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ACOUSTICAL REPORT

PROPOSED FOOD AND DRINK PREMISES

SHOP 1/43-45 NORTH STEYNE, MANLY NSW

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ACOUSTICAL REPORT

PROPOSED FOOD AND DRINK PREMISES

SHOP 1/43-45 NORTH STEYNE, MANLY NSW

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1.0 INTRODUCTION

Koikas Acoustics Pty Ltd was commissioned to conduct a noise impact assessment of the proposed development at Shop 1/43-45 North Steyne, Manly seeking approval for the change of use to a licensed food and drink premises.

For this DA, the acoustical adequacy of the proposed design must be assessed in terms of standard planning guidelines issued by the Northern Beaches Council in their Local Environment Plan (LEP), Development Control Plan (DCP), and other standard planning guidelines related to common sources of noise.

As per the Council guidelines and other standard planning instruments, Koikas Acoustics has determined the following acoustical components require an assessment at the current DA stage:

- Noise emissions from plant and equipment and potential impacts on nearby residential receivers;
- Noise emission from patrons and music and potential impacts on nearby residential receivers;
- Internal transfer of noise from the use of the premises to the apartments above via the common floor-ceiling system.

This report presents the results and findings of an acoustical assessment for the subject proposal. In-principle acoustic treatments and noise control measures detailed within this report are deemed necessary for the development to comply with the nominated acoustical planning levels/project noise objectives.



2.0 THE PROPOSED DEVELOPMENT

The development is proposed to occupy the site at Shop 1/43-45 North Steyne, Manly.

This location is situated in a primarily urban area classified as B2 'Local Centre' as per relevant land zoning maps included in the Northern Beaches Council Local Environment Plan 2013 (Manly). Surrounding properties are also predominantly residential and commercial in classification, also located within B2 'Local Centre' Zoning. The subject site and surrounding properties are identified in the aerial photograph in Figure 1.



Figure 1. Aerial photo of the subject site, monitoring locations and surrounding area – Image from SixMaps

Prevailing ambient noise conditions on-site and in the local area are generally the result of typical environmental noise such as traffic and localised commercial noise sources.

This acoustic report and any associated recommendations are based solely on the architectural design and drawings prepared by Nexfit Fitout and Install (Dated 16/06/2022). Any changes to the design may impact the findings of this report and associated noise control recommendations.

The food and drink premises is proposed to operate between 7 am – 10 pm every day.



3.0 NOISE SURVEYS

3.1 UNATTENDED AMBIENT NOISE SURVEY

Two unattended noise logging surveys were conducted between the 17th to the 23rd of August 2022.

Noise Logger 'A' – Svantek 957: The microphone was placed on the awning fronting North Steyne at approximately 1.5 metres above the first-floor level.

Noise Logger 'B' – Svantek 977: The microphone was placed on a residential balcony fronting Henrietta Lane at approximately 1.5 metres above the second-floor level.

The instruments were set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response. Noise levels were stored within the logger memory at 15 minutes intervals on the quarter-hour.

A NATA calibrated and certified Larson Davis CAL200 precision acoustic calibrator was used to field calibrate the sound level meter before and after the noise survey. No system drift was observed for this sound level meter.

A review of the weather records from the Bureau of Meteorology shows that adverse weather conditions did not influence the noise environment during the measurement period. Observable short-duration extraneous noise events were removed from the survey data.

A summary of the noise survey data is presented below.



Table 1. Summar	y of noise logger resul	ts [dB]				
Location	Period, T ¹	Ambient noise level L _{Aeq}	Rating background level LA90			
	Day	64	59			
Noise Logger 'A' Fonring North Stevne	Evening	63	59			
	Night	64	59			
Noise Logger 'B'	Day	62	55			
Froning Henrietta	Evening	58	55			
Lane	Night	57	54			
Notes 1. The NSW EP Daytime: 7 a Evening: 6 p Night: 10 2. The EPA/RM Daytime: 7 a Night: 10	A Noise Policy for Industry im – 6 pm Monday to Saturd pm – 10 pm Monday to Sunda pm - 7 am Monday to Saturc S/NSW DoP refers to: im – 10 pm seven days per w pm - 7 am seven days per w	(NPfI) refers to: ay and 8 am to 6 pm Sunday and public ay lay and 10 pm to 8 am Sunday and pub eek. eek	c holidays. Iic holidays.			

1/1 octave band background noise levels ($L_{A90 Period}$) were also derived from the survey data and are presented below.

Table 2. 1/1 octave band background noise levels [LA90, Period dB]													
		1/1 octave band centre frequency [Hz]											
Description	31.5	63	125	250	500	1000	2000	4000	8000	Total			
Residential Properties Fronting North Steyne													
Daytime – 7 am-6 pm	21	31	40	49	53	54	53	49	37	59			
Evening – 6 pm-10 pm	21	32	41	49	54	55	52	48	37	59			
Nighttime – 10 pm-12 am	21	31	40	48	53	54	52	48	36	59			
	Re	sidentia	l Propert	ies Front	ing Henr	ietta Lan	e						
Daytime – 7 am-6 pm	22	26	39	46	50	51	47	40	26	55			
Evening – 6 pm-10 pm	22	26	40	46	50	51	48	41	26	55			
Nighttime – 10 pm-12 am	20	23	39	46	49	50	46	39	25	54			

Daily logger graphs are attached in **Appendix A**.

3.2 ATTENDED ENVIRONMENTAL NOISE MONITORING

Ambient and ambient background noise levels were also taken within a residential apartment directly above the subject site to determine the internal noise environment of the residential apartments with 43-45 North Steyne, Manly.

Attended noise level measurements were conducted on the 3rd of August 2022 between 11:00 am and 12:00 pm.





Noise levels were measured in the living/dining area fronting North Steyne (Location 1) and in a rear bedroom fronting Henrietta Lane (Location 2).

Noise level measurements were taken with a NATA-calibrated Type 1 NTi XL2 sound level meter. The instrument was set up to measure sound pressure levels as 'A' frequency weighting and 'Fast' time response.

Sound level measurements were taken for durations deemed sufficient to represent the underlying ambient and background noise environment without the influence of extraneous noise or noise from the subject's development.

The sound level meter microphone was placed 1.5 metres above the natural ground.

A summary of the noise survey results is tabulated below.

Table 3. Summary of measured internal noise levels [dB]										
Location	Lago	L _{Aeq}								
1 – Kitchen/Dining Fronting North Steyne	32	35								
2 – Bedroom Fronting Henrietta Lane	25	31								



4.0 ACOUSTIC REQUIREMENTS

4.1 NORTHERN BEACHES COUNCIL DEVELOPMENT CONTROL PLAN (FORMALLY MANLY)

The following has been extracted from the northern beaches DCP regarding noise emissions from

licensed premises:



Figure 2. Section 3.4.2.3 Acoustical Privacy (Noise Nuisance) of the Northern Beaches DCP – Image from Former Manly DCP

The above is a direct copy of the noise condition adopted by *Liquor and Gaming NSW (L&GNSW)*, which is further outlined in Section 4.2 of this report. The following has also been extracted from the DCP regarding mechanical plant noise emissions.

3.9.3 Noise from Mechanical Plant
External mechanical plant systems (for pools, air conditioning and the like) must be acoustically enclosed and located centrally and away from neighbours living areas of neighbouring properties and side and rear boundaries.

Figure 3. Section 3.9.3 Noise from Mechanical Plant of the Northern Beaches DCP – Image from Former Manly DCP

To comply with this requirement of the Northern Beaches DCP, Koikas Acoustics has referred to the EPA's Noise Policy for Industry, the EPA's Noise Guide for Local Government and offensive noise definitions as published by POEO. See Sections 4.3, 4.4 and 4.5 of this report for details regarding the noise control guidelines referenced above.

4.2 L&G NSW LA10 NOISE CONDITION

The standard noise condition that is applied to licensed venues was originally developed by the *Liquor Administration Board (LAB)* and is now adopted by *Liquor and Gaming NSW (L&GNSW)*. The criteria require an assessment of noise before and after midnight and as per the 1/1 octave band components of the noise (31.5 Hz to 8 kHz inclusive).



Before midnight (7 am to midnight), the L_{A10} noise level from licensed premises must not exceed the background by more than 5 dB in any 1/1 octave band centre frequency from (31.5 Hz to 8 kHz inclusive) at the boundary of any residential premises.

After midnight (midnight to 7 am) the L_{A10} noise level from licensed premises must not exceed the background noise level in any 1/1 octave band centre frequency (31.5 Hz to 8 kHz inclusive) at any residential boundary and must not be audible within any habitable room of any residential premises.

Table 4. L&GNSW Noise Criteria	, L A10 15 mi	ns [dB]								
		:	1/1 octa	ve bano	d centre	freque	ncy [Hz]		
Assessment Period	31.5	63	125	250	500	1k	2k	4k	8k	Total
Residential Properties Fronting North	Steyne									
7 am to 6 pm (assessed at the boundary) <i>Background</i> + 5	26	36	45	54	58	59	58	54	42	64
6 pm to 10 pm (assessed at the boundary) <i>Background</i> + 5	26	37	46	54	59	60	57	53	42	64
7 am to 8 am Sunday/Public Holidays (assessed at the boundary) <i>Background</i> + 0	21	31	40	48	53	54	52	48	36	59
7 am to 8 am Sunday/Public Holidays (assessed at the façade) Inaudibility: <i>Background–10 or Tf</i> _{1/1 oct} ¹	26	21	30	38	43	44	42	38	26	49
Residential Properties Fronting Henrie	etta Lane									
7 am to 6 pm (assessed at the boundary) <i>Background</i> + 5	27	31	44	51	55	56	52	45	31	60
6 pm to 10 pm (assessed at the boundary) <i>Background</i> + 5	27	31	45	51	55	56	53	46	31	60
7 am to 8 am Sunday/Public Holidays (assessed at the boundary) <i>Background</i> + 0	20	23	39	46	49	50	46	39	25	59
7 am to 8 am Sunday/Public Holidays (assessed at the façade) Inaudibility: <i>Background–10 or Tf</i> _{1/1 oct} ¹	26	17	29	36	39	40	36	29	15	45
Notes: 1. Inaudibility is determined as th 226:2003, whichever is greater. 2. For sound sources that may co	ne backgrou Table 1 of ntain musi	und nois ISO226: cal tone	e level m 2003 pres s, the corr	inus 10 d ents a 1/ respondi	B, or the 3 octave ng 1/1 oc	threshold band thr tave ban	d of heari eshold o d Tf 1/1 oct	ing (Tf) a f hearing is taken	s defined values (1 as the m	in ISO [f _{1/3 oct}). inimum

A detailed summary of the licensed area noise criteria is provided below.

226:2003, whichever is greater. Table 1 of ISO226:2003 presents a 1/3 octave band threshold of hearing values (1f 1/3 oct, 2).
 For sound sources that may contain musical tones, the corresponding 1/1 octave band Tf 1/1 oct is taken as the minimum of the three (3) Tf (1/3 oct) values within the corresponding 1/1 octave band.
 For sound sources that are defined as being broadband, the corresponding 1/1 octave band Tf 1/1 oct is taken as the arithmetic average of the three (3) Tf (1/3 oct) values within the corresponding 1/1 octave band.

4. The inaudibility level (noise criterion) at the identified frequency is set by the threshold of hearing (ISO 226:2003).

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 Prepared For:
 CGMB Co Pty Ltd



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4.3 EPA NOISE POLICY FOR INDUSTRY

Noise emission design targets have been referenced from the NSW Environmental Protection Authority (EPA) Noise Policy for Industry (NPfI).

The NPfI is designed to assess environmental noise impacts associated with scheduled activities prescribed within the Protection of the *Environment Operations Act 1997*, Schedule 1. It is also used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial operations.

For residential receivers, the guideline applies limits on the short-term intrusive nature of a noise or noise-generating development (<u>project intrusive noise level</u>), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (<u>project amenity</u> <u>noise level</u>).

The most stringent of the project intrusive noise level and project amenity noise level is applied as the **project noise trigger level (PNTL)**. To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same.

As the <u>intrusive noise level</u> is defined in terms of an $L_{Aeq, 15 \text{ minutes}}$ and the <u>amenity noise level</u> is defined in terms of an $L_{Aeq, Period}$, a +3 dB correction is applied to the project amenity noise level to equate the $L_{Aeq, Period}$ to $L_{Aeq, 15 \text{ minutes}}$.

Non-residential receivers are assessed to project amenity noise levels relevant to the applicable receiver category (commercial).

Where noise is measured or predicted below the project noise trigger level, the noise outcome is deemed acceptable. Above the project noise trigger level, management responses such as applying reasonable and feasible noise mitigation measures are to be recommended, along with assessing any residual noise impacts once noise mitigation has been considered. The policy allows the assessing authority to determine whether the noise mitigation measures are reasonable and feasible against project noise trigger levels. The site-specific project noise trigger levels need only be considered for the hours under which the noise or activity occurs, in this case, daytime hours.





Table 5.	NPfI planning levels – L _{Aeq, 15 minutes} [dB]										
Period, T	Int	rusive		Amenity							
(Note 1)	RBL	RBL + 5	Recommended Area amenity noise classification level		High traffic area	² Project amenity noise level	+3dB correction	Project noise trigger level			
			Residential	Properties Frontin	g North Ste	eyne					
Day	59	64	Urban	60	No	55	58	58			
Evening	59	64	Urban	50	No	45	48	48			
Night	59	64	Urban	45	No	40	43	43			
			Residential P	roperties Fronting	g Henrietta	Lane					
Day	55	60	Urban	60	No	55	58	58			
Evening	55	60	Urban	50	No	45	48	48			
Night	54	59	Urban	45	No	40	43	43			
Notes:1.	Notes:1.EPA defines the following periods: Day:7 am to 6 pm Mon to Sat and 8 am to 6 pm Sun and public holidays, Evening: 6 pm to 10 pm Mon to Sun, Night:4343										
2.	such as	high traffic.	.y level – recommen	ided noise amenity te	evel – 5 0B, e	xcept where sp		ices are met,			

4.4 OFFENSIVE NOISE (POEO ACT 1997 DEFINITION)

In the definitions of the Protection of the Environment Operations Act 1997, 'offensive noise' means:

(a) noise that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(*i*) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

(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

(b) noise 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 regulations.

4.5 OFFENSIVE NOISE CHECKLIST (EPA NOISE GUIDE FOR LOCAL GOVERNMENT, 2013)

The EPA Noise Guide for Local Government (NGLG) provides a checklist that is used to assist with

establishing if a particular noise is 'offensive'. The checklist is summarised below:

- Is the noise loud in an absolute sense? Is it loud relative to other noise in the area?
- Does the noise include characteristics that make it particularly irritating?
- Does the noise occur at times when people expect to enjoy peace & quiet?
- *Is the noise atypical for the area?*
- Does the noise occur often?
- Are several people affected by the noise?



5.0 LICENSED PREMISES NOISE ASSESSMENT

Noise levels from licensed areas of the premises were assessed to the Council's noise policy/L&GNSW noise criteria. The assessment considers the proposed layout of the premises per architectural drawings by Nexfit Fitout and Install.

5.1 DESIGN SCENARIOS AND MODELLING ASSUMPTIONS

Noise generated by licensed areas associated with the premises will originate from within the main ground floor seating area.

Specific operating conditions have been assessed that consider varying occupancy levels and noise sources during specific periods throughout the day. These are summarised as follows:

Table 6. Licensed venues assessment scenarios										
Assessment period	Food and Drink Premises									
7 am – 10 pm	70 patrons – 50% speaking with a raised vocal effort Doors/win OPEN									
7 am – 8 am (Sundays and Public Holidays)	70 patrons – 50% speaking with a raised vocal effort Doors/win CLOSED									

5.2 SOURCE NOISE LEVELS

Noise data used in the assessment is sourced from Published noise data from other reference material such as research papers, acoustical texts etc.

Noise levels attributed to people speaking within the food and drink premises are sourced from ANSI S3.5. Indoor noise levels are derived from these sound power levels as well as applying a correction for a reverberant field in a room. The reverberant room noise level presumes an internal reverberation time within the food and drinks premises not exceeding 2.0 secs.

The assessment considers the cumulative impact of the major noise-generating areas of the food and drinks premises with the greatest potential to impact nearby residential receivers.

A summary of the base noise data as taken from reference material is included below.

Table 7. Noise level data, LAIO												
Measurement	Noise	1/1 octave band centre frequency [Hz]										
	metric	31.5	63	125	250	500	1k	2k	4k	8k	Total	
1 x Person speaking with a raised vocal effort	L _{Aw10} SWL	38	47	56	64	74	74	69	64	53	78	

SWL = Sound power level

The above noise data has been corrected to represent the specific design conditions related to the subject premises. The following noise levels have been used in the assessment.

Table 8. Adopted source noise levels for modelling, LA10 dB												
Measurement	Noise	1/1 octave band centre frequency [Hz]										
	metric		63	125	250	500	1k	2k	4k	8k	Total	
70 x Patrons within the food and drinks premises 50% speaking with a raised vocal effort Correction for internal reverberant room level	L _{aw10} SWL	40	49	58	66	76	76	71	66	55	80	

SWL = Sound power level

5.3 IDENTIFIED NOISE-AFFECTED RECEIVERS

Noise is assessed to specific Assessment Locations within each of the identified noise-affected residential and/or commercial receiver sites. The following table provides a summary of the locations that have been assessed.

Table 9.	Assessment locations									
ID	Classification	Address / Receiver Site	Assessment Location							
R1	Residential	43-45 North Steyne	Upper floor window							
R2	Residential	43-45 North Steyne	Upper floor window							
R3	Residential	43-45 North Steyne	Upper floor window							
R4	Residential	42 North Steyne	Upper floor window							

5.4 PREDICTED RECEIVER LEVELS

5.4.1 Before midnight

Table 10. Receiver noise levels - Scenario 1 before midnight, LA10 [dB]										
Description			1/1 oct	tave ban	d centre	frequen	cy [Hz]			Total
	31.5	63	125	250	500	1k	2k	4k	8k	
Daytime: Background + 5 Evening: Background + 5	26 26	36 37	45 46	54 54	58 59	59 60	58 57	54 53	42 42	64 64
R1	22	29	36	42	49	47	40	35	23	52
R2	22	29	36	42	49	46	39	33	21	52
R3	18	26	33	39	46	44	37	30	17	49
R4	22	31	40	48	58	58	53	47	35	62

The following noise levels are predicted for the identified noise-sensitive receivers before midnight:

The noise levels shown in Table 10 confirm that the development <u>complies</u> with the L&GNSW noise condition between 7 am – 10 pm on Monday to Saturdays and between 8 am – 10 pm on Sundays and public holidays.

5.4.2 After midnight

The following noise levels are predicted for the identified noise-sensitive receivers during the nighttime period:

Table 11. Receiver noise levels - Scenario 2 after midnight, LAIO [dB]										
Description	1/1 octave band centre frequency [Hz]									Total
	31.5	63	125	250	500	1k	2k	4k	8k	
Criteria: Background + 0	21	31	40	48	53	54	52	48	36	59
Criteria: Inaudibility ¹	26	21	30	38	43	44	42	38	26	49
R1	5	8	11	13	19	14	5	3	-14	22
R2	5	8	11	13	19	13	4	1	-16	21
R3	1	5	8	10	16	11	2	-2	-20	19
R4	5	10	15	19	28	25	18	15	-2	30
Notes:										

1. Inaudibility is determined as the background noise level minus 10 dB of the threshold of hearing (Tf) as defined in ISO 226:2003, whichever is greater.

The inaudibility level (noise criterion) at the identified frequency is set by the threshold of hearing (ISO 226:2003).



The noise levels shown in Table 11 confirm that the development <u>complies</u> with the L&GNSW noise condition between 7 am – 8 am on Sundays and public holidays.

5.5 RECOMMENDED NOISE CONTROLS

This report finds that the following noise control/noise management strategies are recommended for the proposed development:

- All windows and doors should remain closed between the hours of 7 am 8 am on Sundays and public holidays, except as used for entry and exit.
- The main sliding door may remain open during all other times.
- Perimeter and drop seals should be fitted to the main entry and bi-fold doors so that the doors seal correctly. Suitable acoustic seals could be provided from Raven door frame/perimeter and door bottom seals, or an approved equivalent from another manufacturer.

6.0 MECHANICAL PLANT NOISE ASSESSMENT

Mechanical plant noise emission has been assessed as per the specification of plant and equipment and installation locations as detailed on the project mechanical services plans, issued by Elite Ventilation, Drawing No. KE2246-22, dated 17/06/2021.

6.1 ASSESSMENT SCENARIOS

All plant & equipment have been assessed to be operating at maximum capacity during night-time hours. Compliance during the night-time period implies that compliance will also be achieved during other periods of the day with less stringent noise criteria.

6.2 EQUIPMENT AND ASSOCIATED SOUND LEVELS

The mechanical services plans identify the following plant and equipment to be installed in the development. Associated noise data is included.

Table 12.	Table 12. Schedule of equipment and noise levels									
ltem	Model		ID	Descriptor	Noise level [dBA]	Location				
Makeup Air Fan		Eco Dynamic Fans IC400-EC	MUA.1	Lw	55	Shop 1				
Kitchen Exhaust Fan		Fan Select GR31C-ZID.DG0CR	Exhaust Fan	Lw	87	Shop 1				
Toilet Exhaust Fan ^{1, 2}		Generic Commercial Toilet Exhaust Fan		Lw	62	Loading Dock				
AC Condenser Unit ^{1,} 2		Panasonic CU-L72JD1R8		Lw	69	Loading Dock				
Notes: 1.	These mechanical plant items have not been included in the mechanical services drawings, however, Koikas Acoustics has been advised that these items may be introduced in the future. Koikas Acoustics has adopted equipment that is comparable in size to what would typically be required for a shop of this nature, however, the mechanical plant selections for these items should be verified by a mechanical engineer and re-assessed when final selections and locations are made, should these items be introduced in the future.									
2.	These sou Koikas Ace	rce noise levels have been sou oustics	rced from measu	rements taken	of the units pre	viously by				

An attenuator schedule is also included in the mechanical services plans. The silence used for the makeup air fan has not been specified on the mechanical services drawings, Koikas Acoustics has assumed that the same silencer will be used for the makeup air fan, as what is used on the kitchen exhaust fan. Alternate attenuators may be used where they are shown to have comparable or better insertion loss values than those nominated below.



Table 13.	Schedule of attenuators									
ID	Attenuator serving	enuator serving 1/1 octave band centre frequency insertion loss, [dB]								
		63	125	250	500	1000	2000	4000	8000	
Silencer 1	Kitchen Exhaust Fan/Makeup Air Fan	5	9	17	28	32	25	17	13	

6.3 CALCULATED RECEIVER LEVELS

Mechanical plant noise levels have been predicted to nearby residential and commercial receivers by way of preparing an acoustic model and conducting point-to-point calculations based on standard sound propagation algorithms. All calculations consider the equipment as selected in the mechanical services plans, the associated sound levels and corresponding attenuators.

Reference should also be made to additional noise control recommendations included within Section 6.4 of this report, which also govern the calculated receiver noise levels.

Due to the size of the development, several potentially affected receiver locations must be assessed in terms of their respective noise exposure from mechanical plant & equipment associated with the development. The most noise-sensitive receiver locations are summarised below.

Table 14	Assessment locations	
ID	Receiver type and address	Assessment location
R1	Residential / 43-45 North Steyne	Upper floor level
R2	Residential / 43-45 North Steyne	Upper floor level
R3	Residential / 43-45 North Steyne	Upper floor level
R4	Residential / 42 North Steyne	Upper floor level
R5	Residential / 42 North Steyne	Upper floor level
R6	Residential / 42 North Steyne	Upper floor level
R7	Residential / 43-45 North Steyne	Upper floor level
R8	Residential / 43-45 North Steyne	Upper floor level
R9	Residential / 43-45 North Steyne	Upper floor level
R10	Residential / 43-45 North Steyne	Upper floor level
R11	Residential / 3-7 Central Avenue	Upper floor level
R12	Residential / 3-7 Central Avenue	Upper floor level
R13	Residential / 3-7 Central Avenue	Upper floor level
R14	Commercial / 46 North Steyne	Upper floor level



Predicted mechanical plant and equipment noise levels, inclusive of all identified fans and air conditioning condensers are as follows:

Table 15. Calcul	ated receiver noise levels [d	B]	
Receiver location	Calculated Mechanical Plant Noise Levels - L _{Aeq}	EPA NPfl Residential Nighttime Criterion - L _{Aeq}	Exceedance
R1	4		
R2	4		
R3	2		
R4	2		
R5	12		
R6	13		
R7	31	43	
R8	43		
R9	24		
R10	31		
R11	37		
R12	31		
R13	30		
R14	10	63	

Mechanical plant noise levels have been assessed to comply with the limiting NPfI criteria, pending the inclusion of noise control measures as detailed in the following section of this report.

6.4 **RECOMMENDATIONS**

- Fans and AC condensers are to be installed in locations as identified on the current mechanical services plans as nominated within this report.
- Internal duct lining as shown on the mechanical services plans should be 50 mm thick fibreglass duct lining material that has a density of no less than 24 kg/m³.
- All ductwork after the kitchen exhaust fan and its silencer to the existing riser shaft should be fitted with 50 mm thick fibreglass duct lining material that has a density of no less than 24 kg/m³. The existing riser shaft may remain without duct lining.
- All ductwork and fans are required to be vibration isolated from the ceiling and/or walls. Contact Embelton or Mason Mercer regarding vibration isolation hangers and mounts.



- Acoustic attenuators (silencers) are to be provided for the kitchen exhaust fan and the makeup air fan and are to achieve the sound insertion loss levels as identified in Section 6.2 of this report.
- If an AC condenser unit is to be placed in the loading dock, the condenser unit should not have a sound power level that exceeds 69 dB(A), and the roller door to the loading dock should remain closed between 7 am – 8 am on Sundays and public holidays if the condenser unit is in use during this time.
- Alternate fans and AC condensers to those nominated in this report may be used provided their performance is certified by a mechanical and acoustical engineer.



7.0 OPERATIONAL INTERNAL NOISE TRANSFER

Internal noise level transfer to the directly adjoining residential premises is assessed against the POEO offensive noise guidelines outlined in Section 4.4 of this report. It is the opinion of Koikas Acoustics that during daytime and evening operations (7 am – 10 pm), noise levels are generally considered non-offensive if noise levels do not exceed the prevailing internal ambient background noise by more than 5 dB. Where the background noise level + 5 dB was below the threshold of hearing (*as identified in ISO 226:2003*), the threshold of hearing has been adopted as the criteria. Internal noise transfer through the common ceiling/floor system has been assessed to the adjoining residential premises at 43-45 North Steyne, Manly.

As such, the following noise criteria have been adopted for the residential units directly above the subject site.

Table 16. Summary of adopted internal noise criteria [dB]									
Location	Adopted Criterion - L _{Aeq}								
Rooms fronting North Steyne	32	37							
Rooms fronting Henrietta Lane	25	30							

As the unattended noise logging survey measured the ambient background noise levels (L_{A90}) to be the same during the day and evening periods, Koikas Acoustics assumes that the internal ambient background noise levels will also be the same during these two periods.

Per the architectural drawings outlined in Section 2.0 of this report, a 200 mm concrete slab exists between the ground floor shops and the apartments directly above. However, as this is not confirmed, Koikas Acoustics has assumed a 150 mm slab exists between the ground floor shops and the adjoining residential units directly above, as a worst-case scenario. The following sound transmission data has been obtained from Insul V9.0 transmission loss prediction calculations:

Table 17. Sound Transmission Loss (STL) for common partitions [dB]									
	1/1 octave band centre frequency [Hz]								
Construction	63	125	250	500	1k	2k	4k	8k	RW
150 mm concrete	42	44	42	49	57	63	68	70	54



7.1 SOURCE NOISE LEVELS AND ASSESSMENT SCENARIOS

Table 18.	Noise Source and noise levels							
Noise Sour	ce	Descriptor	Noise level, [dB]	Location				
Front Food	and Drink Premises	-						
A person	speaking with a raised vocal effort ¹	L _{Aw}	75	Front main service area				
	Makeup air fan ²	Law	76	Shop 1				
Breakout	noise from the kitchen exhaust duct	Law	53	Existing riser shaft				
Middle to R	Rear Prep Rooms/Kitchen/Loading Do	ock						
A person	speaking with a raised vocal effort ¹	Law	75	Rear kitchen/loading dock				
	Kitchen Exhaust Fan ³	L _{Aw}	87	Shop 1				
AC Con	denser Unit/Loading Dock Noise ³	L _{Aw}	58	Loading Dock				
	Toilet Exhaust Fan ³	Law	62	Toilets				
Se	elf-contained fridge/freezer ³	Law	74	Kitchen				
Notes: 1. 2. 3.	Source noise levels have been sourced from ANSI S3.5. Source noise levels have been sourced from the mechanical services drawings as outlined in Section 6.2 of this report. Source noise levels have been sourced from measurements taken previous of the equipment/area by Koikas Acoustics at similar premises.							

The noise sources considered in the assessment scenario are tabulated below.

The following design scenarios are assessed. Assumptions included in the design are also noted for reference.

Table 19. D	esign scenarios and assump	otions
Scenario	Area Description	Design assumptions
	Front main service area	 70 x people in the main service area – 50 % speaking with a raised vocal effort Makeup air fan operating at maximum capacity Breakout noise from kitchen exhaust duct – Calculated using Strutt's duct breakout calculation
3	Middle to rear kitchens/prep areas/loading dock	 24 x people in the prep areas/loading dock - 50 % speaking with a raised vocal effort Toilet exhaust fan operating at maximum capacity Kitchen exhaust fan operating at maximum capacity Loading dock area/AC operating at maximum capacity Self-contained fridge/freezer unit

Internal noise levels have been corrected to represent the reverberant field in the room. The reverberant room noise level presumes an internal reverberation time of 2.0 seconds.



7.2 CALCULATED RECEIVER NOISE LEVELS

Strutt's room-to-room noise transfer calculation has been used to assess noise transfer through the common ceiling/floor system. The program uses the following equation:

 $L_{p2} = L_{p1} + TL + 10 \log_{10}(S/A)$

Where:

 L_{p2} = the internal noise level in the adjoining residential unit

 L_{p1} = the sound power level in the shop on the ground floor

TL = the sound transmission loss through the existing slab

- S = the surface area of the common existing slab
- A = the absorption area of the room, which is back-calculated using the volume (V) and reverberation time (*RT*) of the room using the Sabines equation ($A = \frac{0.161V}{PT}$)

Table 20. Internal Receiver Noise Levels from Internal Transfer, LAEq, 15 mins [dB]											
				1/1 octa	ve ban	d centre	freque	ncy [Hz]		
Description	ı	31.5	63	125	250	500	1k	2k	4k	8k	Total
Criteria Fro	nting North Steyne	26	17	21	29	28	30	30	23	16	37
Front servic	e area sound power level	41	45	54	61	68	78	78	73	68	82
STL 150 mm	n concrete	-35	-42	-44	-42	-49	-57	-63	-68	-70	
Reverberation time		0.5	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.5	
Calculated	internal noise level	6	4	12	20	21	22	16	6	-2	25
Criteria Fro	nting Henrietta Lane	26	17	19	24	24	21	18	17	15	30
Rear prep a	reas sound power level	45	53	62	69	72	75	74	68	59	80
STL 150 mm	n concrete	-35	-42	-44	-42	-49	-57	-63	-68	-70	
Reverberati	ion time	0.5	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.5	
Calculated	10	12	20	28	27	19	12	1	-11	26	
Notes: 1.	It should be noted that the noi the octave bands. The octave transfer calculations. As such,	ise criteri bands are the broad	a that ap shown dband no	plies is fo in the rep bise level	or broad oort to ou s in the 't	band nois Itline the Iotal' colu	e and are working Imn are t	e not app method used to a	lied thro of the int ssess for	ughout e ernal noi offensive	ach of se noise

The internal receiver noise levels are as follows:

3-4 dB would be perceived as being just perceptible. Operational and mechanical plant noise levels have been assessed to comply with the limiting POEO offensive noise criteria, pending the inclusion of noise control measures as detailed in

intrusion. All areas have complied with the above broadband noise criterion. Furthermore, it is noted that a change in

Sections 5.5 and 6.4 of this report are implemented correctly.



8.0 OFFENSIVE NOISE CHECKLIST (EPA NOISE GUIDE FOR LOCAL GOVERNMENT, 2013)

• Is the noise loud in an absolute sense? Is it loud relative to other noise in the area?

Noise from the proposed food and drink premises is proposed to comply with all relevant noise control guidelines during the most stringent periods and would therefore not be considered loud relative to other noise sources in the area.

• Does the noise include characteristics that make it particularly irritating?

There is potential that some people may find patron and mechanical plant noise irritating, however, noise levels have been calculated to be within the noise control guidelines, and therefore compliant with these criteria.

- Does the noise occur at times when people expect to enjoy peace & quiet?
 The premises is not proposed to operate during the nighttime.
- Is the noise atypical for the area?

The subject site is surrounded by similar commercial premises, and as such, is not considered atypical for the area.

• Does the noise occur often?

The premises is proposed to operate every day, however, noise levels have been calculated to be within the noise control guidelines, and therefore compliant with these criteria.

• Are several people affected by the noise?

The subject site is surrounded by several residential receivers, however, noise levels have been calculated to be within the noise control guidelines, and therefore compliant with these criteria.

9.0 CONCLUSION

Koikas Acoustics was requested to conduct an acoustical assessment and prepare a report for the proposed change of use at Shop 1/43-45 North Steyne, Manly. The acoustical report is to accompany a development application to be submitted to the Northern Beaches Council.

The assessment considers potential noise impacts to surrounding residents such that acceptable acoustic amenity is maintained.

Acoustic planning levels have been referenced from current council DCP, L&GNSW, EPA, and POEO acoustic planning guidelines and requirements.

The included recommendations are based on designs prepared by Nexfit Fitout and Install.

The conclusions reached in this acoustical report should assist Council in making their determination of the proposal. A further detailed acoustical report may be required for the CC submission should the building design be amended, or as required by Council.

Of the assessed components of noise, the following conclusions have been reached:

 Mechanical plant and operational noise emissions are calculated to be within the acoustic design standards from both external and internal noise transmission paths, provided the noise control measures as outlined in this report are implemented correctly.

In our professional opinion, there is sufficient scope within the proposed building design to achieve the applied acoustic planning guidelines.

APPENDIX A

A P P E N D I X

Α

APPENDIX A



[7 day average - [LAmax - LAeq ≥ 15]	

20

in the Environmental Noise

Management Manual

































	······	
Maximum noise events as defined	F	
in the Environmental Noise		
Management Manual	J	
7 day average - [LAmax - LAeq ≥ 15]		































APPENDIX B

APPENDIX B





