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To: Andrew Edwards

Company: Vantage Building Group

Author: Burak Ayva / SW

Subject: Townhouse Units, Lot 8001 Terraces, Birtinya – High Level Acoustic Advice

Pages: 1 of 5

Dear Andrew,

At your request, Trinity Consultants Australia has undertaken a high-level review of potential road traffic noise impacts affecting the proposed townhouse development on Lot 8001 at corner of Aura Boulevard and Baringa Drive, Baringa.

This advice has been prepared with reference to the road traffic noise assessment contained within Acoustic Report - Stages 7, 8, 9, 10, 25B, 32, 33 & H (NEW - Sep 18).pdf, prepared by ASK Consulting Engineers (Report No. 7504R04V05, dated 11 September 2018). Lot 8001 forms part of the broader area addressed within the referenced assessment.

For the purposes of this review, the proposed townhouse concept layout has been geographically overlaid onto the predicted road traffic noise contours presented in Appendix D of the referenced report. The overlay prepared by the undersigned is reproduced in **Figure 1** for ground and upper levels and has been used to provide preliminary advice regarding the relative road traffic noise exposure across the proposed development.

1. RELEVANT NOISE ASSESSMNET FRAMEWORK

The referenced assessment considered road traffic noise associated with Bells Creek Arterial and surrounding higher-order roads and was undertaken with regard to the Queensland road traffic noise planning framework, including the State Development Assessment Provisions (SDAP), Queensland Development Code Mandatory Part MP4.4 Buildings in a Transport Noise Corridor, and Australian Standard AS/NZS 2107 Acoustics – Recommended Design Sound Levels and Reverberation Times for Building Interiors.

As per the criteria section of the report, lots affected by Council-controlled roads and experiencing noise levels above 63 dBA require detailed assessment to determine acoustic ratings for construction materials (using AS 2107 and AS 3671). These assessments involve detailed acoustic modelling and room-by-room analysis to determine the façade sound insulation performance required to achieve the nominated internal design criteria.

A detailed assessment of internal noise levels in accordance with AS/NZS 2107 and AS 3671 has not been undertaken as part of this preliminary review. Rather, as an initial assessment approach, the predicted road traffic noise contour information has been reviewed against the noise category requirements defined in QDC MP4.4 to provide a high-level indication of the likely extent of acoustic building treatments.

2. PRELIMINARY ASSESSMENT

Review of the ground floor and first floor road traffic noise contour plans, as shown in **Figure 1**, indicates that the proposed townhouse development will be subject to varying levels of road traffic noise exposure across the site, from 57 dBA to 73 dBA façade corrected $L_{A10,18hours}$, with the highest road traffic noise levels

occurring adjacent to the arterial road corridor located along the eastern and south-eastern boundaries of the site. Predicted noise levels generally reduce progressively towards the western and north-western portions of the development due to increased separation distance from the surrounding road network and the benefits of intervening building shielding.

In terms of exceedance of 63 dBA (triggering a need for acoustic materials), the following observations are made:

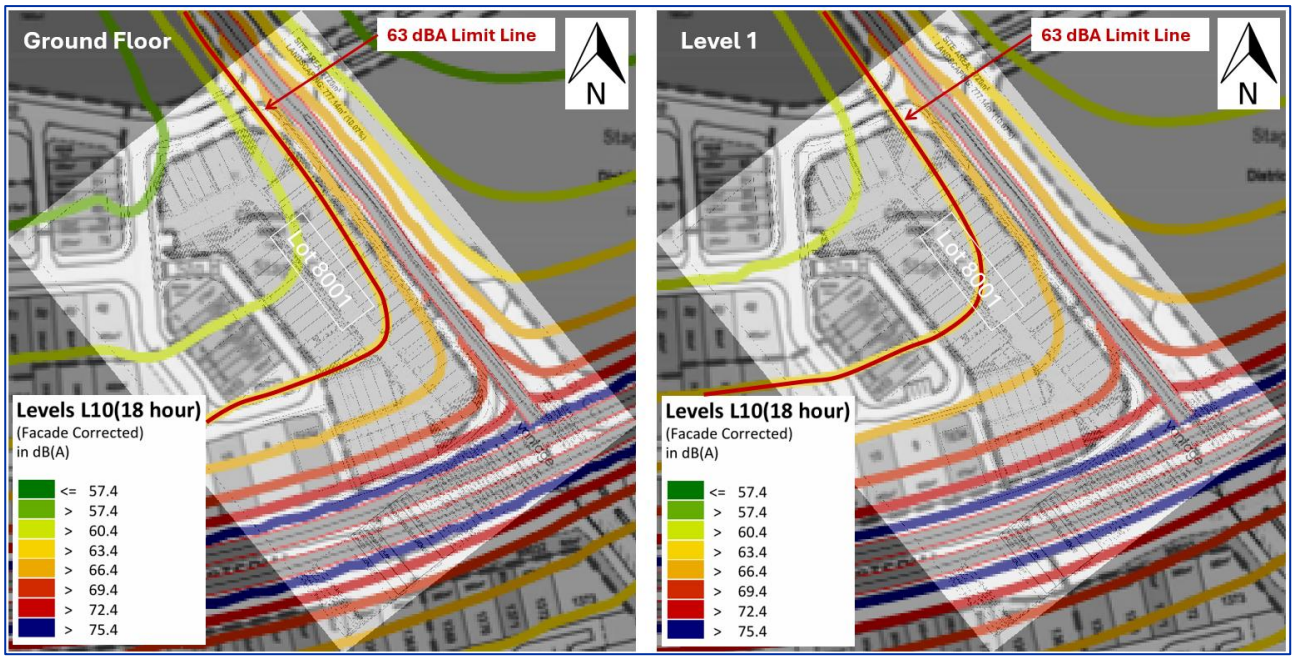
- Eastern boundary of site (southern half) – rooms along the eastern boundary (southern half) may marginally exceed 63 dBA
- Southern portion of site – rooms closest to Aura Boulevard are expected to exceed 63 dBA (with noise levels of up to 73 dBA).

Predicted façade-corrected road traffic noise levels greater than 63 dBA corresponds to Category 2 to Category 4 of QDC MP4.4.

Consistent with this trend, façades directly exposed to the eastern and south-eastern road frontages are expected to require the highest levels of acoustic treatment. Based on the predicted contour mapping, these façades may require building treatments broadly commensurate with QDC MP4.4 Category 3 to Category 4 construction. In contrast, treatment requirements are expected to reduce progressively towards the internal and north-western portions of the development (reducing to no requirements where levels are 63 dBA or below).

Comparison of the ground floor and Level 1 contour plans further indicates that upper-level façades generally experience greater road traffic noise exposure than corresponding ground floor façades due to reduced shielding effects and a more direct line-of-sight to the adjoining road corridor. Consequently, upper-level road-facing façades may require a higher level of acoustic treatment than lower-level façades within the same building.

Figure 1. Road Traffic Noise Contours overlaid on Proposed Townhouse Development



Based on the overlay review, the following observations are made with regards to potential MP4.4 categories:

- Facades/rooms along eastern boundary (southern half) – MP4.4 Category 2 increasing to Category 4 towards south-eastern corner.
- Facades/rooms in close primary to Bellavista Boulevard Rd and along southern boundary – MP4.4 Category 4.

- Facades/rooms facing away from the roads and shielded by proposed buildings – Reducing to Category 2 depending on specific location (and eventually no requirements where levels are 63 dBA or below).
  - Townhouses located within central areas of the development are expected to benefit from partial shielding provided by the eastern and southern row of buildings and generally lower road traffic noise levels than the road-facing dwellings.

Category 4 construction is achieved using widely available building products, glazing systems, doors, wall constructions and ventilation solutions commonly used throughout Australia.

It is understood that Vantage Building Group adopts a standard construction achieving Rw 38 for walls and roof/ceiling systems. This is equivalent to between a QDC MP4.4 Category 1 (which requires Rw 35 for walls and roof/ceilings) and Category 2 (Rw 38 for roof/ceiling and Rw 41 for walls). **Table 2.1** presents a summary of the Rw ratings for different QDC MP4.4 categories.

Table 2.1: QDC MP4.4 Acoustic Rating Requirements

	Cat 1	Cat 2	Cat 3	Cat 4
Glazing	27 (total area > 1.8 m^2) 24 (< 1.8 m^2)	35 (total area > 1.8 m^2) 32 (< 1.8 m^2)	38 (> 1.8 m^2) 35 (< 1.8 m^2)	43
External Walls	35	41	47	52
Roof	35	38	41	45
Floors	-	45	45	51
Entry Doors	28	33	33	35

Based on the above, it is expected that higher than Rw 38 will be required for the external walls and roof.

Acceptable forms of construction for different QDC MP4.4 categories can be reviewed from *Queensland Development Code MP 4.4 – Buildings in A Transport Noise Corridor, version 1.1, dated 17 August 2015*.

3. LIMITATIONS

As noted earlier, AS 2107 assessment is required for lots affected by Council-controlled roads and with noise levels exceeding 63 dBA. This review has been prepared as planning-level preliminary advice only (without undertaking the AS 2107 assessment). As an alternative and simplified approach, predicted noise levels have been reviewed against QDC MP4.4 noise category requirements. It is further noted that predicted noise levels are based on project traffic data (derived for the original noise assessment in 2018). Actual traffic levels may differ from these original estimates.

Detailed assessment according to the following tasks should be undertaken during further design stages:

- Detailed façade noise level calculations using a road traffic noise model and noise monitoring data;
- Assessment of internal noise levels in accordance with AS/NZS 2107;
- Building envelope assessments in accordance with AS 3671;
- Determination of acoustic ratings for glazing, wall, roof, door and other building envelop elements.

4. CONCLUSION

Based on the review of the road traffic noise contours presented in the broader Aura noise assessment, the proposed townhouse development on Lot 8001 will be exposed to varying levels of road traffic noise associated with Aura Boulevard and Baringa Drive. The highest noise exposure is predicted to occur along the eastern

and south-eastern site boundaries, with lower noise levels occurring towards the central and western portions of the development.

The overlay assessment indicates that façade treatment requirements are likely to vary across the development, with the most exposed road-facing townhouses potentially requiring construction treatments broadly consistent with QDC MP4.4 Category 4. Lower categories are anticipated across the more shielded internal and western areas of the site. Construction requirements up to QDC MP4.4 Category 4 are achieved using available Australian residential building systems, including glazing, wall, door and ventilation solutions.

The use of QDC MP4.4 as a guide to potential construction has been adopted in this initial/preliminary review. Ultimately, a more detailed review is required in accordance with AS 2107 and AS 3671.

Accordingly, from a road traffic noise perspective, the proposed townhouse development is considered capable of achieving an appropriate level of residential acoustic amenity through the incorporation of suitable façade treatments during detailed design.

We trust this advice is of assistance. Should you require any further information, please do not hesitate to contact the undersigned.

Document Approval	
Approver Signature	
Name	Burak Ayva
Title	Noise and Vibration Engineer

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