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Vipac Engineers & Scientists

Pace Development Group Pty Ltd

Pace - 223-231 Johnston Street, Fitzroy - Town Planning

Acoustic Report

30T-19-0295-DRP-6768965-3

21 November 2019

Report Title: Acoustic Report **Job Title: Pace - 223-231 Johnston Street, Fitzroy - Town Planning**	
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1 - 3	21/11/2019	Formatting updates

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KEYWORDS:

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1 INTRODUCTION

Vipac Engineers & Scientists Ltd (ViPAC) has been engaged by *Pace Development Group Pty Ltd* to provide an Acoustic Report for the town planning submission of the proposed development at 223 – 231 Johnston Street, Fitzroy.

For the purposes of this report, the 223 – 231 Johnston Street, Fitzroy project shall be referred to as the development.

The acoustic terminology is given in Appendix A

2 REFERENCES

- AS/NZS 2107:2016 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors
- State Environment Protection Policy N-1 (Control of Noise from Commerce, Industry and Trade) (SEPP N-1)
- Better Apartments Design Standards – Victoria State Government

3 DRAWINGS

This report is prepared based on the drawing set "" provided by "" and summarised in Table 3-1

Table 3-1: Development drawing details

Drawing Name	Drawing Number	Revision	Date of Print
Floor Plans_LG	SD02_04	-	6/11/2019
Floor Plans_LUG	SD02_05	-	6/11/2019
Floor Plans_L1	SD02_06	-	6/11/2019
Floor Plans_L2	SD02_07	-	6/11/2019
Floor Plans_L3	SD02_08	4	6/11/2019
Floor Plans_L4	SD02_09	4	6/11/2019
Floor Plans_L5	SD02_10	4	6/11/2019
Floor Plans_L6	SD02_11	4	6/11/2019
Floor Plans_L7	SD02_12	4	6/11/2019
Floor Plans_L8	SD02_13	4	6/11/2019
Floor Plans_L9	SD02_14	4	6/11/2019
Floor Plans_LRD	SD02_15	4	6/11/2019

4 SITE DESCRIPTION

The current site consists of commercial buildings which would be demolished for the proposed development at 223 – 231 Johnston Street, Fitzroy. The future building contains the following:

- Basement 3,2 and 1 contain car parks
- Lower ground contains apartments and a commercial spaces
- Upper ground floor contains apartments
- Level 1 consists of an open communal space and apartments
- Level 2 to 14 consists of apartments
- Rooftop consists of a BBQ area, amenities and pool

The proposed area for the development of this project is highlighted in red in Figure 4-1.

Figure 4-1: Location of the development

5 ACOUSTIC CRITERIA

5.1 RECOMMENDED INTERIOR NOISE LEVELS

Australia and New Zealand standard *AS/NZS 2107* recommends design criteria for conditions affecting the acoustic environment within occupied spaces. The Victorian *Better Apartments Design Standards* also provide acoustic design criteria for apartments. Recommended design sound pressure levels (SPL) for residential and commercial occupancies are given in Table 5-1. The selected design levels for habitable spaces for this project are based on *Better Apartment Design Standards*. These values are applicable to steady state or quasi-steady state sounds and are the reference criteria for selection and assessment of building components that exclude noise both external to the building (e.g., traffic noise, industrial noise), and within the building (e.g., building services noise).

Table 5-1: Design sound levels for background noise, AS/NZS 2107 & Better Apartments Design Standards

Type of Occupancy	Design Sound Level Range, L_{Aeq} [dBA]	
	AS/NZS 2107	Better Apartments
Public Buildings		
Supermarkets	< 55	-
Small retail stores (general)	< 50	-
General office areas	40 to 45	-
Apartments (in inner city areas or entertainment districts or near major roads)		
Living areas	-	$L_{Aeq,16h(0600\text{-}2200)}$ 40
Sleeping areas (night time)	-	$L_{Aeq,8h(2200\text{-}0600)}$ 35
Apartment common areas (e.g. foyer, lift lobby)	45 to 50	-

5.1.1 PLANT NOISE AT RESIDENTIAL PROPERTIES

Mechanical plant noise must be controlled at any affected residential property in accordance with State Environmental Noise Policy No. N-1. Affected residential properties include apartments within the development, and residences in the vicinity of the development. According to the *SEPP N-1* policy environmental noise limits are determined based on a two part procedure – determination of the existing background noise levels (percentile sound pressure level L_{A90}) and zoning levels (highlighted in Appendix B). Table 5-2 presents the SEPP N-1 limits calculated from the averaged background measurements taken during each period.

Table 5-2: SEPP N-1 limits for the development and surrounding residences [dBA]

SEPP N-1 Period	Day of week/Time period		Zoning level	Background level, L_{A90}	Noise limit
Day	Monday – Friday	0700hrs – 1800hrs	58	49	58
	Saturday	0700hrs – 1300hrs			
Evening	Monday – Friday	1800hrs – 2200hrs	52	43	52
	Saturday	1300hrs – 2200hrs			
	Sunday & public holidays	0700hrs – 2200hrs			
Night	Monday – Sunday	2200hrs – 0700hrs	47	34	44

Note: the developer will need to undertake a formal acoustic review by a suitably qualified engineer for all mechanical plant and equipment used in the development to ensure it complies with EPA guidelines.

5.1.2 SWIMMING POOL

Vibration isolators would be required to stop structure borne noise and vibrations from transmitting to other floors. This should be reviewed at the design development stage by an acoustic engineer.

5.2 GARBAGE TRUCKS

In Victoria EPA Publication 1254 - *Noise control guidelines* the noise control guidelines for the industrial waste collection are provided and they are summarised below. These guidelines should be incorporated into the permit condition for garbage trucks operating for this development.

Table 5-3 presents the schedule for garbage trucks at shops.

Table 5-3: Schedule for garbage trucks at shops

One collection per week	
Monday to Saturday	6:30 am — 8 pm
Sundays and public holidays	9 am — 8 pm
Two or more collections per week	
Monday to Saturday	7 am — 8 pm
Sundays and public holidays	9 am — 8 pm

In addition, the following attention should be paid.

- Refuse bins should be located at sites that provide minimal annoyance to residential premises.
- Compaction should be carried out while the vehicle is moving.
- Bottles should not be broken up at collection site.
- Noisy verbal communication between operators should be avoided where possible.

6 NOISE MEASUREMENTS

Noise measurements for background noise and road traffic were conducted on the 14th and 20th of November 2019 in accordance with *SEPP N-1*. Weather conditions at the site during measurements were dry with wind speeds below 5 m/s. A calibration check of the sound level meter was performed before and after the measurements, no significant drift was noted.

Due to construction occurring at the adjacent site during the Day a similar location was selected away from the development to measure road traffic noise.

Figure 6-1 shows the locations for noise measurements. All measurement locations were sufficiently distant from reflective surfaces such that nearfield level corrections were not required.

Instrumentation used for the noise measurements is presented in Appendix C.

Figure 6-1: Measurement locations marked in red

Table 6-1 provides the measurement data obtained from the corresponding locations.

Table 6-1: Measured levels

Location No.	Date / Start time	Duration (minutes)	L_{Aeq} (dB(A))	L_{A90} (dB(A))
1	14-Nov-19 / 12:36	10	67.1	59.0
2	14-Nov-19 / 13:20	10	55.0	49.4
3	14-Nov-19 / 19:51	10	47.3	43.1
4	14-Nov-19 / 20:20	10	45.7	42.5
5	14-Nov-19 / 20:43	5	68.3	59.1
6	20-Nov-19 / 00:10	10	38.2	34.3
7	20-Nov-19 / 00:28	10	36	32.8

7 BUILDING FAÇADE GLAZING RECOMMENDATIONS

The façade glazing for habitable rooms will be designed based on measured traffic noise. The spectrum measured during peak traffic flow conditions will be used to achieve noise limits listed in *Table 5-1*. For habitable rooms the limits will be **$L_{Aeq,8hr}$ = 35 dB(A) for bedrooms** and **$L_{Aeq,16hr}$ = 40 dB(A) living areas**.

The following room finishes are assumed for glazing designs.

- Walls and ceiling: plasterboard
- Floor: carpet for bedrooms, timber floor for living and commercial areas

Operable windows must be fitted with acoustic seals to ensure the acoustic performance of the glazing is not compromised. In addition to the provision of suitable glazing requirements, minimum R_W ratings for window systems are provided to ensure the performance of the glazing will not be compromised by frames and seals.

Ventilation ducts on facade need to be assessed during the design and development stage to ensure internal requirements are achieved.

For living room areas where operable windows are desired, awning type windows are preferred in terms of achieving an effective acoustic seal. However, sliding windows are acceptable provided they include tight fitting seals. Care should be taken to ensure that all external sliding glass doors are proprietary acoustic door sets with integral frame and seals.

It should be noted that the minimum glazing requirements specified in this report are based on assumed glazing and room dimensions. If the ratio glazing area to room area differs significantly from the assumed values detailed in Table 7-1, further assessment of glazing will be required.

Special consideration was taken for apartments adjacent to communal areas. The highest incident noise in these areas is assumed to be due to verbal communication between residents.

Normal speech at a distance of 5.5 meters from residence boundaries on the 1st floor is assumed for worst case conditions. An internal level of 37 dB(A) for living rooms and 32 dB(A) for bedrooms was adopted as the targeted voice noise which is guided by the target level of 40 dB(A) for a living room and 35 dB(A) for a bedroom (better apartments design standards), the higher glazing between the BADS and voice noise was then used.

The following assumptions were used when modelling the bedrooms and living rooms:

- Timber floors on living rooms
- Carpeted floors for bedrooms
- Volume of bedroom is 35m^3
- Volume of living room is 82m^3
- Volume of commercial space facing Johnston street is 2127m^3
- Volume of commercial space facing Gore street is 218m^3
- Height of floors are 2.7m
- Both commercial spaces are retail stores
- Assumed on average 14 people present in the communal space with 7 talking at a time

Appendix D provides a mark-up of the facades facing the corresponding roads or communal space.

Table 7-1: Minimum transmission loss for glazing

Glazing No.	Room Type	Octave band central frequency (Hz)							Rw	Glazing Area (m^2)
		63	125	250	500	1000	2000	4000		
Facing Johnston Street (Ground to Level 7)										
1	Commercial	13	15	19	23	28	32	30	28	122
2	Bedroom	26	27	26	37	44	46	50	41	4
3	Living room	23	25	21	35	41	37	39	35	8
Facing Johnston Street (Level 8 to Level 14)										
4	Bedroom	23	25	21	35	41	37	39	35	4
3	Living room	21	23	27	31	34	31	39	33	8
Facing Gore Street (Ground to Level 7)										
1	Commercial	13	15	19	23	28	32	30	28	32
4	Bedroom	23	25	21	35	41	37	39	35	4
3	Living room	21	23	27	31	34	31	39	33	8
Facing Gore Street (Level 8 to Level 14)										
3	Bedroom	21	23	27	31	34	31	39	33	4
5	Living room	18	21	25	29	33	31	35	31	8
Facing Argyle Street (Ground to Level 14)										
5	Bedroom	18	21	25	29	33	31	35	31	4
6	Living room	15	17	21	26	30	33	30	30	8
1st to 7th Floor facing Communal open space										
5	Bedroom	18	21	25	29	33	31	35	31	4
5	Living room	18	21	25	29	33	31	35	31	8
8th to 14th Floor facing Communal open space										
5	Bedroom	18	21	25	29	33	31	35	31	4
6	Living room	15	17	21	26	30	33	30	30	8

8 CONCLUSION

Vipac Engineers and Scientists Ltd (Vipac) have been engaged by *Pace Development Group* to provide acoustic consulting services for the development at 223 – 231 Johnston Street, Fitzroy. The assessments contained within this document follow the methodology and criteria specified in relevant Australian standards, guidelines and policies.

Appendix A GLOSSARY OF TERMS

Term	Definition
dB	Decibel Magnitude of the sound pressure level.
dBA	A-weighted Decibels. The 'A'-weighting adjusts the measured levels to better reflect the sensitivity of the human ear to different frequencies.
$L_{Aeq,T}$	The A-weighted continuous equivalent sound pressure level. It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.
$L_{A90,T}$	The A-weighted sound pressure level exceeded for 90% of the measurement period. L_{A90} is used in Victoria as the descriptor for background noise level.
L_{Amax}	The A-weighted maximum sound pressure level of the measurement period.
Sound pressure level	The ratio in decibels (dB) of the sound pressure at a given receiver position to a reference pressure of 2.10^5 Pa. The sound pressure level depends, amongst other parameters, on the sound power level of the source and the distance separating the source and the receiver.

Appendix B SEPP N-1 ZONING

The zoning level for the nearest sensitive receiver to the development was carried out and is highlighted in

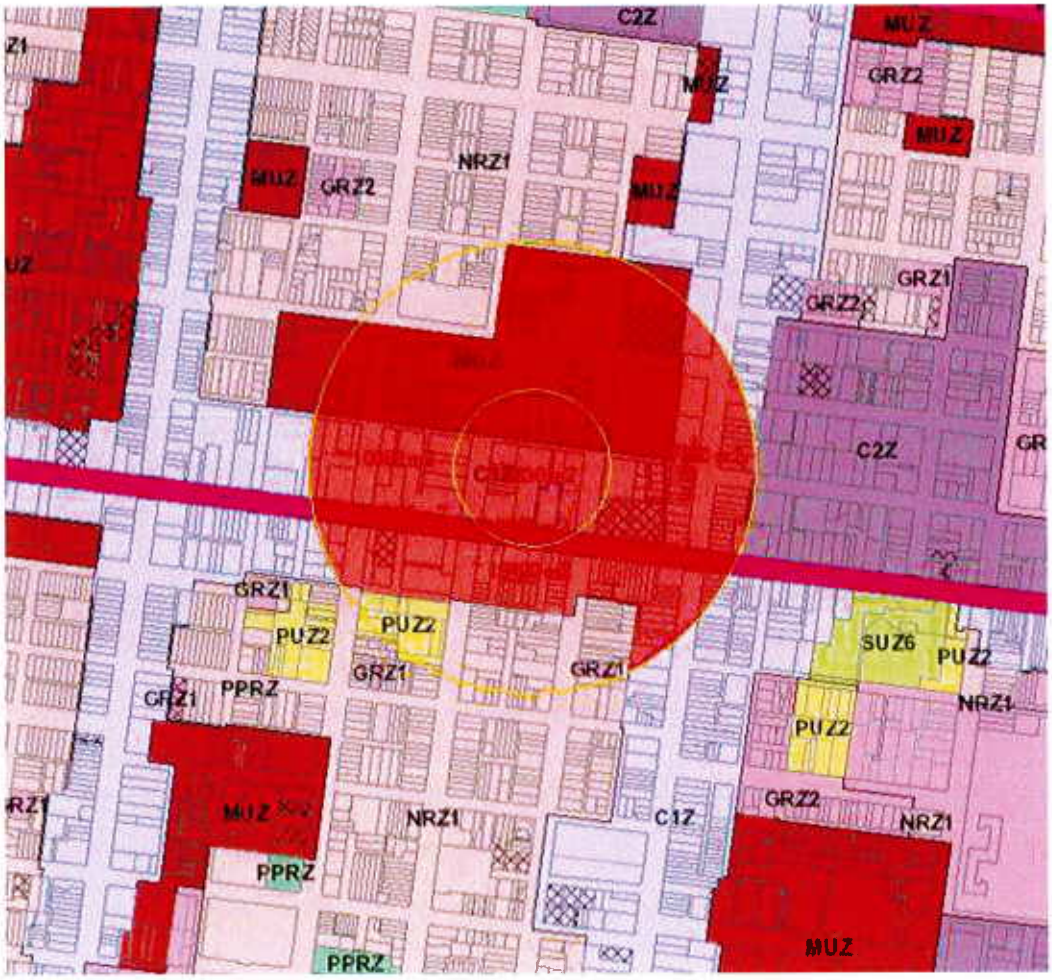

Figure 8-1: Determination of Zoning Levels