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Hayball Pty Ltd

264- 270 Normanby Road

Acoustic Town Planning Report

30U-15-0097-DRP-367887-6

09 Sep 2015



Report Title: Acoustic Town Planning Report Job Title: 264- 270 Normanby Road		
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REVISION HISTORY		
Revision No.	Date Issued	Reason/Comments
0	14 Aug 2015	Initial Issue
1	09 Sep 2015	Client Comments
2	02 May 2019	Updated report and glazing calculations to the updated drawings by Matthew Nolan. Reviewed by Davyn Mather.
3	17 May 2019	Updated report and glazing calculations to include the BADS Assessment by Matthew Nolan. Reviewed by Conrad Williams.

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1 INTRODUCTION

Vipac Engineers & Scientists Ltd (ViPAC) has been engaged by *Hayball* to provide an acoustics report for the preliminary design stage of the proposed development at 264 - 270 Normanby Rd, South Melbourne, Victoria.

For the purposes of this report, the 264 - 270 Normanby Rd project shall be referred to as the *proposed development*.

2 REFERENCES

- AS/NZS 2107:2000 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)
- State Environment Protection Policy N-2 (Control of Music Noise from Public Premises) (SEPP N-2)
- EPA Noise Control Guidelines – Publication 1254
- Port Phillip Planning Scheme – Standard D16 Clause 58.04-3 Noise Impacts (BADS)

3 DRAWINGS

This report is based on the drawings from *Hayball* listed in **Table 3-1**.

Table 3-1: List of drawings

Drawing description	Drawing Number	Revision	Dated
Site 1 – Basement & Ground	S01_A03.01	4	05/04/2019
Site 1 – Upper Ground & Level 1	S01_A03.02	4	05/04/2019
Site 1 – Level 2 & 3	S01_A03.03	4	05/04/2019
Site 1 – Level 4 & 5-9 & 9-19	S01_A03.04	4	05/04/2019
Site 1 – Tower Plans	S01_A11.01	4	05/04/2019

4 SITE DESCRIPTION

The development site 264 - 270 Normanby Rd has existing commercial premises. The proposed development will have retail outlets on the ground level with commercial tenancies on levels 1 to 3. Car parks are located on basement, upper ground and levels 1 to 3, which are accessible from the ground level. A terrace, gym, family/lounge, conference room and apartments are located on level 4. Residential apartments are located from level 5-19. The site is located on Normanby Rd, between Johnson St and Montague St. **Figure 4-1** shows the location of the site.

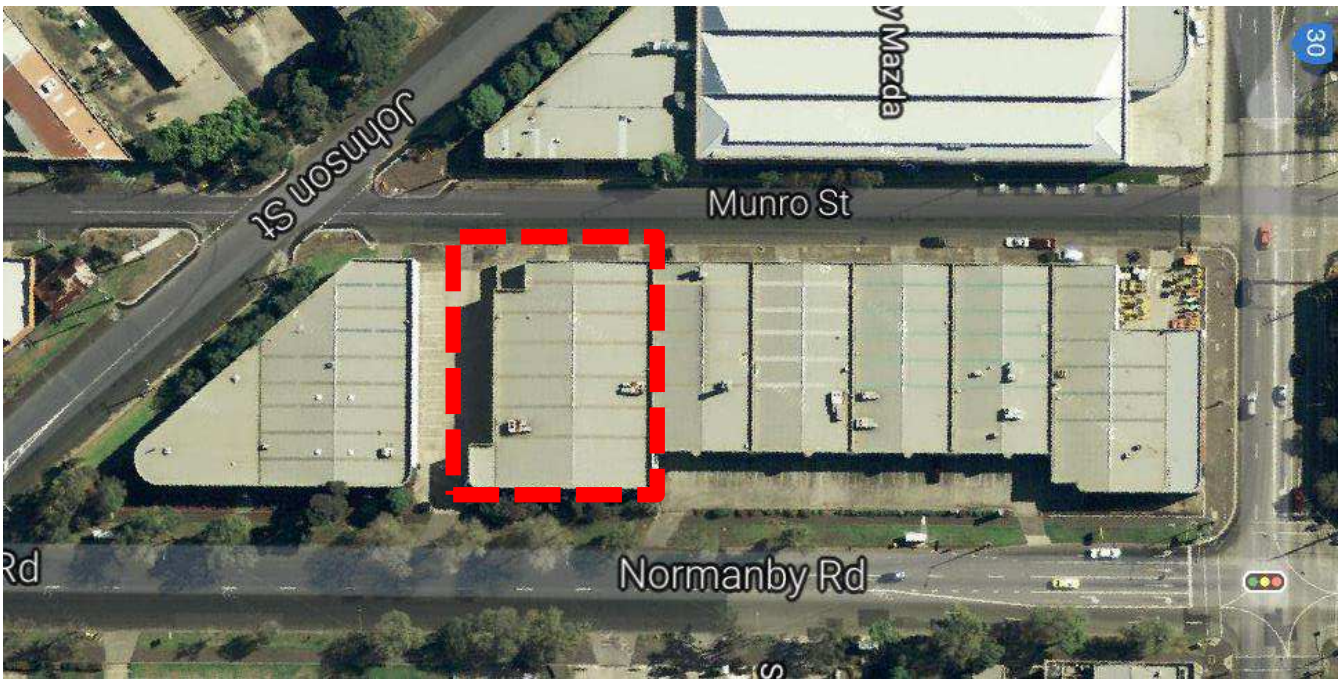


Figure 4-1: Development site and surroundings

The development is located in a Capital City Zone (CCZ1), flanked by the intersection of two Road Zones (RDZ1), with a nearby Industrial Zone (IN1Z), a light rail transport Public Use Zone (PUZ4) and an education Public Use Zone (PUZ2) shown in **Figure 4-2**. Vipac conducted site visits during the daytime, evening and night time on on 4 and 31 August and 1 September 2015 and observed that the noise climate was dominated by road traffic noise from both Normanby Road and Montague Street.

The noise survey results are presented in detail in **Section 5**.

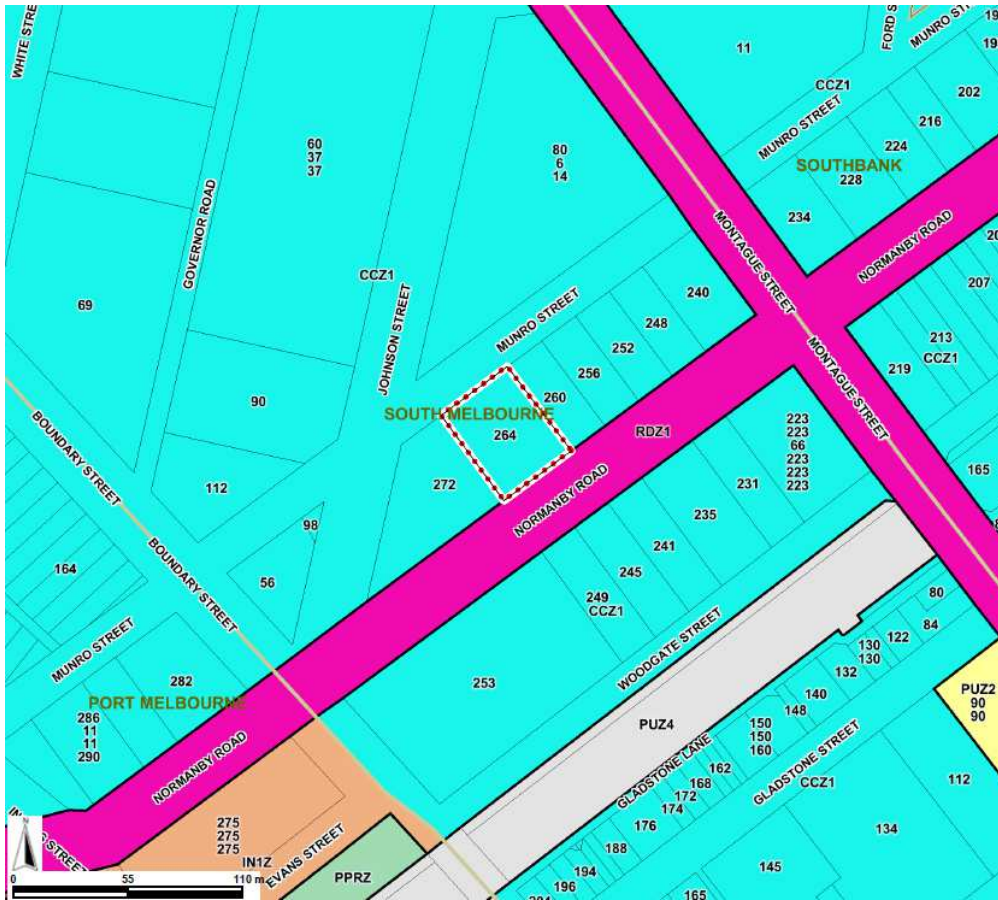


Figure 4-2: Zoning Map

5 NOISE SURVEY

Vipac conducted three handheld noise surveys: One during the daytime, one in the evening and one at night time. These noise surveys were conducted at various measurement positions in the vicinity of the proposed development site.

The equipment used during the surveys is listed in **Appendix A**. The Sound level meter was set to Fast and was calibrated before and after each measurement session. No significant drift was noted. The weather was calm with no rain. A windshield was fitted to the microphone to prevent potential effects of wind on the measured noise levels. All measurements were taken at the edge of the pavement at a height of approximately 1.2 m.

5.1 DAYTIME

The daytime survey was to quantify the noise climate in the vicinity of the proposed development. The results are used to inform the design of the building envelope to achieve the indoor ambient noise levels. Daytime noise measurements were taken between 4.30pm and 6:30pm to measure the worst case traffic noise, the traffic was free flowing. The noise environment around the proposed development was dominated by road traffic noise from both Normanby Road and Montague Street. The measurement positions are indicated in **Figure 5-1** and the noise measurement data in **Table 5-1**.



Figure 5-1: Noise measurement positions

Table 5-1: Daytime noise measurements

Location	Date/Time	Duration (Minutes)	L _{Aeq} (dB)	L _{Amax} (dB)	L _{A90} (dB)
2	4/08/2015 16:59	5	69	81	59
3	4/08/2015 17:26	5	66	78	59
4	4/08/2015 17:08	5	73	85	62
5	4/08/2015 17:16	5	71	81	59

5.2 EVENING AND NIGHT TIME

Vipac conducted an evening noise survey in the vicinity of the proposed development between 8:00pm and 9:00pm and a night time noise survey in the vicinity of the proposed development between 1:00am and 2:00am. The purpose of these surveys was to quantify the background noise levels relevant to the boundary of the nearest residential building. These noise levels are then used to calculate the noise emission limits for the building services of the proposed development in accordance with SEPP N-1.

The evening and night noise measurements were taken in accordance with SEPP N-1. The measurement position (location 1) is indicated in **Figure 5-1** and the noise measurement data is presented in **Table 5-2**. The weather conditions were calm with no rain.

Table 5-2: Evening and Night time noise measurements

Location	Date/Time	Duration (Minutes)	L _{Aeq} (dB)	L _{Amax} (dB)	L _{A90} (dB)
1	31/08/2015 20:03	10	61	76	53
1	31/08/2015 20:14	10	61	75	52
1	1/09/2015 1:41	10	57	76	46
1	1/09/2015 1:52	10	61	87	47

6 ACOUSTIC CRITERIA

6.1 RECOMMENDED INTERIOR NOISE LEVELS

Australia & 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. Design sound pressure levels for residential buildings near major roads are given in **Table 6-1**. The selected glazing for this project are based on *Better Apartment Design Standards*. These are the reference criteria for selection and assessment of building components. The sources considered include those external to the building and within the building (e.g. building services noise and traffic).

Table 6-1: Recommended design noise levels near major roads (AS/NZS 2107 and BADS)

Type of occupancy	Recommended Design Sound Level AS/NZS 2107, L _{Aeq} , dBA		Recommended Design Sound Level Better Apartments, L _{Aeq} , dBA
	Satisfactory	Maximum	Maximum
Apartment			
Sleeping areas (near major roads)	-	-	L_{Aeq,8h}(2200-0600) 35
Living areas(near major roads)	-	-	L_{Aeq,16h}(0600-2200) 40
Common areas (e.g. foyer, lift lobby)	45	55	-
Retail			
General retail stores	45	50	-
Show rooms	45	50	-
General			
Enclosed Carpark	55	65	-

In **Table 6-1** the satisfactory level has been found to be acceptable by most people for the environment in question and also to be not intrusive. The maximum level is the noise level above which most people occupying the space start to become dissatisfied with the level of noise.

6.2 ENVIRONMENTAL NOISE LIMITS (EPA SEPP N-1)

The plant noise must be controlled at any affected residential properties in accordance with State Environmental Noise Policy *SEPP N-1*.

According to the *SEPP N-1* policy the 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 (obtained from the town plan scheme map).

The general background noise levels for the day, evening and night periods were measured at the site and the town plan scheme map for the development site shown in **Figure 4-2**. For noise sources of steady character running 24 hrs a day, complying with the night time limit will ensure compliance with the less stringent limits at other times of day. **Table 6-2** presents the zoning level and noise limit for the development.

Table 6-2: SEPP N-1 noise limit, dBA

SEPP N-1 Period	Day of week/Time period		Zoning level	Background level, L ₉₀	Noise limit
Evening	Monday – Friday	1800hrs – 2200hrs	47	52	55
	Saturday	1300hrs – 2200hrs			
	Sunday & public holidays	0700hrs – 2200hrs			
Night	Monday – Sunday	2200hrs – 0700hrs	42	46	49

The assessment location for a multi-storey apartment is outside the façade for an operable window and inside the habitable room with fixed windows. The adjustment for the indoor assessment is -15 dBA for a single glazing window and -25 dBA for a double glazing window according to *SEPP N-1*.

7 BUILDING FAÇADE

Windows provide an acoustic weakness to the external façade of a building as noise is generally transferred more easily through glazing than through the external walls. Improving the sound insulation of windows will help to reduce external noise ingress. The larger the glazed area, the greater the sound transmission through the window, so the level of noise reduction will be dependent on the area of glazing that is treated. The noise transfer through and around windows can be reduced by using thicker and/or laminated glazing, a double glazed system and high quality window perimeter seals.

7.1 BUILDING FAÇADE/GLAZING

The glazing configurations were designed by estimating noise intrusion inside of the proposed development. Given the variety of ambient noise affecting the different areas of the development and glazing surface area, specific calculations have been carried out for each habitable room of each type of apartment using the measured noise levels in **Section 5.1**, in order to achieve the indoor ambient noise levels shown in **Table 6-1**.

The glazing configurations are as presented in **Table 7-1**.

Table 7-1: Minimum glazing requirement

Room Type	Criteria (dBA) Leq	Glazing mm	Rw dB
		Double (glass/air/glass)	
Living/ Kitchen	40 _{16h(0600-2200)}	6/12/10	39
Bedroom	35 _{8h(2200-0600)}	6/12/10	39

The building envelope including glazing constructions shall be assessed further during Detailed Design.

8 NOISE CONTROL FOR BUILDING SERVICES

Noise emissions from common building services shall not exceed the SEPP N-1 limit at the boundary of the nearest residences within and outside the development.

The noise limits have been calculated and presented in **Table 6-2** for the closest residences.

Noise emissions from air conditioners shall be controlled to comply with EPA Noise Control Guidelines 1254. Noise from any fixed domestic plant must not be audible within a habitable room of any other residence during prohibited hours prescribed by the Environment Protection (Residential Noise) Regulations 2008. The sound pressure level of the condensers on the balconies of the development must not exceed 59dBA at 1 meter. This sound pressure level was estimated based on the following assumptions.

- a noise source (condenser) on the neighbour's balcony
- there is a solid partition between the balconies
- inaudible sound in bedrooms

The assessment shall be conducted during detailed design, as it requires confirmation of the plant equipment schedule with manufacturer or third-party testing results and mechanical drawings. Further design details including vibration isolation can only be confirmed upon review of equipment schedules, platform structural details, operating conditions and services design drawings.

9 COMMERCIAL TENANCIES

It is recommended that the tenant fit-out manual include a requirement for compliance to SEPP N-1 and SEPP N-2 in order to address the issues of noise from building services (e.g. kitchen exhaust) and music respectively.

This requirement should include an obligation for an assessment by a professional acoustician should music from the units be audible at the nearest noise sensitive areas.

10 CARPARK NOISE

Noise emissions from the carpark door shall not exceed the SEPP N-1 limit at the boundary of the nearest residences within and outside the development.

A motorized carpark door can be a significant source of noise and vibration. The car park door, including rail and motor, shall be resiliently isolated on neoprene mounts selected for approximately 4 mm static deflection. Suspension of the door from the slab above on a bracket may be more robust than lateral fixings; thus, a door isolation system purpose-built for reliability is recommended.

Further requirements shall be verified during Detailed Design.

11 CONCLUSIONS

This report for the proposed development at 264 – 270 Normanby Road, South Melbourne, provides the acoustic criteria for the project in accordance with the relevant policies/standards. The constructions of façade glazing were designed based on the external noise measurements to achieve the appropriate levels of internal amenity.



Appendix A INSTRUMENTATION

Table A-1: Noise measurement instrumentation used for noise surveys

Instrument	Vipac Serial number	Last Calibration
Brüel & Kjaer Sound Level Meter 2250 (Type 1)	33050	5 Feb 2015
Brüel & Kjaer Calibrator 4231	21063	25 Nov 2013