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292-300 City Road, Southbank

Town Planning Report (Stage 1B)

MELBOURNE

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1 INTRODUCTION

Acoustic Logic Pty Ltd (AL) was engaged by IMG Australia Investments Pty Ltd to undertake an acoustic assessment for the proposed mixed-use development located at 292-300 City Road, Southbank. The assessment has been undertaken to address Condition 37 of Planning Permit No. TP-2019-929/A by City of Melbourne (date of amendment 20 September 2023) which is to address external traffic noise intrusion from surrounding road network into the proposed development.

The following documents are referenced in this assessment.

Company	Drawing/Document Number	Date
City of Melbourne	Planning Permit No. TP-2019-929/A	20 September 2023 (date of amendment)
Elenberg Fraser	Drawings No. A0099, A0100 to 109, A0130, A0131, A0900 to 903 (rev K)	21 November 2023
Acoustic Logic Pty Ltd	Town Planning Report (doc ref: 20220518.1/0606A/R1/BAW) ¹	6 June 2022

Table 1 – Referenced Documents

Note 1: the acoustic report referenced in Condition 37 of Planning Permit.

2 PROPOSED DEVELOPMENT

The proposed development is a multi-level tower located at 292-300 City Road, Southbank with basement carpark, café tenancies on lower ground and ground floor, office tenancies on level 2, function space and residential amenities on level 2, and residential apartments on level 6 to 29.

The subject site is bounded by City Road to the south, an existing two storeys building to the north, Haig Lane to the east, and Shadowplay multi-level residential development to the west. The West Gate Freeway is located approximately 130 metres south which the view is generally obstructed by existing building.

Figure 1 details the subject site location and its surroundings.



Figure 1 – Subject site and surroundings (source: Google Maps)

2.1 LOCAL NOISE SOURCES

AL was involved in nearby development such as Shadowplay Apartments, Home Southbank, Platinum Tower, 61-65 Haig Street and others. Based on our experience of these development and additional inspections and measurements for the subject site, we confirm that the dominant noise source at the subject site is traffic noise from City Road with an underlying traffic noise from the West Gate Freeway.

2.2 PLANNING PERMIT

Planning Permit No. TP-2019-929/A by City of Melbourne (date of amendment 20 September 2023) contains the following condition:

37. Acoustic Measures

Prior to the occupation of the development, noise attenuation measures designed by a recognised acoustic consultant must be included to ensure that the development is designed and constructed to achieve the noise levels in accordance with Standard D16 (Noise Impacts) at Clause 58.04-3 of the Melbourne Planning Scheme to the satisfaction of the Responsible Authority.

The recommendations contained in the Acoustic Report prepared by Acoustic Logic, dated 6/06/2022 (and updated as necessary) must be implemented, at no cost to the Responsible Authority, prior to the occupation of the dwellings. Once approved, the Acoustic Report will be endorsed to form part of the permit.

3 ENVIRONMENTAL NOISE DESCRIPTORS

Environmental noise constantly varies in level, due to fluctuations in local noise sources including road traffic. Accordingly, a 15-minute measurement interval is normally 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 the case of 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 L₁₀ 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 depends 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 measurement 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 industrial noise.

The L₁ parameter (or the noise level exceeded for 1% of the time) is used during the night period to assess potential sleep arousal effects due to transient noise sources.

4 ASSESSMENT CRITERIA – INTERNAL TRAFFIC NOISE LEVEL

4.1 STANDARD D16 AT CLAUSE 58.04-3

Condition 37 of the Planning Permit references Standard D16 at Clause 58.04-3 which contains the following condition:

To contain noise sources in developments that may affect existing dwellings.

To protect residents from external and internal noise sources.

Standard D16

Noise sources, such as mechanical plants should not be located near bedrooms of immediately adjacent existing dwellings.

The layout of new dwellings and buildings should minimise noise transmission within the site.

Noise sensitive rooms (such as living areas and bedrooms) should be located to avoid noise impacts from mechanical plants, lifts, building services, non-residential uses, car parking, communal areas and other dwellings.

New dwellings should be designed and constructed to include acoustic attenuation measures to reduce noise levels from off-site noise sources.

Buildings within a noise influence area specified in Table D3 should be designed and constructed to achieve the following noise levels:

- Not greater than 35dB(A) for bedrooms, assessed as an LAeq,8h from 10pm to 6am.
- Not greater than 40dB(A) for living areas, assessed LAeq,16h from 6am to 10pm.

Buildings, or part of a building screened from a noise source by an existing solid structure, or the natural topography of the land, do not need to meet the specified noise level requirements.

Noise levels should be assessed in unfurnished rooms with a finished floor and the windows closed.

Table D3 Noise influence area

Noise Source	Noise influence area	
Zone interface		
Industry	300 metres from the industrial 1, 2 and 3 zone boundary	
Roads		
Freeways, tollways and other roads carrying 40,000 Annual Average Daily Traffic Volume	300 metres from the nearest trafficable lane	
Railways		
Railway servicing passengers in Victoria	80 metres from the centre of the nearest track	
Railway servicing freight outside Metropolitan Melbourne	80 metres from the centre of the nearest track	
Railway servicing freight in Metropolitan Melbourne	135 metres from the centre of the nearest track	

Note: The noise influence area should be measured from the closest part of the building to the noise source.

Decision guidelines

Before deciding on an application, the responsible authority must consider:

- The design response.
- Whether it can be demonstrated that the design treatment incorporated into the development meets the specified noise levels or an acoustic report by a suitably qualified consultant submitted with the application.
- Whether the impact of potential noise sources within a development have been mitigated through design, location and siting.
- Whether the layout of rooms within a dwelling mitigates noise transfer within and between dwellings.
- Whether an alternative design meets the relevant objectives having regard to the amenity of the dwelling and the site context.

Based on these conditions, the subject site has been reviewed as follows:

- 1. The development is **<u>not</u>** within 300m of an industrial zone.
- 2. The development **is within 300m of a freeway** or road carrying an AADT >40,000
 - City Road carries a two-way AADT of 19,000 based on the VicRoads Open Data Hub website.
 - The development is located approximately 130 metres from the West Gate Freeway.
 - The development is located approximately 190 metres from Kings Way which carries a twoway AADT of 45,000 based on the VicRoads Open Data Hub website.
- 3. The development is **not** within 85m of train line.

Based on the above the following criteria are recommended for this development to achieve the objective of protecting residents from traffic noise from the West Gate Freeway and Kings Way:

Table 2 – Apartment Internal Traffic Noise Criteria from West Gate Freeway and KingsWay

Location	Internal Design Noise Level ¹
Living Rooms (traffic from West Gate Freeway and Kings Way	40 dB(A) L _{eq(16hr)} (6am – 10pm)
Bedrooms (traffic from West Gate Freeway and Kings Way	35 dB(A) L _{eq(8hr)} (10pm – 6am)

Note 1: With external windows and doors closed. Apartments are unfurnished with finished floor.

For traffic noise from City Road and surround local roads, and where apartments are obstructed from West Gate Freeway and Kingsway, the internal noise level of these apartments shall be designed in accordance with Australian Standards AS2107:2016 per below.

4.2 AUSTRALIAN STANDARDS 2107:2016

Australian Standard AS/NZS 2107:2016 "Recommended Design Sound Levels and Reverberation Times for Building Interiors" sets out recommended design sound levels for residential developments depending on locality to minor or major roads. Table 3 below details the criterion set for apartments for traffic noise from City Road and surrounding roads and for apartments with no view of West Gate Freeway and Kings Way.

Table 3 – Apartment Internal Traffic Noise Criteria from City Road and Local Roads and for Apartments with no view of West Gate Freeway and Kings Way

Location	Internal Design Noise Level ¹	
	Day (7am – 10pm) dB(A) L _{eq}	Night (10pm – 7am) dB(A) L _{eq}
Bedrooms (Applicable for traffic noise from City Road and local roads and for apartments with no view of West Gate Freeway and Kings Way)	35 - 45	35 - 40
Living Rooms (Applicable for traffic noise from City Road and local roads and for apartments with no view of West Gate Freeway and Kings Way)	35 - 45	N/A

Note 1: Noise level within furnished room ready for occupation with external windows and doors closed.

4.3 PROJECT INTERNAL TRAFFIC NOISE LEVEL CRITERIA

Based on the above the following criteria are recommended for the proposal to achieve the objective of protecting residents from external traffic noise:

Location	Required Internal Noise Level ¹
Bedrooms	35 – 45 dB(A) ² L _{eq}
(Applicable for traffic noise from City Road and local	(7am – 10pm)
roads and for apartments with no view of West Gate	35 – 40 dB(A) ² L _{eq}
Freeway and Kings Way)	(10pm – 7am)
Living Rooms (Applicable for traffic noise from City Road and local roads and for apartments with no view of West Gate Freeway and Kings Way)	35 – 45 dB(A) ² L _{eq} (7am – 10pm)
Bedrooms (traffic from West Gate Freeway and	35 dB(A) ³ L _{eq(8hr)}
Kings Way	(10pm – 6am)
Living Rooms (traffic from West Gate Freeway and	40 dB(A) ³ L _{eq(16hr)}
Kings Way	(6am – 10pm)

Table 4 – Internal Noise Criteria – Traffic Noise

Note 1: With external windows and doors closed.

Note 2: Noise level within furnished room ready for occupation.

Note 3: Noise level from West Gate Freeway and Kings Way only within unfurnished rooms with finished floor.

5 TRAFFIC NOISE LEVEL MEASUREMENTS



5.1 MEASUREMENT LOCATIONS AND DATE OF MEASUREMENTS

Figure 2 – Noise Level Measurement Locations of City Road (source: Google Maps)

Measurement locations are presented in Figure 2 which are detailed below.

- Measurement Location 1: Attended noise level measurements were conducted to measure traffic noise levels along City Road. The sound level meter location was approximately in-line with the southern boundary subject site with the microphone located approximately 1.5 metres above grade. The measurements were conducted on 17 May 2022 against a reflective surface with full view of City Road.
- **Measurement Location 2:** Attended noise level measurements were conducted on a level 2 apartment external balcony within the Shadowplay Apartments to measure traffic noise levels along City Road. The sound level meter location was approximately in-line with the southern boundary subject site with the microphone located approximately 1.5 metres above FFL. The measurements were conducted on 27 February 2018 between 3:30pm and 4:00pm against a reflective surface with full view of City Road.



Figure 3 – Measurement Locations of West Gate Freeway (source: Google Maps)

Measurement locations are presented in Figure 3 which are detailed below.

- An unattended noise monitor was installed on the roof of Urban Central facing the Westgate Freeway. Noise monitor was in free field.
- Location A Attended noise measurement on the roof of Urban Central facing Westgate Freeway. Measurement was in free field.
- Location B Attended noise measurement at the unattended noise monitor location on the roof of Urban Central facing Westgate Freeway. Measurement was in free field.
- Location C Attended noise measurement on the roof of Urban Central facing Westgate Freeway and City Road. Measurement was with façade reflections.
- Location D Attended noise measurement on the roof of Urban Central facing Westgate Freeway and City Road. Measurement was in free field.
- Location E Attended noise measurement on the roof of Urban Central facing Westgate Freeway and City Road. Measurement was in free field.
- Location F Attended noise measurement on the roof of Urban Central facing Westgate Freeway and Clarendon Street. Measurement was in free field.
- Location G Attended noise measurement at ground level facing City Road. Measurement was 1.5m above grade and with façade reflections.
- Location H Attended noise measurements on the level 11 and 13 Balconies of 61-63 Haig Street. Measurement was 1.5m above grade and with façade reflections.

NORTH

The unattended noise monitor was installed on the roof of existing Urban Central building on 30 October to 7 November 2013. Attended noise level measurements were conducted within the roof level of Urban Central (locations A-F) on 30 October 2013 between 2-3pm and on 7 November 2013 between 9-11am.

Attended noise level measurements at Location G facing City Road were conducted on 1 July 2014 between 7.30-7.45am.

Attended noise level measurements at Location H on the level 11 and 13 balconies of the 61-63 Haig Street development was conducted on the 9 May 2018 between 10:00am and 11:20am.



Figure 4 – Measurement Locations of Kings Way (source: Google Maps)

Two un-attended noise monitors were installed on Bella Apartments located at 250 City Road, Southbank to measure the traffic noise level on Kings Way. The monitors were installed on site between 22 and 30 June 2015.

The monitors were installed level 5 and 15 apartment external balconies with the locations indicated in Figure 4. Both monitors had clear view of Kings Way and were affected by reflective surface.

5.2 MEASUREMENT EQUIPMENT

An Ngara noise monitor was used for all the unattended noise monitoring. The noise monitor was programmed to store 15-minute statistical noise levels through the monitoring period. Equipment was calibrated at the beginning and the end of the measurements using a Rion NC-74 calibrator; no significant drift was detected. All measurements were taken on fast response mode.

A Norsonic Nor140 Sound Level Analyser, a Svan 958 Noise and Vibration Analyser and a Rion NL42EX Sound Level Meter were used for the attended noise level measurements. The Norsonic was calibrated using a B&K Type 4231 calibrator, the Svan was calibrated using an SV30A Acoustic Calibrator and the Rion using a Rion NC-74 calibrator. All equipment was calibrated at the beginning and the end of the measurements; no significant drift was detected. All measurements were taken on fast response mode.

5.3 MEASUREMENT RESULTS

Measurement Locations	Measurement Period	Measured Noise Levels ¹
	17/05/2022 (15:33-15:48)	70 dB(A)L _{eq,15mins}
Measurement Location 1 of	17/05/2022 (15:48-16:07)	70 dB(A)L _{eq,15mins}
facing City Road	17/05/2022 (16:07-16:22)	70 dB(A)L _{eq,15mins}
	17/05/2022 (16:26-16:41)	70 dB(A)L _{eq,15mins}
Measurement Location 2 of	27/02/2018 (15:30-15:45)	69 dB(A)L _{eq,15mins}
Figure 2 – facing City Road	27/02/2018 (15:45-16:00)	69 dB(A)L _{eq,15mins}

Table 5 – Attended Traffic Noise Measurements (City Road)

Note 1 – Noise level measurements have been corrected -2.5dB for façade reflection.

Table 6 – Attended Noise Level Measurements (West Gate Freeway)

Date	Measurement Locations	Measured Noise Levels dB(A)
	Location A	74 L _{eq,15mins}
	Location B	75 L _{eq,15mins}
7 November 2012	Location C	76 ¹ L _{eq,15mins}
7 November 2013	Location D	76 L _{eq,15mins}
	Location E	75 L _{eq,15mins}
	Location F	70 L _{eq,15mins}
1 July 2014	Location G	71 ¹ L _{eq,15mins}
	Location H	74 ¹ L _{eq,10mins}
9 May 2018	Location H	74 ¹ L _{eq,10mins}
	Location H	73 ¹ L _{eq,10mins}
	Location H	73 ¹ L _{eq,10mins}
	Location H	74 ¹ L _{eq,10mins}
	Location H	74 ¹ L _{eq,10mins}

Note 1 – Noise level measurements have been corrected -2.5dB for façade reflection.

Table 7 – Unattended Noise Level Measurements (West Gate Freeway)

Measurement Locations	Period	Measured Noise Levels
Unattended noise monitor	Day (6.00 – 22.00)	74 L _{eq,16hr} dB (A)
indicated in Figure 3 (roof of Urban Central)	Night (22.00 – 7.00)	69 L _{eq,8hr} dB (A)

Measurement Locations	Period	Measured Noise Levels
Level 5 apartment external	Day (6.00 – 22.00)	72 L _{eq,16hr} dB (A)
balcony of Bella Apartments facing Kings Way	Night (22.00 – 6.00)	68 L _{eq,8hr} dB (A)
Level 14 apartment external	Day (6.00 – 22.00)	69 L _{eq,16hr} dB (A)
balcony of Bella Apartments facing Kings Way	Night (22.00 – 6.00)	64 L _{eq,8hr} dB (A)

Table 8 – Unattended Noise Level Measurements (Kings Way)

6 EVALUATION OF EXTERNAL NOISE INTRUSION

Internal noise levels will primarily be as a result of noise transfer through the windows, doors and roof as these are relatively light building elements that offer less resistance to the transmission of sound. Walls that are proposed to be heavy masonry elements will not require upgrading.

The predicted noise levels through the windows, doors and roof are discussed below. The predicted noise levels have been based on the expected level and spectral characteristics of the external noise, the area of building elements exposed to traffic noise, the absorption characteristics of the rooms and the noise reduction performance of the building elements.

Glazing/façade treatment was determined based on the measured noise levels and transmission loss of the façade. The constructions set out below are necessary for the satisfactory control of external noise to comply with the internal noise level criteria detailed in Table 4.

6.1 RECOMMENDED GLAZING FOR APARTMENTS

The glass thicknesses shown in the schedule do not consider thermal, structural, safety or any other requirements other than acoustic requirements and thus may require upgrading in some instances. In these instances, increasing the glass thickness beyond the acoustic requirement will be acceptable. Where the glazing thickness has not been specified, standard glazing will be acceptable.

Table 9 below details the minimum R_w performance requirements for the glazing assembly installed. Where open-able windows or sliding doors are installed, the total Rw performance of the system shall not be lower than the values listed in Table 9. It is noted that the system supplied shall meet the overall minimum Rw ratings nominated based on a laboratory test report for the system. If an alternative system is proposed the system shall be reviewed and will require approval by a suitably qualified acoustic consultant to ensure that the proposed system is acceptable and will ensure compliance with the nominated internal noise design criteria detailed in Table 4.

Location	Required Glazing Construction ¹	Minimum Rw of Installed Window System	Acoustic Seals ²
Refer Appendix 1 – Glazing Mark- up	6.38mm lam or 6/12/6.38mm lam IGU	31	Yes
	10.38mm lam or 6/12/10.38 lam IGU	35	Yes
	12.76mm lam or 6/12/12.76 lam IGU	37	Yes
	8.38mm lam / 12mm air gap / 12.76mm lam	39	Yes
	6mm	29 ³	Yes
	(100mm air gap)	(100mm air gap)	
	10.38mm lam ³	35 ³	

Table 9 – Minimum External Glazing Requirements / Performance

Note 1 – Alternative glazing system may be installed provided they are approved by a suitable qualified acoustic consultant.

Note 2 – Mohair Seals in windows and doors are **not** acceptable where acoustic seals are required. Seals in these instances shall be equal to Schlegel Q-lon.

Note 3 – The R_w rating specified applies to each glazing section. The glazing assembly assumes that the secondary glazing system is a jockey sash installed within the common frame.

6.2 APARTMENT EXTERNAL WALLS

Apartment external walls incorporating concrete, or masonry construction will be sufficient to address external traffic noise intrusion and will not require further acoustic treatment. Any lightweight external wall shall be reviewed by a suitably qualified acoustic consultant to ensure compliance with the internal traffic noise level criteria detailed in Table 4 is achieved.

Penetrations in walls must be sealed gap free with a flexible sealant. Any ventilation openings in should be acoustically treated to maintain the acoustic performance of the external wall construction.

6.3 APARTMENT ROOF / CEILING CONSTRUCTION

Apartments incorporating concrete roof construction will be sufficient to address external traffic noise intrusion and will not require further acoustic treatment.

Penetrations in roof must be sealed gap free with a flexible sealant. Any ventilation openings in should be acoustically treated to maintain the acoustic performance of the roof / ceiling construction.

7 CONCLUSION

This report details our acoustic assessment for the proposed residential development site located at 292-300 City Road Southbank. Provided the acoustic treatment recommendations in Section 6 are implemented, compliance with the criteria in Section 4 will be achieved and therefore satisfy Condition 37 of Planning Permit No. TP-2019-929/A by City of Melbourne (date of amendment 20 September 2023).

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

Yours faithfully,

Acoustic Logic Pty Ltd Barli Wibisono

APPENDIX 1 – GLAZING MARKUP





