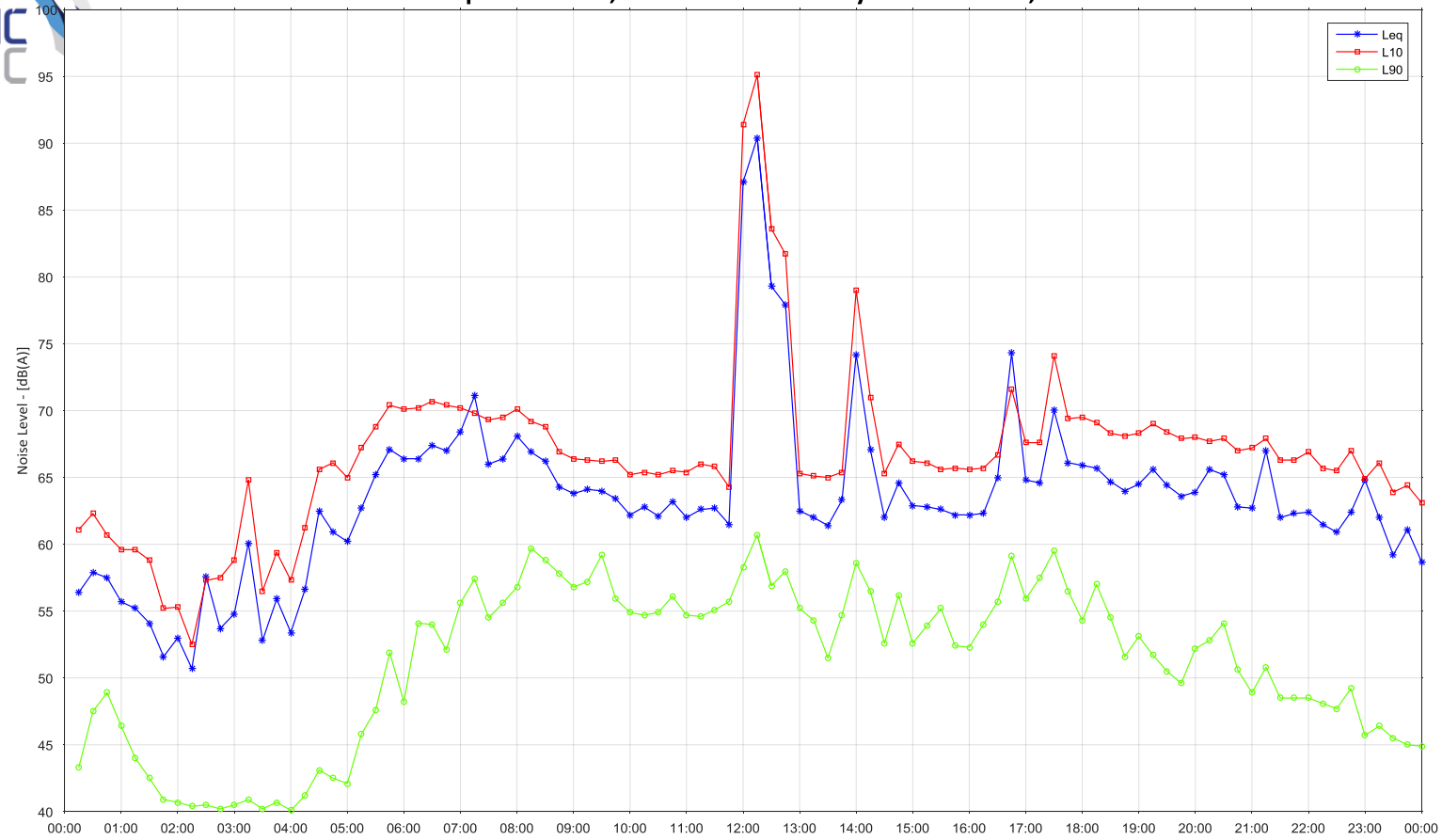



2 Macquarie Street, Parramatta: Saturday 16 December, 2017
Noise Level - [dB(A)]
Leq
L10
L90
100
95
90
85
80
75
70
65
60
55
50
45
40
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00

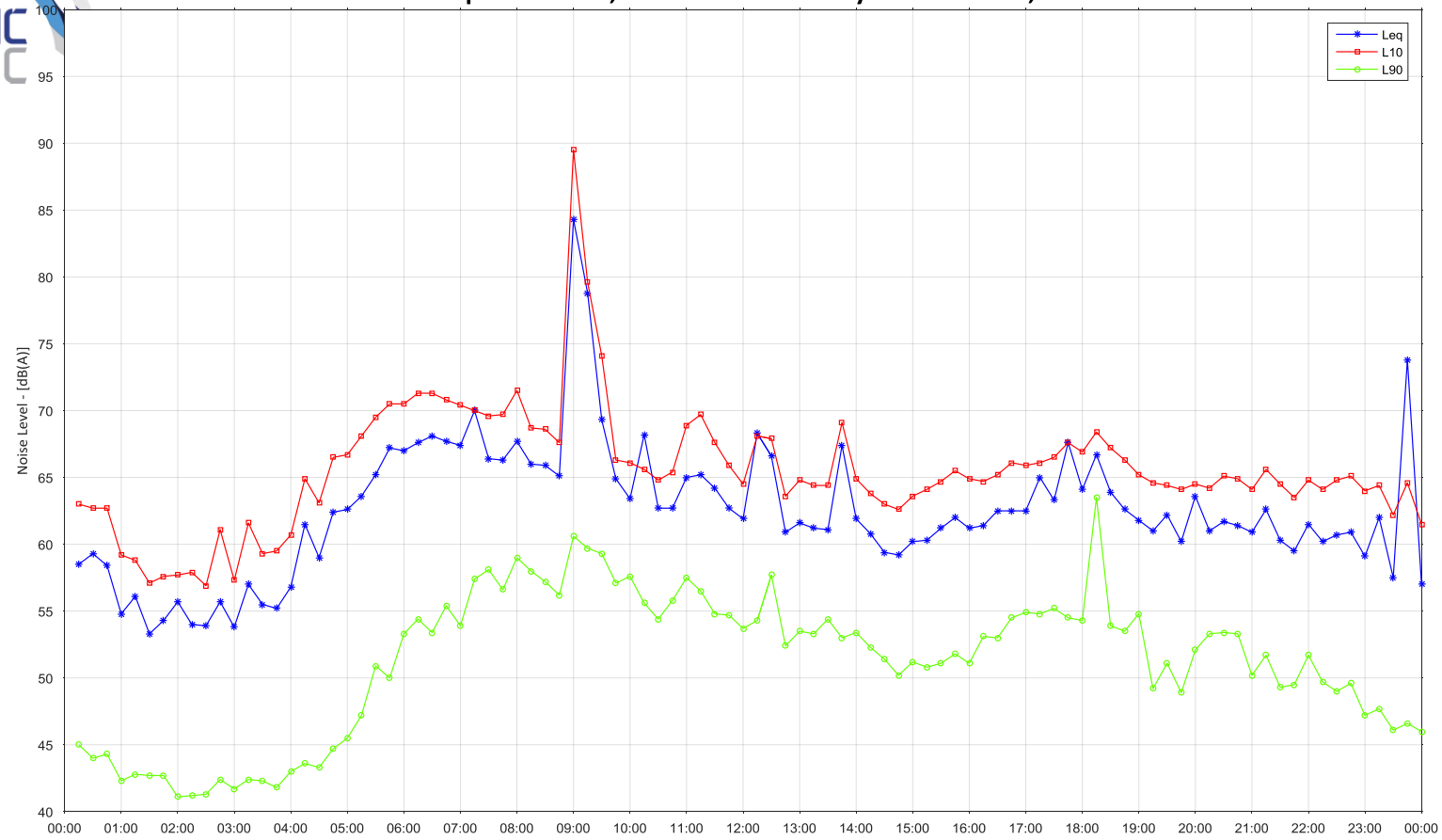
2 Macquarie Street, Parramatta: Sunday 17 December, 2017



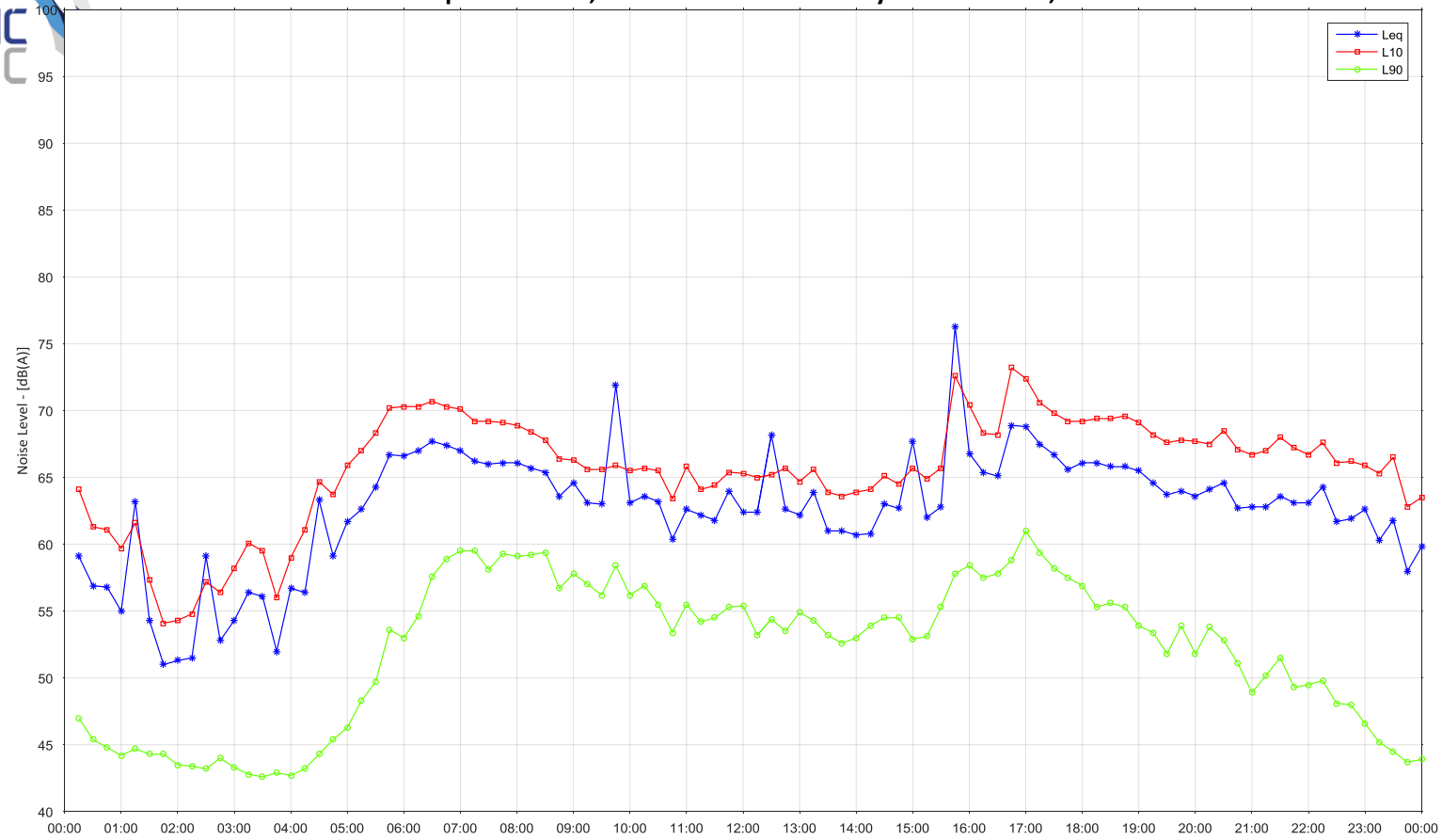
2 Macquarie Street, Parramatta: Monday 18 December, 2017



2 Macquarie Street, Parramatta: Tuesday 19 December, 2017



2 Macquarie Street, Parramatta: Wednesday 20 December, 2017



2 Macquarie Street, Parramatta: Thursday 21 December, 2017