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# ***Acoustic Impact Report***

**For proposed Small Bar**

**at**

**No. 17-19 Central Ave, Manly**

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## **1.0 CONSULTING BRIEF**

Acoustic, Vibration & Noise Pty Ltd was engaged to investigate the environmental noise impact of the proposed Small Bar at No. 17-19 Central Ave, Manly (Figure 1 – Site Location) as per Northern Beaches Council requirements.

The following assessment will be prepared as per the architectural plans by Blackmore Design Group dated the 15<sup>th</sup> October, 2018 and the Statement of Environmental Effects by Symons Goodyer dated April 2018.

As per our calculations and the acoustical study below, the activities from the proposed small bar will not exceed the background noise level by more than 5 dB(A) at the boundary of the most affected noise sensitive location provided all noise control items in Section 7 are adhered to. This report is carried out in accordance with NSW Environmental Protection Authority (EPA), Industrial Noise Policy, and relevant Australian Standards.

This commission involves the following:

- Inspect the site and environs.
- Measure the background noise levels at critical locations and times.
- Prepare an Environmental Noise Impact Report.
- Establish acceptable noise level criterion.
- Quantify noise emissions from the proposed small bar
- Calculate the level of noise emission, taking into account building envelope transmission loss, screen walls and distance attenuation.
- Provide in principle noise control recommendations (if necessary).

## **2.0 PROJECT DESCRIPTION & SUMMARY OF FINDINGS**

The proposed small bar will be located in the basement of an existing seven (7) storey mixed use development (Figure 2 – Existing Building). The development will include one (1) basement level, retail tenancies on the ground floor, six (6) commercial tenancies and ten (10) residential dwellings.

The proposed small bar will be located in the basement of the building. Patrons will access the bar by walking through a proposed ground floor delicatessen. The ground floor area will be used as a food preparation area for the basement Bar. Northern Beaches Council has already approved patrons to use the ground floor area as a walk-through and therefore we will not assess the noise emission of any patrons in the ground floor area in this report.

For the purpose of this report, the nearest residential receiver will be the residential dwellings located in the development at No. 17-19 Central Ave, Manly.

The surrounding environment consists of a high mix of commercial, retail properties and residential properties (Figure 3 – Surrounding Environment) including Novotel Hotel located approximately 60 metres north of the site, St Mary’s Church & School located 70 metres north-west of the site, and mixed use buildings located directly south and west of the site at No. 9-15 Central Ave & 22 Central Ave respectively (Figures 4 & 5).

The proposed small bar will cater to a maximum of seventy-five (75) patrons and five (5) staff members in their indoor dining area. The proposed operating hours are as follows:

- Monday-Sunday: 7:00am – 1:00am

No parking is allocated for the proposed small bar for neither staff nor patrons. Non-allocated parking will be available in the basement of No. 17-19 Central Ave, Manly with limited on-street parking available in surrounding streets.

The existing background noise is dominated by traffic noise from the surrounding streets, the high mix of surrounding commercial and retail tenancies, including their associated Mechanical Plant & Equipment.

The noise emissions from the proposed bar must not exceed the acceptable levels at the nearby receptor location. Noise control may be required for the proposed small bar to comply with the noise criteria set out in Section 5 of this report. The noise controls in Section 6 of this report are reasonable and feasible in reducing the noise to an acceptable level.

### **3.0 NOISE SURVEY INSTRUMENTATION**

On the 5<sup>th</sup> April, 2017, an engineer from this office visited the site at above address to carry out acoustic measurements of the existing background noise levels. Noise measurements were unable to be carried out at the boundary of the nearest receiver, as the development was under construction at the time and any recorded noise levels would have been contaminated due to construction noise

Unattended noise monitoring was carried out on the southern boundary of Pacific Waves at No. 9-15 Central Ave, (Figure 6 – Noise Reading Location); to measure the existing background noise level of the area. Recorded noise levels at this location were not be affected by the construction noise and gave the same indication of what the existing background noise level is.

Unattended noise measurements were carried out for a period of seven (7) days between the 5<sup>th</sup> April, 2017 and the 11<sup>th</sup> April, 2017, to determine a conservative reading of the existing day [07:00-18:00], evening [18:00-22:00] and night [22:00-0:00] noise levels  $L_{(A90, 15 \text{ minutes [1hr])}}$  and  $L_{(Aeq, 15 \text{ minutes [1 hr])}}$ .

All sound pressure levels are rounded to the nearest whole decibel. All measurements were taken in accordance with the Australian Standards AS 1055 “*Acoustics- Description and Measurements of Environmental Noise*”. The measurement procedure and the equipment used for the noise survey are described below. The existing noise readings presented here are carried with Svantek 957 Noise and vibration level meter which has the following features:

- Type 1 sound level measurements meeting IEC 61672:2002
- General vibration measurements (acceleration, velocity and displacement) and HVM meeting ISO 8041:2005 standard
- Three parallel independent profiles
- 1/1 and 1/3 octave real time analysis
- Acoustic dose meter function
- FFT real time analysis (1920 lines in up to 22.4 kHz band)
- Reverberation Time measurements (RT 60)
- Advanced Data Logger including spectra logging
- USB Memory Stick providing almost unlimited logging capacity
- Time domain signal recording
- Advanced trigger and alarm functions
- USB 1.1 Host & Client interfaces (real time PC “front end” application supported)
- RS 232 and IrDA interfaces
- Modbus protocol

Machine was calibrated prior to reading. Any noise results affected by strong wind or rain have been disregarded. The Full Average Statistical Noise Parameters  $L_{(Aeq, 15 \text{ minutes})}$ ,  $L_{(A90, 15 \text{ minutes})}$ ,  $L_{(A10, 15 \text{ minutes})}$ ,  $L_{(A1, 15 \text{ minutes})}$  are presented in Figure 8 - Noise Survey. A Summary of those readings is presented in Table 1 below.

**Table 3.0 - Summary of Existing Noise Survey between the 5<sup>th</sup> April, 2017 & 11<sup>th</sup> April, 2017  
(Confirmed on the 6<sup>th</sup> April, 2018)**

<b>Point A</b>	<b>Leq dB(A)</b>	<b>L90 dB(A)</b>
<b>Day Time (7:00am-6:00pm)</b>	56	49
<b>Evening Time (6:00pm-10:00pm)</b>	55	48
<b>Night Time (10:00pm – 01:00am)</b>	51	43

**\*Small bar will not operate between 1:00am and 7:00am**

**Note\*** An engineer from this office visited the site again on the 6<sup>th</sup> of April, 2018 to confirm above noise levels as construction of the development has been completed. Noise measurements were carried out at the boundary of the site (Point B), adjacent to No. 21 Central Ave, above the proposed bar as shown in Figure-6.

Short-term noise measurements were carried out from 9:05 pm.- 11:45 pm with the results as below.

- Between 9:05 pm. and 10:00 pm. [Evening]. Leq= 57 , and L90 = 48 dB(A).
- Between 10:00 pm. and 11:45 pm. [Night]. Leq= 52 , and L90 = 44 dB(A).

Those measurements are in line with what we monitored and calculated previously.

## **4.0 ACCEPTABLE NOISE LEVELS**

### **4.1 Noise Guide for Local Government**

The Department of Environment and Conservation (NSW) published the amended *Noise Guide for Local Government* in October 2010. The policy is specifically aimed at assessing noise from light industry, shops, entertainment, public buildings, air conditioners, pool pumps and other noise sources in residential areas.

The appropriate regulatory authority (Local Council) may, by notice in writing given to such a person, prohibit the person from causing, permitting or allowing:

1. any specified activity to be carried on at the premises, or
2. any specified article to be used or operated at the premises.

or both, in such a manner as to cause the emission from the premises, at all times or on specified days, or between specified times on all days or on specified days, of noise that, when measured at any specified point (whether within or outside the premises,) is in excess of a specified level.

It is an offence to contravene a noise control notice. Prior to being issued with a noise control notice, no offence has been committed.

The Protection of the Environment Operations Act 1997 defines “Offensive Noise” as noise:

1. (a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:
2. (i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or
3. (ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or
2. (b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulation.

## 4.2 Protecting Noise Amenity

To limit continuing increases in noise levels, the maximum ambient noise level within an area from industrial noise sources should not normally exceed acceptable noise levels for the area.

Relevant parts of the recommended noise levels from industrial noise sources shown in Table 5.2a of the “NSW Industrial Noise Policy”, are shown below:

**Table 4.2.1- Recommended Noise Levels from Industrial Noise Sources**

TYPE OF RECIEVER	AREA	TIME PERIOD	RECOMMENDED Leq NOISE LEVEL, dB(A)
Residence	Urban	Day	60
		Evening	50
		Night	45

Where a noise source contains certain characteristics such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, a correction is to be applied which is to be added to the measured or predicted noise levels at the receiver, before comparison with the criteria. Shown below are the correction factors that are to be applied:

**Table 4.2.2 – Modifying Factor Corrections**

FACTOR	CORRECTION
Tonal Noise	+ 5 dB
Low Frequency Noise	+ 5 dB
Impulsive Noise	Apply difference in measured fast and impulse response levels, as the correction, up to a maximum of 5 dB.
Intermittent Noise	+ 5 dB

A maximum correction of 10 dB is applied where two or more modifying factors are indicated.

## 4.3 Residential Receptor Noise Intrusiveness Criteria

Section 2.2.1 of the Noise Guide for Local Government states that a noise source is generally considered to be intrusive if the noise from the source when measured over a 15 minute period exceeds the background noise by more than 5 dB(A). Similarly The Industrial Noise Policy in Section 2.1 summarizes the intrusive criteria as below:

$$L_{Aeq, 15 \text{ minute}} \leq \text{rating background level plus 5}$$



The ambient  $L_{90}$  background noise level is a statistical measure of the sound pressure level that is exceeded for 90% of the measuring period (typically 15 minutes). The RBL is defined as the overall single-figure  $L_{A90,15 \text{ minutes}}$  background level representing each assessment period (day/evening/night) over the whole monitoring period.

The noise from the source is measured as  $L_{Aeq,15 \text{ min}}$  at the most affected point within the residential property boundary and ideally should be measured at the point where the impact occurs. The Rating Background Level,  $L_{90}$  of the site and the acceptable  $L_{eq}$  noise intrusiveness criterion for **broadband noise** in this area is as follows:

- **Day (7:00-18:00):  $49 + 5 = 54 \text{ dB(A)}$**
- **Evening (18:00-22:00):  $48 + 5 = 53 \text{ dB(A)}$**
- **Night (22:00-1:00):  $43 + 5 = 48 \text{ dB(A)}$**

Where a noise source contains certain characteristics, such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise at the same noise level. Correction factors may be applied to the noise annoyance criteria to determine the project specific criteria.

The proposed small bar and its activity will not exceed the background noise level by more than 5 dB(A) at the boundary of the most affected noise sensitive locations (the residential units located above the site at No. 17-19 Central Ave, Manly), provided all noise control recommendations in Section 6 of this report are adhered to.

#### **4.4 LAB Criterion Related to Noise from Hotels, Clubs & Restaurants**

The Liquor Administration Board (LAB) requires the  $L_{10}$  amplified noise emission to be not more than 5 dB(A) above the background noise level at any time, and not more than 5 dB above the background noise level in any octave band.

After midnight the LAB requires noise emissions to be inaudible inside a habitable room of any nearby residence with the windows open (up to 5% of the floor area).

The NSW EPA is similar, requiring the  $L_{10}$  noise emission level to be not more than 5 dB(A) above the ambient  $L_{90}$  background noise level before midnight and to be not more than background noise level after midnight (where no tonality correction applies).

## **5.0 NOISE EMISSION FROM PROPOSED LAYOUT**

The main sources of noise from the proposed Small Bar may include but are not limited to:

- Mechanical Plant & Equipment including kitchen and toilet exhaust fans, air conditioning and refrigeration condensers; and
- Patron noise from Indoor Dining Area

### **5.1 Mechanical Plant Noise Emission**

The mechanical plant & equipment for the proposed small bar will be carried out using the proposed service ducts through the building. The mechanical plant will not produce any additional offensive noise for the nearest residential receiver as background noise levels are dominated by mechanical plant/equipment from surrounding commercial offices, restaurants and retail shops on Central Ave, which will supersede any potential noise produced by the small bar's mechanical plant.

Recommendations in Section 6 of this report are to be adhered to.

### **5.2 Patron Noise**

As previously discussed, the proposed bar will accommodate a total seventy-five (75) patrons and 5 staff members (Figure 7 – Proposed Layout). No live music will be played in the bar, with controlled background music only.

*Patrons will access the bar through the ground floor area by walking through a proposed delicatessen. The ground floor area will be used as a food preparation area for the basement bar. Noise generated by the use & operation of the ground floor area will be higher than any noise generated by patrons walking through to the basement area. Therefore noise emitted by patrons walking through the ground floor will not be assessed in this report.*

The following table lists the average speech level of different voice efforts at a distance of 1 metre from the Speakers Mouth.

**Table 5.2.1 – Equivalent Sound Levels of Speakers at a Distance of 1m from the Speakers Mouth for Indicated Vocal Efforts**

<b>Voice Effort</b>	<b>Average Speech Level dB(A)</b>
Whispering	36
Soft Speaking	42
Relaxed Speaking	48
Relaxed Normal Speaking	54
Raised Normal Speaking	60
Raised Speaking	66
Loud Speaking	72
Very Loud Speaking	78
Shouting	84
Maximal Shout	90
Maximal Shout (Individual)	96

*Source: Applied Acoustics, Lazarus H (1986)*

It is usually the case that approximately 20% to 60% of the patrons in the proposed small bar could be talking loudly at any one time. Based on noise statistics gathered over many years for similar restaurants in our database, Table 6 below presents noise levels from background music with a maximum of 75 patrons and 5 staff members at the proposed small bar.

**Table 5.2.2 – Predicted Sound Power Level of Background Music and Patrons in the proposed Small Bar**

<b>Activity</b>	<b>dB(A)</b>	<b>Sound Power Level (db) at Octave Band Centre Frequencies (Hz)</b>							
		<b>63</b>	<b>125</b>	<b>250</b>	<b>500</b>	<b>1k</b>	<b>2k</b>	<b>4k</b>	<b>8k</b>
Sound Power Level per Patron <b>L<sub>10</sub></b>	<b>74</b>	57	65	65	71	68	63	54	53
Add Correction for 50% Patrons Speaking	<b>15</b>	15	15	15	15	15	15	15	15
Music Playing in Background	<b>83</b>	62	78	74	74	75	72	73	59
Total Noise from 75 Patrons and 5 Staff Dining and Talking with Music Playing in the Background (50% Speaking)	<b>88</b>	72	82	80	86	83	79	74	68

The predicted noise levels at the potentially most affected receiver (the residential units located above the site at No. 17-19 Central Ave) are presented in the table below and have taken into consideration factors such as Distance Attenuation and Room Enclosure Attenuation.

**Table 5.2.3 – Predicted Sound Pressure Level of Background Music and Patrons at Boundary of Nearest Receiver during the day and evening**

Activity	dB(A)	L <sub>10</sub> Sound Pressure Level (db) at Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
<b>Existing L<sub>90</sub></b> Assessed at Point B in the evening time period	<b>49/day</b> <b>48/evening</b>								
		47	38	34	33	31	27	20	14
Industrial Noise Policy Criterion = L <sub>90</sub> + 5	<b>54/day</b> <b>53/evening</b>	52	43	39	38	36	32	25	19
<b>Predicted L<sub>eq</sub></b> of 75 Patrons and 5 Staff Dining and Talking with Music Playing in the Background (50% Speaking) at Boundary of Nearest Receiver	<b>42</b>	41	32	26	27	25	21	14	8
<b>Complies with NSW Industrial Noise Policy Criteria (L<sub>eq</sub> &lt; L<sub>90</sub> + 5)</b>	✓	✓	✓	✓	✓	✓	✓	✓	✓

**Table 5.2.4 – Predicted Sound Pressure Level of Background Music and Patrons at Boundary of Nearest Receiver during the night**

Activity	dB(A)	Octave Band Centre Frequencies (Hz)							
		63	125	250	500	1k	2k	4k	8k
<b>Existing L<sub>90</sub></b> Assessed at Point A in the night time period	<b>43</b>	42	33	27	28	26	22	15	9
INP & LAB Noise Criterion = L <sub>90</sub> + 5 (before midnight)	<b>48</b>	47	38	34	33	31	27	20	14
LAB Noise Criterion = L <sub>90</sub> (after midnight)	<b>43</b>	42	33	27	28	26	22	15	9
<b>Predicted L<sub>10</sub></b> of 75 Patrons and 5 Staff Dining and Talking with Music Playing in the Background (50% Speaking) at Boundary of Nearest Receiver	<b>42</b>	41	32	26	27	25	21	14	8
<b>Complies with NSW INP, &amp; LAB Noise Criteria</b>	<b>Yes ✓</b>								

The predicted noise levels from the proposed small bar in the table above are mitigated through the existing structure and the distance between the proposed site and the receiver. These levels will comply with the criteria in Section 4 of this report. Noise produced by the operation of the proposed small bar will be contained within the basement. It is assumed that the development is of concrete construction and all noise control recommendations presented in section 6 below are adhered to.

## **6.0 NOISE CONTROL RECOMMENDATIONS**

The proposed use complies with the noise criteria as shown in Section 4 of this report. The predicted level of noise emission from the proposed 75 patrons and 5 staff inside is not in excess of the acceptable noise criterion established in Section 4 of this report. We recommend the following acoustical measures to ensure such compliance.

### **6.1 Mechanical Ventilation**

The mechanical ventilation for the proposed small bar will be carried out using the proposed service ducts through the building. We recommend insulating the ducts with 50mm thick insulation blankets to minimise external noise propagation and installing a silencer Min 2D (E29/90)<sup>1</sup> or Equivalent for any fans.

Provided the above recommendations are adhered to, the mechanical plant will not produce any additional offensive noise for the nearest residential receiver as background noise levels are dominated by mechanical ventilation from surrounding residential buildings, restaurants and retail/commercial premises on Central Ave, Manly.

### **6.2 Background Music and Patron Noise**

The predicted noise levels from soft background music and people talking in the indoor dining area, complies with the criteria among all octave frequency bands. Sound System volume controls should be used to control the level of noise in the indoor bar area. No live bands are permitted to play inside the bar.

### **6.3 Entrance Door**

The door at the entrance to the bar should have a minimum  $R_w$  equal or greater than 40. Door to be fitted with an automatic door closer, parameter and drop acoustic seals.

### **6.4 Noise Management Plan**

A Noise Management Plan should be implemented and should include the following:

- Install a contact number at the front of the bar so that complaints regarding the operation can be made.
- Implement a complaint handling procedure. If a noise complaint is received the complaint should be recorded on a Complaint Form. The Complaint Form should contain the following:
  - Name and Address of the Complainant
  - Time and Date the Complaint was received
  - The nature of the complaint and the time/date the noise was heard
  - The name of the employee that received the complaint
  - Actions taken to investigate the complaint and the summary of the results

of the investigation

- Indication of what was occurring at the time the noise was happening (if applicable)
- Required remedial action (if applicable)
- Validation of the remedial action
- Summary of feedback to the complaint

Also a permanent register of complaints should be held on the premises, which shall be reviewed monthly by staff to ensure all complaints are being responded to. All complaints received shall be reported to management with initial action/investigation commencing within 7 days. The complaint should also be notified of the results and actions arising from the investigation.

## **7 NOISE IMPACT STATEMENT**

Measurements and computations presented in this report show that the noise emissions from the proposed small bar at No. 17-19 Central Ave, Manly with a maximum of 75 patrons and 5 staff, will not exceed the noise criteria set out in the NSW Industrial Noise Policy and Northern Beaches Council requirements.

Noise control recommendations are outlined in Section 7 to ensure compliance through the operation of the proposed small bar. The proposed small bar will comply with the relative sections of the EPA and will not create any offensive noise as stated in the NSW Industrial Noise Policy.

Should you require further explanations, please do not hesitate to contact us.

Yours sincerely,



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**8 APPENDIX**

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Figure 1 – Site Location



Figure 2 - Existing Building



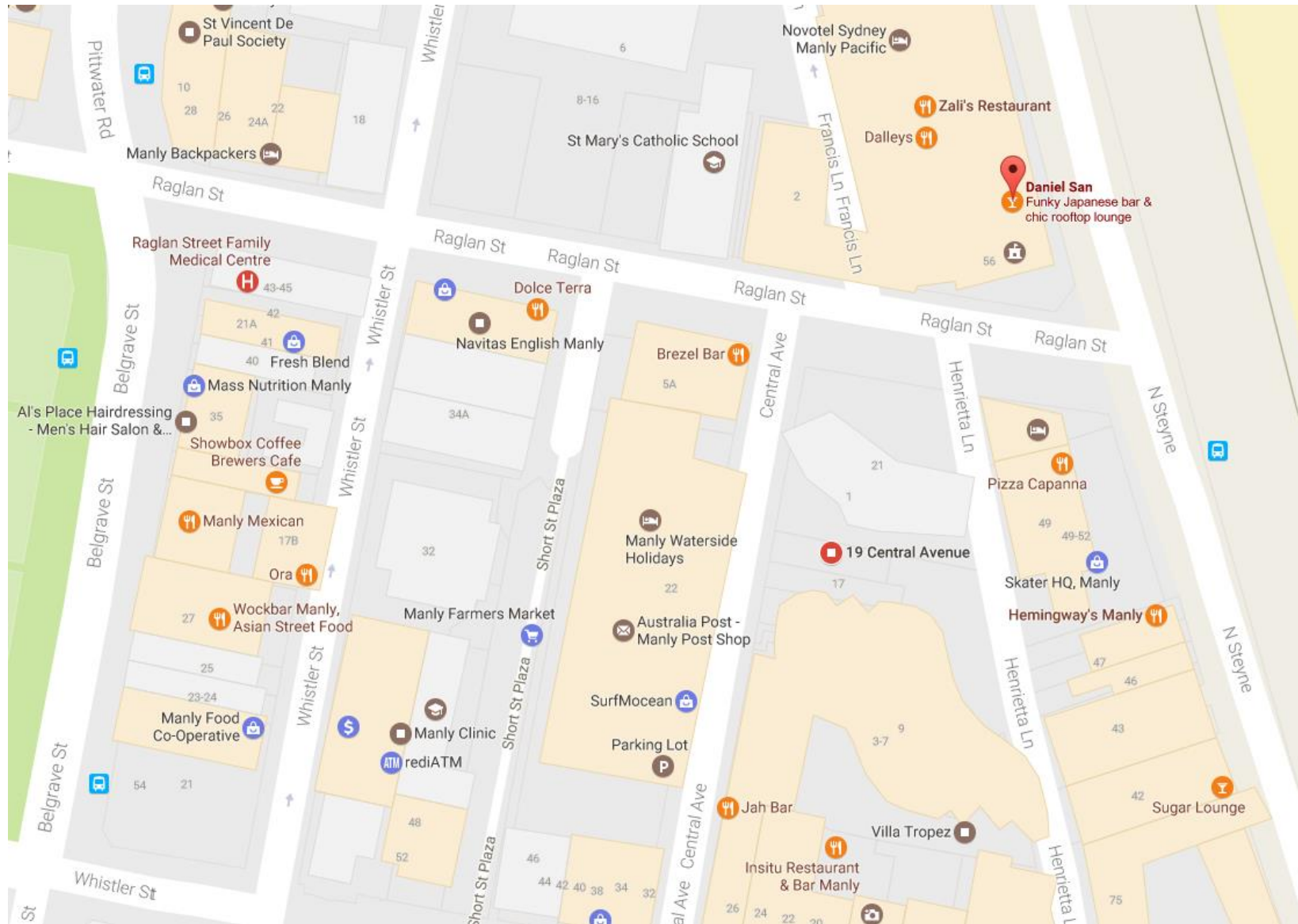


Figure 3 - Surrounding Environment



Figure 4 - Mixed Use Building located at No. 9-15 Central Ave (Pacific Waves)





Figure 5 – Mixed Use Building Located at No. 22 Central Ave, Manly (Manly National Building & Australia Post Office)



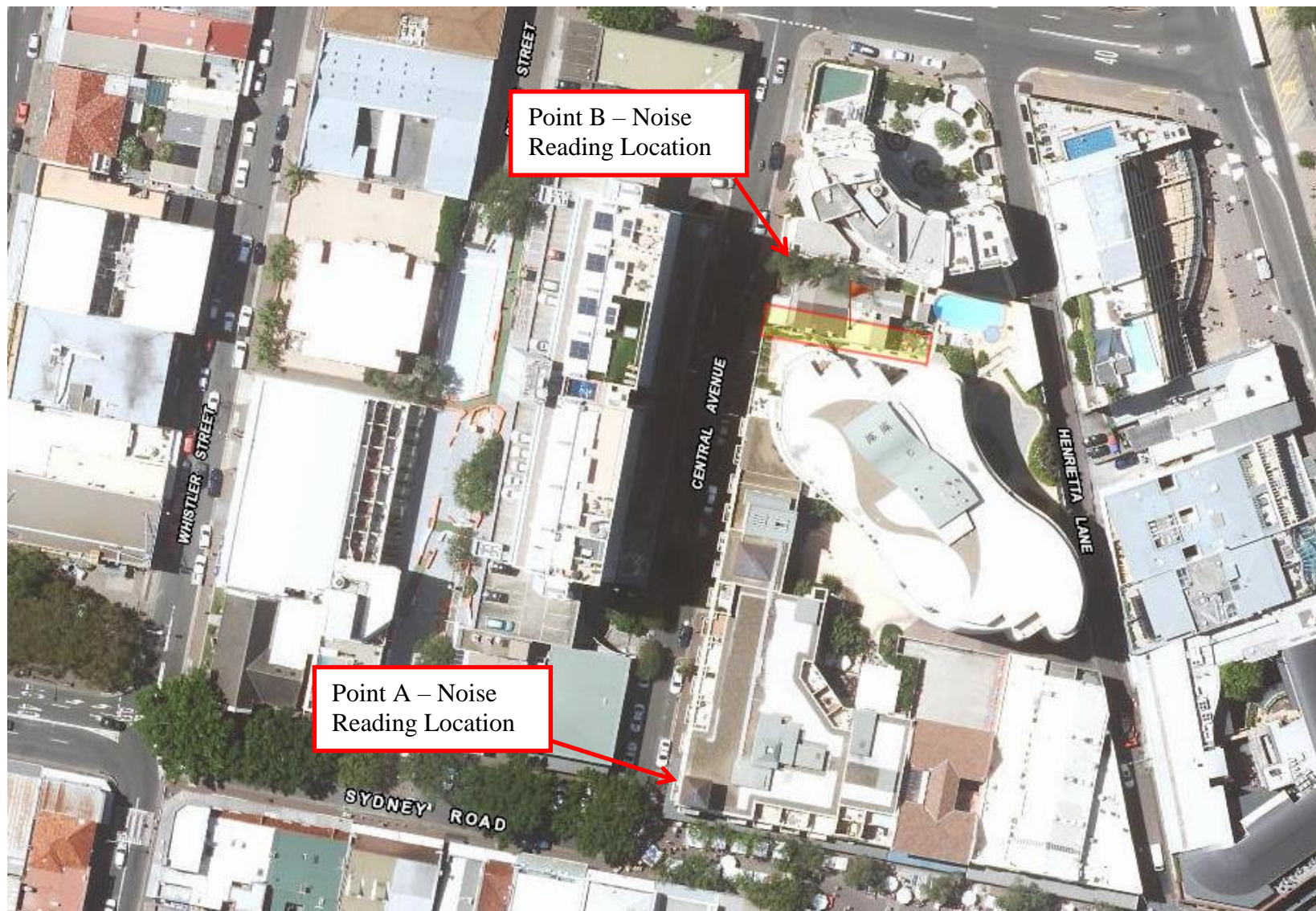
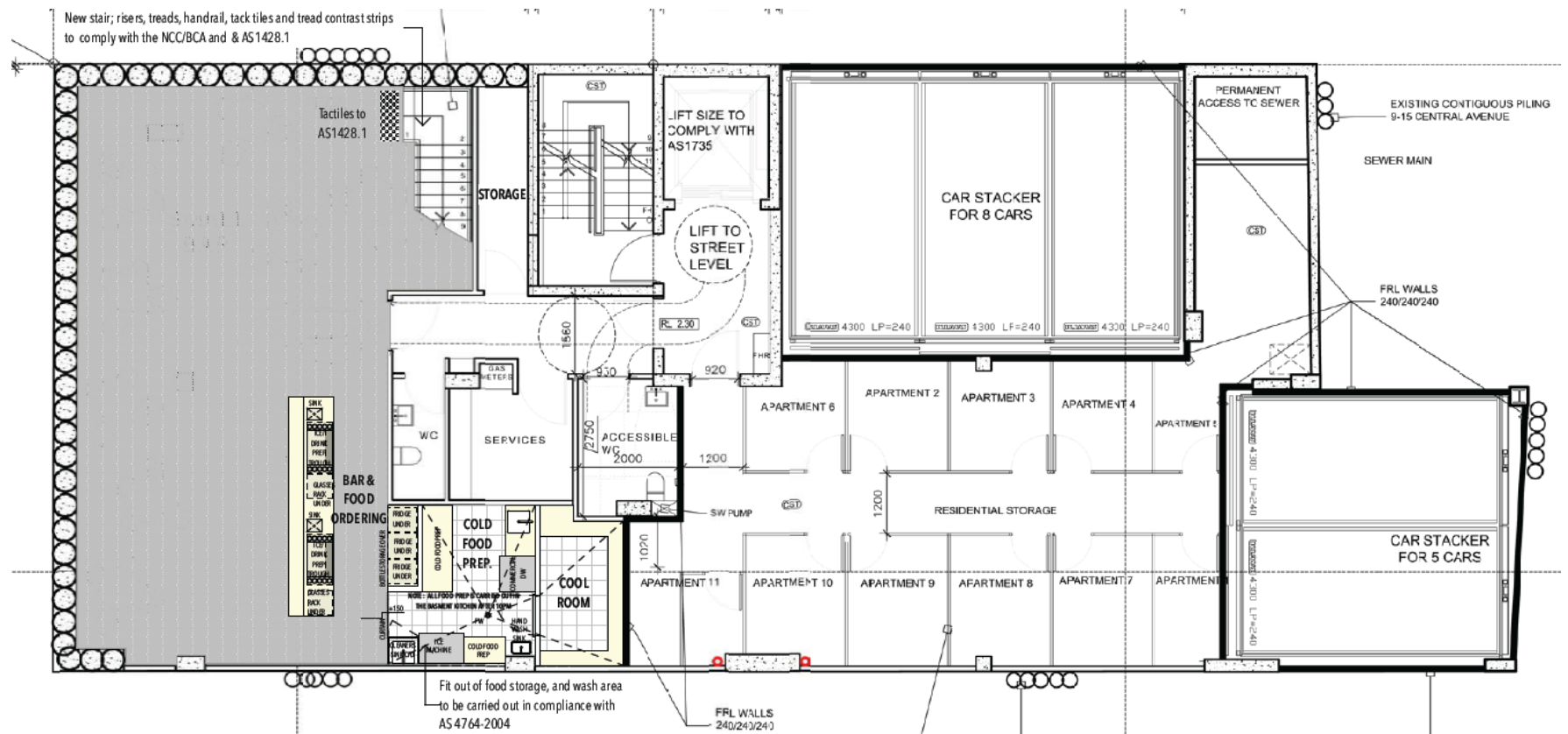


Figure 6 - Noise Reading Location



**Figure 7 - Proposed Small bar Layout**

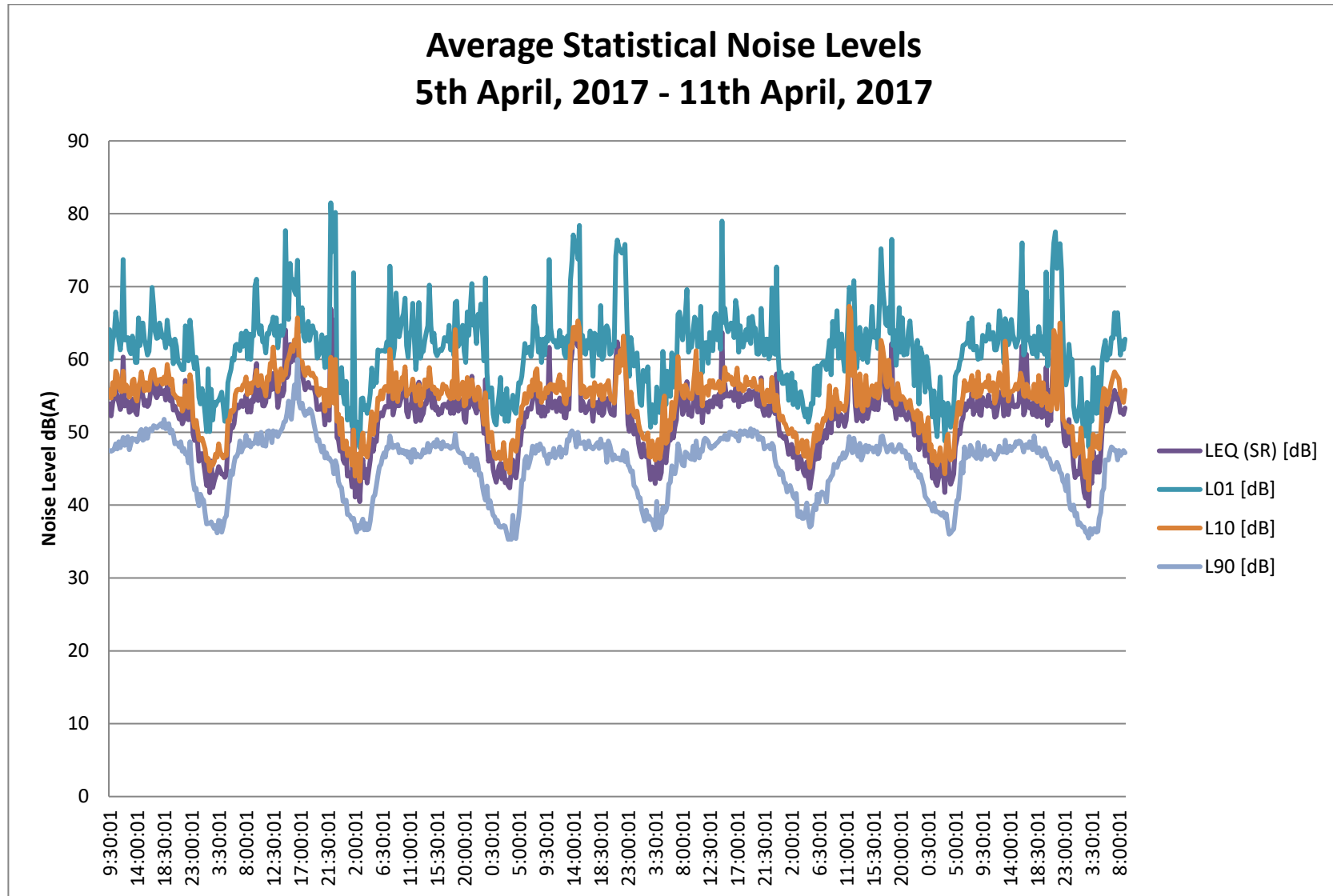


Figure 8 - Noise Survey