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Acoustic Assessment of External Retail Areas

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1 INTRODUCTION

This report presents our assessment of the likely impact on residential acoustic amenity caused by the operation of the proposed outdoor seating areas of various retail tenancies to be situated on the ground floor of the residential development Jewel, located at 1 Burroway Road, Wentworth Point.

This report has been prepared to address Department of Planning comments regarding the outdoor seating, as stated below:

"To progress the application, please provide the following:

- *a full detailed noise report (noting this was a key recommendation of the original Acoustic Assessment), which:*
    - *analyses the existing and proposed noise impacts allowing a clear comparison between the approved and proposed situation*
    - *includes physical mitigation and management measures to further address/reduce the significant noise impact on the site*
- *confirmation whether the recommended mitigation measure proposed within the original Acoustic Statement have been / are being installed and implemented (roofs, awnings, noise control and management, specification of residential building envelope)*
- *confirmation of by how much (if at all) the glass canopy would reduce noise impacts to apartments;*
- *confirmation of noise impacts of the additional outdoor dining areas (if retained)."*

This report will:

- Present the original planning proposal and the originally predicted noise levels.
- Assess the proposed outdoor area proposal and present predicted noise levels.
- Present a discussion of predicted noise levels against the original proposal.
- If necessary, determine building and/or management controls necessary to ensure the acoustic amenity of the residential receivers above is maintained.

2 NOISE DESCRIPTORS

Environmental noise constantly varies. Accordingly, it is not possible to accurately determine prevailing environmental noise conditions by measuring a single, instantaneous noise level.

To accurately determine the environmental noise a 15-20 minute measurement interval is 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 analysing 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 L_{10} 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 will depend 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 15 minute 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 environmental noise.

L_1 levels represent is the loudest 1% noise event during a measurement period.

3 ORIGINAL CONDITIONS AND PROPOSED OUTDOOR SEATING

3.1 ORIGINAL PROPOSAL

The original proposal included outdoor seating to the northeast facing the wharf, and between buildings A and B on a shared forecourt at ground level. It is noted that the original proposal did not include an imperforate glass canopy over the outdoor seating areas, which is currently proposed.

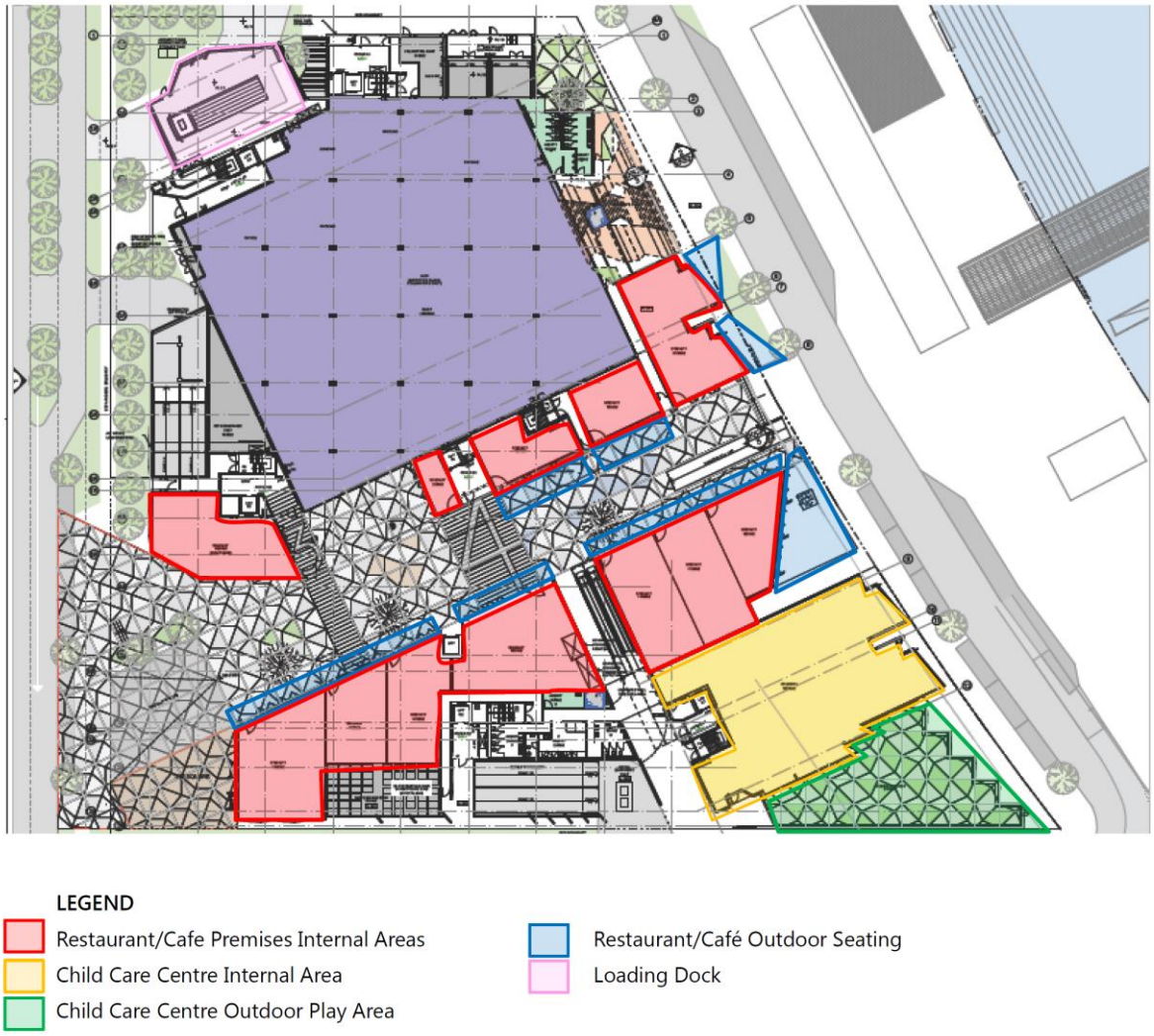


Figure 1 – Original Outdoor Seating Proposal

3.2 PREDICTED NOISE LEVELS

This original proposal was assessed in Renzo Tonin report with reference TG490-01F02 (R3). The results of the original assessment. The predicted noise levels as a result of the operation of the outdoor seating areas are presented in Figure 2. All noise levels are cumulative dB(A) $L_{eq\ (15\ minute)}$. It is noted that the two locations on the northernmost portion of the plans were originally affected by a loading dock area. This loading dock area has been relocated to beneath the development and these receivers are no longer subject to loading dock noise.

Figure 2 – Original Predicted Noise Levels dB(A) L_{eq}

3.3 PROPOSED OUTDOOR SEATING

The current proposal includes a main outdoor seating area on the ground floor forecourt between buildings A & B, which includes an imperforate structural glass canopy, shielding the main outdoor seating area from the residential properties above.

The outdoor seating area to the northeast remains. However, where this originally had been assessed to have operating hours up to 11pm, the current proposal is for outdoor seating to cease operation at 7pm. These two outdoor spaces, to the northeast and the main forecourt, are the only two proposed licenced areas of the current proposal.

In addition to the original proposal, there is currently a bench seating area associated with tenancy 5, with a capacity for 30 people. Additionally, there is a provision for 10 outdoor seats for tenancy 10. Both outdoor seating areas for tenancy 5 and tenancy 10 not licenced and both areas will cease operation at 7pm.

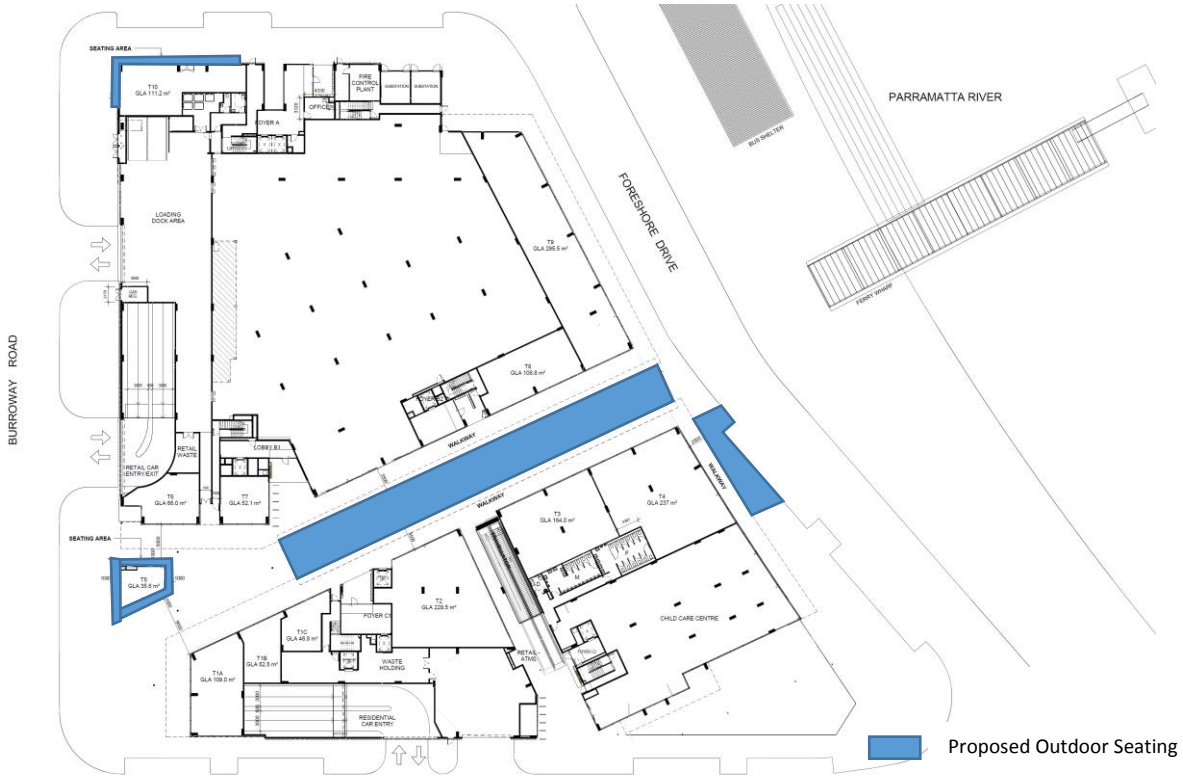


Figure 3 - Proposed Outdoor Seating

3.4 PREDICTED NOISE LEVELS FROM CURRENT OUTDOOR SEATING PROPOSAL

This section of the report examines the potential noise impacts from the proposed outdoor areas. The main potential noise sources will be patrons within the outdoor areas and background music.

The noise predictions are based on typical noise levels likely to be generated by the restaurants. These emission levels were corrected for distance attenuation, barrier effects where applicable (specifically the structural glass awning), and the orientation of the respective receivers to determine the resultant noise level at the potentially affected properties.

The following is a summary of the noise emission levels used as a basis for the noise predictions to the potentially affected properties. Predicted noise levels within the outdoor seating areas of the restaurants have been assessed using the following assumptions:

- Patron noise is subject to 1 in 3 patrons talking at a moderately loud level at any one time.
- A sound power level of 75dB(A) L_{eq} was used for patron voice levels for this assessment.
- All tenancies are filled to capacity and operating simultaneously.
- There are no openings in the solid structural glass above the external seating areas (colonnade).
- Background music only is proposed within restaurants as such, a noise level of 65dB(A) SPL has been used for this assessment which is typical of a normal restaurant.

All predicted levels are based on the implementation of treatments nominated in Section 5.

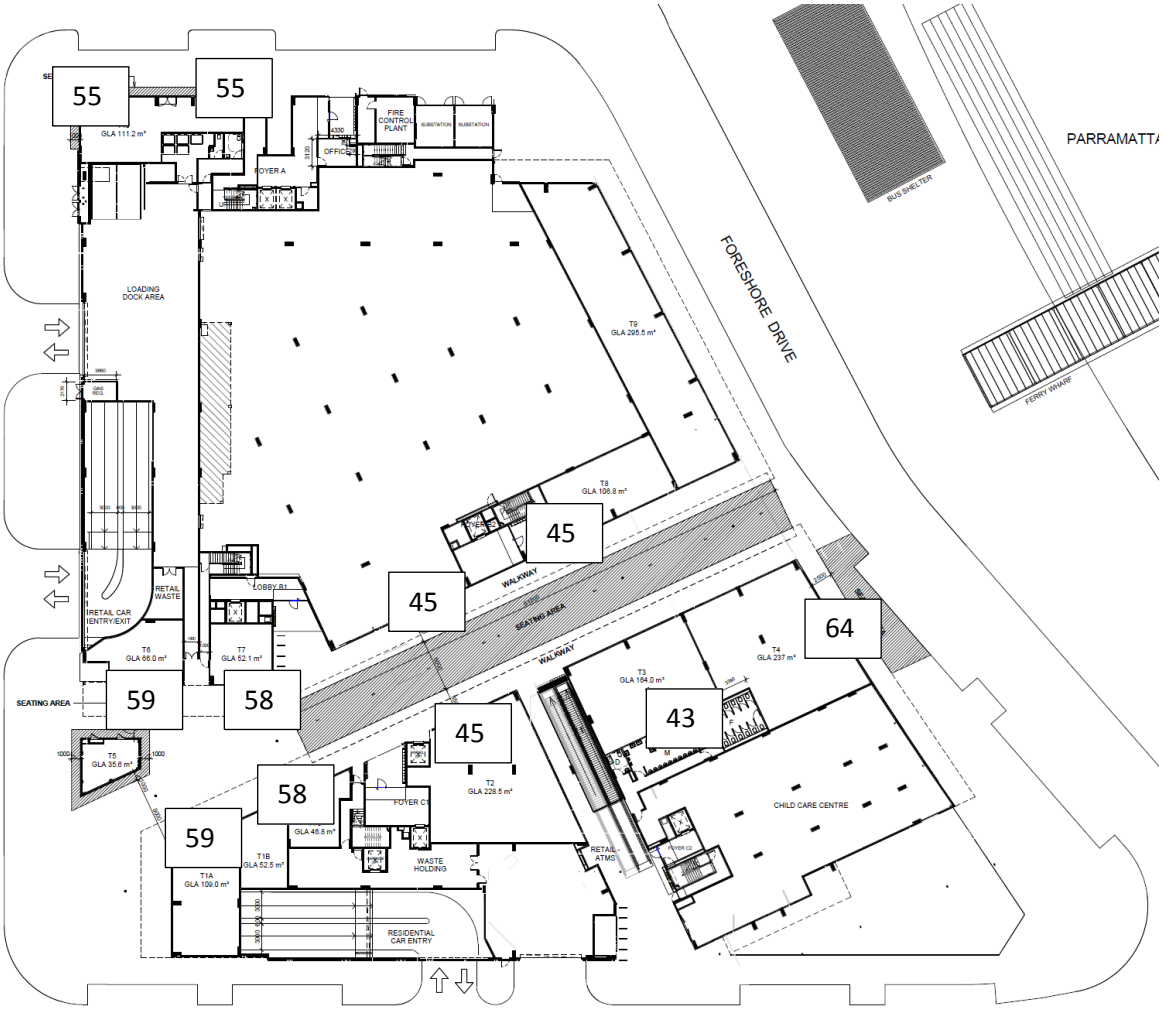


Figure 4 – Current Proposal Predicted Noise Levels at Residential Above dB(A) L_{eq}

Table 1 – Comparison of Approved and Current Scheme

Location	Approved Proposal Noise Level dB(A) L_{eq}	Current Proposal Noise Levels dB(A) L_{eq}
Balconies Above Tenancy 10	53 - 56	55
Balconies Above Tenancy 5	69 - 73	58 - 59
Balconies Above Main Seating (covered in current proposal)	62 - 72	43 - 45
Balcony Above Tenancy 4	73	64

4 DISCUSSION OF NOISE LEVELS

At all receiver locations on the façade of the buildings, predicted noise levels are lower with the implementation of the current planning scheme. This is due to the current distribution of patrons, the implementation of a completely solid, imperforate, structural glass awning covering the main noise generating colonnade, and the fact that (as noted in the original acoustic report) predictions were conservatively high, as very little information was available about the tenancies uses.

There is only one receiver with marginally higher predicted noise levels than the previous scheme are this receiver is directly above tenancy 10. However, it is noted that: a) there is only a 2dB(A) increase in previously predicted noise at one receiver location; b) this noise is café noise rather than loading dock noise which can subjectively be perceived as less annoying that loading dock noise; c) tenancy 10 has limited outdoor seating (only 10 patrons); and d) tenancy 10 is not licenced; patron vocal noise is unlikely to be elevated in the way a licenced premises would.

It is also noted that even though the noise level has been predicted/assessed to a resident‘s balcony, the development has a modern laminated glass façade with acoustic seals and occupants can benefit from closing their windows in order to reduce noise.

See Section 5 for a detailed set of recommendations in order to maintain the amenity of the occupants above.

5 RECOMMENDATIONS

5.1 RECOMMENDED TREATMENTS

The following treatments are recommended:

- Only 150 patrons are permitted within the main outdoor covered area at any point in time.
- Tenancy 4 is to be limited to 40 patrons in the outdoor seating area. Tenancy 5 must be limited to 30 patrons seated in the outdoor area, ensuring seating is evenly distributed around all sides of the tenancy. Tenancy 10 should be limited to 10 patrons in the outdoor seating area.
- Benches within the kitchen are to be isolated from structural walls and columns (no rigid connection).
- Any tiled flooring within the kitchen or back of house and bar area is to be acoustically treated with 5mm thick Acoustic Supplies Vibramat.
- Any loudspeakers installed within the space should be suitably vibration isolated from the building structure to render structure borne noise inaudible within the residences above.

5.2 RECOMMENDED MANAGEMENT CONTROLS

Required management controls are as follows:

- Outdoor seating for all areas to be closed at 10pm. Restaurants may continue to operate until 12am internally, provided windows and doors are closed and all patrons are contained within the premises.
- Background music is to be limited to a level of 65dB(A) within the restaurants.
- Management should ensure that patrons depart the premises in a prompt and orderly manner at closing times.
- Prominent notices shall be placed to remind patrons that a minimum amount of noise is to be generated when leaving the premises.
- All garbage should be retained within the premises and removed the following day after 7am.

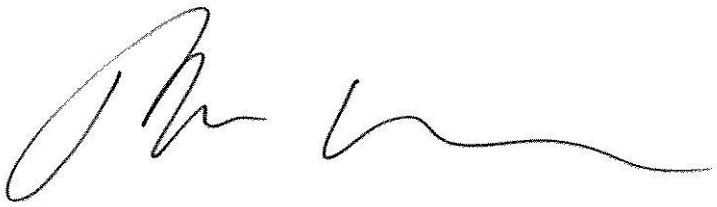
6 CONCLUSION

This letter has been prepared to address comments presented by the Department of Planning regarding the change in proposal for outdoor seating areas of ground floor tenancies of the residential development, Jewel located at Wentworth Point.

This report has:

- Presented the original proposal with the predicted noise levels from the original noise impact assessment;
- Predicted noise levels from the operation of outdoor seating areas based on the current planning;
- Predicted noise levels based on the current planning proposal are lower than the original scheme. This is due to the current distribution of patrons, the implementation of a completely solid, imperforate, structural glass awning covering the main noise generating colonnade, and the fact that (as noted in the original acoustic report) original predictions were conservatively high, as very little information was available about the tenancies uses at that time.
- Mitigation measures have been included in this report to ensure the ongoing acoustic amenity of residential properties above is maintained.

Yours faithfully,



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