

Proposed Residential Subdivision
2236 Beaudesert Road, Calamvale
(Lot 1197 on S312437, Lot 41 on RP225105 and
Lots 30 & 33 on RP810107)

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

Prepared For:

Orchard (Calamvale) Developments Pty Ltd
ATF The Calamvale Trust

31 January 2024

crgref: 19169 report subdivision rev.2

1.0 INTRODUCTION

This report is in response to a request by Orchard (Calamvale) Developments Pty Ltd ATF The Calamvale Trust for a revised environmental noise assessment of a proposed residential subdivision along 2236 Beaudesert Road in Calamvale.

In undertaking the assessment, unattended noise monitoring was undertaken, and through modelling, noise predictions of existing and future road noise impacts and onsite activity noise impacts were produced. Based upon the predicted noise impact levels, recommendations regarding acoustic treatment to the development have been provided.

This report is a revision to a previous assessment (CRGref: 19169 report subdivision dated March 2023) and is required due to updated development plans. It is noted that the Referral Agency provided response conditions report dated 20/04/2023 regarding our previous report (SARA ref 2210-31503 SRA), which included barrier design and noise impact levels at residential lots.

2.0 SITE & DEVELOPMENT DESCRIPTION

The proposal relates to 2236 Beaudesert Road, 9A Brentwood Street, 8A Dalwood Street and 14 Palatine Street, Calamvale, formally described as Lot 1197 on S312437, Lot 41 on RP225105, Lot 33 on RP810107 and Lot 30 on RP810107. The site is zoned EC “Emerging Community” and is bounded by Beaudesert Road to the west, residential properties to the north, east and south. For site location and surrounding environs refer to Appendix A.

The proposal is to subdivide the parcel of land to yield 36 residential lots. For development plans refer to Appendix B.

As the proposal is constructing a noise sensitive development in close proximity to Beaudesert Road, the development has been assessed under the State Development Assessment Provisions (SDAP) Queensland State Code 1: “*Development in a State-controlled Road Environment*” Version 3.0 (effective 4th February 2022).

Under the Queensland Government’s SPP Interactive Mapping System the northern section of the development is located within a Transport Noise Corridor (refer to Attachment A in Appendix A); hence building shell treatments will be required for all habitable rooms in accordance with the Queensland Development Code “*Mandatory Part 4.4 – buildings in transport noise corridor*”. This assessment provides specific Noise Categories based upon verified 3D road noise modelling, which is an alternate solution to applying the blanket Noise Category Classification as detailed in the Development Code MP 4.4. This revised Noise Categories apply to the Building Application stage.

Onsite activity associated with the proposed development (i.e. mechanical plant) has been assessed to ensure the activity does not impact adversely on the surroundings offsite noise sensitive dwellings / apartments immediately to the north, south and east of the site.

3.0 AMBIENT NOISE SURVEY

3.1 Instrumentation

The following equipment was used to record ambient noise levels at the subject site locale.

- Rion NC 73 Calibrator; and
- Rion NL 21 Environmental Noise Logger.

All instrumentation used in the survey held current calibration certificates from a certified NATA calibration laboratory.

3.2 Unattended Measurement Methodology

A logger was located to the western boundary of the subject site. The logger was within a free-field location with the microphone approximately 1.2m above ground and 18m from the nearest lane of Beaudesert Road. Refer to Figure 2 in Appendix A for the logger location.

The logger was set to record noise statistics in 15 minute blocks continually between Thursday 03/12/2020 to Thursday 10/12/2020. Noise measurements were conducted generally in accordance with Australian Standard AS2702 - 1984 “Acoustics - Methods for the measurement of road traffic noise”. The operation of the sound level logging equipment was field calibrated before and after the measurement session with no significant drift from the reference signal recorded.

Weather conditions during the monitoring period were obtained from the Bureau of Meteorology website from the Archerfield weather station. Weather conditions were generally fine (except for 12mm of rain on Tuesday 08/12/2020) with a temperature range between 18 and 36°C and a relative humidity range between 16 and 74%. Due to the poor weather conditions, ambient levels have been excluded from the road traffic noise assessment.

3.3 Unattended Measurement Results

Table 1 below presents the measured ambient noise levels from the logger location. Graphical presentation of the measured noise levels from the logger are presented in the Appendix C.

| Road Traffic Noise Descriptor | Time Period | Measured Level dB(A) | | | |
|--------------------------------|-----------------|----------------------|----------|----------|---------|
| | | 04/12/20 | 07/12/20 | 09/12/20 | Average |
| L _{10,18hr} | 6am to Midnight | 65 | 66 | 66 | 66 |
| L _{10,12hr} | 6am to 6pm | 67 | 67 | 67 | 67 |
| L _{eq,1hr} Daytime | 6am to 10pm | 65 | 69 | 65 | 66 |
| L _{eq,1hr} Night time | 10pm to 6am | 64 | 64 | 63 | 64 |
| L _{90,18hr} | 6am to Midnight | 51 | 52 | 51 | 51 |
| L _{90,8hr} | 10pm to 6am | 40 | 41 | 42 | 41 |

| Background Noise Descriptors | Time period | 03/12 – 10/12/2020 Measured level dB(A) |
|---|-------------|---|
| Daytime Background RBL L ₉₀ | 7am to 6pm | 51 |
| Evening Background RBL L ₉₀ | 6pm to 10pm | 46 |
| Night-time Background RBL L ₉₀ | 10pm to 7am | 36 |

Table 1: Measured ambient noise levels at the logger location.

4.0 NOISE CRITERIA

4.1 Road Traffic Noise Criterion

The State Development Assessment Provisions (SDAP) Queensland State Code 1 “*Development in a state-controlled road environment*”, Table 1.2.2: “*Environmental emissions*” sets the following road traffic noise criterion:

| Involving the creation of 6 or more new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor | |
|---|--|
| <p>PO38 Reconfiguring a lot minimises free field noise intrusion from a state-controlled road.</p> | <p>AO38.1 Development provides noise barrier or earth mound which is designed, sited and constructed:</p> <ol style="list-style-type: none"> 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: <ol style="list-style-type: none"> a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. <p>OR</p> <p>AO38.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.</p> |

Reference tables

Table 2: Maximum free field acoustic levels

| Applicable use | Acoustic levels |
|--|---|
| <p>2.1: Private open space for residential lots</p> | <p>a. ≤57 dB(A) L₁₀ (18 hour) free field (measured L₉₀ (18 hour) free field between 6am and 12 midnight ≤45 dB(A))</p> |
| <p>2.2: Private open space for an accommodation activity (including lots created for a future accommodation activity)</p> | <p>OR</p> <p>b. ≤60 dB(A) L₁₀ (18 hour) free field (measured L₉₀ (18 hour) free field between 6am and 12 midnight >45 dB(A))</p> |

4.2 Onsite Mechanical Plant Activity Noise Criteria

Brisbane City Council’s “Multiple Dwelling Code” cites the following in relation to mechanical plant (i.e. air-conditioning plant, heat pumps and pool pumps) noise:

| Performance outcomes | Acceptable outcomes |
|--|--|
| <p>PO22 Development that includes mechanical plant (including air-conditioning plant, heat pumps and swimming pool pumps) ensures it is located, designed and attenuated to achieve the following criteria:</p> <ul style="list-style-type: none"> • $L_{Aeq,adj,T}$ emitted from mechanical plant is not greater than the rating background level plus 3 at a sensitive use not associated with the development. <p>Note— Where T is</p> <ul style="list-style-type: none"> • Day (7am to 6pm): 11hr, • Evening (6pm to 10pm): 4hr, • Night (10pm to 7am): 9hr. <p>Where-</p> <ul style="list-style-type: none"> • $L_{Aeq,adj,T}$ is the A-weighted equivalent continuous sound pressure level during measurement time T, adjusted for tonal and impulsive noise characteristics, determined in accordance with the methodology described in the Noise impact assessment planning scheme policy. • The rating background level is determined in accordance with the methodology described in the Noise impact assessment planning scheme policy. <p>Note—A noise impact assessment report prepared in accordance with the Noise impact assessment planning scheme policy can assist in demonstrating achievement of this performance outcome.</p> | <p>AO22 Development ensures mechanical plant is acoustically screened from nearby sensitive uses.</p> |

Based upon the above criterion, the following criterion applies for mechanical plant:

- Day 7am to 6pm: 54 dB(A).
- Evening 6pm to 10pm: 49 dB(A).
- Night-time 10pm to 7am: 39 dB(A).

5.0 PREDICTED NOISE IMPACTS

5.1 Predicted Road Traffic Noise Immissions

5.1.1 Traffic Volumes

Existing: The existing hourly year 2020 traffic volume for Beaudesert Road, including percentage of heavy vehicles, was obtained from a tube count undertaken by Bitzios Consulting. Tube counts were undertaken from Thursday 3/12/2020 to Wednesday 9/12/2020 at approximately 410m north of Ormskirk Street (approximately 150m from the noise logger location). The tabulated hourly and 24 hour data for the three weekdays are presented in Appendix C. The traffic counts were undertaken simultaneously with the recent traffic noise measurements detailed in Section 3.3.

Northbound (Against Gazettal)

3 Day Average 18hr Traffic Volume: 22,406 vehicles per 18 hour, 10.53% heavy vehicles
Average speed 64 km/hr

Southbound (Gazettal)

3 Day Average 18hr Traffic Volume: 24,006 vehicles per 18 hour, 12.05% heavy vehicles
Average speed 72 km/hr

Ultimate: The predicted volume for year 2033 assumes a 1.54% compound growth per annum (calculated from 5-year traffic growth obtained from the Department of Transport and Main Roads Traffic Engineering, Technology & Systems Section (data provided from the Traffic Analysis and Reporting System (TARS) from the DTMR traffic counter (No 136208) – refer to Appendix C).

Northbound (Against Gazettal)

Predicted 2033 18hr Traffic Volume: 26,364 vehicles per 18 hour, 10.53% heavy vehicles

Southbound (Gazettal)

Predicted 2033 18hr Traffic Volume: 28,246 vehicles per 18 hour, 12.05% heavy vehicles

5.1.2 Road Traffic Noise Model Parameters

Road traffic noise predictions were conducted using PEN3D, a CoRTN based model acceptable under the Environmental Protection (Noise) Policy. The following parameters were used in developing the PEN3D model for the development site:

- 2.5 dB façade correction.
- 80 km/hr speed limit on Beaudesert Road.
- Year 2033 traffic volumes presented in Section 5.1.1.
- Stone Mastic Asphalt road surface (minus 1 dB correction required).
- CoRTN calibration factors for Queensland Conditions - NAASRA Working Group (Saunders, Samuels, Leach and Hall 1983) adjustments for Australian conditions of minus (-) 0.7 dB for free-field locations and minus (-) 1.7 dB for façade locations.
- CoRTN soft ground cover has been used in the model for grassed / landscaped areas and CoRTN hard ground surface for roads and concrete pavements.
- Ground levels of the surrounding land obtained from ELVIS website (Elevation and Depth – Foundation Spatial Data) as a LiDAR file and converted to a 3D dxf file
- Development Plans provided in Appendix B.
- Finished / modelled floor levels provided in Appendix B / Tables 2 and 3.
- Ground Floor receiver heights taken at 1.8m above finished pad levels.
- Aboveground First Floor receiver heights taken at 4.6m above finished pad levels.
- Outdoor private open space receiver heights taken at 1.5m above finished pad levels.

For PEN3D point calculations results refer to Appendix C.

5.1.3 Modelled Road Traffic Noise Levels – Existing Situation

To verify the road traffic noise prediction model, the existing $L_{A10,18hr}$ traffic noise level was calculated for the logger location and compared to the measured noise level. For PEN3D point calculation sheets refer to Appendix C.

The calculated existing $L_{A10,18hr}$ noise level, approximately 20m from the nearest lane of Beaudesert Road is 66.5 dB(A). Compared with the measured $L_{10,18hr}$ level of 65.7 dB(A), which is within the allowable 2 dB(A) deviation from measured levels.

5.1.4 Modelled Road Traffic Noise Levels – Year 2033 Ultimate Situation

Based upon year 2033 traffic volumes and the development layout, the PEN3D model predicts the following traffic noise levels as detailed below:

- Scenario 1:** No acoustic barrier – Table 2 and Figure 5.1.
- Scenario 2:** Acoustic barriers (as detailed in refer to Sketch 1 in Section 6.1.1) to comply with the ground level private open space criterion of Section 4.1 – Table 3 and Figure 5.2.

For ground floor and aboveground floor building façades, we have recommended application of The Queensland Development Code (QDC) Mandatory Part (MP) 4.4 “Buildings in a Transport Noise Corridor” for building shell treatments.

| PRIVATE OPEN SPACES: FREE-FIELD NOISE IMPACT LEVELS | | | |
|---|------------|-----------------------------|--|
| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted Year 2032 L _{10 18hr} dB(A) |
| Ground Level | 1 | 77.11 | 68 |
| | 2 | 76.04 | 68 |
| | 3 | 74.54 | 67 |
| | 4 | 74.36 | 64 |
| | 5 | 74.18 | 63 |
| | 6 | 73.91 | 62 |
| | 7 | 73.59 | 61 |
| | 8 | 73.29 | 60 |
| | 9 | 72.89 | 59 |
| | 10 | 72.42 | 58 |
| | 11 | 71.97 | 57 |
| | 12 | 71.56 | 57 |
| | 13 | 71.16 | 56 |
| | 14 | 70.71 | 55 |
| | 15 | 70.26 | 55 |
| | 16 | 69.81 | 54 |
| | 17 | 69.41 | 54 |
| | 18 | 69.12 | 53 |
| | 19 | 68.60 | 54 |
| | 20 | 68.80 | 55 |
| | 21 | 69.36 | 55 |
| | 22 | 68.86 | 55 |
| | 23 | 68.46 | 55 |
| | 24 | 68.68 | 54 |
| | 25 | 69.08 | 56 |
| | 26 | 69.58 | 56 |
| | 27 | 71.50 | 58 |
| | 28 | 72.02 | 59 |
| | 29 | 72.47 | 60 |
| | 30 | 72.84 | 61 |
| | 31 | 73.19 | 62 |
| | 32 | 73.42 | 63 |
| | 33 | 73.64 | 65 |
| | 34 | 73.82 | 66 |
| | 35 | 73.96 | 68 |
| | 36 | 74.16 | 71 |
| EXTERNAL CRITERION | | | 60 |

Table 2: No Barrier - Predicted traffic noise impact levels across the subdivision.

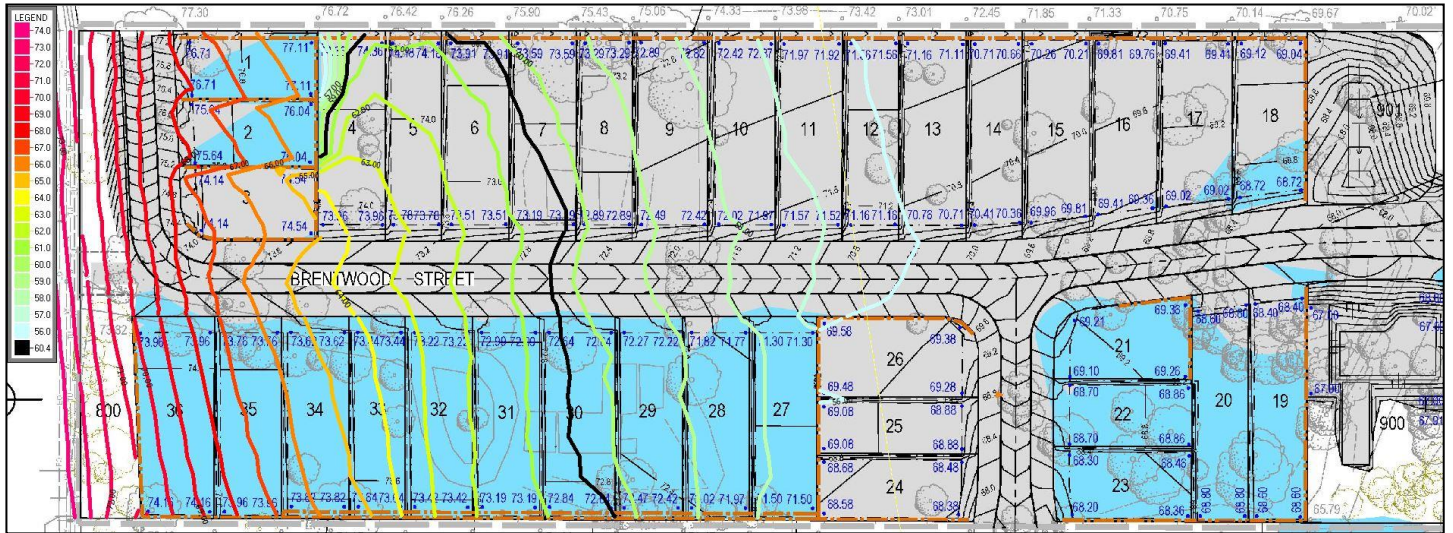
Based upon the above free-field L_{10 18hr} levels (for the private open spaces), noise exceedances are predicted over Lots 1 to 7 and 30 to 36, hence acoustic barrier / earthmounds are required (Table 3 / Figure 5.2).

| BUILDING FAÇADES: FAÇADE CORRECTED NOISE IMPACT LEVELS | | | |
|--|------------|-----------------------------|--|
| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted Year 2032 L ₁₀ 18hr dB(A) |
| Ground Level | 1 | 77.11 | 70 |
| | 2 | 76.04 | 69 |
| | 3 | 74.54 | 69 |
| | 4 | 74.36 | 66 |
| | 5 | 74.18 | 65 |
| | 6 | 73.91 | 64 |
| | 7 | 73.59 | 63 |
| | 8 | 73.29 | 62 |
| | 9 | 72.89 | 61 |
| | 10 | 72.42 | 60 |
| | 11 | 71.97 | 59 |
| | 12 | 71.56 | 58 |
| | 13 | 71.16 | 58 |
| | 14 | 70.71 | 57 |
| | 15 | 70.26 | 57 |
| | 16 | 69.81 | 56 |
| | 17 | 69.41 | 56 |
| | 18 | 69.12 | 55 |
| | 19 | 68.60 | 56 |
| | 20 | 68.80 | 57 |
| | 21 | 69.36 | 57 |
| | 22 | 68.86 | 56 |
| | 23 | 68.46 | 56 |
| | 24 | 68.68 | 57 |
| | 25 | 69.08 | 58 |
| | 26 | 69.58 | 58 |
| | 27 | 71.50 | 60 |
| | 28 | 72.02 | 61 |
| | 29 | 72.47 | 62 |
| | 30 | 72.84 | 63 |
| | 31 | 73.19 | 64 |
| | 32 | 73.42 | 65 |
| | 33 | 73.64 | 67 |
| | 34 | 73.82 | 68 |
| | 35 | 73.96 | 70 |
| | 36 | 74.16 | 72 |
| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted Year 2032 L ₁₀ 18hr dB(A) |
| Aboveground level | 1 | 77.11 | 71 |
| | 2 | 76.04 | 71 |
| | 3 | 74.54 | 71 |
| | 4 | 74.36 | 68 |
| | 5 | 74.18 | 67 |
| | 6 | 73.91 | 66 |
| | 7 | 73.59 | 65 |
| | 8 | 73.29 | 64 |
| | 9 | 72.89 | 63 |
| | 10 | 72.42 | 62 |
| | 11 | 71.97 | 61 |
| | 12 | 71.56 | 60 |
| | 13 | 71.16 | 60 |
| | 14 | 70.71 | 59 |
| | 15 | 70.26 | 58 |
| | 16 | 69.81 | 58 |
| | 17 | 69.41 | 57 |
| | 18 | 69.12 | 57 |
| | 19 | 68.60 | 57 |
| | 20 | 68.80 | 57 |
| | 21 | 69.36 | 58 |
| | 22 | 68.86 | 58 |
| | 23 | 68.46 | 58 |
| | 24 | 68.68 | 59 |
| | 25 | 69.08 | 60 |
| | 26 | 69.58 | 60 |
| | 27 | 71.50 | 62 |
| | 28 | 72.02 | 63 |
| | 29 | 72.47 | 64 |
| | 30 | 72.84 | 65 |
| | 31 | 73.19 | 66 |
| | 32 | 73.42 | 67 |
| | 33 | 73.64 | 68 |
| | 34 | 73.82 | 70 |
| | 35 | 73.96 | 71 |
| | 36 | 74.16 | 73 |

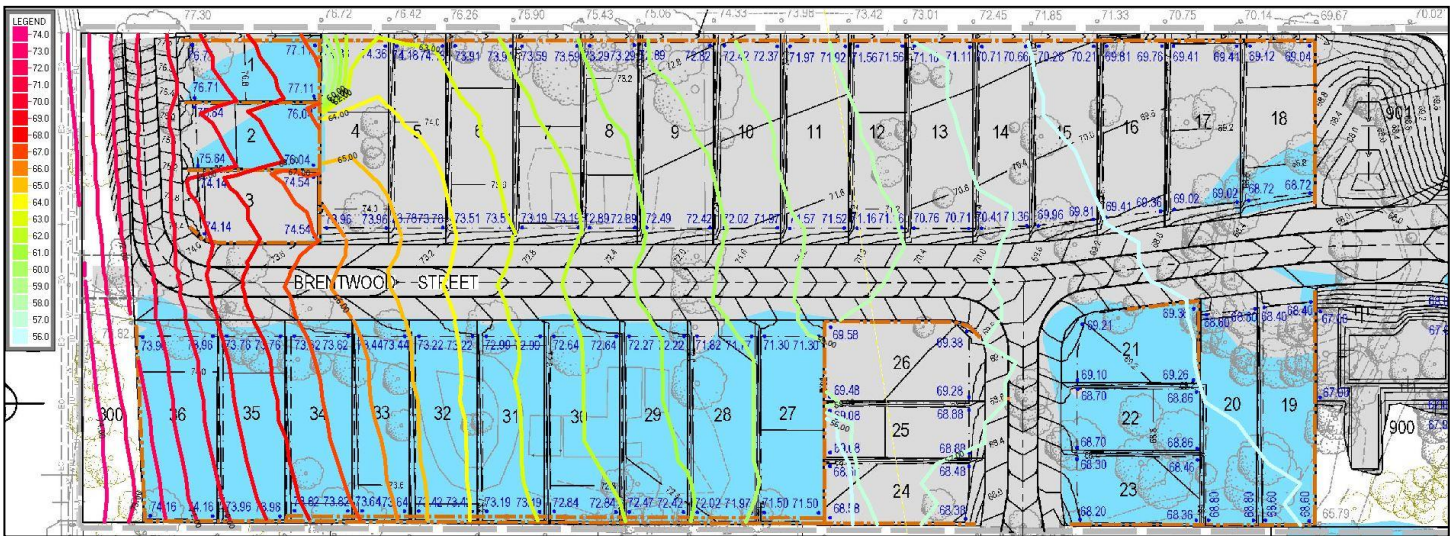
Table 2 (con't): No Barrier - Predicted traffic noise impact levels across the subdivision.

Figure 5.1: NO Acoustic Barrier - Predicted $L_{10\ 18hr}$ noise contours across the subdivision.

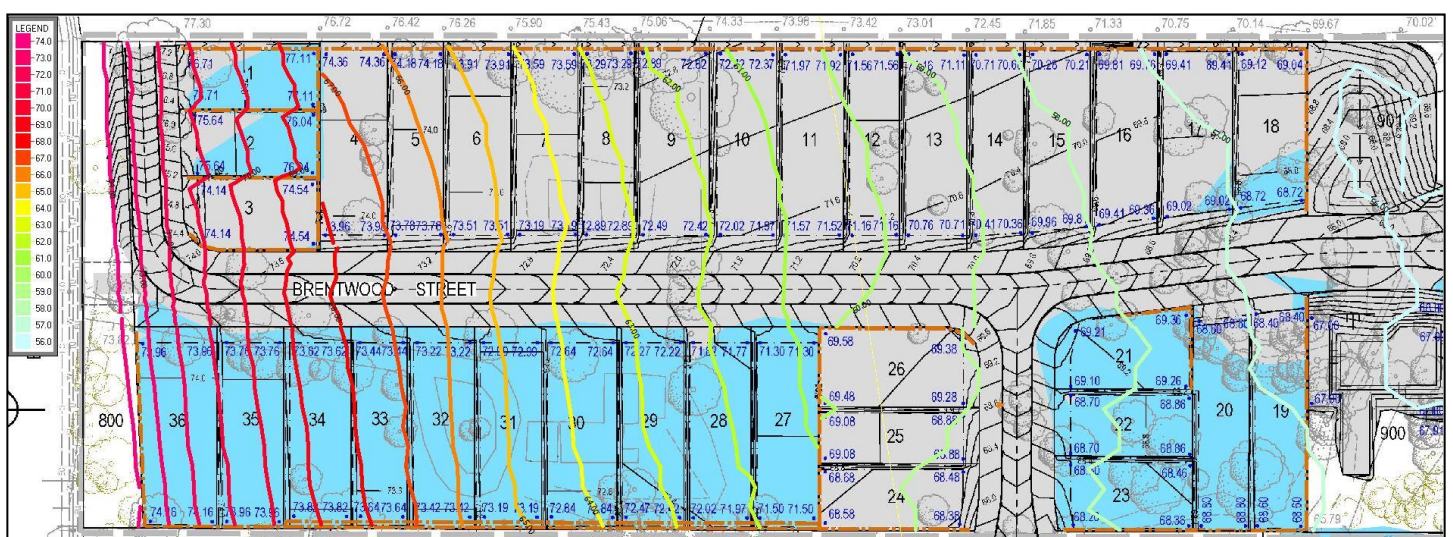
Ground Level Private Open Spaces (Free-field Levels)



Ground Level Façades (Façade Corrected Levels)



Aboveground Level Façades (Façade Corrected Levels)



| PRIVATE OPEN SPACES: FREE-FIELD NOISE IMPACT LEVELS | | | |
|---|------------|-----------------------------|--|
| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted Year 2032 L _{10 18hr} dB(A) |
| Ground Level | 1 | 77.11 | 60 |
| | 2 | 76.04 | 60 |
| | 3 | 74.54 | 59 |
| | 4 | 74.36 | 58 |
| | 5 | 74.18 | 58 |
| | 6 | 73.91 | 58 |
| | 7 | 73.59 | 58 |
| | 8 | 73.29 | 57 |
| | 9 | 72.89 | 57 |
| | 10 | 72.42 | 56 |
| | 11 | 71.97 | 56 |
| | 12 | 71.56 | 55 |
| | 13 | 71.16 | 55 |
| | 14 | 70.71 | 54 |
| | 15 | 70.26 | 54 |
| | 16 | 69.81 | 53 |
| | 17 | 69.41 | 53 |
| | 18 | 69.12 | 53 |
| | 19 | 68.60 | 54 |
| | 20 | 68.80 | 54 |
| | 21 | 69.36 | 54 |
| | 22 | 68.86 | 54 |
| | 23 | 68.46 | 54 |
| | 24 | 68.68 | 54 |
| | 25 | 69.08 | 54 |
| | 26 | 69.58 | 55 |
| | 27 | 71.50 | 56 |
| | 28 | 72.02 | 58 |
| | 29 | 72.47 | 58 |
| | 30 | 72.84 | 59 |
| | 31 | 73.19 | 59 |
| | 32 | 73.42 | 58 |
| | 33 | 73.64 | 59 |
| | 34 | 73.82 | 59 |
| | 35 | 73.96 | 60 |
| | 36 | 74.16 | 60 |
| EXTERNAL CRITERION | | | 60 |

Table 3: Compliant Barrier - Predicted traffic noise impact levels across the subdivision.

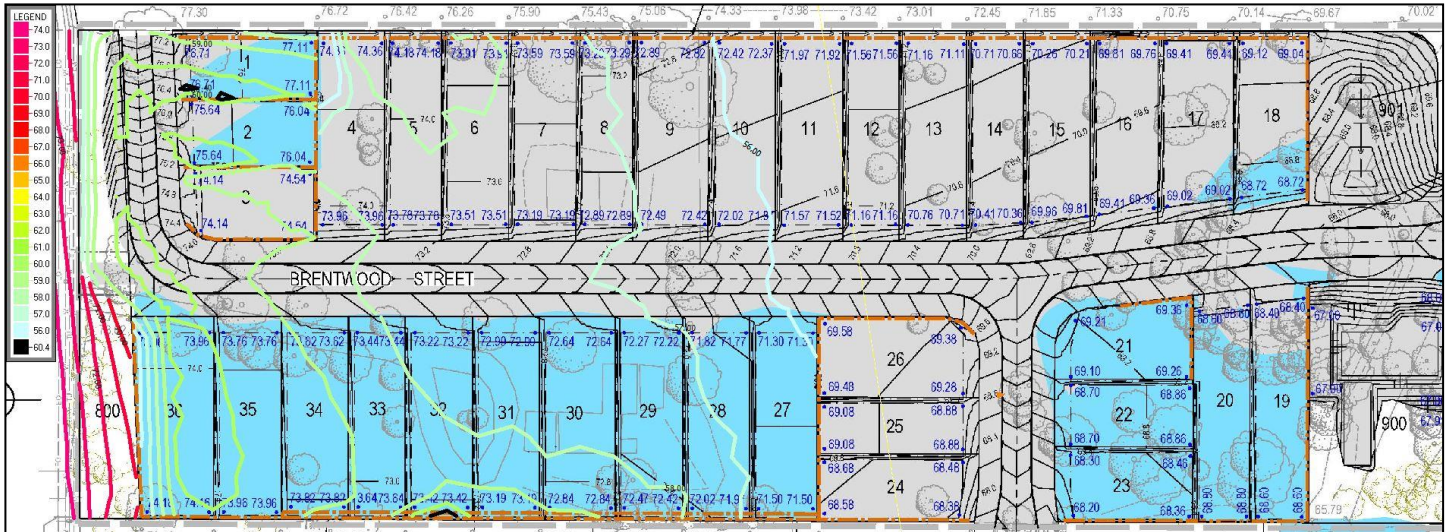
Based upon the designed acoustic barrier as detailed in Sketch A, the external noise criterion of 60 dB(A) L_{10 18hr} (free-field) is predicted to be achieved at ground level private open spaces.

| BUILDING FAÇADES: FAÇADE CORRECTED NOISE IMPACT LEVELS | | | |
|--|------------|-----------------------------|--|
| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted Year 2032 L _{10 18hr} dB(A) |
| Ground Level | 1 | 77.11 | 62 |
| | 2 | 76.04 | 62 |
| | 3 | 74.54 | 61 |
| | 4 | 74.36 | 60 |
| | 5 | 74.18 | 59 |
| | 6 | 73.91 | 60 |
| | 7 | 73.59 | 59 |
| | 8 | 73.29 | 59 |
| | 9 | 72.89 | 59 |
| | 10 | 72.42 | 58 |
| | 11 | 71.97 | 57 |
| | 12 | 71.56 | 57 |
| | 13 | 71.16 | 57 |
| | 14 | 70.71 | 56 |
| | 15 | 70.26 | 56 |
| | 16 | 69.81 | 55 |
| | 17 | 69.41 | 55 |
| | 18 | 69.12 | 54 |
| | 19 | 68.60 | 55 |
| | 20 | 68.80 | 56 |
| | 21 | 69.36 | 56 |
| | 22 | 68.86 | 56 |
| | 23 | 68.46 | 56 |
| | 24 | 68.68 | 56 |
| | 25 | 69.08 | 56 |
| | 26 | 69.58 | 56 |
| | 27 | 71.50 | 58 |
| | 28 | 72.02 | 59 |
| | 29 | 72.47 | 60 |
| | 30 | 72.84 | 60 |
| | 31 | 73.19 | 61 |
| | 32 | 73.42 | 60 |
| | 33 | 73.64 | 61 |
| | 34 | 73.82 | 61 |
| | 35 | 73.96 | 62 |
| | 36 | 74.16 | 62 |
| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted Year 2032 L _{10 18hr} dB(A) |
| Aboveground level | 1 | 77.11 | 69 |
| | 2 | 76.04 | 67 |
| | 3 | 74.54 | 65 |
| | 4 | 74.36 | 63 |
| | 5 | 74.18 | 63 |
| | 6 | 73.91 | 62 |
| | 7 | 73.59 | 62 |
| | 8 | 73.29 | 61 |
| | 9 | 72.89 | 60 |
| | 10 | 72.42 | 60 |
| | 11 | 71.97 | 59 |
| | 12 | 71.56 | 59 |
| | 13 | 71.16 | 58 |
| | 14 | 70.71 | 58 |
| | 15 | 70.26 | 57 |
| | 16 | 69.81 | 57 |
| | 17 | 69.41 | 56 |
| | 18 | 69.12 | 56 |
| | 19 | 68.60 | 56 |
| | 20 | 68.80 | 56 |
| | 21 | 69.36 | 57 |
| | 22 | 68.86 | 57 |
| | 23 | 68.46 | 57 |
| | 24 | 68.68 | 58 |
| | 25 | 69.08 | 58 |
| | 26 | 69.58 | 58 |
| | 27 | 71.50 | 60 |
| | 28 | 72.02 | 61 |
| | 29 | 72.47 | 62 |
| | 30 | 72.84 | 63 |
| | 31 | 73.19 | 64 |
| | 32 | 73.42 | 66 |
| | 33 | 73.64 | 67 |
| | 34 | 73.82 | 68 |
| | 35 | 73.96 | 70 |
| | 36 | 74.16 | 73 |

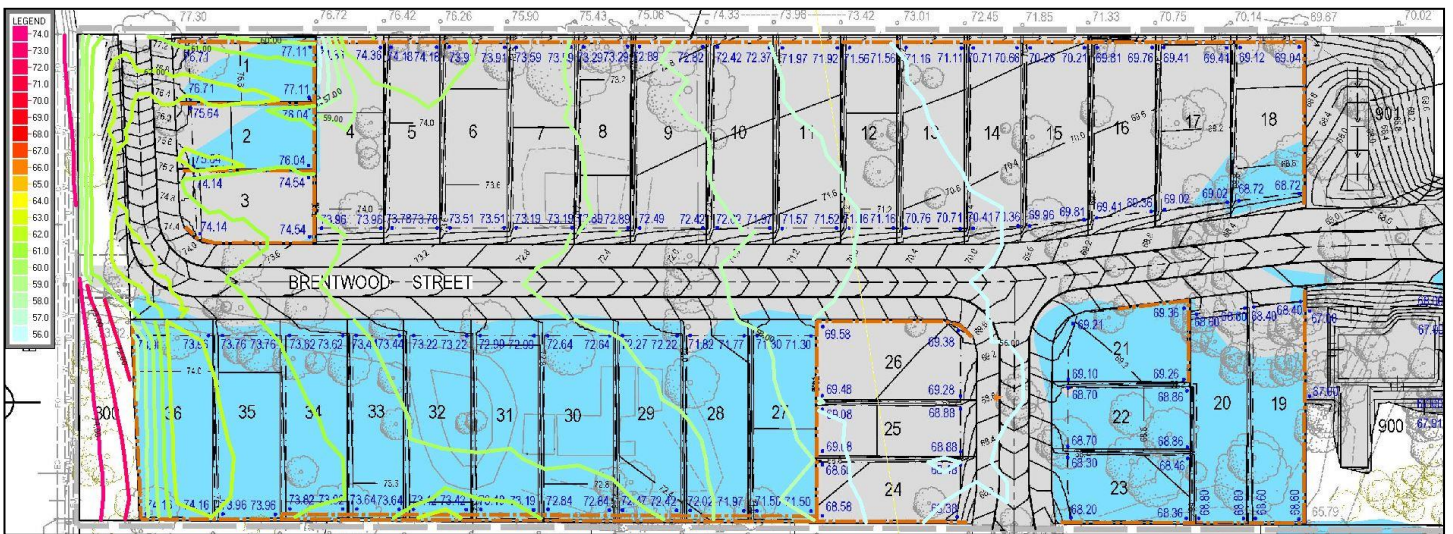
Table 3 (Con't): Compliant Barrier - Predicted traffic noise impact levels across the subdivision.

Figure 5.2: WITH Acoustic Barrier - Predicted L_{10} 18hr noise contours across the subdivision.

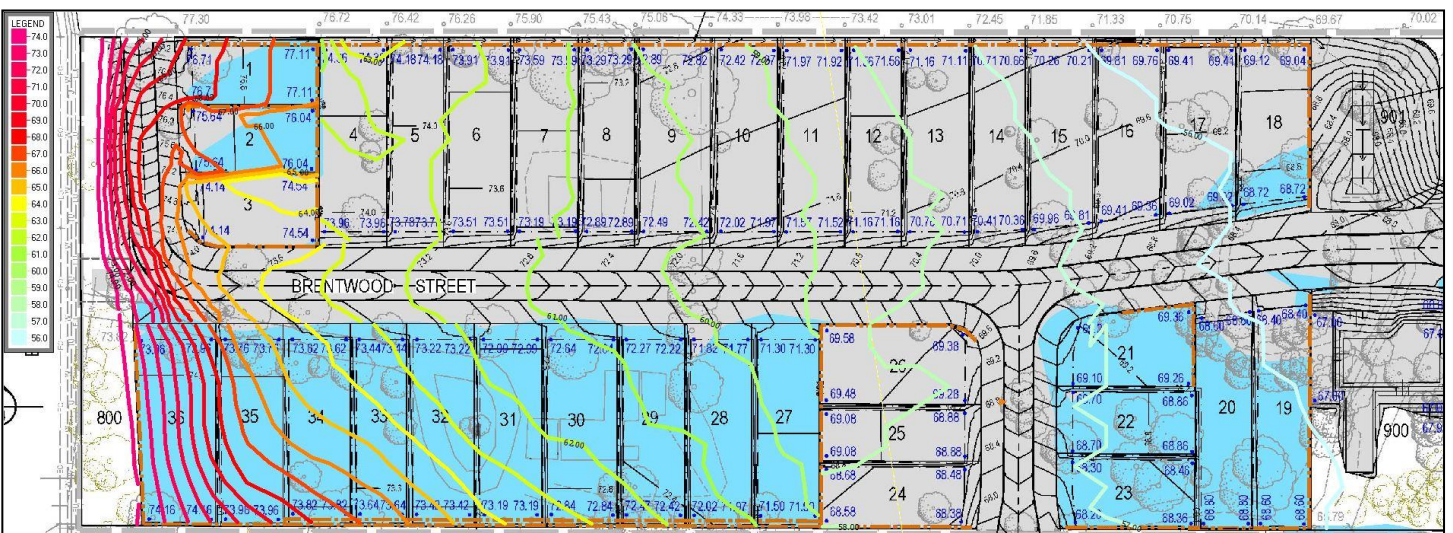
Ground Level Private Open Spaces (Free-field Levels)



Ground Level Façades (Façade Corrected Levels)



Aboveground Level Façades (Façade Corrected Levels)



5.2 Modelled Onsite Mechanical Plant Noise

Onsite mechanical plant noise source levels have been compiled from similar previous investigations. All noise levels have been corrected for impulsiveness or tonality as per Australian Standard AS 1055 “Acoustics-Description and measurement of environmental noise”.

The following mechanical plant noise sources are typically associated with the operation of a row of houses with the residential subdivision and have been assessed within this report:

| Activity/Noise Source | Noise Level, SPL L_{eq} dB(A) |
|---------------------------------|---------------------------------|
| Split system A/C condenser unit | 52 dB(A) at 1m |

* Denotes + 5 dB correction for impulsiveness in accordance with AS1055. ** Denotes + 5 dB correction for tonality in accordance with AS1055.

Table 4: Typical noise source levels associated with a residential development.

Based upon the location of onsite mechanical plant (assumed at nearest proposed row of future houses) in relation to offsite noise sensitive receivers, we predict the following noise impact levels as presented in Table 5 below.

We note that the predicted levels include the acoustic treatment recommendations detailed in Section 6.2.

| Continuous Noise Source | Predicted Noise Impact, SPL L_{eq} dB(A) |
|-----------------------------|---|
| Apartments Due North | Nearest Façade to Development |
| Apartment A/C x 2 units | 31 |
| Dwellings Due East | Nearest Façade to Development |
| Apartment A/C x 2 units | 39 |
| Dwellings Due South | Nearest Façade to Development |
| Townhouse A/C x 2 units | 39 |
| Criterion | 7am to 6pm: 54 / 6pm to 10pm: 49 / 10pm to 7am: 39 |

Table 5: Predicted onsite activity noise impact levels at offsite noise sensitive receivers.

For point source calculation sheets, refer to the Appendix C.

6.0 RECOMMENDED ACOUSTIC TREATMENTS

6.1 Road Traffic Noise Acoustic Recommendations

6.1.1 *Recommended Acoustic Barrier / Earthmounds*

To achieve PO38, and in accordance with AO38.1, we recommend construction of acoustic barriers as detailed in Sketch 1 over the page.

Road traffic noise barriers are to be constructed free of holes or gaps, including the ground level junction in accordance with:

- a. Chapter 7 “*Integrated noise barrier design of the Transport Management Code of Practice: Volume 1 (Road Traffic Noise)*”, Department of Transport and Main Roads 2013;
- b. Technical Specifications MRTS15 “*Noise Fences*”, Transport and Main Roads 2019;
- c. Technical Specifications MRTS04 “*General Earthworks*”, Transport and Main Roads 2020.

6.1.2 *Recommended Queensland Development Code MP4.4 Noise Categories*

For residential buildings impacted by road traffic noise, the Queensland Development Code “*Mandatory Part 4.4 – buildings in a transport noise corridor*” states the following with regards to acoustic treatments:

“The external envelope of each habitable room in a relevant residential building must comply with the minimum R_w^1 for each building component specified in Schedule 1 to achieve a minimum transport noise reduction level for the relevant noise category by:

- (a) using materials specified in Schedule 2 (of the Development Code);*

OR

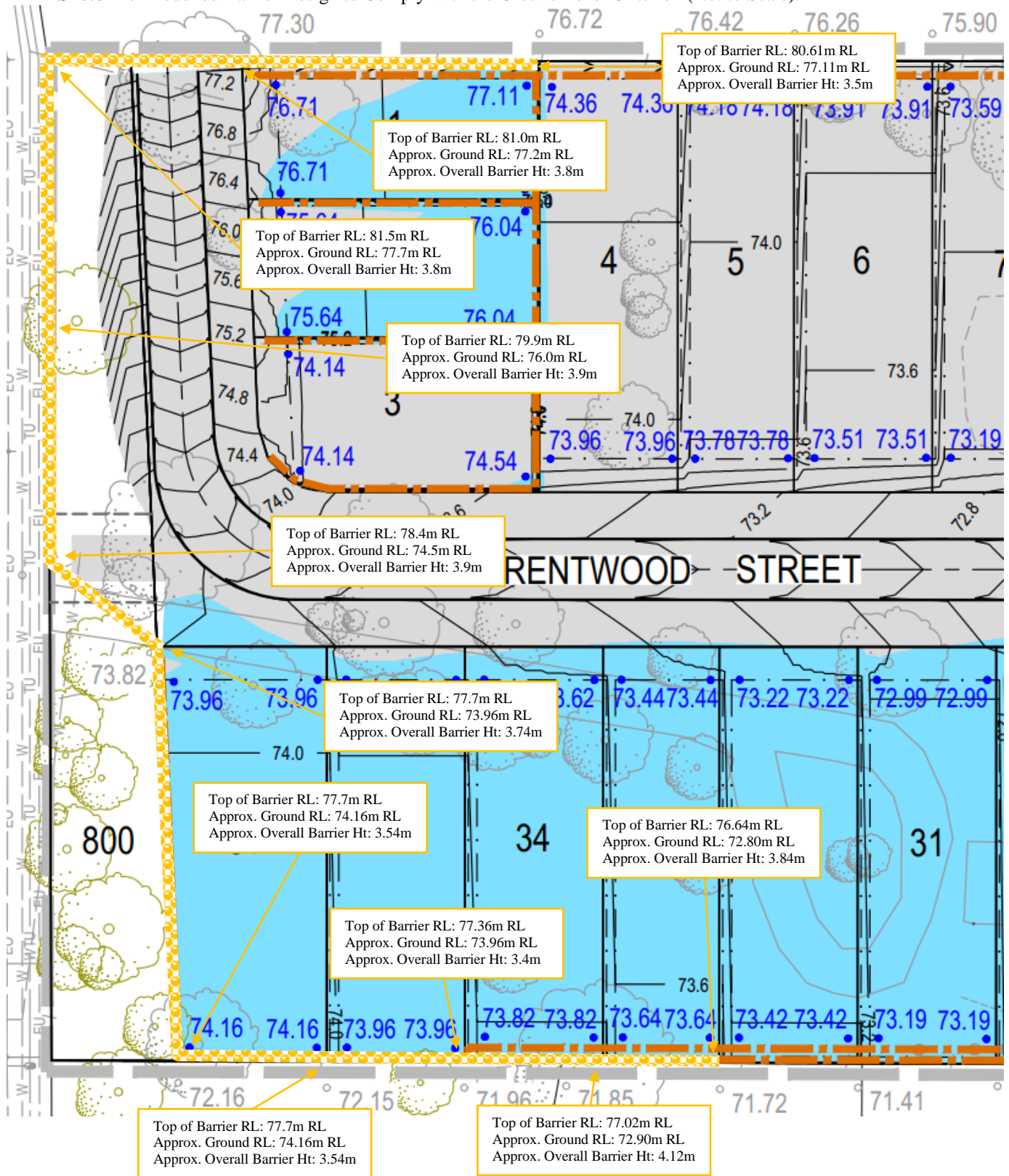
- (b) using materials with manufacturer’s specifications² that, in combination, achieve the minimum R_w value for the relevant building component and applicable noise category.”*

The predicted Noise Categories for habitable rooms of future dwellings within the proposed lots are presented in Table 6, Figure 6.1 and Figure 6.2 based upon the road traffic noise impact predictions of Section 5.4 (acoustic barrier scenario, refer to Table 3 of Section 5.1.4).

¹ R_w means the “*Weighted Sound Reduction Index*” as specified in ISO 140-3.

² Manufacturers’ Specifications means specifications that have been measured in accordance with AS/NZS ISO 717.1 for a material or system and have been approved by a registered testing Authority.

Sketch 1: Modelled Barrier Design to Comply with the Ground Level Criterion (Not to Scale).



ACOUSTIC TREATMENT LEGEND – ROAD TRAFFIC NOISE



Acoustic barriers to achieve the minimum “Top of Barrier RL” or the “Overall Barrier Ht”, as detailed in the sketch above, whichever is higher. Noise barriers are to be constructed in accordance with Technical Specification MRTS15 “Noise Fences” and Chapter 7 “Integrated Noise Barrier Design” of the “Transport Noise Management Code of Practice – Volume 1 Road Traffic Noise”, Department of Transport and Main Roads, 2013. Barrier should be free of holes or gaps, including the ground level junction.

The specific Noise Categories in Table 6, Figure 6.1 and Figure 6.2 and the R_w ratings specified in Schedule 1 of the Development Code (as detailed in Table 7 of this report) should be used in combination to determine the specific building shell treatments for the habitable rooms of the proposed development to mitigate road traffic noise.

We note that more detailed QDC MP4.4 assessments can be undertaken once detailed dwelling designs have been finalised so that specific Noise Categories can be determined for each habitable room (i.e. bedrooms and living areas). The opportunity to undertaken such an assessment would typically be alerted to the owner of the purchased lot by the Certifier prior to Building Application.

Under the meaning of “*Transport Noise Reduction*”, the Queensland Development Code MP4.4 states that “*the predicted levels of transport noise will be achieved only when doors, windows and other openings in the relevant parts of the building’s external envelope are closed*”. Rooms with building shell treatment requirements (rooms with Categories above Category “0”) require external openings to the rooms (i.e. operable windows and doors) to be closed to exclude road traffic noise. Therefore, there are requirements under the Building Code of Australia for ventilation that will need to be reviewed for the noise affected habitable rooms. Any air conditioning or sealed mechanical ventilation proposed should also not reduce the acoustic performance of the building shell. Habitable rooms with operable windows or sliding doors along façades that are predicted to have a Noise Category 0; could remain open for the purposes of fresh air ventilation to the relevant spaces.

| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted PEN3D MP4.4 Categories |
|--------------|------------|-----------------------------|--------------------------------------|
| Ground Level | 1 | 77.11 | 1 |
| | 2 | 76.04 | 1 |
| | 3 | 74.54 | 1 |
| | 4 | 74.36 | 1 |
| | 5 | 74.18 | 1 |
| | 6 | 73.91 | 1 |
| | 7 | 73.59 | Outside the Transport Noise Corridor |
| | 8 | 73.29 | |
| | 9 | 72.89 | |
| | 10 | 72.42 | |
| | 11 | 71.97 | |
| | 12 | 71.56 | |
| | 13 | 71.16 | |
| | 14 | 70.71 | |
| | 15 | 70.26 | |
| | 16 | 69.81 | |
| | 17 | 69.41 | |
| | 18 | 69.12 | |
| | 19 | 68.60 | |
| | 20 | 68.80 | |
| | 21 | 69.36 | |
| | 22 | 68.86 | |
| | 23 | 68.46 | |
| | 24 | 68.68 | |
| | 25 | 69.08 | |
| | 26 | 69.58 | |
| | 27 | 71.50 | |
| | 28 | 72.02 | |
| | 29 | 72.47 | |
| | 30 | 72.84 | |
| | 31 | 73.19 | 1 |
| | 32 | 73.42 | 1 |
| | 33 | 73.64 | 1 |
| | 34 | 73.82 | 1 |
| | 35 | 73.96 | 1 |
| | 36 | 74.16 | 1 |

Table 6: Recommended MP4.4 Noise Categories to mitigate road traffic noise.

| Floor Level | Lot Number | Modelled Pad Level R.L. (m) | Predicted PEN3D MP4.4 Categories |
|-------------------|------------|-----------------------------|--------------------------------------|
| Aboveground level | 1 | 77.11 | 3 |
| | 2 | 76.04 | 2 |
| | 3 | 74.54 | 2 |
| | 4 | 74.36 | 2 |
| | 5 | 74.18 | 1 |
| | 6 | 73.91 | 1 |
| | 7 | 73.59 | Outside the Transport Noise Corridor |
| | 8 | 73.29 | |
| | 9 | 72.89 | |
| | 10 | 72.42 | |
| | 11 | 71.97 | |
| | 12 | 71.56 | |
| | 13 | 71.16 | |
| | 14 | 70.71 | |
| | 15 | 70.26 | |
| | 16 | 69.81 | |
| | 17 | 69.41 | |
| | 18 | 69.12 | |
| | 19 | 68.60 | |
| | 20 | 68.80 | |
| | 21 | 69.36 | |
| | 22 | 68.86 | |
| | 23 | 68.46 | |
| | 24 | 68.68 | |
| | 25 | 69.08 | |
| | 26 | 69.58 | |
| | 27 | 71.50 | |
| | 28 | 72.02 | |
| | 29 | 72.47 | |
| | 30 | 72.84 | |
| | 31 | 73.19 | 2 |
| | 32 | 73.42 | 2 |
| | 33 | 73.64 | 2 |
| | 34 | 73.82 | 3 |
| | 35 | 73.96 | 3 |
| | 36 | 74.16 | 4 |

Table 6 (Con't): Recommended MP4.4 Noise Categories to mitigate road traffic noise.

Figure 6.1: Predicted Noise Categories at Ground Floor Façades, with Acoustic Barriers.

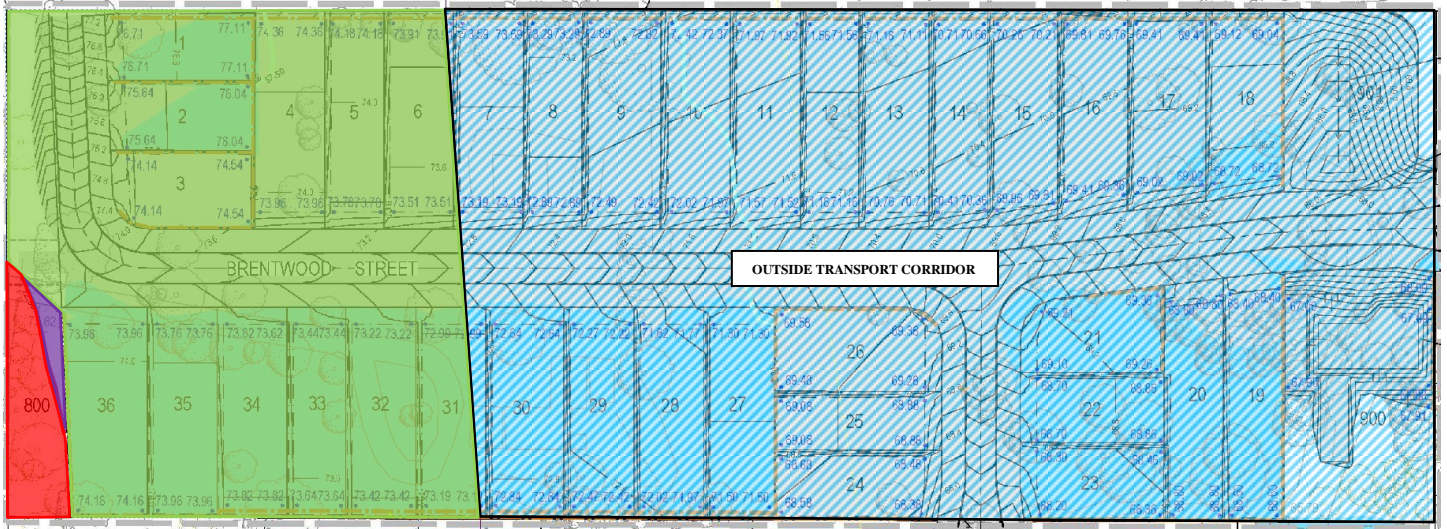
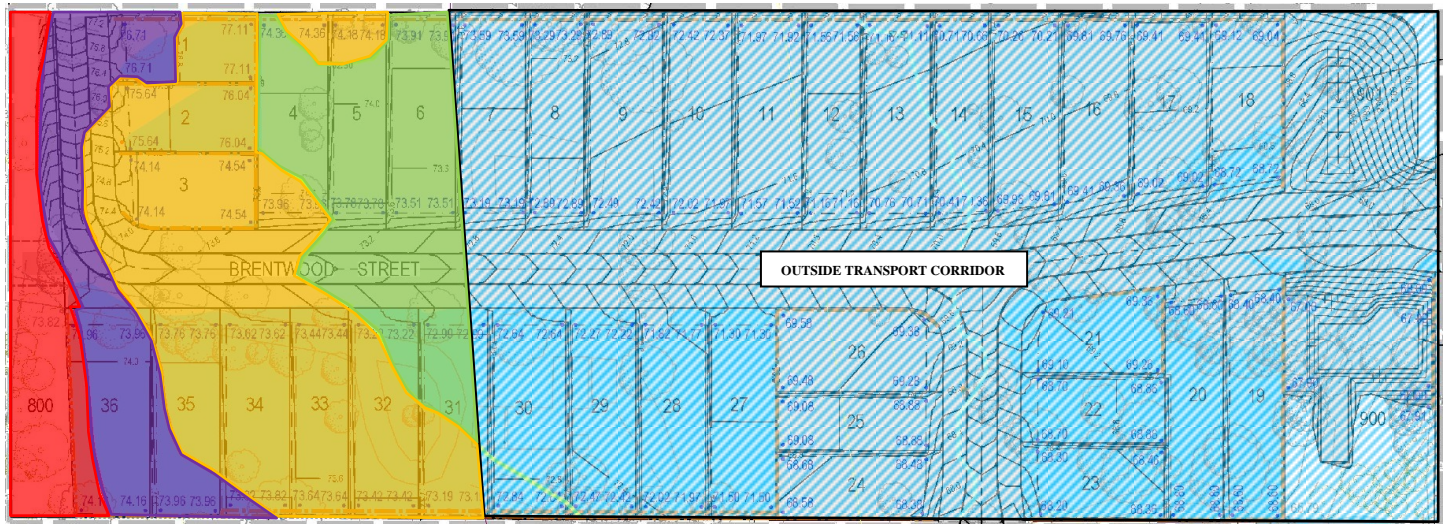


Figure 6.2: Predicted Noise Categories at First Floor Façades, with Acoustic Barriers.



Schedule 1

| Noise category | Minimum transport noise reduction (dB (A)) required for habitable rooms | Component of building's external envelope | Minimum R_w required for each component |
|----------------|--|---|--|
| Category 4 | 40 | Glazing | 43 |
| | | External walls | 52 |
| | | Roof | 45 |
| | | Floors | 51 |
| | | Entry doors | 35 |
| Category 3 | 35 | Glazing | 38 (where total area of glazing for a habitable room is greater than 1.8m ²) |
| | | | 35 (where total area of glazing for a habitable room is less than or equal to 1.8m ²) |
| | | External walls | 47 |
| | | Roof | 41 |
| | | Floors | 45 |
| | | Entry doors | 33 |
| Category 2 | 30 | Glazing | 35 (where total area of glazing for a habitable room is greater than 1.8m ²) |
| | | | 32 (where total area of glazing for a habitable room is less than or equal to 1.8m ²) |
| | | External walls | 41 |
| | | Roof | 38 |
| | | Floors | 45 |
| | | Entry doors | 33 |
| Category 1 | 25 | Glazing | 27 (where total area of glazing for a habitable room is greater than 1.8m ²) |
| | | | 24 (where total area of glazing for a habitable room is less than or equal to 1.8m ²) |
| | | External walls | 35 |
| | | Roof | 35 |
| | | Entry Doors | 28 |
| Category 0 | No additional acoustic treatment required – standard building assessment provisions apply. | | |

Table 7: Relevant extract from Schedule 1 from the “Mandatory Part 4.4 – buildings in transport noise corridor”.

6.2 Onsite Mechanical Plant Acoustic Recommendations

We recommend that the following acoustic treatments be incorporated into the development to mitigate onsite mechanical plant noise emissions:

- Mechanical plant be designed and installed to comply with the noise criterion presented in Section 4.2. As final plant selection has not been completed, an assessment of plant should be conducted during the design phase, and a Certificate provided to the Building Certifier confirming that installed plant achieves the noise limit criteria. Based upon the assumed levels, air-conditioning condenser units should be located as far as possible from the nearest offsite dwellings to the immediate south.

7.0 DISCUSSION

7.1 Road Traffic Noise

As the proposal is constructing a noise sensitive development in close proximity to Beaudesert Road, the development has been assessed under the State Development Assessment Provisions (SDAP) Queensland State Code 1: *“Development in a State-controlled Road Environment”* Version 3.0 (effective 4th February 2022).

To achieve PO38, and in accordance with AO38.1, we have recommended the construction of acoustic barriers around the northern, southern, and western perimeters of the subdivision to mitigate road traffic noise to ground floor private open spaces (and to future ground level building façades).

In relation to future dwellings (at noise sensitive habitable rooms), the Queensland Development Code (QDC) Mandatory Part (MP) 4.4 *“Buildings in a Transport Noise Corridor”* applies; therefore, this assessment provides specific Transport Noise Corridor Categories for the proposed onsite lots based upon the verified 3D road traffic noise model. We note that more detailed QDC MP4.4 assessments can be undertaken once detailed dwelling designs have been finalised so that specific Noise Categories can be determined for each habitable room. The opportunity to undertake such an assessment would typically be alerted to the owner of the purchased lot by the Certifier prior to Building Application.

7.2 Onsite Mechanical Plant

We have provided an indication of potential noise impact levels of likely onsite mechanical plant; although the levels are merely a guide as no plant selections have yet been completed. For this reason, additional more detailed assessment/s should be conducted upon determination of plant. Such assessments should be undertaken prior to Building Approval; and be conditioned within the Development Approval.

Based upon the assumed levels, air-conditioning condenser units should be located as far as possible from the nearest offsite dwellings to the immediate south.

8.0 CONCLUSIONS

This report is in response to a request by Orchard (Calamvale) Developments Pty Ltd ATF The Calamvale Trust for a revised environmental noise assessment of a proposed residential subdivision along 2236 Beaudesert Road in Calamvale.

This report is a revision to a previous assessment (CRGref: 19169 report subdivision dated March 2023) and is required due to updated development plans.

Based upon the assessed attached Development Plans, the proposal can be shown to comply with the adopted acceptable outcomes subject to the recommended treatments detailed in Section 6 being incorporated into the development.

Report Reviewed By:



JAY CARTER BSc
Director

Report Compiled by:



Matthew Lopez BEng
Consultant

APPENDIX A

Attachments, Subject Site and Logger Location

Attachment A: Results from the Queensland Government's Interactive Mapping System.



State Planning Policy

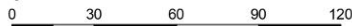
Making or amending a local planning instrument and designating land for community infrastructure

Date: 18/08/2022



Queensland Government

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Disclaimer:
This map has been prepared with due care based on the best available information at the time of publication. However, the State of Queensland (acting through the department) makes no representations, either express or implied, that the map is free from errors, inconsistencies or omissions. Reliance on information contained in this map is the sole responsibility of the user. The State disclaims responsibility for any loss, damage or inconvenience caused as a result of reliance on information or data contained in this map.

Figure No. 1: Subject Site Location (Brisbane City Council City Plan 2014).

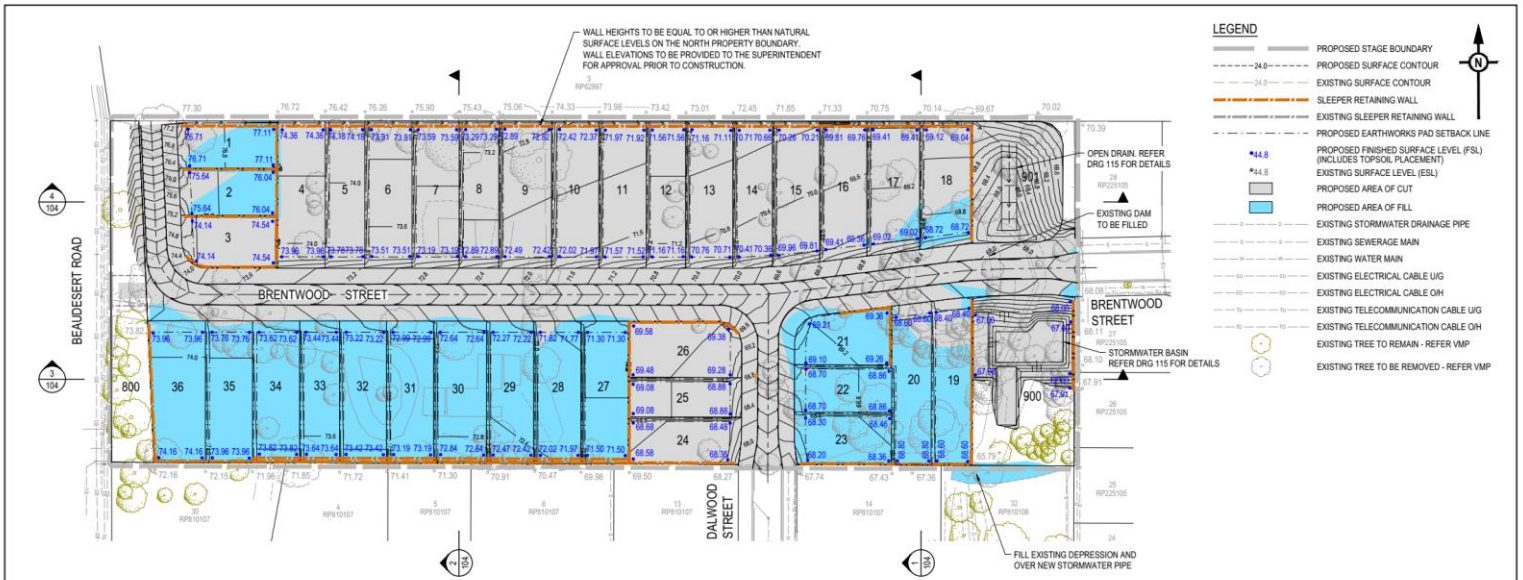


Figure No. 2: Subject Site and Noise Monitoring Location (QLD Globe).



APPENDIX B

Development Plans



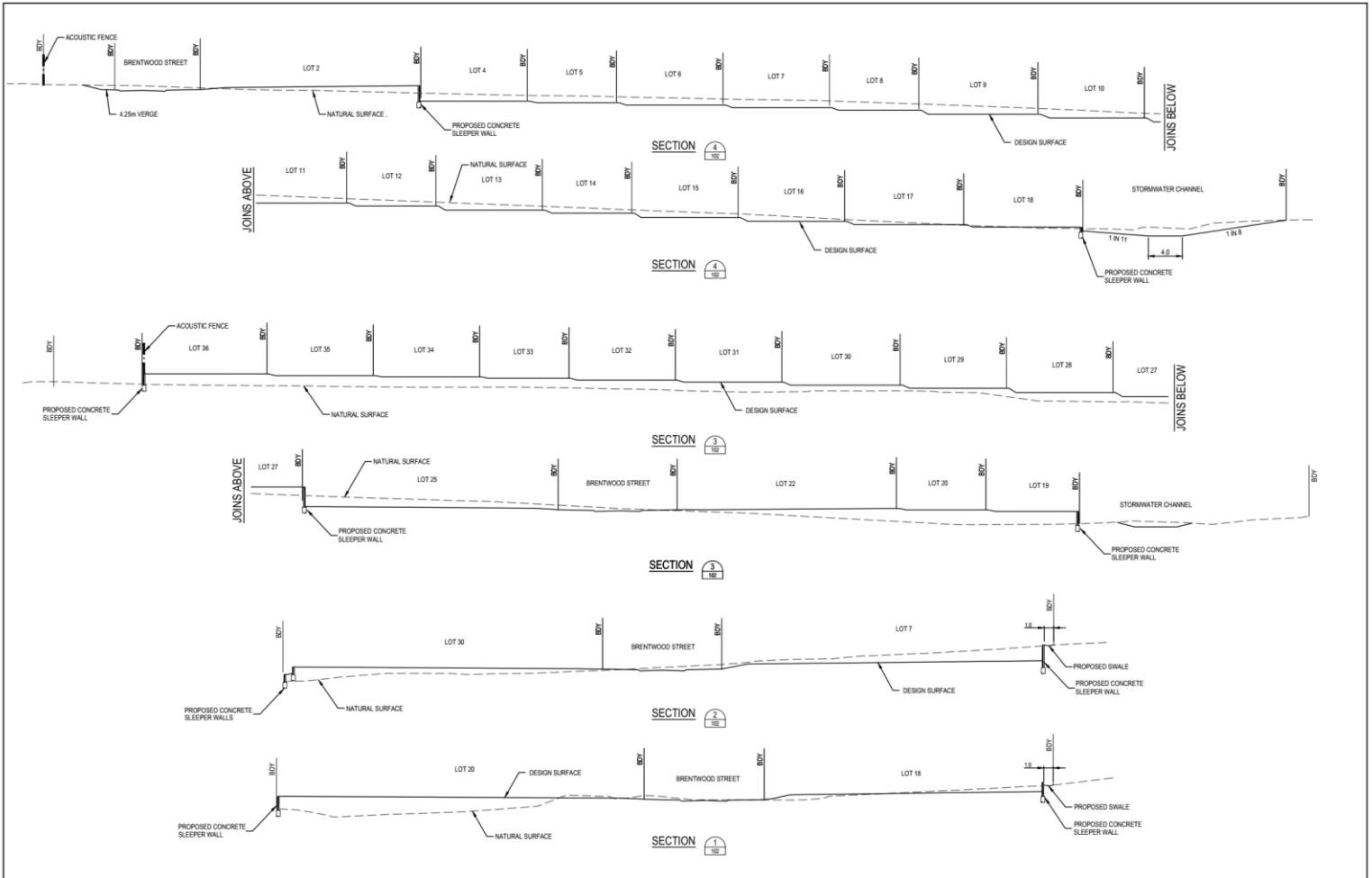
REFER DRAWING 103 FOR RETAINING WALL TYPICAL SECTIONS

WARNING! - EXISTING SERVICES
 EXTREME CARE SHOULD BE TAKEN WHEN EXCAVATING IN THIS AREA. THE FOLLOWING EXISTING SERVICES ARE LIKELY TO BE PRESENT IN THE VICINITY OF THE SITE:

- ELECTRICAL CABLES
- TELECOMMUNICATIONS CABLES
- GAS MAINS
- WATER MAINS
- SEWER MAINS

THE CONTRACTOR SHOULD CONTACT THE SERVICE PROVIDER FOR FURTHER INFORMATION AND SATISFY THEMSELVES OF ANY SPECIFIC TREATMENT OR REQUIREMENTS.

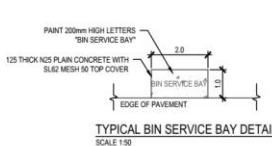
| | | | | | | | | | | | |
|--|------|--------|--------|--|----------|--------|----------------------|---------------|---|--|-----------------------------|
| REV | DATE | DESIGN | STATUS | REVISION DETAILS | DESIGNER | STATUS | NOT FOR CONSTRUCTION | SCALE | CLIENT | PROJECT NAME | DRAWING TITLE |
| A | | | | ORIGINAL ISSUE | | | | 1:1000 | ORCHARD (CALAMVALE) DEVELOPMENTS PTY LTD | 2236 BEAUDESERT ROAD CALAMVALE | BULK EARTHWORKS LAYOUT PLAN |
| <p>DRAFT ONLY ISSUED FOR COMMENT 19-09-2023</p> | | | | <p>DESIGNED BY TROY SCHULTZ RPEQ 20631</p> | | | | <p>1:1000</p> | <p>ASSOCIATED CONSULTANTS: SAUNDERS HAVILL GROUP 1300 123 744</p> | <p>PROJECT NO. 22-0340 DRAWING NO. 102</p> | <p>REVISION A</p> |



| | | | | | | | | | | | |
|--|------|--------|--------|--|----------|--------|----------------------|---------------|---|--|--------------------------|
| REV | DATE | DESIGN | STATUS | REVISION DETAILS | DESIGNER | STATUS | NOT FOR CONSTRUCTION | SCALE | CLIENT | PROJECT NAME | DRAWING TITLE |
| A | | | | ORIGINAL ISSUE | | | | 1:1000 | ORCHARD (CALAMVALE) DEVELOPMENTS PTY LTD | 2236 BEAUDESERT ROAD CALAMVALE | BULK EARTHWORKS SECTIONS |
| <p>DRAFT ONLY ISSUED FOR COMMENT 19-09-2023</p> | | | | <p>DESIGNED BY TROY SCHULTZ RPEQ 20631</p> | | | | <p>1:1000</p> | <p>ASSOCIATED CONSULTANTS: SAUNDERS HAVILL GROUP 1300 123 744</p> | <p>PROJECT NO. 22-0340 DRAWING NO. 104</p> | <p>REVISION A</p> |



- LEGEND**
- PROPOSED STAGE BOUNDARY
 - PROPOSED ROAD CONTROL LINE
 - PROPOSED KERB INVERT LINE
 - ▭ PROPOSED NEW ROAD PAVEMENT
 - ▭ PROPOSED CONCRETE DRIVEWAY
 - INDICATIVE DRIVEWAY LOCATION
 - FINISHED SURFACE CONTOUR
 - PROPOSED STORMWATER DRAINAGE PIPE
 - EXISTING STORMWATER DRAINAGE PIPE
 - PROPOSED DRAINAGE SWALE
 - PROPOSED ROOFWATER KERB ADAPTOR WITH PIPE CONNECTION TO ALLOTMENT
 - PROPOSED ROOFWATER KERB ADAPTOR WITH PIPE CONNECTION TO ALLOTMENT
 - PROPOSED CONCRETE SLEEPER RETAINING WALL
 - PROPOSED SEWERAGE MAIN
 - EXISTING SEWERAGE MAIN
 - PROPOSED WATER MAIN
 - EXISTING WATER MAIN
 - PROPOSED WATER CONDUIT
 - EXISTING ELECTRICAL CABLE UG
 - EXISTING ELECTRICAL CABLE OH
 - EXISTING TELECOMMUNICATION CABLE UG
 - EXISTING TELECOMMUNICATION CABLE OH
 - EXISTING TREE TO REMAIN - REFER VMP



ROOFWATER CONNECTION NOTE:
THE CONTRACTOR SHALL INSTALL A ROOFWATER CONNECTION TO EACH PROPERTY BY ONE OF THE FOLLOWING METHODS, AS SHOWN ON THE LAYOUT PLAN:

- ONE ROOFWATER KERB ADAPTOR 500mm FROM THE DOWNSTREAM BOUNDARY (UNLESS SHOWN ON A DIFFERENT ALIGNMENT, WHERE THERE IS A CONCRETE FOOTPATH, A ROOFWATER PIPE SHALL BE INSTALLED FROM THE PROPERTY BOUNDARY CONNECTED TO THE KERB ADAPTOR AT 1.20% MINIMUM GRADE, IN ACCORDANCE WITH THE LOCAL AUTHORITY STANDARDS.
- ONE 1500 ROOFWATER PIPE CONNECTED TO PROPOSED STORMWATER GULLY PIT OR MANHOLE AT MINIMUM 1.0% GRADE WITH 1.0m COVER.
- ONE 1500 ROOFWATER PIPE DISCHARGING TO THE FILTER SURFACE LEVEL OF PROPOSED TREE PIT AT MINIMUM 1.0% GRADE.

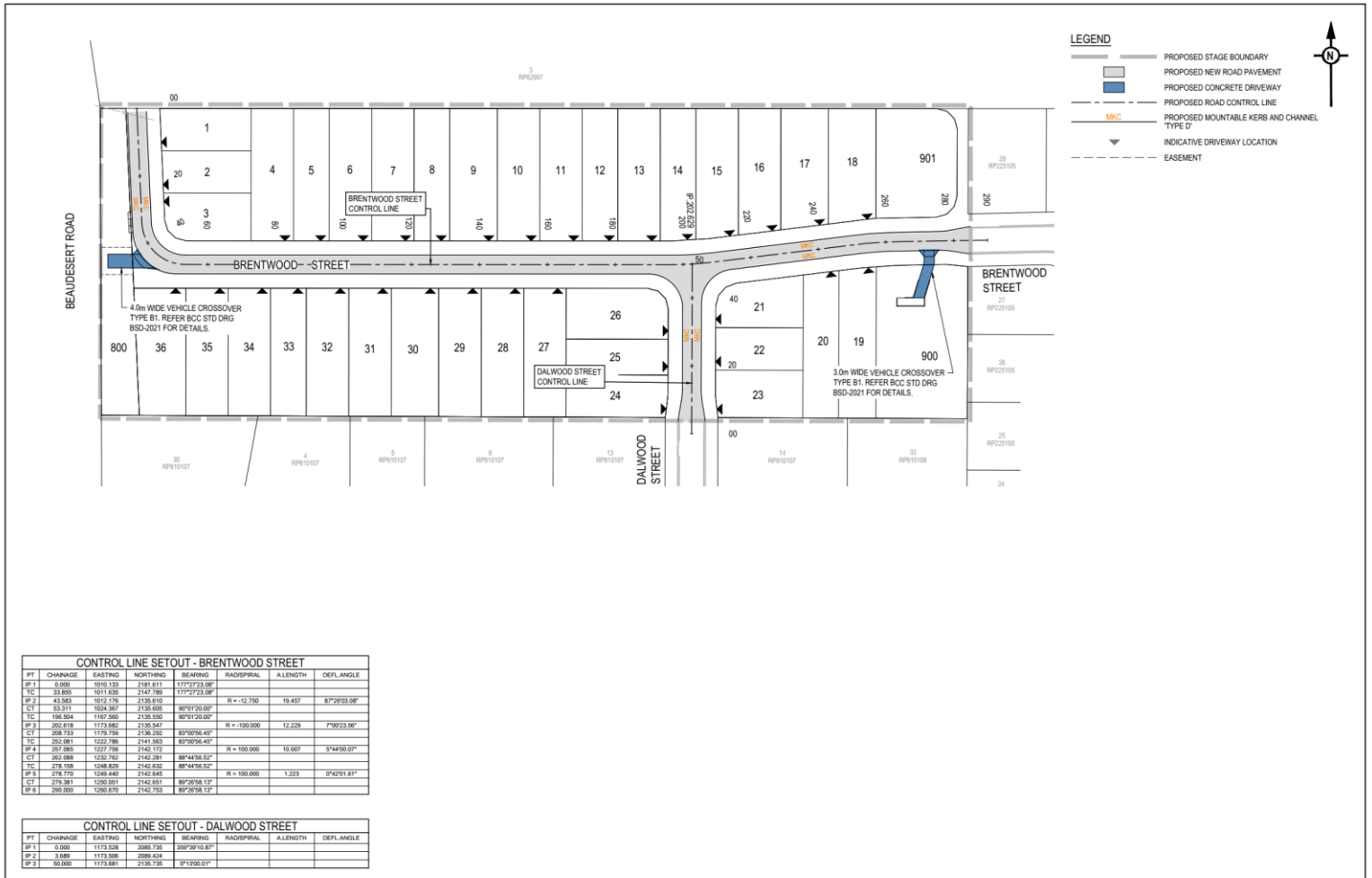
KERB TYPES NOTE:
REFER TO THE SURVEY SETOUT ENGINEERING DRAWING FOR KERB TYPES AND TRANSITION LOCATIONS

WARNING! - EXISTING SERVICES
EXTREME CARE SHOULD BE TAKEN WHEN EXCAVATING IN THIS AREA. THE FOLLOWING EXISTING SERVICES ARE LIKELY TO BE PRESENT IN THE VICINITY OF THE SITE:

- TELECOMMUNICATIONS CABLES
- ELECTRICAL CABLES
- GAS MAINS
- WATER MAINS
- SEWER MAINS

THE CONTRACTOR SHOULD CONTACT THE SERVICE PROVIDER FOR FURTHER INFORMATION AND SATISFY THEMSELVES OF ANY SPECIFIC TREATMENT OR REQUIREMENTS.

| | | | | | | | | | |
|--|------|--------|--------|--|----------------------|-----------------|--|---|------------------------------------|
| REV. A | DATE | DESIGN | ORIGIN | DESCRIPTION | STATUS | SCALE | CLIENT | PROJECT NAME | ISSUE TITLE |
| | | | | REVISION DETAILS | NOT FOR CONSTRUCTION | 1:500 1:1000 | ORCHARD (CALAMVALE) DEVELOPMENTS PTY LTD | 2236 BEAUDESERT ROAD CALAMVALE | ROADWORKS AND DRAINAGE LAYOUT PLAN |
| <p>DRAFT ONLY ISSUED FOR COMMENT 19-09-2023</p> | | | | <p>DESIGN: TROY SCHULTZ RPEQ 20631</p> | | | | <p>ASSOCIATED CONSULTANTS: SAUNDERS HAVILL GROUP 1300 123 744</p> | |
| | | | | | | | | <p>PROJECT NO. 22-0340 DRAWING NO. 105 REVISION A</p> | |



- LEGEND**
- PROPOSED STAGE BOUNDARY
 - ▭ PROPOSED NEW ROAD PAVEMENT
 - ▭ PROPOSED CONCRETE DRIVEWAY
 - PROPOSED ROAD CONTROL LINE
 - MKC PROPOSED MOUNTABLE KERB AND CHANNEL TYPE 'D'
 - INDICATIVE DRIVEWAY LOCATION
 - EASEMENT

CONTROL LINE SETOUT - BRENTWOOD STREET

| PT | CHAINAGE | EASTING | NORTHING | BEARING | RADSPIRAL | A LENGTH | DEFL ANGLE |
|------|----------|----------|----------|---------------|--------------|----------|--------------|
| BP 1 | 0.000 | 1050.130 | 2181.411 | 177°27'23.98" | | | |
| TC | 33.855 | 1011.635 | 2147.789 | 177°27'23.98" | R = -13.750 | 19.457 | 87°20'53.08" |
| BP 2 | 43.563 | 1015.730 | 2158.653 | | | | |
| CT | 53.311 | 1024.367 | 2158.656 | 90°01'20.50" | | | |
| PTC | 106.504 | 1147.506 | 2158.506 | 90°01'20.50" | | | |
| BP 3 | 205.618 | 1173.651 | 2155.547 | | R = -100.000 | 12.229 | 7°02'23.56" |
| CT | 269.723 | 1179.799 | 2156.262 | 83°00'54.49" | | | |
| TC | 292.981 | 1222.786 | 2141.463 | 83°00'54.49" | | | |
| BP 4 | 297.085 | 1227.798 | 2142.172 | | R = 100.000 | 10.007 | 0°44'00.07" |
| CT | 292.986 | 1226.762 | 2142.281 | 88°44'56.52" | | | |
| TC | 278.158 | 1248.829 | 2142.632 | 88°44'56.52" | | | |
| BP 5 | 278.170 | 1248.440 | 2142.640 | | R = 100.000 | 1.223 | 0°42'01.61" |
| CT | 279.361 | 1250.051 | 2142.651 | 89°28'34.13" | | | |
| BP 6 | 290.000 | 1280.670 | 2142.793 | 89°28'34.13" | | | |

CONTROL LINE SETOUT - DALWOOD STREET

| PT | CHAINAGE | EASTING | NORTHING | BEARING | RADSPIRAL | A LENGTH | DEFL ANGLE |
|------|----------|----------|----------|---------------|-----------|----------|------------|
| BP 1 | 0.000 | 1173.226 | 2085.726 | 359°39'10.61" | | | |
| BP 2 | 3.686 | 1173.206 | 2085.624 | | | | |
| BP 3 | 50.000 | 1173.681 | 2135.735 | 0°13'30.01" | | | |

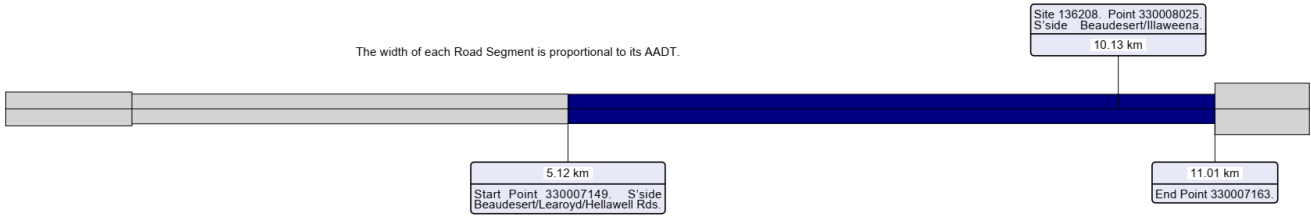
| | | | | | | | | | |
|--|------|--------|--------|--|----------------------|-----------------|--|---|--|
| REV. A | DATE | DESIGN | ORIGIN | DESCRIPTION | STATUS | SCALE | CLIENT | PROJECT NAME | ISSUE TITLE |
| | | | | REVISION DETAILS | NOT FOR CONSTRUCTION | 1:500 1:1000 | ORCHARD (CALAMVALE) DEVELOPMENTS PTY LTD | 2236 BEAUDESERT ROAD CALAMVALE | SURVEY SETOUT AND KERB TYPES LAYOUT PLAN |
| <p>DRAFT ONLY ISSUED FOR COMMENT 19-09-2023</p> | | | | <p>DESIGN: TROY SCHULTZ RPEQ 20631</p> | | | | <p>ASSOCIATED CONSULTANTS: SAUNDERS HAVILL GROUP 1300 123 744</p> | |
| | | | | | | | | <p>PROJECT NO. 22-0340 DRAWING NO. 106 REVISION A</p> | |

APPENDIX C

Measurement Results and Model Calculations / Predictions

2019 TARS TRAFFIC COUNTS

The width of each Road Segment is proportional to its AADT.



| All Vehicles (00) | |
|-------------------|-------------|
| G | 17,146 100% |
| A | 19,911 100% |
| B | 37,057 100% |

| | Annual Segment Growth | | |
|---|------------------------|------------------------|-------------------------|
| | Based on 1 year's data | Based on 5 years' data | Based on 10 years' data |
| G | -2.46% | -0.42% | |
| A | 0.09% | 3.39% | |
| B | -1.11% | 1.54% | |

No Traffic Class data found.

YEAR 2020 TRAFFIC TUBE COUNTS

Job No Q2870
 Client Bitzios Consultants
 Site Beaudesert Rd - 410m north of Ormskirk St
 Location Calamvale
 Site No 1
 Start Date 3-Dec-20
 Day Friday
 Description Class Summary
 Classification AustRoads94

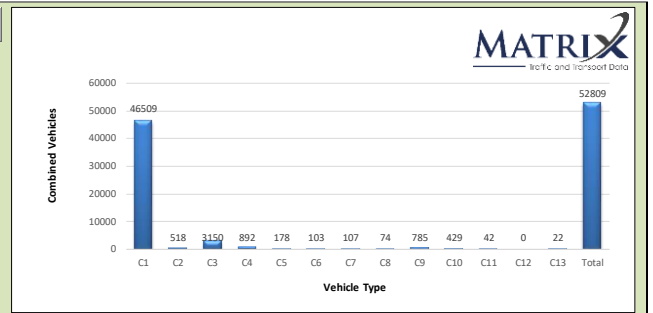
Class Summary

| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | Total |
|--------------|-----|-----|-----|----|----|----|----|----|----|-----|-----|-----|-----|-------|
| Light | 88% | 89% | 87% | | | | | | | | | | | |
| Medium | 1% | 1% | 1% | 6% | 5% | 7% | 2% | 2% | 2% | 0% | 0% | 0% | 0% | |
| Heavy | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 2% | 1% | 1% | |
| Unclassified | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | |

Menu

Select Site
 1. Beaudesert Rd - 410m north of Ormskirk St

Select Day
 Friday



| Hour Standing | NB | | | | | | | | | | | | | Total | SB | | | | | | | | | | | | | Total | COMBINED | | | | | | | | | | | | | Total |
|---------------|-------|-----|------|-----|----|----|----|----|-----|-----|-----|-----|-----|-------|-------|-----|------|-----|----|----|----|----|-----|-----|-----|-----|------|-------|----------|-----|------|-----|-----|-----|-----|----|-----|-----|-----|-----|------|-------|
| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | |
| 0:00 | 84 | 1 | 5 | 4 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 101 | 187 | 1 | 10 | 2 | 1 | 0 | 0 | 1 | 6 | 2 | 0 | 0 | 210 | 271 | 2 | 15 | 6 | 1 | 0 | 0 | 1 | 1 | 7 | 8 | 0 | 0 | 0 | 311 |
| 1:00 | 105 | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 3 | 2 | 0 | 0 | 0 | 115 | 102 | 0 | 8 | 1 | 0 | 0 | 1 | 0 | 4 | 3 | 0 | 0 | 119 | 207 | 0 | 12 | 1 | 0 | 0 | 1 | 1 | 7 | 5 | 0 | 0 | 0 | 234 | |
| 2:00 | 112 | 1 | 2 | 2 | 1 | 0 | 0 | 0 | 3 | 5 | 0 | 0 | 0 | 126 | 95 | 1 | 6 | 4 | 1 | 0 | 0 | 0 | 7 | 2 | 0 | 0 | 116 | 207 | 2 | 8 | 6 | 2 | 0 | 0 | 0 | 10 | 7 | 0 | 0 | 0 | 242 | |
| 3:00 | 254 | 0 | 10 | 5 | 2 | 0 | 1 | 1 | 8 | 4 | 1 | 0 | 0 | 286 | 98 | 1 | 9 | 1 | 2 | 0 | 0 | 1 | 5 | 3 | 0 | 0 | 120 | 352 | 1 | 19 | 5 | 4 | 0 | 1 | 2 | 13 | 7 | 1 | 0 | 0 | 406 | |
| 4:00 | 655 | 2 | 49 | 12 | 1 | 0 | 1 | 2 | 16 | 8 | 0 | 0 | 1 | 747 | 168 | 1 | 20 | 10 | 1 | 0 | 0 | 0 | 10 | 1 | 0 | 0 | 211 | 823 | 3 | 69 | 22 | 2 | 0 | 1 | 2 | 26 | 9 | 0 | 0 | 1 | 958 | |
| 5:00 | 1643 | 22 | 117 | 36 | 6 | 1 | 3 | 1 | 17 | 11 | 0 | 0 | 2 | 1859 | 312 | 4 | 25 | 15 | 6 | 0 | 1 | 4 | 22 | 6 | 0 | 0 | 395 | 1955 | 26 | 142 | 51 | 12 | 1 | 4 | 5 | 39 | 17 | 0 | 0 | 2 | 2254 | |
| 6:00 | 2021 | 28 | 164 | 36 | 10 | 2 | 3 | 1 | 19 | 18 | 0 | 0 | 2 | 2304 | 536 | 6 | 64 | 32 | 6 | 3 | 5 | 1 | 21 | 13 | 2 | 0 | 687 | 2557 | 34 | 228 | 68 | 16 | 5 | 6 | 2 | 40 | 31 | 2 | 0 | 2 | 2991 | |
| 7:00 | 2104 | 27 | 138 | 32 | 10 | 4 | 7 | 1 | 35 | 17 | 2 | 0 | 0 | 2377 | 706 | 12 | 117 | 29 | 6 | 1 | 2 | 2 | 17 | 8 | 1 | 0 | 901 | 2810 | 39 | 255 | 61 | 16 | 5 | 9 | 3 | 52 | 25 | 3 | 0 | 0 | 3278 | |
| 8:00 | 1839 | 23 | 93 | 38 | 8 | 2 | 4 | 6 | 29 | 16 | 2 | 0 | 4 | 2064 | 974 | 15 | 107 | 28 | 9 | 4 | 0 | 1 | 32 | 7 | 3 | 0 | 1180 | 2813 | 38 | 200 | 66 | 17 | 6 | 4 | 7 | 61 | 23 | 5 | 0 | 4 | 3244 | |
| 9:00 | 1392 | 23 | 112 | 27 | 9 | 3 | 9 | 1 | 33 | 13 | 3 | 0 | 1 | 1626 | 993 | 23 | 138 | 28 | 9 | 7 | 6 | 2 | 31 | 16 | 0 | 0 | 1253 | 2385 | 46 | 250 | 55 | 18 | 10 | 15 | 3 | 64 | 29 | 3 | 0 | 1 | 2879 | |
| 10:00 | 1252 | 24 | 109 | 30 | 8 | 6 | 3 | 3 | 36 | 20 | 2 | 0 | 2 | 1495 | 1099 | 19 | 130 | 28 | 7 | 3 | 8 | 3 | 28 | 10 | 5 | 0 | 1340 | 2351 | 43 | 239 | 58 | 15 | 9 | 11 | 6 | 64 | 30 | 7 | 0 | 2 | 2835 | |
| 11:00 | 1289 | 15 | 97 | 24 | 5 | 4 | 7 | 2 | 32 | 9 | 3 | 0 | 1 | 1488 | 1270 | 19 | 123 | 35 | 4 | 7 | 5 | 4 | 28 | 18 | 1 | 0 | 1514 | 2559 | 34 | 220 | 59 | 9 | 11 | 12 | 6 | 60 | 27 | 4 | 0 | 1 | 3002 | |
| 12:00 | 1208 | 19 | 89 | 21 | 7 | 5 | 5 | 1 | 25 | 27 | 2 | 0 | 0 | 1409 | 1389 | 21 | 129 | 38 | 2 | 7 | 2 | 5 | 31 | 24 | 0 | 0 | 1649 | 2597 | 40 | 218 | 59 | 9 | 12 | 7 | 6 | 56 | 51 | 2 | 0 | 1 | 3058 | |
| 13:00 | 1152 | 14 | 77 | 22 | 4 | 2 | 3 | 2 | 28 | 15 | 0 | 0 | 0 | 1319 | 1531 | 26 | 131 | 34 | 6 | 5 | 7 | 2 | 20 | 19 | 5 | 0 | 1786 | 2683 | 40 | 208 | 56 | 10 | 7 | 10 | 4 | 48 | 34 | 5 | 0 | 0 | 3105 | |
| 14:00 | 1158 | 17 | 78 | 19 | 9 | 4 | 4 | 2 | 26 | 8 | 0 | 0 | 3 | 1328 | 1753 | 21 | 149 | 32 | 7 | 12 | 5 | 3 | 25 | 4 | 3 | 0 | 2017 | 2911 | 38 | 227 | 51 | 16 | 16 | 9 | 5 | 51 | 12 | 3 | 0 | 6 | 3345 | |
| 15:00 | 1161 | 16 | 84 | 33 | 6 | 3 | 3 | 4 | 23 | 10 | 0 | 0 | 2 | 1345 | 1754 | 20 | 131 | 26 | 6 | 4 | 5 | 1 | 25 | 6 | 1 | 0 | 1979 | 2915 | 36 | 215 | 59 | 12 | 7 | 8 | 5 | 48 | 16 | 1 | 0 | 2 | 3324 | |
| 16:00 | 1128 | 12 | 44 | 24 | 5 | 1 | 1 | 1 | 18 | 10 | 0 | 0 | 0 | 1244 | 2157 | 26 | 142 | 22 | 3 | 4 | 5 | 4 | 20 | 4 | 1 | 0 | 2388 | 3285 | 38 | 186 | 46 | 8 | 5 | 6 | 5 | 38 | 14 | 1 | 0 | 0 | 3632 | |
| 17:00 | 1184 | 9 | 52 | 13 | 2 | 1 | 0 | 4 | 16 | 12 | 1 | 0 | 0 | 1294 | 2009 | 15 | 123 | 21 | 2 | 2 | 3 | 0 | 12 | 8 | 2 | 0 | 2197 | 3193 | 24 | 175 | 34 | 4 | 3 | 3 | 4 | 28 | 20 | 3 | 0 | 0 | 3491 | |
| 18:00 | 1042 | 4 | 37 | 17 | 1 | 1 | 0 | 2 | 8 | 4 | 1 | 0 | 0 | 1117 | 1475 | 11 | 64 | 28 | 1 | 2 | 0 | 0 | 16 | 5 | 1 | 0 | 1603 | 2517 | 15 | 101 | 45 | 2 | 3 | 0 | 2 | 24 | 9 | 2 | 0 | 0 | 2720 | |
| 19:00 | 919 | 4 | 24 | 10 | 0 | 0 | 0 | 2 | 9 | 3 | 0 | 0 | 0 | 971 | 1141 | 5 | 36 | 20 | 0 | 0 | 0 | 0 | 7 | 17 | 0 | 0 | 1226 | 2060 | 9 | 60 | 30 | 0 | 0 | 0 | 2 | 16 | 20 | 0 | 0 | 0 | 2197 | |
| 20:00 | 664 | 3 | 11 | 8 | 0 | 0 | 0 | 0 | 8 | 3 | 0 | 0 | 0 | 697 | 1018 | 1 | 24 | 11 | 2 | 2 | 0 | 1 | 5 | 6 | 0 | 0 | 1070 | 1682 | 4 | 35 | 19 | 2 | 2 | 0 | 1 | 13 | 9 | 0 | 0 | 0 | 1767 | |
| 21:00 | 589 | 3 | 7 | 5 | 1 | 0 | 0 | 0 | 4 | 7 | 0 | 0 | 0 | 616 | 918 | 2 | 20 | 7 | 1 | 0 | 0 | 1 | 7 | 4 | 0 | 0 | 960 | 1507 | 5 | 27 | 12 | 2 | 0 | 0 | 1 | 11 | 11 | 0 | 0 | 0 | 1576 | |
| 22:00 | 384 | 0 | 7 | 5 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 403 | 784 | 0 | 16 | 8 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 814 | 1168 | 0 | 23 | 13 | 0 | 0 | 0 | 0 | 5 | 8 | 0 | 0 | 0 | 1217 | |
| 23:00 | 242 | 0 | 8 | 5 | 0 | 0 | 0 | 1 | 1 | 5 | 0 | 0 | 0 | 262 | 459 | 1 | 10 | 4 | 1 | 1 | 0 | 0 | 3 | 2 | 0 | 0 | 481 | 701 | 1 | 18 | 9 | 1 | 1 | 0 | 1 | 4 | 7 | 0 | 0 | 0 | 743 | |
| Total | 23581 | 267 | 1418 | 428 | 95 | 39 | 54 | 38 | 400 | 238 | 17 | 0 | 18 | 26593 | 22928 | 251 | 1732 | 464 | 83 | 64 | 53 | 36 | 385 | 191 | 25 | 0 | 4 | 26216 | 46509 | 518 | 3150 | 892 | 178 | 103 | 107 | 74 | 785 | 429 | 42 | 0 | 22 | 52809 |

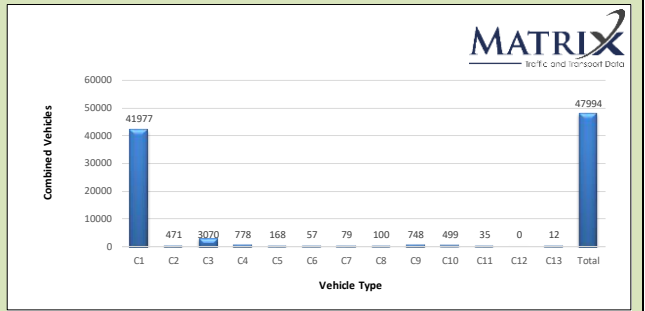
Job No Q2870
 Client Bitzios Consultants
 Site Beaudesert Rd - 410m north of Ormskirk St
 Location Calamvale
 Site No 1
 Start Date 3-Dec-20
 Day Monday
 Description Class Summary
 Classification AustRoads94

Select Site
 1. Beaudesert Rd - 410m north of Ormskirk St

Select Day
 Monday

| Class Summary | | C | NB | SB |
|---------------|--------------|-----|-----|-----|
| Light | C1 | 87% | 88% | 86% |
| | C2 | 1% | 1% | 1% |
| | C3 | 6% | 5% | 7% |
| | C4 | 2% | 2% | 2% |
| | C5 | 0% | 0% | 0% |
| Medium | C6 | 0% | 0% | 0% |
| | C7 | 0% | 0% | 0% |
| | C8 | 0% | 0% | 0% |
| | C9 | 2% | 2% | 2% |
| | C10 | 1% | 1% | 1% |
| | C11 | 0% | 0% | 0% |
| | C12 | 0% | 0% | 0% |
| Heavy | C13 | 0% | 0% | 0% |
| | Unclassified | 0% | 0% | 0% |

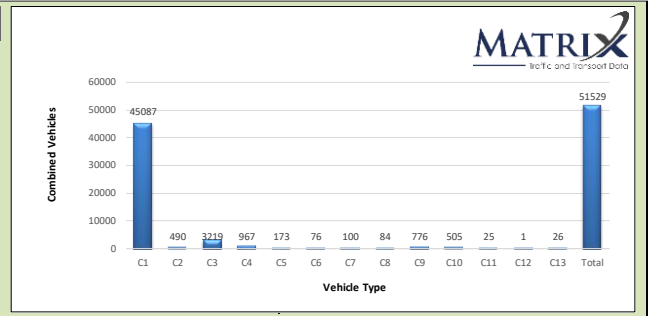
Menu



| Hour Starting | NB | | | | | | | | | | | | | Total | SB | | | | | | | | | | | | | Total | COMBINED | | | | | | | | | | | | | Total |
|---------------|-------|--------------|---------------------|---------------------|-------------------|--------------------|--------------------|--------------------|--------------------|----------|-------------------|-------------------|----------------|-------|-------|--------------|---------------------|---------------------|-------------------|--------------------|--------------------|--------------------|--------------------|----------|-------------------|-------------------|----------------|-------|----------|--------------|---------------------|---------------------|-------------------|--------------------|--------------------|--------------------|--------------------|----------|-------------------|-------------------|----------------|-------|
| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | |
| | Short | Short Towing | 2 axle Truck or bus | 3 axle Truck or bus | 4 or 5 Axle Truck | 3 axle Articulated | 4 Axle Articulated | 5 Axle Articulated | 6 Axle Articulated | B Double | Double Road Train | Triple Road Train | Unclassifiable | | Short | Short Towing | 2 axle Truck or bus | 3 axle Truck or bus | 4 or 5 Axle Truck | 3 axle Articulated | 4 Axle Articulated | 5 Axle Articulated | 6 Axle Articulated | B Double | Double Road Train | Triple Road Train | Unclassifiable | | Short | Short Towing | 2 axle Truck or bus | 3 axle Truck or bus | 4 or 5 Axle Truck | 3 axle Articulated | 4 Axle Articulated | 5 Axle Articulated | 6 Axle Articulated | B Double | Double Road Train | Triple Road Train | Unclassifiable | |
| 0:00 | 93 | 0 | 4 | 1 | 1 | 0 | 0 | 2 | 2 | 5 | 0 | 0 | 0 | 108 | 108 | 0 | 7 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 119 | 201 | 0 | 11 | 2 | 2 | 1 | 0 | 3 | 2 | 5 | 0 | 0 | 0 | 227 | | |
| 1:00 | 87 | 0 | 2 | 1 | 0 | 0 | 0 | 1 | 3 | 2 | 0 | 0 | 0 | 96 | 93 | 0 | 5 | 1 | 2 | 0 | 0 | 1 | 2 | 2 | 0 | 106 | 180 | 0 | 7 | 2 | 2 | 0 | 0 | 2 | 5 | 4 | 0 | 0 | 0 | 202 | | |
| 2:00 | 104 | 0 | 3 | 1 | 0 | 0 | 1 | 0 | 2 | 2 | 0 | 0 | 0 | 113 | 53 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 58 | 157 | 0 | 4 | 1 | 0 | 0 | 1 | 1 | 3 | 4 | 0 | 0 | 0 | 171 | | |
| 3:00 | 244 | 1 | 11 | 3 | 1 | 1 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 265 | 76 | 0 | 12 | 3 | 1 | 0 | 1 | 0 | 6 | 4 | 0 | 103 | 320 | 1 | 23 | 6 | 2 | 1 | 1 | 0 | 6 | 8 | 0 | 0 | 0 | 368 | | |
| 4:00 | 641 | 4 | 40 | 8 | 5 | 0 | 1 | 1 | 9 | 5 | 0 | 0 | 0 | 714 | 161 | 0 | 17 | 5 | 2 | 0 | 0 | 2 | 7 | 4 | 0 | 198 | 802 | 4 | 57 | 13 | 7 | 0 | 1 | 3 | 16 | 9 | 0 | 0 | 0 | 912 | | |
| 5:00 | 1693 | 22 | 123 | 24 | 5 | 2 | 4 | 1 | 12 | 10 | 0 | 0 | 0 | 1896 | 306 | 6 | 25 | 14 | 9 | 0 | 3 | 1 | 11 | 7 | 1 | 384 | 1999 | 28 | 148 | 38 | 14 | 2 | 7 | 2 | 23 | 17 | 1 | 0 | 1 | 2280 | | |
| 6:00 | 2017 | 50 | 149 | 29 | 12 | 2 | 6 | 6 | 27 | 14 | 1 | 0 | 0 | 2313 | 475 | 8 | 94 | 23 | 11 | 4 | 2 | 4 | 27 | 4 | 2 | 654 | 2492 | 58 | 243 | 52 | 23 | 6 | 8 | 10 | 54 | 18 | 3 | 0 | 0 | 2967 | | |
| 7:00 | 2117 | 28 | 116 | 28 | 4 | 3 | 3 | 4 | 23 | 12 | 3 | 0 | 1 | 2342 | 690 | 10 | 99 | 31 | 7 | 1 | 3 | 1 | 16 | 14 | 1 | 874 | 2807 | 38 | 215 | 59 | 11 | 4 | 6 | 5 | 39 | 26 | 4 | 0 | 2 | 3216 | | |
| 8:00 | 1945 | 23 | 106 | 31 | 7 | 0 | 5 | 5 | 30 | 24 | 1 | 0 | 2 | 2179 | 923 | 16 | 115 | 22 | 5 | 3 | 3 | 3 | 16 | 15 | 2 | 1123 | 2868 | 39 | 221 | 53 | 12 | 3 | 8 | 8 | 46 | 39 | 3 | 0 | 2 | 3302 | | |
| 9:00 | 1389 | 22 | 104 | 25 | 4 | 1 | 3 | 2 | 31 | 16 | 1 | 0 | 0 | 1598 | 905 | 13 | 117 | 27 | 4 | 3 | 5 | 5 | 28 | 27 | 0 | 1134 | 2294 | 35 | 221 | 52 | 8 | 4 | 8 | 7 | 59 | 43 | 1 | 0 | 0 | 2732 | | |
| 10:00 | 1146 | 14 | 102 | 22 | 7 | 1 | 2 | 2 | 21 | 24 | 2 | 0 | 0 | 1343 | 1026 | 18 | 127 | 18 | 4 | 3 | 0 | 6 | 35 | 21 | 1 | 1259 | 2172 | 32 | 229 | 40 | 11 | 4 | 2 | 8 | 56 | 45 | 3 | 0 | 0 | 2602 | | |
| 11:00 | 1111 | 20 | 89 | 26 | 8 | 3 | 3 | 0 | 29 | 19 | 1 | 0 | 0 | 1309 | 1118 | 19 | 121 | 30 | 5 | 2 | 6 | 6 | 38 | 23 | 1 | 1369 | 2229 | 39 | 210 | 56 | 13 | 5 | 9 | 6 | 67 | 42 | 2 | 0 | 0 | 2678 | | |
| 12:00 | 1081 | 13 | 85 | 28 | 4 | 2 | 0 | 1 | 32 | 19 | 3 | 0 | 0 | 1268 | 1131 | 15 | 137 | 19 | 6 | 3 | 4 | 1 | 30 | 20 | 1 | 1367 | 2212 | 28 | 222 | 47 | 10 | 5 | 4 | 2 | 62 | 39 | 4 | 0 | 0 | 2635 | | |
| 13:00 | 1166 | 17 | 84 | 25 | 6 | 1 | 3 | 3 | 30 | 16 | 0 | 0 | 0 | 1351 | 1307 | 18 | 113 | 30 | 8 | 4 | 4 | 6 | 34 | 19 | 4 | 1 | 1548 | 2473 | 35 | 197 | 55 | 14 | 5 | 7 | 9 | 64 | 35 | 4 | 0 | 1 | 2899 | |
| 14:00 | 1078 | 20 | 84 | 24 | 7 | 0 | 4 | 3 | 20 | 15 | 2 | 0 | 1 | 1258 | 1731 | 19 | 158 | 30 | 2 | 4 | 4 | 2 | 37 | 18 | 1 | 2008 | 2809 | 39 | 242 | 54 | 9 | 4 | 8 | 5 | 57 | 33 | 3 | 0 | 3 | 3266 | | |
| 15:00 | 1116 | 11 | 55 | 26 | 3 | 2 | 0 | 1 | 26 | 17 | 1 | 0 | 0 | 1258 | 1763 | 14 | 157 | 22 | 6 | 3 | 3 | 3 | 11 | 16 | 2 | 0 | 2001 | 2879 | 25 | 212 | 48 | 9 | 5 | 3 | 4 | 37 | 33 | 3 | 0 | 1 | 3259 | |
| 16:00 | 1019 | 14 | 50 | 17 | 1 | 3 | 0 | 4 | 20 | 9 | 1 | 0 | 0 | 1138 | 2179 | 20 | 181 | 27 | 2 | 3 | 3 | 4 | 25 | 7 | 3 | 0 | 1 | 2455 | 3198 | 34 | 231 | 44 | 3 | 6 | 3 | 8 | 45 | 16 | 4 | 0 | 1 | 3593 |
| 17:00 | 954 | 11 | 44 | 16 | 2 | 0 | 0 | 2 | 15 | 10 | 0 | 0 | 0 | 1054 | 2088 | 6 | 113 | 19 | 3 | 1 | 0 | 2 | 13 | 9 | 0 | 0 | 2254 | 3042 | 17 | 157 | 35 | 5 | 1 | 0 | 4 | 28 | 19 | 0 | 0 | 0 | 3308 | |
| 18:00 | 824 | 3 | 33 | 11 | 1 | 0 | 0 | 4 | 13 | 3 | 0 | 0 | 0 | 892 | 1317 | 7 | 54 | 20 | 1 | 0 | 1 | 0 | 16 | 11 | 0 | 0 | 1427 | 2141 | 10 | 87 | 31 | 2 | 0 | 1 | 4 | 29 | 14 | 0 | 0 | 0 | 2319 | |
| 19:00 | 603 | 4 | 18 | 9 | 1 | 0 | 0 | 1 | 5 | 2 | 0 | 0 | 1 | 644 | 903 | 0 | 40 | 21 | 1 | 0 | 0 | 1 | 9 | 7 | 0 | 0 | 982 | 1506 | 4 | 58 | 30 | 2 | 0 | 0 | 2 | 14 | 9 | 0 | 0 | 1 | 1626 | |
| 20:00 | 442 | 1 | 10 | 8 | 1 | 0 | 2 | 2 | 7 | 3 | 0 | 0 | 0 | 476 | 653 | 2 | 21 | 11 | 1 | 0 | 0 | 2 | 5 | 10 | 0 | 0 | 705 | 1095 | 3 | 31 | 19 | 2 | 0 | 2 | 4 | 12 | 13 | 0 | 0 | 0 | 1181 | |
| 21:00 | 380 | 1 | 4 | 6 | 1 | 0 | 0 | 1 | 8 | 7 | 0 | 0 | 0 | 408 | 597 | 0 | 14 | 8 | 1 | 0 | 0 | 5 | 5 | 0 | 0 | 630 | 977 | 1 | 18 | 14 | 2 | 0 | 0 | 1 | 13 | 12 | 0 | 0 | 0 | 1038 | | |
| 22:00 | 238 | 0 | 5 | 5 | 1 | 0 | 0 | 1 | 3 | 4 | 0 | 0 | 0 | 257 | 465 | 0 | 14 | 8 | 1 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 493 | 703 | 0 | 19 | 13 | 2 | 0 | 0 | 1 | 5 | 7 | 0 | 0 | 0 | 750 | |
| 23:00 | 128 | 0 | 2 | 10 | 2 | 0 | 0 | 1 | 3 | 5 | 0 | 0 | 0 | 151 | 293 | 1 | 5 | 4 | 1 | 1 | 0 | 0 | 3 | 4 | 0 | 0 | 312 | 421 | 1 | 7 | 14 | 3 | 1 | 0 | 1 | 6 | 9 | 0 | 0 | 0 | 463 | |
| Total | 21616 | 279 | 1323 | 384 | 84 | 21 | 37 | 48 | 371 | 247 | 16 | 0 | 5 | 24431 | 20361 | 192 | 1747 | 394 | 84 | 36 | 42 | 52 | 377 | 252 | 19 | 0 | 7 | 23563 | 41977 | 471 | 3070 | 778 | 168 | 57 | 79 | 100 | 748 | 499 | 35 | 0 | 12 | 47994 |

Job No Q2870
 Client Bitzios Consultants
 Site Beaudesert Rd - 410m north of Ormskirk St
 Location Calamvale
 Site No 1
 Start Date 3-Dec-20
 Day Wednesday
 Description Class Summary
 Classification AustRoads94
 Select Site
 1. Beaudesert Rd - 410m north of Ormskirk St
 Select Day
 Wednesday

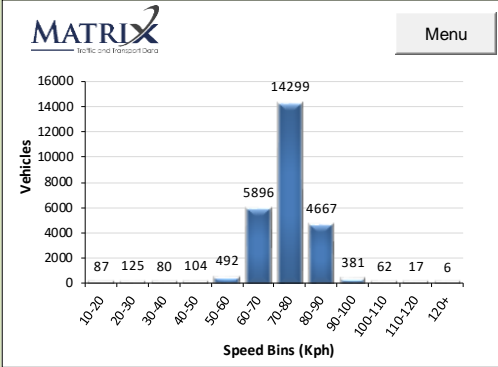
| Class Summary | | C | NB | SB |
|---------------|-----|-----|-----|-----|
| Light | C1 | 87% | 88% | 87% |
| | C2 | 1% | 1% | 1% |
| | C3 | 6% | 5% | 7% |
| Medium | C4 | 2% | 2% | 2% |
| | C5 | 0% | 0% | 0% |
| | C6 | 0% | 0% | 0% |
| Heavy | C7 | 0% | 0% | 0% |
| | C8 | 0% | 0% | 0% |
| | C9 | 2% | 1% | 2% |
| | C10 | 1% | 1% | 1% |
| | C11 | 0% | 0% | 0% |
| | C12 | 0% | 0% | 0% |
| Unclassified | C13 | 0% | 0% | 0% |



| Hour Starting | NB | | | | | | | | | | | | | Total | SB | | | | | | | | | | | | | Total | COMBINED | | | | | | | | | | | | | Total |
|---------------|--------------|--------------|---------------------|---------------------|-------------------|--------------------|--------------------|--------------------|--------------------|------------|-------------------|-------------------|----------------|--------------|--------------|--------------|---------------------|---------------------|-------------------|--------------------|--------------------|--------------------|--------------------|------------|-------------------|-------------------|----------------|--------------|--------------|--------------|---------------------|---------------------|-------------------|--------------------|--------------------|--------------------|--------------------|------------|-------------------|-------------------|----------------|--------------|
| | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | |
| | Short | Short Towing | 2 axle Truck or bus | 3 axle Truck or bus | 4 or 5 Axle Truck | 3 axle Articulated | 4 Axle Articulated | 5 Axle Articulated | 6 Axle Articulated | B Double | Double Road Train | Triple Road Train | Unclassifiable | | Short | Short Towing | 2 axle Truck or bus | 3 axle Truck or bus | 4 or 5 Axle Truck | 3 axle Articulated | 4 Axle Articulated | 5 Axle Articulated | 6 Axle Articulated | B Double | Double Road Train | Triple Road Train | Unclassifiable | | Short | Short Towing | 2 axle Truck or bus | 3 axle Truck or bus | 4 or 5 Axle Truck | 3 axle Articulated | 4 Axle Articulated | 5 Axle Articulated | 6 Axle Articulated | B Double | Double Road Train | Triple Road Train | Unclassifiable | |
| 0:00 | 104 | 0 | 3 | 4 | 1 | 0 | 0 | 1 | 1 | 9 | 0 | 0 | 0 | 123 | 184 | 0 | 5 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 200 | 288 | 0 | 8 | 5 | 1 | 0 | 1 | 1 | 7 | 12 | 0 | 0 | 0 | 323 | | |
| 1:00 | 100 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 107 | 112 | 0 | 6 | 1 | 3 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 126 | 212 | 0 | 7 | 2 | 3 | 0 | 0 | 2 | 3 | 4 | 0 | 0 | 0 | 233 | |
| 2:00 | 112 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 5 | 0 | 0 | 125 | 77 | 0 | 3 | 2 | 1 | 0 | 0 | 1 | 5 | 3 | 0 | 0 | 92 | 189 | 1 | 4 | 1 | 0 | 0 | 1 | 9 | 8 | 0 | 0 | 0 | 217 | | |
| 3:00 | 258 | 1 | 13 | 0 | 2 | 1 | 1 | 0 | 0 | 5 | 5 | 0 | 0 | 286 | 79 | 0 | 8 | 3 | 2 | 0 | 0 | 0 | 5 | 5 | 0 | 0 | 102 | 337 | 1 | 21 | 3 | 4 | 1 | 1 | 0 | 10 | 10 | 0 | 0 | 0 | 388 | |
| 4:00 | 696 | 2 | 54 | 12 | 3 | 1 | 1 | 0 | 11 | 8 | 0 | 0 | 1 | 789 | 158 | 1 | 21 | 6 | 1 | 0 | 0 | 2 | 2 | 4 | 0 | 0 | 197 | 854 | 3 | 75 | 18 | 4 | 1 | 1 | 2 | 13 | 12 | 0 | 0 | 3 | 986 | |
| 5:00 | 1795 | 21 | 104 | 28 | 8 | 1 | 3 | 5 | 17 | 10 | 1 | 0 | 3 | 1996 | 319 | 9 | 26 | 13 | 4 | 0 | 2 | 2 | 9 | 4 | 0 | 0 | 388 | 2114 | 30 | 130 | 41 | 12 | 1 | 5 | 7 | 26 | 14 | 1 | 0 | 3 | 2384 | |
| 6:00 | 2071 | 41 | 156 | 34 | 7 | 3 | 2 | 5 | 30 | 15 | 1 | 0 | 3 | 2368 | 521 | 7 | 82 | 32 | 5 | 2 | 1 | 2 | 20 | 13 | 0 | 0 | 685 | 2592 | 48 | 238 | 66 | 12 | 5 | 3 | 7 | 50 | 28 | 1 | 0 | 3 | 3053 | |
| 7:00 | 2135 | 39 | 130 | 34 | 9 | 5 | 2 | 4 | 28 | 16 | 2 | 0 | 1 | 2405 | 736 | 10 | 139 | 27 | 9 | 2 | 1 | 3 | 24 | 7 | 0 | 1 | 959 | 2871 | 49 | 269 | 61 | 18 | 7 | 3 | 7 | 52 | 23 | 2 | 1 | 1 | 3364 | |
| 8:00 | 1960 | 22 | 122 | 43 | 5 | 0 | 2 | 2 | 25 | 27 | 1 | 0 | 1 | 2210 | 899 | 10 | 121 | 26 | 7 | 2 | 3 | 1 | 27 | 11 | 2 | 0 | 0 | 1109 | 2859 | 32 | 243 | 69 | 12 | 2 | 5 | 3 | 52 | 38 | 3 | 0 | 1 | 3319 |
| 9:00 | 1445 | 14 | 103 | 38 | 6 | 5 | 5 | 1 | 33 | 24 | 2 | 0 | 0 | 1676 | 931 | 20 | 121 | 30 | 10 | 2 | 8 | 2 | 30 | 14 | 2 | 0 | 1 | 1172 | 2376 | 34 | 224 | 68 | 16 | 7 | 13 | 4 | 63 | 38 | 4 | 0 | 1 | 2848 |
| 10:00 | 1173 | 15 | 105 | 31 | 7 | 1 | 0 | 3 | 34 | 22 | 0 | 0 | 0 | 1391 | 1052 | 13 | 111 | 31 | 7 | 6 | 3 | 1 | 41 | 23 | 0 | 0 | 0 | 1288 | 2225 | 28 | 216 | 62 | 14 | 7 | 3 | 4 | 75 | 45 | 0 | 0 | 0 | 2679 |
| 11:00 | 1113 | 14 | 84 | 33 | 9 | 1 | 6 | 1 | 24 | 19 | 3 | 0 | 0 | 1307 | 1071 | 13 | 125 | 35 | 5 | 5 | 7 | 5 | 36 | 16 | 0 | 0 | 0 | 1318 | 2184 | 27 | 209 | 68 | 14 | 6 | 13 | 6 | 60 | 35 | 3 | 0 | 0 | 2625 |
| 12:00 | 1111 | 18 | 110 | 32 | 2 | 1 | 3 | 1 | 37 | 15 | 2 | 0 | 0 | 1332 | 1268 | 12 | 130 | 43 | 7 | 4 | 4 | 7 | 33 | 15 | 1 | 0 | 0 | 1524 | 2379 | 30 | 240 | 75 | 9 | 5 | 7 | 8 | 70 | 30 | 3 | 0 | 0 | 2856 |
| 13:00 | 1137 | 15 | 72 | 35 | 6 | 4 | 6 | 1 | 34 | 15 | 1 | 0 | 0 | 1326 | 1271 | 14 | 104 | 36 | 9 | 4 | 4 | 3 | 27 | 26 | 3 | 0 | 0 | 1501 | 2408 | 29 | 176 | 71 | 15 | 8 | 10 | 4 | 61 | 41 | 4 | 0 | 0 | 2827 |
| 14:00 | 1094 | 15 | 78 | 33 | 5 | 2 | 4 | 2 | 23 | 10 | 0 | 0 | 0 | 1266 | 1750 | 20 | 145 | 39 | 3 | 4 | 5 | 3 | 35 | 22 | 1 | 0 | 0 | 2027 | 2844 | 35 | 223 | 72 | 8 | 6 | 9 | 5 | 58 | 32 | 1 | 0 | 0 | 3293 |
| 15:00 | 1138 | 14 | 72 | 28 | 6 | 6 | 1 | 3 | 23 | 9 | 0 | 0 | 0 | 1300 | 1860 | 23 | 154 | 37 | 5 | 0 | 5 | 1 | 20 | 9 | 0 | 0 | 3 | 2117 | 2998 | 37 | 226 | 65 | 11 | 6 | 6 | 4 | 43 | 18 | 0 | 0 | 3 | 3417 |
| 16:00 | 1157 | 18 | 57 | 16 | 5 | 1 | 2 | 0 | 14 | 10 | 1 | 0 | 1 | 1282 | 2137 | 18 | 179 | 33 | 4 | 5 | 2 | 2 | 13 | 12 | 0 | 0 | 4 | 2409 | 3294 | 36 | 236 | 49 | 9 | 6 | 4 | 2 | 27 | 22 | 1 | 0 | 5 | 3691 |
| 17:00 | 1194 | 6 | 49 | 17 | 2 | 0 | 0 | 2 | 13 | 3 | 0 | 0 | 0 | 1286 | 2097 | 16 | 134 | 26 | 1 | 3 | 5 | 3 | 15 | 6 | 1 | 0 | 5 | 2312 | 3291 | 22 | 183 | 43 | 3 | 3 | 5 | 5 | 28 | 9 | 1 | 0 | 5 | 3598 |
| 18:00 | 892 | 11 | 45 | 14 | 0 | 0 | 1 | 2 | 9 | 10 | 0 | 0 | 0 | 984 | 1627 | 10 | 65 | 26 | 2 | 0 | 4 | 1 | 11 | 10 | 0 | 0 | 0 | 1756 | 2519 | 21 | 110 | 40 | 2 | 0 | 5 | 3 | 20 | 20 | 0 | 0 | 0 | 2740 |
| 19:00 | 729 | 5 | 25 | 13 | 0 | 1 | 0 | 2 | 6 | 3 | 1 | 0 | 0 | 785 | 1106 | 7 | 35 | 13 | 0 | 2 | 2 | 0 | 12 | 8 | 0 | 0 | 0 | 1185 | 1835 | 12 | 60 | 26 | 0 | 3 | 2 | 2 | 18 | 11 | 1 | 0 | 0 | 1970 |
| 20:00 | 634 | 5 | 19 | 10 | 1 | 0 | 2 | 0 | 5 | 9 | 0 | 0 | 0 | 685 | 1079 | 3 | 34 | 8 | 0 | 1 | 1 | 0 | 7 | 0 | 0 | 0 | 0 | 1133 | 1713 | 8 | 53 | 18 | 1 | 1 | 3 | 0 | 5 | 16 | 0 | 0 | 0 | 1818 |
| 21:00 | 491 | 3 | 16 | 6 | 2 | 0 | 0 | 0 | 9 | 4 | 0 | 0 | 0 | 531 | 815 | 1 | 17 | 8 | 1 | 0 | 0 | 1 | 5 | 6 | 0 | 0 | 0 | 854 | 1306 | 4 | 33 | 14 | 3 | 0 | 0 | 1 | 14 | 10 | 0 | 0 | 0 | 1385 |
| 22:00 | 274 | 1 | 4 | 6 | 0 | 0 | 0 | 2 | 0 | 13 | 0 | 0 | 1 | 301 | 592 | 2 | 17 | 10 | 1 | 0 | 0 | 1 | 3 | 4 | 0 | 0 | 0 | 630 | 866 | 3 | 21 | 16 | 1 | 0 | 0 | 3 | 3 | 17 | 0 | 0 | 1 | 931 |
| 23:00 | 164 | 0 | 4 | 7 | 0 | 0 | 0 | 1 | 3 | 6 | 0 | 0 | 0 | 185 | 369 | 0 | 10 | 4 | 0 | 1 | 1 | 2 | 6 | 6 | 0 | 0 | 0 | 395 | 533 | 0 | 14 | 11 | 0 | 1 | 1 | 3 | 9 | 12 | 0 | 0 | 0 | 584 |
| Total | 22977 | 281 | 1427 | 477 | 86 | 33 | 41 | 39 | 390 | 269 | 15 | 0 | 11 | 26046 | 22110 | 209 | 1792 | 490 | 87 | 43 | 59 | 45 | 386 | 236 | 10 | 1 | 15 | 25483 | 45087 | 490 | 3219 | 967 | 173 | 76 | 100 | 84 | 776 | 505 | 25 | 1 | 26 | 51529 |

| | | | | |
|-------------------------|--|-------------|--------------------|-------|
| Job No | Q2870 | | Bin Summary | |
| Client | Bitzios Consultants | | 10-20 | 0.6% |
| Site | Beaudesert Rd - 410m north of Ormskirk St | | 20-30 | 1.5% |
| Location | Calamvale | | 30-40 | 2.5% |
| Site No | 1 | | 40-50 | 4.3% |
| Start Date | 3-Dec-20 | | 50-60 | 13.8% |
| Day | Friday | | 60-70 | 54.1% |
| Direction | NB | | 70-80 | 20.7% |
| Description | Speed Summary | | 80-90 | 2.2% |
| Select Site | | | 90-100 | 0.3% |
| | 1. Beaudesert Rd - 410m north of Ormskirk St | | 100-110 | 0.1% |
| | | | 110-120 | 0.0% |
| | | | 120+ | 0.0% |
| Select Day | Friday | 63.8 | 71.6 | |
| Select Direction | NB | | | |

| Hour Starting | Vehicle Speed Bins (kph) | | | | | | | | | | | | Speed | |
|---------------|--------------------------|------------|------------|-------------|-------------|--------------|-------------|------------|-----------|-----------|----------|----------|-------------|-------------|
| | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 100-110 | 110-120 | 120+ | Ave | 85%ile |
| 0:00 | 0 | 0 | 0 | 0 | 6 | 53 | 32 | 7 | 2 | 1 | 0 | 0 | 70.0 | 76.7 |
| 1:00 | 0 | 0 | 0 | 0 | 7 | 58 | 39 | 9 | 2 | 0 | 0 | 0 | 70.2 | 77.1 |
| 2:00 | 0 | 0 | 0 | 0 | 3 | 41 | 60 | 18 | 3 | 0 | 0 | 1 | 73.5 | 80.7 |
| 3:00 | 0 | 0 | 0 | 0 | 5 | 98 | 135 | 39 | 7 | 2 | 0 | 0 | 73.1 | 80.4 |
| 4:00 | 0 | 0 | 0 | 0 | 7 | 314 | 334 | 75 | 11 | 6 | 0 | 0 | 72.3 | 78.8 |
| 5:00 | 0 | 0 | 1 | 9 | 78 | 998 | 684 | 83 | 4 | 2 | 0 | 0 | 69.2 | 75.2 |
| 6:00 | 2 | 0 | 0 | 5 | 118 | 1494 | 643 | 37 | 4 | 1 | 0 | 0 | 67.8 | 72.6 |
| 7:00 | 0 | 0 | 12 | 61 | 325 | 1577 | 386 | 14 | 2 | 0 | 0 | 0 | 64.8 | 70.4 |
| 8:00 | 75 | 186 | 296 | 333 | 428 | 635 | 105 | 5 | 0 | 1 | 0 | 0 | 50.4 | 66.0 |
| 9:00 | 0 | 0 | 0 | 8 | 141 | 1119 | 328 | 28 | 1 | 1 | 0 | 0 | 66.7 | 71.6 |
| 10:00 | 2 | 9 | 41 | 112 | 339 | 744 | 223 | 18 | 6 | 1 | 0 | 0 | 61.8 | 70.4 |
| 11:00 | 5 | 21 | 41 | 53 | 234 | 846 | 267 | 20 | 1 | 0 | 0 | 0 | 63.3 | 70.8 |
| 12:00 | 0 | 2 | 2 | 26 | 202 | 809 | 333 | 34 | 1 | 0 | 0 | 0 | 66.1 | 72.6 |
| 13:00 | 0 | 2 | 6 | 29 | 129 | 744 | 369 | 35 | 4 | 0 | 0 | 1 | 67.0 | 73.6 |
| 14:00 | 27 | 43 | 71 | 106 | 264 | 615 | 179 | 20 | 2 | 0 | 1 | 0 | 59.2 | 70.0 |
| 15:00 | 30 | 95 | 114 | 192 | 298 | 433 | 166 | 15 | 2 | 0 | 0 | 0 | 55.0 | 69.4 |
| 16:00 | 0 | 0 | 1 | 35 | 181 | 718 | 281 | 26 | 2 | 0 | 0 | 0 | 65.7 | 72.2 |
| 17:00 | 11 | 32 | 72 | 118 | 256 | 592 | 191 | 19 | 2 | 1 | 0 | 0 | 59.9 | 70.4 |
| 18:00 | 2 | 1 | 13 | 38 | 218 | 652 | 175 | 15 | 3 | 0 | 0 | 0 | 63.9 | 70.4 |
| 19:00 | 0 | 0 | 0 | 9 | 194 | 593 | 162 | 10 | 2 | 1 | 0 | 0 | 64.8 | 70.6 |
| 20:00 | 0 | 0 | 0 | 1 | 97 | 462 | 115 | 19 | 2 | 1 | 0 | 0 | 65.8 | 71.3 |
| 21:00 | 0 | 0 | 0 | 1 | 78 | 397 | 123 | 13 | 4 | 0 | 0 | 0 | 66.4 | 72.5 |
| 22:00 | 0 | 0 | 0 | 2 | 39 | 244 | 106 | 9 | 3 | 0 | 0 | 0 | 67.3 | 72.6 |
| 23:00 | 0 | 0 | 0 | 1 | 22 | 160 | 58 | 14 | 1 | 2 | 0 | 4 | 68.8 | 74.6 |
| Total | 154 | 391 | 670 | 1139 | 3669 | 14396 | 5494 | 582 | 71 | 20 | 1 | 6 | 63.8 | 71.6 |

| | | | | |
|-------------------------|--|--|--------------------|-------|
| Job No | Q2870 |  | Bin Summary | |
| Client | Bitzios Consultants | | 10-20 | 0.3% |
| Site | Beaudesert Rd - 410m north of Ormskirk St | | 20-30 | 0.5% |
| Location | Calamvale | | 30-40 | 0.3% |
| Site No | 1 | | 40-50 | 0.4% |
| Start Date | 3-Dec-20 | | 50-60 | 1.9% |
| Day | Friday | | 60-70 | 22.5% |
| Direction | SB | | 70-80 | 54.5% |
| Description | Speed Summary | | 80-90 | 17.8% |
| Select Site | 1. Beaudesert Rd - 410m north of Ormskirk St | | 90-100 | 1.5% |
| Select Day | Friday | 100-110 | 0.2% | |
| Select Direction | SB | 110-120 | 0.1% | |
| | | 120+ | 0.0% | |
| | | 73.9 | 81.0 | |

| Hour Starting | Vehicle Speed Bins (kph) | | | | | | | | | | | | Speed | |
|---------------|--------------------------|------------|-----------|------------|------------|-------------|--------------|-------------|------------|-----------|-----------|----------|-------------|-------------|
| | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 100-110 | 110-120 | 120+ | Ave | 85%ile |
| 0:00 | 0 | 0 | 0 | 1 | 2 | 29 | 115 | 55 | 6 | 1 | 0 | 1 | 76.7 | 83.5 |
| 1:00 | 0 | 0 | 0 | 0 | 1 | 21 | 52 | 36 | 4 | 2 | 3 | 0 | 78.4 | 84.8 |
| 2:00 | 0 | 0 | 0 | 0 | 0 | 13 | 57 | 36 | 8 | 1 | 1 | 0 | 79.2 | 87.0 |
| 3:00 | 0 | 0 | 0 | 0 | 1 | 11 | 57 | 41 | 5 | 5 | 0 | 0 | 79.2 | 85.7 |
| 4:00 | 0 | 0 | 0 | 0 | 0 | 23 | 93 | 78 | 12 | 4 | 1 | 0 | 79.3 | 85.7 |
| 5:00 | 0 | 0 | 0 | 0 | 4 | 31 | 208 | 129 | 17 | 5 | 0 | 1 | 78.8 | 85.3 |
| 6:00 | 0 | 0 | 1 | 1 | 2 | 138 | 417 | 113 | 12 | 3 | 0 | 0 | 75.1 | 81.1 |
| 7:00 | 0 | 0 | 0 | 1 | 8 | 254 | 500 | 128 | 9 | 0 | 1 | 0 | 73.8 | 80.0 |
| 8:00 | 0 | 0 | 1 | 0 | 29 | 326 | 661 | 149 | 12 | 1 | 1 | 0 | 73.3 | 79.6 |
| 9:00 | 0 | 0 | 2 | 3 | 37 | 325 | 682 | 193 | 11 | 0 | 0 | 0 | 73.3 | 80.4 |
| 10:00 | 0 | 0 | 0 | 0 | 0 | 212 | 794 | 313 | 21 | 0 | 0 | 0 | 76.2 | 82.2 |
| 11:00 | 0 | 0 | 0 | 1 | 2 | 245 | 942 | 301 | 21 | 1 | 1 | 0 | 75.7 | 81.5 |
| 12:00 | 0 | 0 | 0 | 0 | 5 | 291 | 968 | 362 | 21 | 2 | 0 | 0 | 75.7 | 82.0 |
| 13:00 | 0 | 0 | 0 | 0 | 8 | 316 | 1049 | 390 | 18 | 4 | 0 | 1 | 75.6 | 81.9 |
| 14:00 | 87 | 125 | 74 | 50 | 107 | 438 | 846 | 263 | 19 | 6 | 2 | 0 | 65.5 | 79.7 |
| 15:00 | 0 | 0 | 0 | 1 | 60 | 452 | 1120 | 316 | 28 | 0 | 0 | 2 | 74.2 | 80.9 |
| 16:00 | 0 | 0 | 0 | 17 | 143 | 854 | 1074 | 270 | 24 | 5 | 1 | 0 | 71.4 | 79.1 |
| 17:00 | 0 | 0 | 1 | 26 | 72 | 688 | 1095 | 281 | 28 | 6 | 0 | 0 | 72.5 | 79.7 |
| 18:00 | 0 | 0 | 0 | 1 | 6 | 369 | 920 | 286 | 15 | 5 | 1 | 0 | 74.8 | 81.1 |
| 19:00 | 0 | 0 | 0 | 0 | 1 | 236 | 738 | 223 | 23 | 2 | 3 | 0 | 75.6 | 81.5 |
| 20:00 | 0 | 0 | 0 | 0 | 2 | 236 | 613 | 195 | 20 | 4 | 0 | 0 | 75.1 | 81.3 |
| 21:00 | 0 | 0 | 0 | 1 | 0 | 175 | 531 | 229 | 22 | 2 | 0 | 0 | 75.9 | 82.2 |
| 22:00 | 0 | 0 | 0 | 1 | 2 | 144 | 486 | 163 | 15 | 1 | 2 | 0 | 75.6 | 81.8 |
| 23:00 | 0 | 0 | 1 | 0 | 0 | 69 | 281 | 117 | 10 | 2 | 0 | 1 | 76.3 | 83.1 |
| Total | 87 | 125 | 80 | 104 | 492 | 5896 | 14299 | 4667 | 381 | 62 | 17 | 6 | 73.9 | 81.0 |

| | | | | |
|-------------------------|--|-------------|--------------------|-------|
| Job No | Q2870 | | Bin Summary | |
| Client | Bitzios Consultants | | 10-20 | 0.3% |
| Site | Beaudesert Rd - 410m north of Ormskirk St | | 20-30 | 1.3% |
| Location | Calamvale | | 30-40 | 2.0% |
| Site No | 1 | | 40-50 | 3.4% |
| Start Date | 3-Dec-20 | | 50-60 | 14.8% |
| Day | Monday | | 60-70 | 53.5% |
| Direction | NB | | 70-80 | 22.1% |
| Description | Speed Summary | | 80-90 | 2.3% |
| Select Site | 1. Beaudesert Rd - 410m north of Ormskirk St | | 90-100 | 0.3% |
| Select Day | Monday | 100-110 | 0.0% | |
| Select Direction | NB | 110-120 | 0.0% | |
| | | 120+ | 0.0% | |
| | | 64.4 | 71.8 | |

| Hour Starting | Vehicle Speed Bins (kph) | | | | | | | | | | | | Speed | |
|---------------|--------------------------|------------|------------|------------|-------------|--------------|-------------|------------|-----------|----------|----------|----------|-------------|-------------|
| | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 100-110 | 110-120 | 120+ | Ave | 85%ile |
| 0:00 | 0 | 0 | 0 | 0 | 4 | 70 | 31 | 3 | 0 | 0 | 0 | 0 | 68.5 | 74.6 |
| 1:00 | 0 | 0 | 0 | 0 | 4 | 52 | 30 | 7 | 2 | 0 | 1 | 0 | 70.3 | 76.5 |
| 2:00 | 0 | 0 | 0 | 0 | 5 | 43 | 44 | 16 | 5 | 0 | 0 | 0 | 72.5 | 80.4 |
| 3:00 | 0 | 0 | 0 | 0 | 6 | 108 | 113 | 32 | 5 | 0 | 1 | 0 | 72.4 | 79.7 |
| 4:00 | 1 | 0 | 0 | 0 | 6 | 269 | 341 | 77 | 15 | 4 | 1 | 0 | 72.9 | 79.4 |
| 5:00 | 2 | 1 | 0 | 1 | 40 | 1041 | 737 | 64 | 9 | 1 | 0 | 0 | 69.7 | 74.9 |
| 6:00 | 0 | 0 | 1 | 8 | 234 | 1495 | 551 | 23 | 1 | 0 | 0 | 0 | 66.6 | 71.8 |
| 7:00 | 2 | 52 | 145 | 238 | 750 | 973 | 172 | 9 | 1 | 0 | 0 | 0 | 57.8 | 67.6 |
| 8:00 | 47 | 228 | 253 | 249 | 513 | 749 | 134 | 5 | 1 | 0 | 0 | 0 | 52.3 | 66.4 |
| 9:00 | 0 | 0 | 1 | 38 | 183 | 1036 | 315 | 21 | 3 | 0 | 1 | 0 | 65.7 | 71.3 |
| 10:00 | 0 | 0 | 0 | 33 | 181 | 739 | 349 | 36 | 4 | 0 | 1 | 0 | 66.6 | 73.3 |
| 11:00 | 0 | 6 | 19 | 43 | 202 | 723 | 291 | 21 | 3 | 1 | 0 | 0 | 64.9 | 72.3 |
| 12:00 | 0 | 0 | 0 | 15 | 123 | 769 | 329 | 31 | 0 | 0 | 1 | 0 | 66.9 | 73.0 |
| 13:00 | 0 | 0 | 0 | 19 | 227 | 662 | 387 | 48 | 7 | 1 | 0 | 0 | 66.7 | 73.8 |
| 14:00 | 2 | 10 | 27 | 61 | 232 | 627 | 266 | 25 | 7 | 1 | 0 | 0 | 63.9 | 71.9 |
| 15:00 | 8 | 30 | 29 | 69 | 213 | 668 | 218 | 22 | 1 | 0 | 0 | 0 | 62.3 | 71.3 |
| 16:00 | 0 | 0 | 0 | 22 | 157 | 624 | 306 | 27 | 2 | 0 | 0 | 0 | 66.5 | 72.9 |
| 17:00 | 0 | 0 | 0 | 4 | 119 | 675 | 231 | 24 | 1 | 0 | 0 | 0 | 66.5 | 71.9 |
| 18:00 | 0 | 0 | 0 | 6 | 157 | 559 | 147 | 18 | 3 | 0 | 1 | 1 | 65.4 | 71.2 |
| 19:00 | 0 | 0 | 2 | 11 | 159 | 360 | 100 | 11 | 1 | 0 | 0 | 0 | 63.9 | 70.7 |
| 20:00 | 0 | 2 | 0 | 1 | 41 | 312 | 112 | 6 | 2 | 0 | 0 | 0 | 66.8 | 72.1 |
| 21:00 | 0 | 0 | 0 | 0 | 28 | 260 | 101 | 17 | 2 | 0 | 0 | 0 | 67.9 | 73.0 |
| 22:00 | 0 | 0 | 0 | 1 | 22 | 185 | 40 | 8 | 1 | 0 | 0 | 0 | 66.7 | 71.4 |
| 23:00 | 0 | 0 | 0 | 2 | 16 | 81 | 43 | 7 | 2 | 0 | 0 | 0 | 67.5 | 74.4 |
| Total | 62 | 329 | 477 | 821 | 3622 | 13080 | 5388 | 558 | 78 | 8 | 7 | 1 | 64.4 | 71.8 |

| | | | | |
|-------------------------|---|-------------|--------------------|-------|
| Job No | Q2870 | | Bin Summary | |
| Client | Bitzios Consultants | | 10-20 | 0.4% |
| Site | Beadesert Rd - 410m north of Ormskirk St | | 20-30 | 1.0% |
| Location | Calamvale | | 30-40 | 1.0% |
| Site No | 1 | | 40-50 | 1.4% |
| Start Date | 3-Dec-20 | | 50-60 | 3.9% |
| Day | Monday | | 60-70 | 24.7% |
| Direction | SB | | 70-80 | 50.4% |
| Description | Speed Summary | | 80-90 | 15.7% |
| Select Site | 1. Beadesert Rd - 410m north of Ormskirk St | | 90-100 | 1.3% |
| Select Day | Monday | 100-110 | 0.2% | |
| Select Direction | SB | 110-120 | 0.1% | |
| | | 120+ | 0.0% | |
| | | 72.1 | 80.2 | |

| Hour Starting | Vehicle Speed Bins (kph) | | | | | | | | | | | | Speed | |
|---------------|--------------------------|------------|------------|------------|------------|-------------|--------------|-------------|------------|-----------|-----------|----------|-------------|-------------|
| | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 100-110 | 110-120 | 120+ | Ave | 85%ile |
| 0:00 | 0 | 0 | 0 | 0 | 0 | 27 | 64 | 22 | 5 | 1 | 0 | 0 | 75.8 | 82.1 |
| 1:00 | 0 | 0 | 0 | 0 | 0 | 17 | 59 | 27 | 3 | 0 | 0 | 0 | 76.8 | 84.1 |
| 2:00 | 0 | 0 | 0 | 0 | 0 | 6 | 31 | 15 | 4 | 0 | 1 | 1 | 80.2 | 85.5 |
| 3:00 | 0 | 0 | 0 | 0 | 1 | 14 | 51 | 29 | 7 | 0 | 0 | 1 | 78.7 | 86.7 |
| 4:00 | 0 | 0 | 0 | 0 | 1 | 17 | 102 | 59 | 12 | 6 | 1 | 0 | 79.5 | 87.7 |
| 5:00 | 0 | 0 | 0 | 1 | 1 | 41 | 203 | 120 | 11 | 5 | 0 | 2 | 78.1 | 84.5 |
| 6:00 | 0 | 0 | 2 | 1 | 3 | 126 | 372 | 138 | 12 | 0 | 0 | 0 | 75.3 | 81.9 |
| 7:00 | 0 | 0 | 0 | 2 | 25 | 243 | 482 | 112 | 8 | 1 | 1 | 0 | 73.0 | 79.6 |
| 8:00 | 0 | 0 | 0 | 1 | 39 | 378 | 566 | 126 | 11 | 2 | 0 | 0 | 72.3 | 79.2 |
| 9:00 | 0 | 0 | 0 | 0 | 14 | 290 | 642 | 173 | 15 | 0 | 0 | 0 | 74.0 | 80.4 |
| 10:00 | 0 | 0 | 0 | 0 | 1 | 183 | 726 | 328 | 19 | 2 | 0 | 0 | 76.4 | 82.4 |
| 11:00 | 0 | 0 | 0 | 0 | 3 | 225 | 814 | 302 | 22 | 2 | 0 | 1 | 76.0 | 82.0 |
| 12:00 | 0 | 0 | 0 | 0 | 2 | 193 | 819 | 329 | 22 | 2 | 0 | 0 | 76.3 | 82.5 |
| 13:00 | 0 | 0 | 0 | 0 | 2 | 262 | 934 | 339 | 11 | 0 | 0 | 0 | 75.7 | 81.8 |
| 14:00 | 5 | 37 | 47 | 42 | 99 | 552 | 922 | 279 | 20 | 3 | 2 | 0 | 70.2 | 80.0 |
| 15:00 | 0 | 0 | 3 | 21 | 149 | 675 | 925 | 208 | 18 | 2 | 0 | 0 | 71.0 | 78.3 |
| 16:00 | 39 | 103 | 90 | 113 | 371 | 790 | 767 | 170 | 10 | 2 | 0 | 0 | 63.7 | 76.4 |
| 17:00 | 46 | 99 | 98 | 139 | 154 | 620 | 854 | 215 | 23 | 3 | 3 | 0 | 65.1 | 78.5 |
| 18:00 | 0 | 0 | 0 | 5 | 23 | 383 | 797 | 207 | 12 | 0 | 0 | 0 | 73.5 | 80.1 |
| 19:00 | 0 | 0 | 1 | 1 | 21 | 379 | 497 | 75 | 7 | 0 | 1 | 0 | 71.9 | 78.1 |
| 20:00 | 0 | 0 | 0 | 0 | 5 | 161 | 430 | 99 | 9 | 0 | 1 | 0 | 74.5 | 80.1 |
| 21:00 | 0 | 0 | 0 | 0 | 3 | 118 | 368 | 116 | 22 | 3 | 0 | 0 | 75.5 | 82.3 |
| 22:00 | 0 | 0 | 0 | 0 | 1 | 69 | 271 | 135 | 10 | 3 | 3 | 1 | 77.3 | 83.1 |
| 23:00 | 0 | 0 | 0 | 0 | 1 | 54 | 173 | 72 | 10 | 2 | 0 | 0 | 76.1 | 82.3 |
| Total | 90 | 239 | 241 | 326 | 919 | 5823 | 11869 | 3695 | 303 | 39 | 13 | 6 | 72.1 | 80.2 |

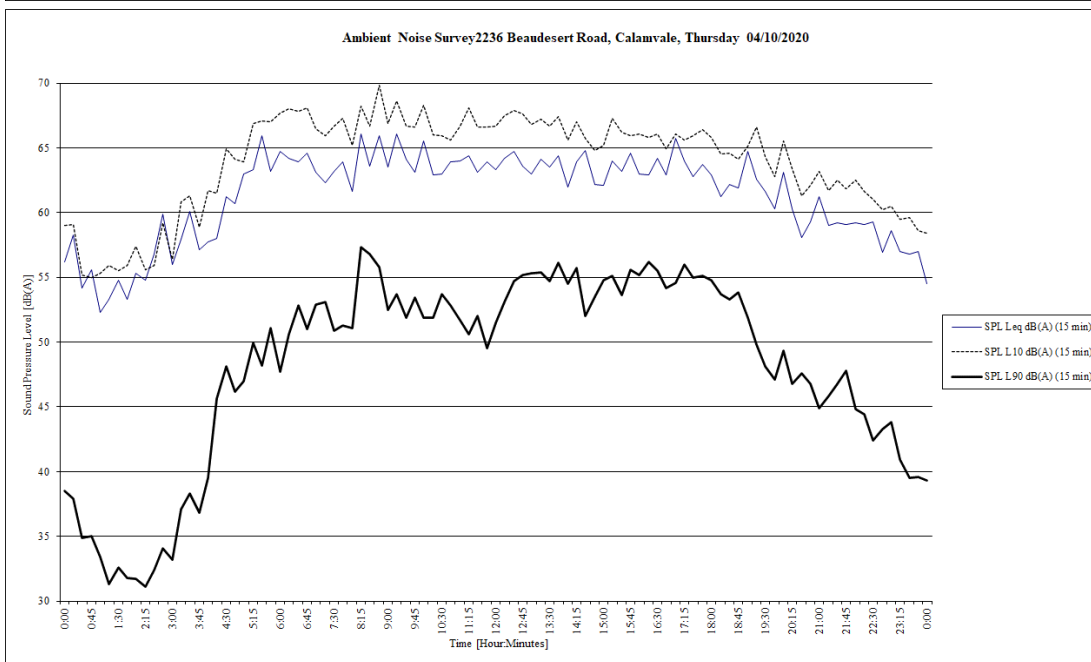
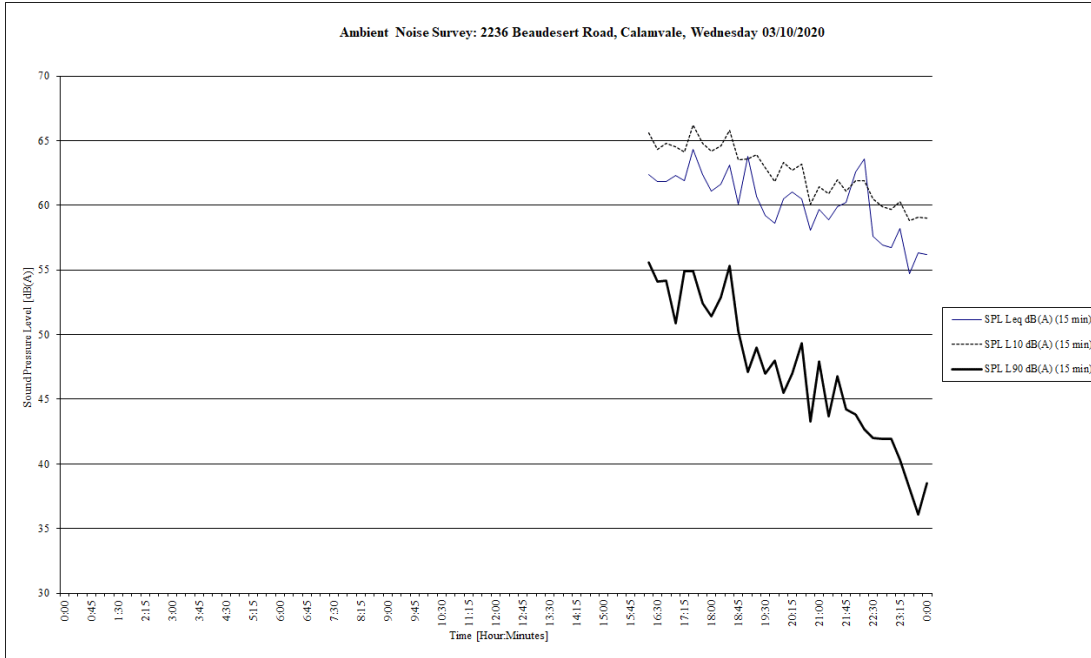
| | | | | |
|--|---|-------------|--------------------|-------|
| Job No | Q2870 | | Bin Summary | |
| Client | Bitzios Consultants | | 10-20 | 0.4% |
| Site | Beaudesert Rd - 410m north of Ormskirk St | | 20-30 | 1.2% |
| Location | Calamvale | | 30-40 | 2.0% |
| Site No | 1 | | 40-50 | 3.8% |
| Start Date | 3-Dec-20 | | 50-60 | 14.1% |
| Day | Wednesday | | 60-70 | 54.3% |
| Direction | NB | | 70-80 | 21.6% |
| Description | Speed Summary | | 80-90 | 2.2% |
| Select Site | | | 90-100 | 0.2% |
| 1. Beaudesert Rd - 410m north of Ormskirk St | | 100-110 | 0.1% | |
| Select Day Wednesday Select Direction NB | | 110-120 | 0.0% | |
| | | 120+ | 0.0% | |
| | | 64.4 | 71.9 | |

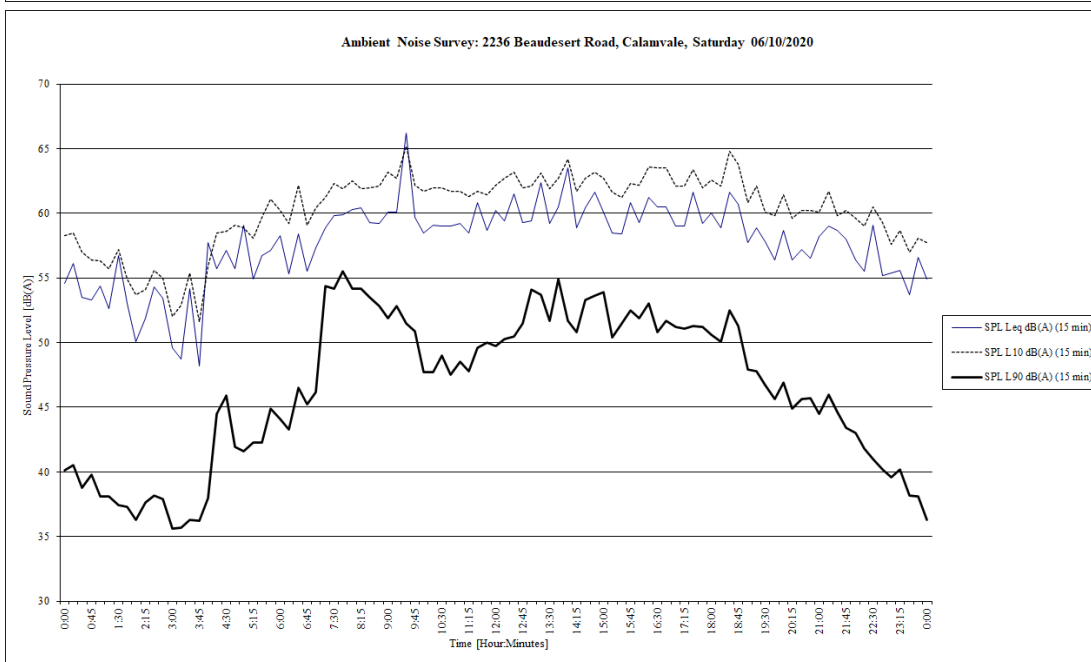
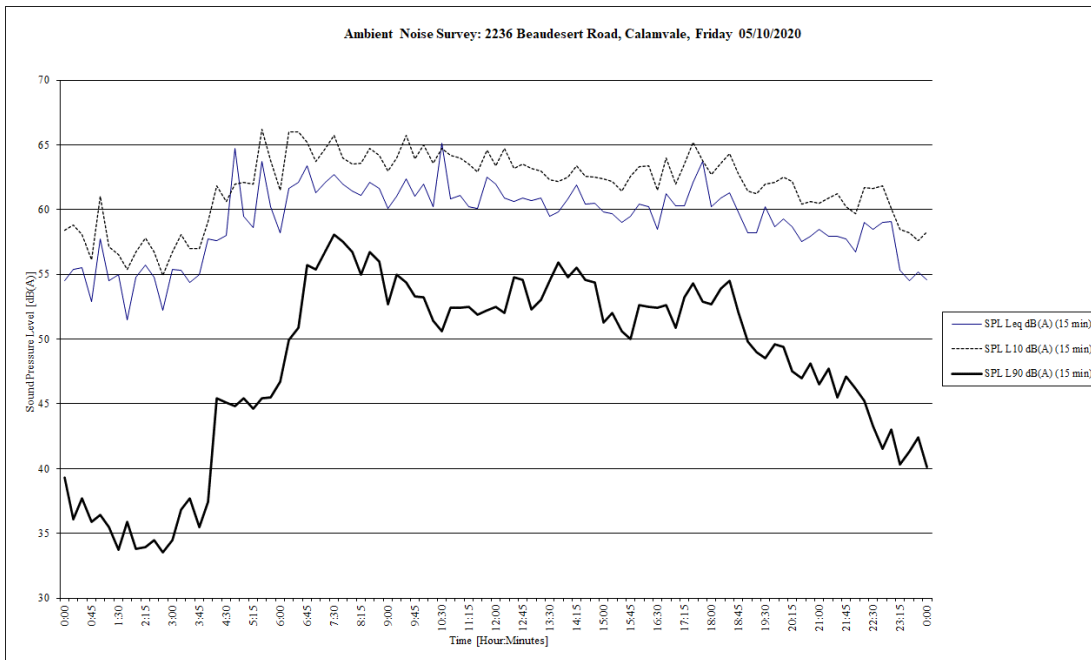
| Hour Starting | Vehicle Speed Bins (kph) | | | | | | | | | | | | Speed | |
|---------------|--------------------------|------------|------------|------------|-------------|--------------|-------------|------------|-----------|-----------|----------|----------|-------------|-------------|
| | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 100-110 | 110-120 | 120+ | Ave | 85%ile |
| 0:00 | 0 | 0 | 0 | 1 | 8 | 67 | 30 | 13 | 4 | 0 | 0 | 0 | 69.9 | 79.1 |
| 1:00 | 0 | 0 | 0 | 1 | 5 | 60 | 34 | 7 | 0 | 0 | 0 | 0 | 69.3 | 76.3 |
| 2:00 | 0 | 0 | 0 | 0 | 3 | 57 | 49 | 12 | 2 | 0 | 2 | 0 | 71.7 | 79.3 |
| 3:00 | 0 | 0 | 0 | 1 | 6 | 106 | 124 | 39 | 9 | 1 | 0 | 0 | 73.1 | 81.1 |
| 4:00 | 0 | 0 | 0 | 1 | 8 | 306 | 361 | 92 | 13 | 7 | 0 | 1 | 72.8 | 79.5 |
| 5:00 | 1 | 3 | 3 | 11 | 70 | 964 | 834 | 104 | 5 | 1 | 0 | 0 | 69.7 | 75.8 |
| 6:00 | 0 | 0 | 3 | 63 | 301 | 1387 | 571 | 40 | 3 | 0 | 0 | 0 | 66.0 | 72.4 |
| 7:00 | 3 | 18 | 60 | 152 | 464 | 1365 | 314 | 24 | 4 | 0 | 1 | 0 | 62.3 | 69.8 |
| 8:00 | 22 | 109 | 210 | 292 | 574 | 825 | 169 | 9 | 0 | 0 | 0 | 0 | 55.4 | 67.7 |
| 9:00 | 0 | 5 | 42 | 49 | 190 | 1066 | 315 | 7 | 1 | 1 | 0 | 0 | 64.5 | 70.8 |
| 10:00 | 0 | 0 | 0 | 35 | 186 | 801 | 339 | 30 | 0 | 0 | 0 | 0 | 66.2 | 72.6 |
| 11:00 | 0 | 0 | 3 | 15 | 202 | 782 | 288 | 14 | 3 | 0 | 0 | 0 | 65.6 | 71.9 |
| 12:00 | 0 | 0 | 0 | 6 | 183 | 768 | 336 | 32 | 6 | 1 | 0 | 0 | 67.0 | 73.3 |
| 13:00 | 0 | 0 | 0 | 14 | 135 | 797 | 355 | 24 | 1 | 0 | 0 | 0 | 67.1 | 72.8 |
| 14:00 | 6 | 8 | 18 | 47 | 235 | 686 | 242 | 24 | 0 | 0 | 0 | 0 | 63.8 | 71.7 |
| 15:00 | 22 | 59 | 85 | 146 | 304 | 507 | 159 | 12 | 3 | 0 | 1 | 2 | 57.5 | 69.4 |
| 16:00 | 1 | 3 | 12 | 55 | 224 | 752 | 217 | 18 | 0 | 0 | 0 | 0 | 64.0 | 70.8 |
| 17:00 | 45 | 112 | 88 | 89 | 215 | 558 | 170 | 8 | 0 | 0 | 0 | 1 | 56.2 | 69.6 |
| 18:00 | 0 | 0 | 0 | 12 | 89 | 616 | 245 | 19 | 2 | 0 | 1 | 0 | 67.0 | 72.6 |
| 19:00 | 0 | 0 | 0 | 3 | 81 | 529 | 153 | 14 | 2 | 2 | 1 | 0 | 66.4 | 71.7 |
| 20:00 | 0 | 0 | 0 | 2 | 100 | 474 | 95 | 13 | 1 | 0 | 0 | 0 | 65.5 | 70.4 |
| 21:00 | 0 | 0 | 1 | 2 | 58 | 343 | 110 | 14 | 3 | 0 | 0 | 0 | 66.7 | 72.1 |
| 22:00 | 0 | 0 | 0 | 1 | 19 | 199 | 70 | 9 | 2 | 1 | 0 | 0 | 67.7 | 73.3 |
| 23:00 | 0 | 0 | 0 | 1 | 16 | 115 | 43 | 8 | 1 | 1 | 0 | 0 | 67.5 | 73.7 |
| Total | 100 | 317 | 525 | 999 | 3676 | 14130 | 5623 | 586 | 65 | 15 | 6 | 4 | 64.4 | 71.9 |

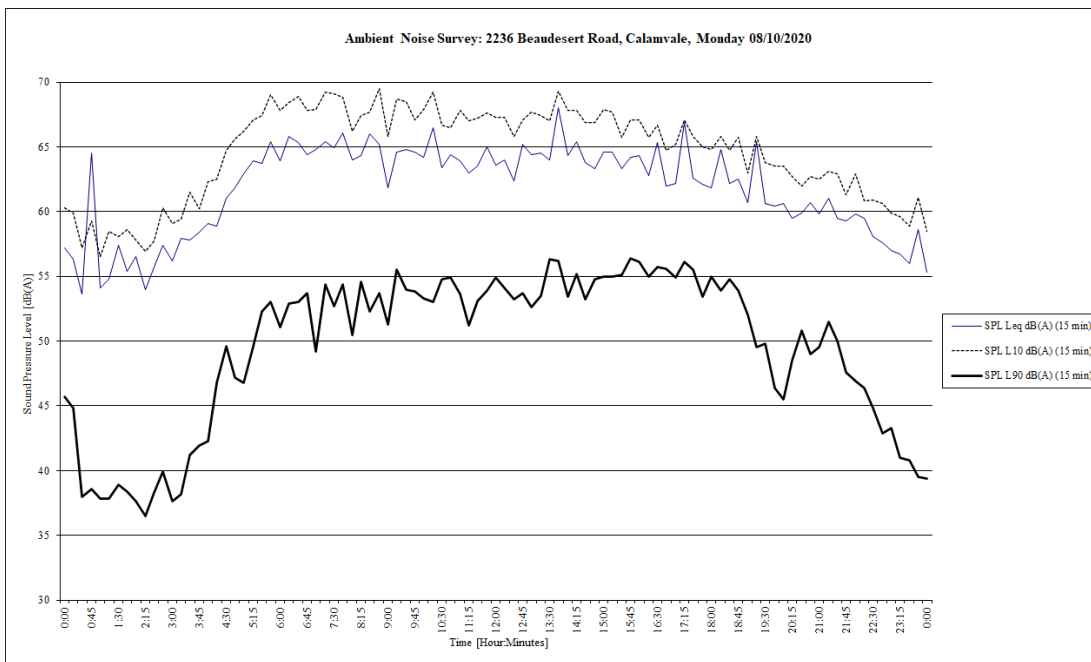
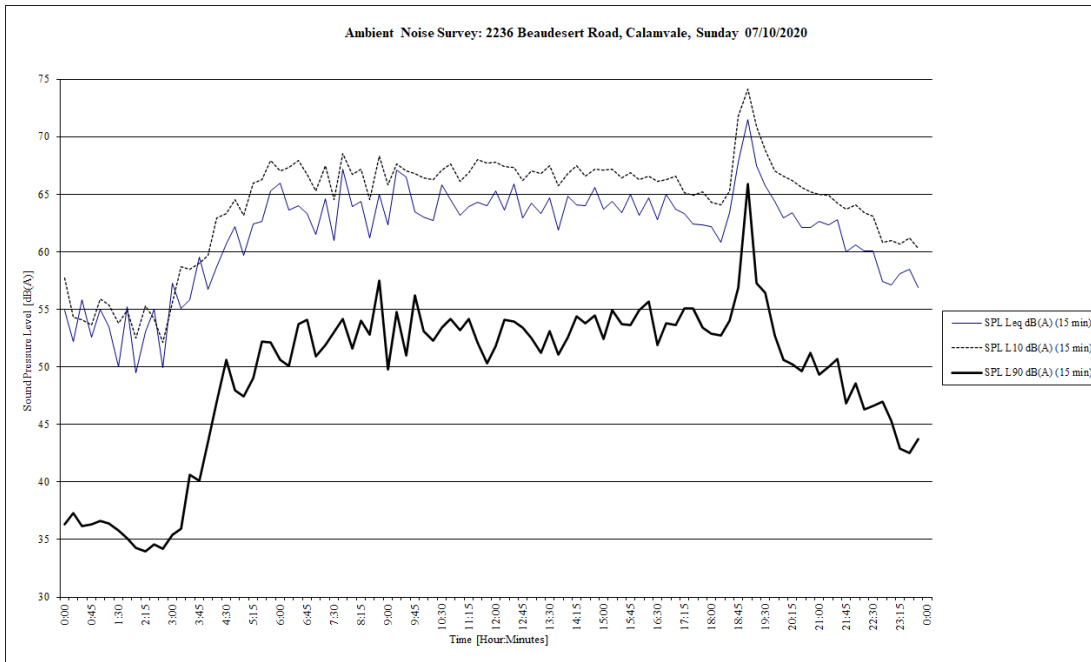
| | | | | |
|-------------------------|--|-------------|--------------------|-------|
| Job No | Q2870 | | Bin Summary | |
| Client | Bitzios Consultants | | 10-20 | 1.8% |
| Site | Beaudesert Rd - 410m north of Ormskirk St | | 20-30 | 2.3% |
| Location | Calamvale | | 30-40 | 2.4% |
| Site No | 1 | | 40-50 | 2.7% |
| Start Date | 3-Dec-20 | | 50-60 | 3.2% |
| Day | Wednesday | | 60-70 | 22.1% |
| Direction | SB | | 70-80 | 49.1% |
| Description | Speed Summary | | 80-90 | 15.0% |
| Select Site | 1. Beaudesert Rd - 410m north of Ormskirk St | | 90-100 | 1.2% |
| Select Day | Wednesday | 100-110 | 0.1% | |
| Select Direction | SB | 110-120 | 0.0% | |
| | | 120+ | 0.0% | |
| | | 70.0 | 79.5 | |

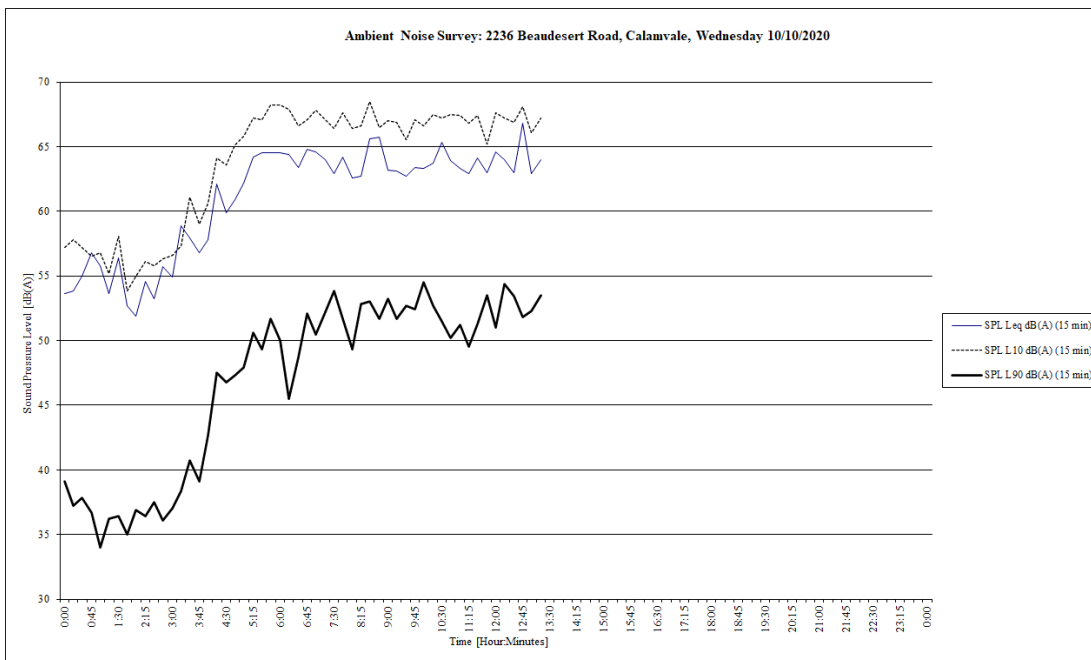
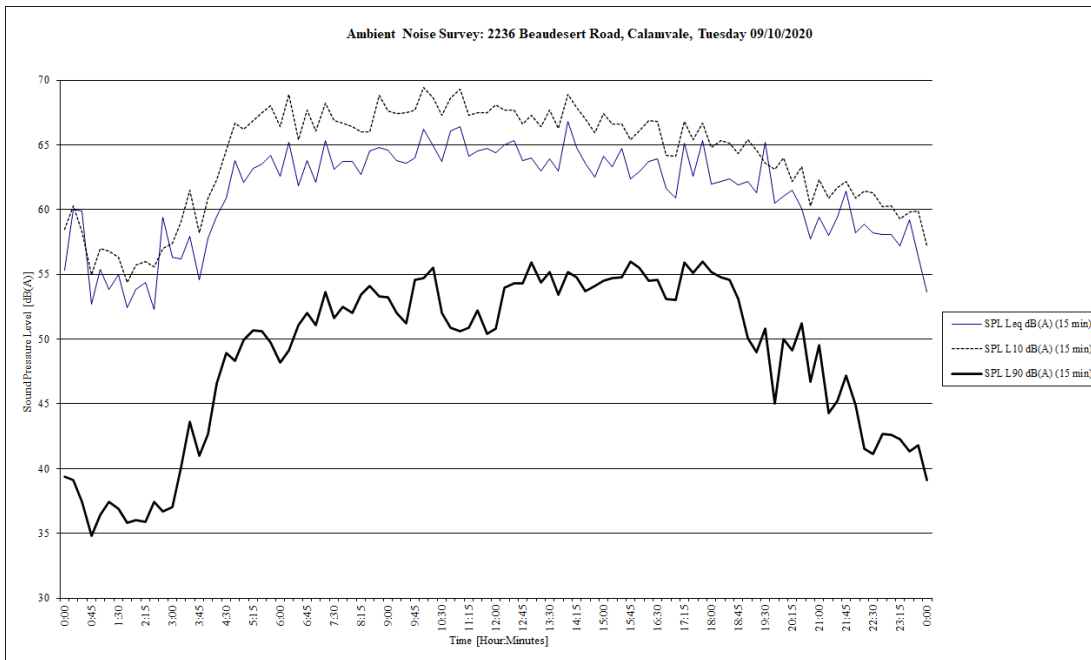
| Hour Starting | Vehicle Speed Bins (kph) | | | | | | | | | | | | Speed | |
|---------------|--------------------------|------------|------------|------------|------------|-------------|--------------|-------------|------------|-----------|-----------|----------|-------------|-------------|
| | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 100-110 | 110-120 | 120+ | Ave | 85%ile |
| 0:00 | 0 | 0 | 0 | 0 | 0 | 36 | 98 | 55 | 8 | 2 | 1 | 0 | 77.0 | 83.3 |
| 1:00 | 0 | 0 | 0 | 0 | 0 | 22 | 59 | 37 | 6 | 1 | 0 | 1 | 77.6 | 83.5 |
| 2:00 | 0 | 0 | 0 | 0 | 0 | 16 | 43 | 24 | 7 | 2 | 0 | 0 | 78.1 | 86.1 |
| 3:00 | 0 | 0 | 0 | 0 | 0 | 9 | 59 | 28 | 5 | 0 | 1 | 0 | 78.0 | 85.6 |
| 4:00 | 0 | 0 | 0 | 0 | 3 | 13 | 90 | 72 | 16 | 1 | 2 | 0 | 80.3 | 88.4 |
| 5:00 | 0 | 0 | 0 | 0 | 3 | 38 | 224 | 107 | 12 | 3 | 0 | 1 | 77.6 | 84.4 |
| 6:00 | 0 | 0 | 0 | 0 | 8 | 101 | 395 | 161 | 17 | 3 | 0 | 0 | 76.2 | 82.9 |
| 7:00 | 0 | 0 | 2 | 1 | 21 | 249 | 557 | 121 | 7 | 1 | 0 | 0 | 73.2 | 79.6 |
| 8:00 | 0 | 0 | 0 | 2 | 37 | 332 | 605 | 129 | 3 | 1 | 0 | 0 | 72.5 | 79.2 |
| 9:00 | 0 | 0 | 0 | 2 | 27 | 356 | 638 | 132 | 13 | 3 | 0 | 1 | 72.8 | 79.4 |
| 10:00 | 0 | 0 | 1 | 0 | 10 | 258 | 734 | 264 | 21 | 0 | 0 | 0 | 75.1 | 81.6 |
| 11:00 | 0 | 0 | 0 | 0 | 5 | 247 | 788 | 266 | 9 | 1 | 1 | 1 | 75.2 | 81.4 |
| 12:00 | 0 | 0 | 2 | 0 | 7 | 328 | 865 | 299 | 21 | 2 | 0 | 0 | 75.1 | 81.3 |
| 13:00 | 0 | 0 | 0 | 0 | 0 | 205 | 960 | 310 | 23 | 3 | 0 | 0 | 76.0 | 82.0 |
| 14:00 | 0 | 0 | 0 | 6 | 50 | 581 | 1035 | 333 | 18 | 2 | 2 | 0 | 73.5 | 80.7 |
| 15:00 | 10 | 48 | 39 | 90 | 103 | 512 | 996 | 297 | 19 | 2 | 1 | 0 | 69.8 | 80.0 |
| 16:00 | 230 | 254 | 202 | 224 | 361 | 653 | 407 | 77 | 1 | 0 | 0 | 0 | 52.5 | 71.7 |
| 17:00 | 207 | 278 | 368 | 362 | 159 | 382 | 451 | 99 | 6 | 0 | 0 | 0 | 49.9 | 73.5 |
| 18:00 | 0 | 0 | 0 | 1 | 28 | 467 | 1051 | 190 | 16 | 3 | 0 | 0 | 73.4 | 79.1 |
| 19:00 | 0 | 0 | 0 | 0 | 0 | 243 | 687 | 238 | 16 | 0 | 1 | 0 | 75.2 | 81.5 |
| 20:00 | 0 | 0 | 0 | 1 | 0 | 247 | 668 | 191 | 23 | 0 | 0 | 3 | 75.2 | 81.2 |
| 21:00 | 0 | 0 | 0 | 0 | 2 | 172 | 508 | 154 | 15 | 3 | 0 | 0 | 75.4 | 81.0 |
| 22:00 | 0 | 0 | 0 | 0 | 1 | 94 | 367 | 149 | 14 | 2 | 1 | 2 | 76.5 | 82.8 |
| 23:00 | 0 | 0 | 0 | 0 | 1 | 71 | 236 | 79 | 11 | 0 | 1 | 0 | 76.1 | 83.4 |
| Total | 447 | 580 | 614 | 689 | 826 | 5632 | 12521 | 3812 | 307 | 35 | 11 | 9 | 70.0 | 79.5 |

ROAD TRAFFIC MEASURED LEVELS









MODEL VERIFICATION

POINT CALCULATIONS

Pen3D2000 V 1.10.0

Project Code:19169a

Project Description:Noise assessment of Calamvale Residential

File:\\Crngas\2019\19169 Townhouses 2236 Beaudesert Rd Calamvale RTN ONSITE\19169a_existing.PEN

File Description:Data file covering existing

Tuesday 18 Oct, 2022 at 16:58:07

CoRTN Calculations

All road segments included. Segmentation angle: 5degrees. Road elevations apply.

| Receptor | X Posn (m) | Y Posn (m) | Height (m) | L10(18hour) (dB(A)) |
|----------|---------------|---------------|---------------|------------------------|
| monitor | 505110.6 | 6945434.2 | 1.2 | 66.5 free-field |

ULTIMATE NO BARRIERS

File:C:\Users\Matty\Desktop\PEN3D 2023\19169a_ultimate GF NO barrier Oct23.PEN

Wednesday 18 Oct, 2023 at 16:10:45

CoRTN Calculations

All road segments included. Segmentation angle: 5degrees. Road elevations apply.

| Receptor | X Posn (m) | Y Posn (m) | Height (m) | L10(18hour) (dB(A)) |
|----------|---------------|---------------|---------------|------------------------|
| 1 | 505133.2 | 6945474.8 | 1.8 | 69.5 |
| 2 | 505131.7 | 6945463 | 1.8 | 69.4 |
| 3 | 505131.5 | 6945450.3 | 1.8 | 68.7 |
| 4 | 505153 | 6945445.9 | 1.8 | 66.1 |
| 5 | 505165.5 | 6945443.6 | 1.8 | 64.9 |
| 6 | 505176.1 | 6945441.7 | 1.8 | 63.9 |
| 7 | 505188.4 | 6945440 | 1.8 | 62.7 |
| 8 | 505201 | 6945438 | 1.8 | 61.6 |
| 9 | 505211.4 | 6945435.9 | 1.8 | 60.8 |
| 10 | 505225.5 | 6945434.5 | 1.8 | 59.8 |
| 11 | 505237.9 | 6945432.4 | 1.8 | 59 |
| 12 | 505250.4 | 6945430.5 | 1.8 | 58.2 |
| 13 | 505260.7 | 6945428.6 | 1.8 | 57.7 |
| 14 | 505273.1 | 6945426.8 | 1.8 | 57.1 |
| 15 | 505283.5 | 6945425.7 | 1.8 | 56.5 |
| 16 | 505296 | 6945424.1 | 1.8 | 55.9 |
| 17 | 505308.5 | 6945423 | 1.8 | 55.5 |
| 18 | 505322.6 | 6945422.7 | 1.8 | 55 |
| 19 | 505317.5 | 6945363.9 | 1.8 | 56.1 |
| 20 | 505306.5 | 6945365.6 | 1.8 | 56.5 |
| 21 | 505288.3 | 6945401.8 | 1.8 | 56.6 |
| 22 | 505285.3 | 6945389.6 | 1.8 | 56.4 |
| 23 | 505283.2 | 6945376.5 | 1.8 | 56.3 |
| 24 | 505241.6 | 6945379.3 | 1.8 | 56.8 |
| 25 | 505242.1 | 6945390.4 | 1.8 | 57.5 |
| 26 | 505241 | 6945404 | 1.8 | 57.7 |
| 27 | 505225.3 | 6945379.3 | 1.8 | 59.5 |
| 28 | 505212.3 | 6945381.5 | 1.8 | 60.7 |
| 29 | 505200.1 | 6945383.4 | 1.8 | 61.6 |
| 30 | 505186.6 | 6945385.7 | 1.8 | 62.6 |
| 31 | 505174.5 | 6945387.3 | 1.8 | 63.6 |
| 32 | 505162 | 6945389.7 | 1.8 | 65.2 |
| 33 | 505151.5 | 6945392.1 | 1.8 | 66.6 |
| 34 | 505139.4 | 6945393 | 1.8 | 68 |
| 35 | 505126.9 | 6945395.4 | 1.8 | 69.7 |
| 36 | 505113.7 | 6945397.3 | 1.8 | 72.2 |
| 1 | 505133.5 | 6945478 | 4.6 | 71 |
| 2 | 505131.2 | 6945458.6 | 4.6 | 71.2 |
| 3 | 505130.9 | 6945445.4 | 4.6 | 70.8 |
| 4 | 505152.9 | 6945442.9 | 4.6 | 68.1 |
| 5 | 505165.4 | 6945441.3 | 4.6 | 66.8 |
| 6 | 505176.1 | 6945440.2 | 4.6 | 65.8 |
| 7 | 505188.2 | 6945438.7 | 4.6 | 64.6 |
| 8 | 505201.2 | 6945438.2 | 4.6 | 63.5 |
| 9 | 505211.8 | 6945435.6 | 4.6 | 62.7 |
| 10 | 505225.6 | 6945433.3 | 4.6 | 61.7 |
| 11 | 505237.9 | 6945432 | 4.6 | 61 |
| 12 | 505250.7 | 6945429.6 | 4.6 | 60.2 |
| 13 | 505261.1 | 6945428 | 4.6 | 59.6 |
| 14 | 505273.1 | 6945426.8 | 4.6 | 59 |
| 15 | 505283.7 | 6945423.9 | 4.6 | 58.4 |
| 16 | 505295.8 | 6945422.5 | 4.6 | 57.9 |
| 17 | 505308.5 | 6945421.9 | 4.6 | 57.4 |
| 18 | 505322.6 | 6945422.7 | 4.6 | 56.8 |
| 19 | 505321.2 | 6945396.8 | 4.6 | 57 |
| 20 | 505310.6 | 6945398.9 | 4.6 | 57.4 |
| 21 | 505288.3 | 6945401.8 | 4.6 | 58.3 |
| 22 | 505285.3 | 6945389.6 | 4.6 | 58.1 |
| 23 | 505283.2 | 6945376.5 | 4.6 | 58.1 |
| 24 | 505238.3 | 6945383.3 | 4.6 | 59.1 |
| 25 | 505239.1 | 6945390.9 | 4.6 | 59.5 |
| 26 | 505241 | 6945404 | 4.6 | 59.7 |
| 27 | 505224.7 | 6945377.9 | 4.6 | 61.6 |
| 28 | 505212.4 | 6945379.8 | 4.6 | 62.6 |
| 29 | 505200.3 | 6945382 | 4.6 | 63.5 |

| | | | | |
|----|----------|-----------|-----|------|
| 30 | 505186.2 | 6945384.2 | 4.6 | 64.5 |
| 31 | 505174.2 | 6945386.1 | 4.6 | 65.5 |
| 32 | 505161.6 | 6945388.1 | 4.6 | 66.9 |
| 33 | 505150.9 | 6945389.9 | 4.6 | 68.1 |
| 34 | 505138.6 | 6945391.8 | 4.6 | 69.5 |
| 35 | 505126.5 | 6945393.8 | 4.6 | 71.1 |
| 36 | 505114.6 | 6945398 | 4.6 | 73.2 |

FREE-FIELD

| | | | | |
|----|----------|-----------|-----|------|
| 1 | 505133.2 | 6945474.8 | 1.5 | 67.7 |
| 2 | 505131.7 | 6945463 | 1.5 | 67.6 |
| 3 | 505131.5 | 6945450.3 | 1.5 | 66.9 |
| 4 | 505153 | 6945445.9 | 1.5 | 64.2 |
| 5 | 505165.5 | 6945443.6 | 1.5 | 63 |
| 6 | 505176.1 | 6945441.7 | 1.5 | 62 |
| 7 | 505188.4 | 6945440 | 1.5 | 60.9 |
| 8 | 505201 | 6945438 | 1.5 | 59.8 |
| 9 | 505211.4 | 6945435.9 | 1.5 | 59 |
| 10 | 505225.5 | 6945434.5 | 1.5 | 58 |
| 11 | 505237.9 | 6945432.4 | 1.5 | 57.3 |
| 12 | 505250.4 | 6945430.5 | 1.5 | 56.5 |
| 13 | 505260.7 | 6945428.6 | 1.5 | 55.9 |
| 14 | 505273.1 | 6945426.8 | 1.5 | 55.4 |
| 15 | 505283.5 | 6945425.7 | 1.5 | 54.8 |
| 16 | 505296 | 6945424.1 | 1.5 | 54.1 |
| 17 | 505308.5 | 6945423 | 1.5 | 53.8 |
| 18 | 505322.6 | 6945422.7 | 1.5 | 53.3 |
| 19 | 505317.5 | 6945363.9 | 1.5 | 54.4 |
| 20 | 505306.5 | 6945365.6 | 1.5 | 54.8 |
| 21 | 505288.3 | 6945401.8 | 1.5 | 54.9 |
| 22 | 505285.3 | 6945389.6 | 1.5 | 54.7 |
| 23 | 505283.2 | 6945376.5 | 1.5 | 54.6 |
| 24 | 505241.6 | 6945379.3 | 1.5 | 54.3 |
| 25 | 505242.1 | 6945390.4 | 1.5 | 55.6 |
| 26 | 505241 | 6945404 | 1.5 | 56 |
| 27 | 505225.3 | 6945379.3 | 1.5 | 57.7 |
| 28 | 505212.3 | 6945381.5 | 1.5 | 58.9 |
| 29 | 505200.1 | 6945383.4 | 1.5 | 59.9 |
| 30 | 505186.6 | 6945385.7 | 1.5 | 60.8 |
| 31 | 505174.5 | 6945387.3 | 1.5 | 61.8 |
| 32 | 505162 | 6945389.7 | 1.5 | 63.4 |
| 33 | 505151.5 | 6945392.1 | 1.5 | 64.9 |
| 34 | 505139.4 | 6945393 | 1.5 | 66.3 |
| 35 | 505126.9 | 6945395.4 | 1.5 | 68 |
| 36 | 505113.7 | 6945397.3 | 1.5 | 70.5 |

ULTIMATE WITH BARRIERS

File:C:\Users\Matty\Desktop\PEN3D 2023\19169a_ultimate GF barrier Oct23.PEN

Thursday 19 Oct, 2023 at 09:06:14

CoRTN Calculations

All road segments included. Segmentation angle: 5degrees. Road elevations apply.

| Receptor | X Posn (m) | Y Posn (m) | Height (m) | L10(18hour) (dB(A)) |
|----------|---------------|---------------|---------------|------------------------|
| 1 | 505132.2 | 6945472 | 1.8 | 62.3 |
| 2 | 505131.9 | 6945458.4 | 1.8 | 62.2 |
| 3 | 505131.6 | 6945445.5 | 1.8 | 61.3 |
| 4 | 505153 | 6945445.9 | 1.8 | 60 |
| 5 | 505165.5 | 6945443.6 | 1.8 | 59.3 |
| 6 | 505176.1 | 6945441.7 | 1.8 | 59.5 |
| 7 | 505188.4 | 6945440 | 1.8 | 59.3 |
| 8 | 505201 | 6945438 | 1.8 | 59 |
| 9 | 505211.4 | 6945435.9 | 1.8 | 58.6 |
| 10 | 505225.5 | 6945434.5 | 1.8 | 58 |
| 11 | 505237.9 | 6945432.4 | 1.8 | 57.4 |
| 12 | 505250.4 | 6945430.5 | 1.8 | 57 |
| 13 | 505260.7 | 6945428.6 | 1.8 | 56.5 |
| 14 | 505273.1 | 6945426.8 | 1.8 | 56.1 |
| 15 | 505283.5 | 6945425.7 | 1.8 | 55.6 |
| 16 | 505296 | 6945424.1 | 1.8 | 55.1 |
| 17 | 505308.5 | 6945423 | 1.8 | 54.8 |
| 18 | 505322.6 | 6945422.7 | 1.8 | 54.3 |
| 19 | 505317.5 | 6945363.9 | 1.8 | 55.3 |
| 20 | 505306.5 | 6945365.6 | 1.8 | 55.7 |
| 21 | 505288.3 | 6945401.8 | 1.8 | 55.7 |
| 22 | 505285.3 | 6945389.6 | 1.8 | 55.6 |
| 23 | 505283.2 | 6945376.5 | 1.8 | 55.5 |
| 24 | 505241.6 | 6945379.3 | 1.8 | 55.8 |
| 25 | 505242.1 | 6945390.4 | 1.8 | 56.3 |
| 26 | 505241 | 6945404 | 1.8 | 56.4 |
| 27 | 505225.3 | 6945379.3 | 1.8 | 58.1 |
| 28 | 505212.3 | 6945381.5 | 1.8 | 59.3 |
| 29 | 505200.1 | 6945383.4 | 1.8 | 60 |
| 30 | 505186.6 | 6945385.7 | 1.8 | 60.4 |
| 31 | 505174.5 | 6945387.3 | 1.8 | 61.1 |
| 32 | 505162 | 6945389.7 | 1.8 | 60.3 |
| 33 | 505151.5 | 6945392.1 | 1.8 | 60.7 |
| 34 | 505141.2 | 6945402 | 1.8 | 61.3 |
| 35 | 505128.6 | 6945403.4 | 1.8 | 62 |
| 36 | 505122.9 | 6945426.7 | 1.8 | 62.1 |
| 1 | 505133.5 | 6945478 | 4.6 | 68.5 |
| 2 | 505131.2 | 6945458.6 | 4.6 | 67.4 |
| 3 | 505130.9 | 6945445.4 | 4.6 | 65.2 |
| 4 | 505152.9 | 6945442.9 | 4.6 | 63.1 |
| 5 | 505171.5 | 6945473.2 | 4.6 | 62.9 |
| 6 | 505180.8 | 6945469.2 | 4.6 | 62.2 |
| 7 | 505193 | 6945465.7 | 4.6 | 61.5 |
| 8 | 505201.7 | 6945441.5 | 4.6 | 60.7 |
| 9 | 505214 | 6945449.2 | 4.6 | 60.1 |
| 10 | 505228 | 6945447.8 | 4.6 | 59.5 |
| 11 | 505237.9 | 6945432 | 4.6 | 59.1 |
| 12 | 505250.7 | 6945429.6 | 4.6 | 58.6 |
| 13 | 505261.1 | 6945428 | 4.6 | 58.2 |
| 14 | 505273.1 | 6945426.8 | 4.6 | 57.7 |
| 15 | 505283.7 | 6945423.9 | 4.6 | 57.2 |
| 16 | 505295.8 | 6945422.5 | 4.6 | 56.7 |
| 17 | 505308.5 | 6945421.9 | 4.6 | 56.4 |
| 18 | 505322.6 | 6945422.7 | 4.6 | 55.8 |
| 19 | 505321.2 | 6945396.8 | 4.6 | 56 |
| 20 | 505310.6 | 6945398.9 | 4.6 | 56.4 |
| 21 | 505288.3 | 6945401.8 | 4.6 | 57 |
| 22 | 505285.3 | 6945389.6 | 4.6 | 57 |
| 23 | 505283.2 | 6945376.5 | 4.6 | 57 |
| 24 | 505238.3 | 6945383.3 | 4.6 | 57.9 |
| 25 | 505239.1 | 6945390.9 | 4.6 | 58.2 |
| 26 | 505241 | 6945404 | 4.6 | 58.1 |
| 27 | 505224.7 | 6945377.9 | 4.6 | 60.4 |
| 28 | 505212.4 | 6945379.8 | 4.6 | 61.3 |
| 29 | 505200.3 | 6945382 | 4.6 | 62.3 |

| | | | | |
|----|----------|-----------|-----|------|
| 30 | 505186.2 | 6945384.2 | 4.6 | 63.2 |
| 31 | 505174.2 | 6945386.1 | 4.6 | 64 |
| 32 | 505161.6 | 6945388.1 | 4.6 | 65.6 |
| 33 | 505150.9 | 6945389.9 | 4.6 | 66.8 |
| 34 | 505138.6 | 6945391.8 | 4.6 | 68 |
| 35 | 505126.5 | 6945393.8 | 4.6 | 69.9 |
| 36 | 505114.6 | 6945398 | 4.6 | 73.1 |

FREE-FIELD

| | | | | |
|----|----------|-----------|-----|------|
| 1 | 505132.2 | 6945472 | 1.5 | 60.4 |
| 2 | 505131.9 | 6945458.4 | 1.5 | 60.3 |
| 3 | 505131.6 | 6945445.5 | 1.5 | 59.4 |
| 4 | 505153 | 6945445.9 | 1.5 | 58.2 |
| 5 | 505165.5 | 6945443.6 | 1.5 | 57.6 |
| 6 | 505176.1 | 6945441.7 | 1.5 | 57.8 |
| 7 | 505188.4 | 6945440 | 1.5 | 57.6 |
| 8 | 505201 | 6945438 | 1.5 | 57.3 |
| 9 | 505211.4 | 6945435.9 | 1.5 | 56.8 |
| 10 | 505225.5 | 6945434.5 | 1.5 | 56.3 |
| 11 | 505237.9 | 6945432.4 | 1.5 | 55.7 |
| 12 | 505250.4 | 6945430.5 | 1.5 | 55.3 |
| 13 | 505260.7 | 6945428.6 | 1.5 | 54.8 |
| 14 | 505273.1 | 6945426.8 | 1.5 | 54.4 |
| 15 | 505283.5 | 6945425.7 | 1.5 | 53.9 |
| 16 | 505296 | 6945424.1 | 1.5 | 53.4 |
| 17 | 505308.5 | 6945423 | 1.5 | 53.1 |
| 18 | 505322.6 | 6945422.7 | 1.5 | 52.6 |
| 19 | 505317.5 | 6945363.9 | 1.5 | 53.6 |
| 20 | 505306.5 | 6945365.6 | 1.5 | 54 |
| 21 | 505288.3 | 6945401.8 | 1.5 | 54 |
| 22 | 505285.3 | 6945389.6 | 1.5 | 53.9 |
| 23 | 505283.2 | 6945376.5 | 1.5 | 53.8 |
| 24 | 505241.6 | 6945379.3 | 1.5 | 53.6 |
| 25 | 505242.1 | 6945390.4 | 1.5 | 54.4 |
| 26 | 505241 | 6945404 | 1.5 | 54.6 |
| 27 | 505225.3 | 6945379.3 | 1.5 | 56.4 |
| 28 | 505212.3 | 6945381.5 | 1.5 | 57.6 |
| 29 | 505200.1 | 6945383.4 | 1.5 | 58.2 |
| 30 | 505186.6 | 6945385.7 | 1.5 | 58.7 |
| 31 | 505174.5 | 6945387.3 | 1.5 | 59.3 |
| 32 | 505162 | 6945389.7 | 1.5 | 58.4 |
| 33 | 505151.5 | 6945392.1 | 1.5 | 58.8 |
| 34 | 505141.2 | 6945402 | 1.5 | 59.4 |
| 35 | 505128.6 | 6945403.4 | 1.5 | 60 |
| 36 | 505122.9 | 6945426.7 | 1.5 | 60.1 |

ONSITE MECHANICAL PLANT NOISE EMISSIONS IMPACTING:

| Apartments due North | | | Dwellings due East | |
|-----------------------------|-----------------|----|-----------------------------|-----------------|
| A/C condensor unit | 52.0 dB(A) @ 1m | ## | A/C condensor unit | 52.0 dB(A) @ 1m |
| No. of units | 2.0 | | No. of units | 2.0 |
| Combined source level | 55.0 dB(A) | | Combined source level | 55.0 dB(A) |
| Distance source to receiver | 22.0 m | | Distance source to receiver | 8.0 m |
| Distance attenuation | -26.8 dB(A) | | Distance attenuation | -18.1 dB(A) |
| Directivity | 0.0 dB(A) | | Barrier screening | 0.0 dB(A) |
| Façade reflection | 2.5 dB(A) | | Façade reflection | 2.5 dB(A) |
| Impact at façade | 31 dB(A) | | Impact at façade | 39 dB(A) |

| Dwellings due South | |
|-----------------------------|-----------------|
| A/C condensor unit | 52.0 dB(A) @ 1m |
| No. of units | 2.0 |
| Combined source level | 55.0 dB(A) |
| Distance source to receiver | 8.0 m |
| Distance attenuation | -18.1 dB(A) |
| Building screening | 0.0 dB(A) |
| Façade reflection | 2.5 dB(A) |
| Impact at façade | 39 dB(A) |