



APPENDIX 11 NOISE IMPACT ASSESSMENT

AP11

RESIDENTIAL DEVELOPMENT

10 HAZELMOUNT STREET BOWEN HILLS QLD 4006



**QDC (SARA) NOISE IMPACT ASSESSMENT
REPORT**

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EXECUTIVE SUMMARY

Palmer Acoustics Pty Ltd (Australia) has been requested by Focus Construct to conduct a QDC (SARA) noise impact assessment on 10 Hazelmount, Bowen Hills QLD 4006. The report is to address noise issues originating from the railway lines near Bowen Hills Station and the roads in Campbell Street and Abbotsford Road. The site is at Lot 47 and 48 on RP9895 to RP9895, 127 metres from the Railway, 43 metres from Campbell Street and 137 metres from Abbotsford Road.

This report is prepared in accordance with the requirements of the State Development Assessment Provision (SDAP), Brisbane City Council Planning Scheme 2014 (BCC.2014), and the Queensland Development Code (QDC) MP4.4. The report address this legislations, by extracting noise measurements, comparing results to an applicable criterion, and recommending compliant design solutions.

Conclusions:

Based our assessment, we conclude:

- The site is impacted by Road Traffic Noise from Campbell Street and Abbotsford Road. The levels range between Categories 0 to 3.
- Railway noise from the Bowen Hills station did not affect the Residential Development as the levels remained within a Category 0. No further acoustic treatment was required.
- Mechanical Plant noise will be assessed once the MEP design is finalised.

Recommendations:

To ensure compliance with the requirement of the SDAP for Road Traffic Noise, the BCC Planning Scheme 2014 and the QDC MP4.4 performance codes we recommend the following:

- ✓ Follow the construction guidance provided in **Table 26** Rw Requirements and **Table 27** Building Recommendations.

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1 INTRODUCTION

Palmer Acoustics Pty Ltd (Australia) has been requested by Focus Construct to conduct a QDC (SARA) noise impact assessment on 10 Hazelmount, Bowen Hills QLD 4006 to address the noise from the railway lines near Bowen Hills Station and Campbell Street and Abbotsford Road. The site is located in Lot 47 and 48 on RP9895 to RP9895, 127 metres from the Railway, 43 metres from Campbell Street and 137 metres from Abbotsford Road.

This report is prepared in accordance with the requirements of the State Development Assessment Provision (SDAP), Brisbane City Council Planning Scheme 2014 (BCC.2014), and the Queensland Development Code (QDC) MP4.4. The report applies this legislation, by extracting noise measurements, comparing results to an applicable criterion, and recommending compliant design solutions.

1.1 Locality



Figure 1: Location of Site



Figure 2: Measurement Locations

1.2 Zones and Surroundings



Figure 3: Brisbane City Council Zoning



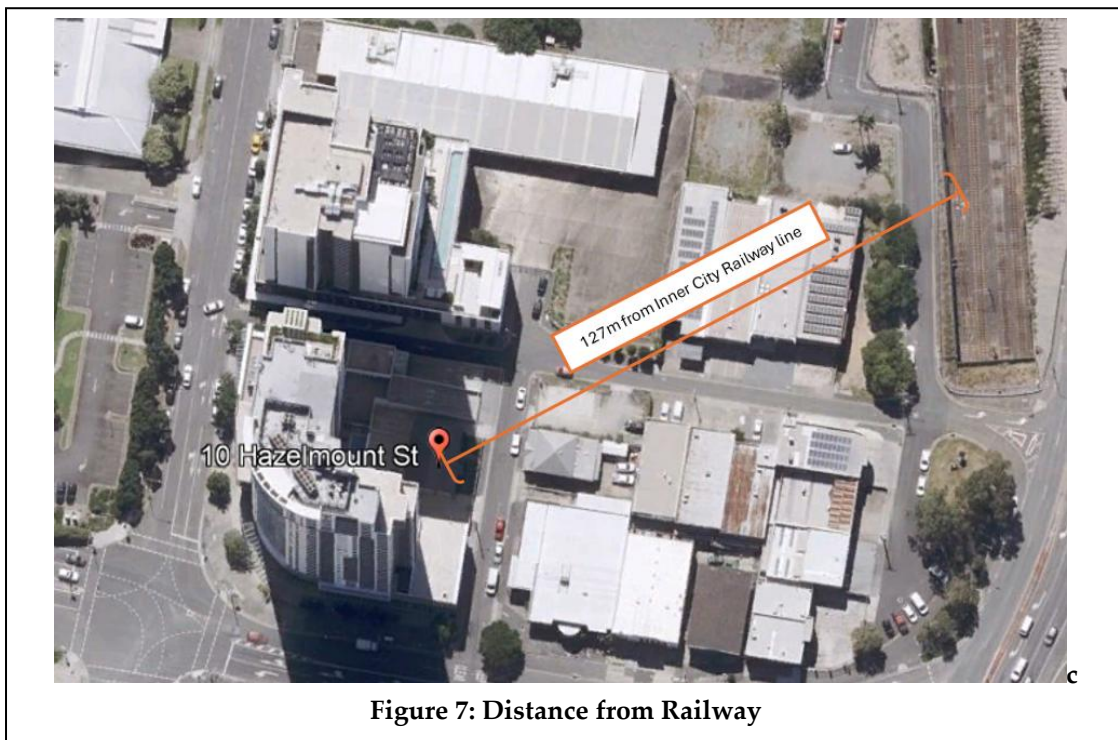
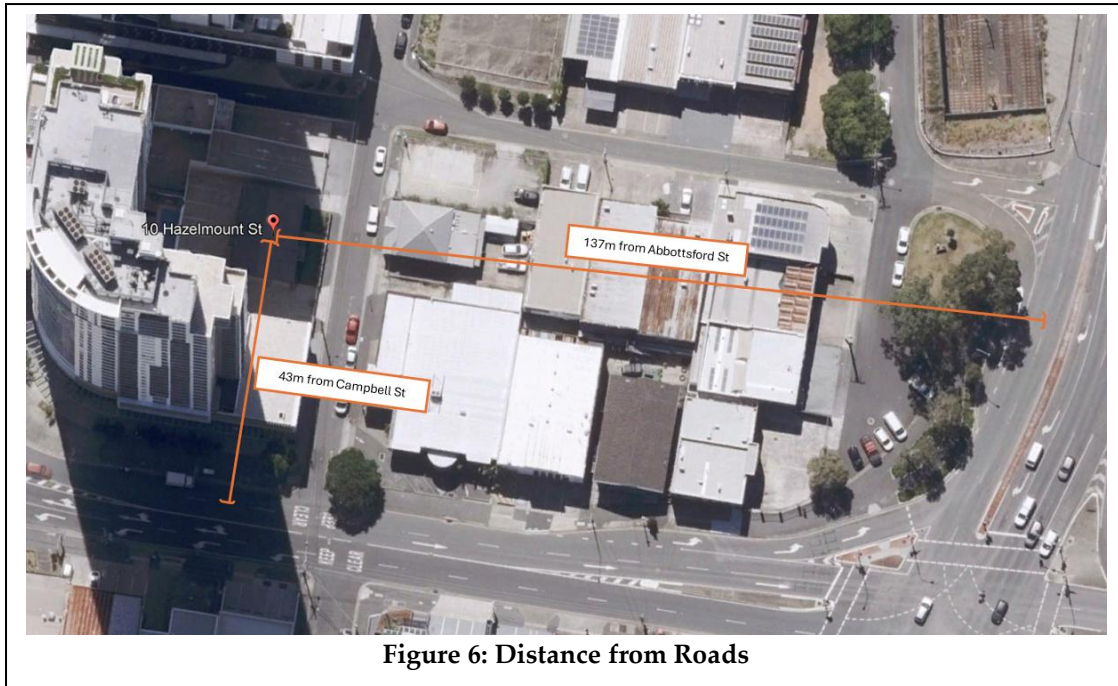
Figure 4: Road Noise Corridor Overlay (BCC)



Figure 5: Railway Noise Corridor Overlay (SDAP)

1.3 Distance from Transport Corridor

The distance from Campbell St to the site is 43 metres, while Abbotsford Rd is 137 metres. The distance from the Inner City Railway line (Bowen Hills Station railway track) is 127 metres from site.



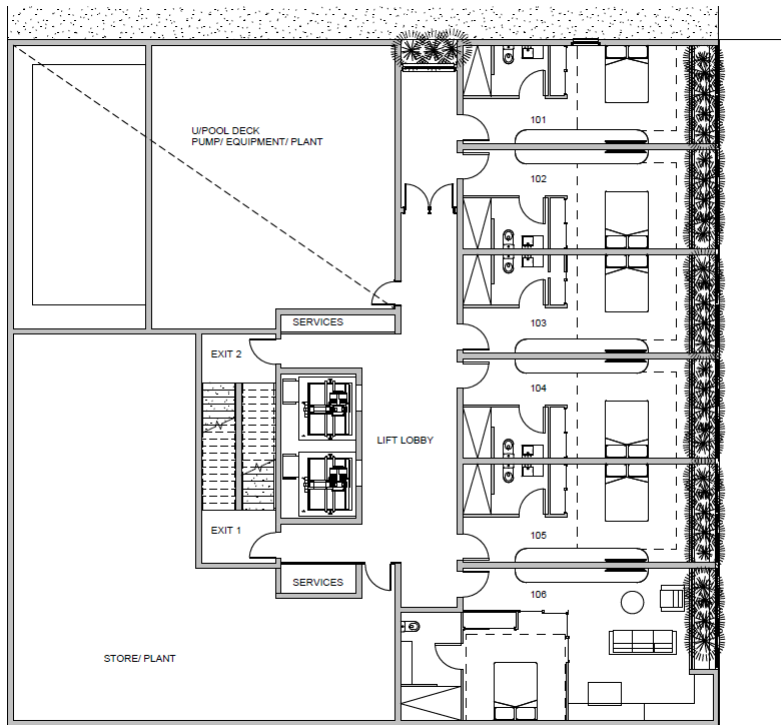


Figure 10: Floorplan Issue 2 v2: Level 1

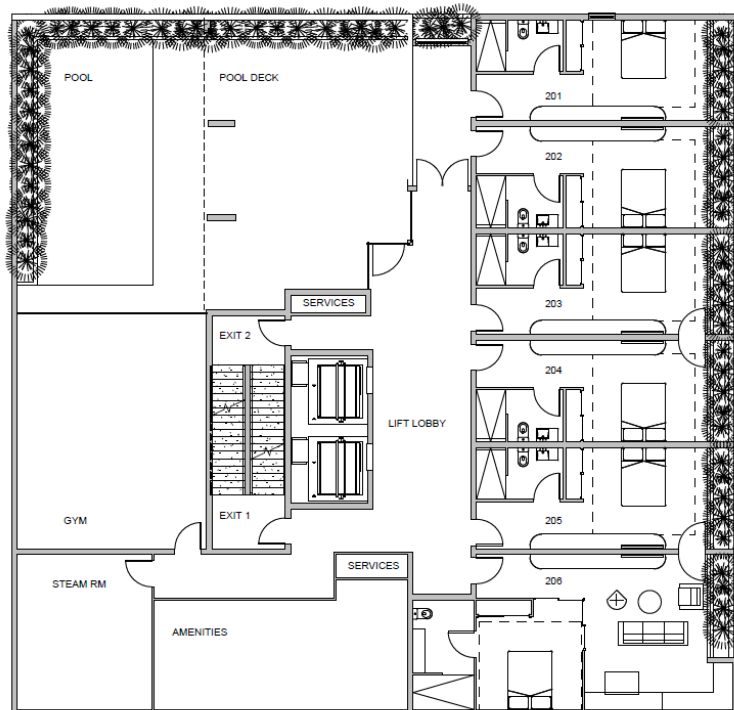


Figure 11: Floorplan Issue 2 v2: Level 2

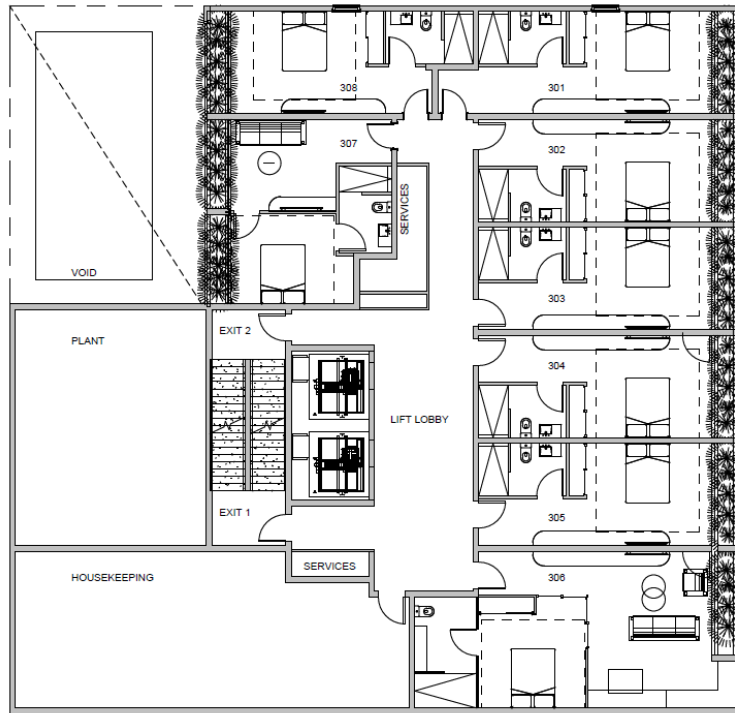


Figure 12: Floorplan Issue 2 v2: Level 3

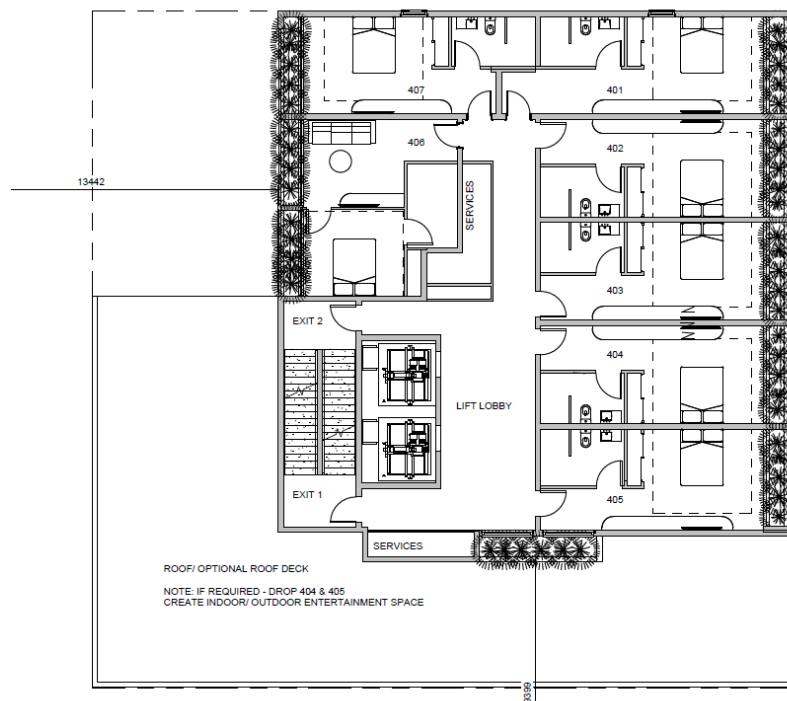
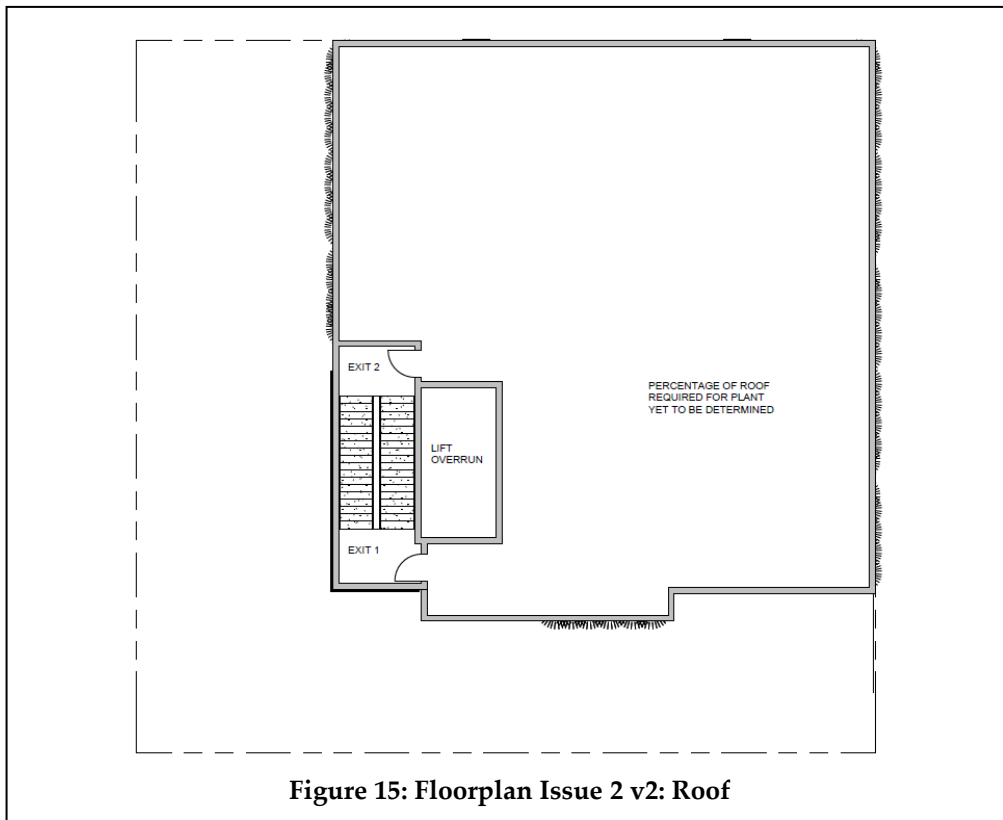
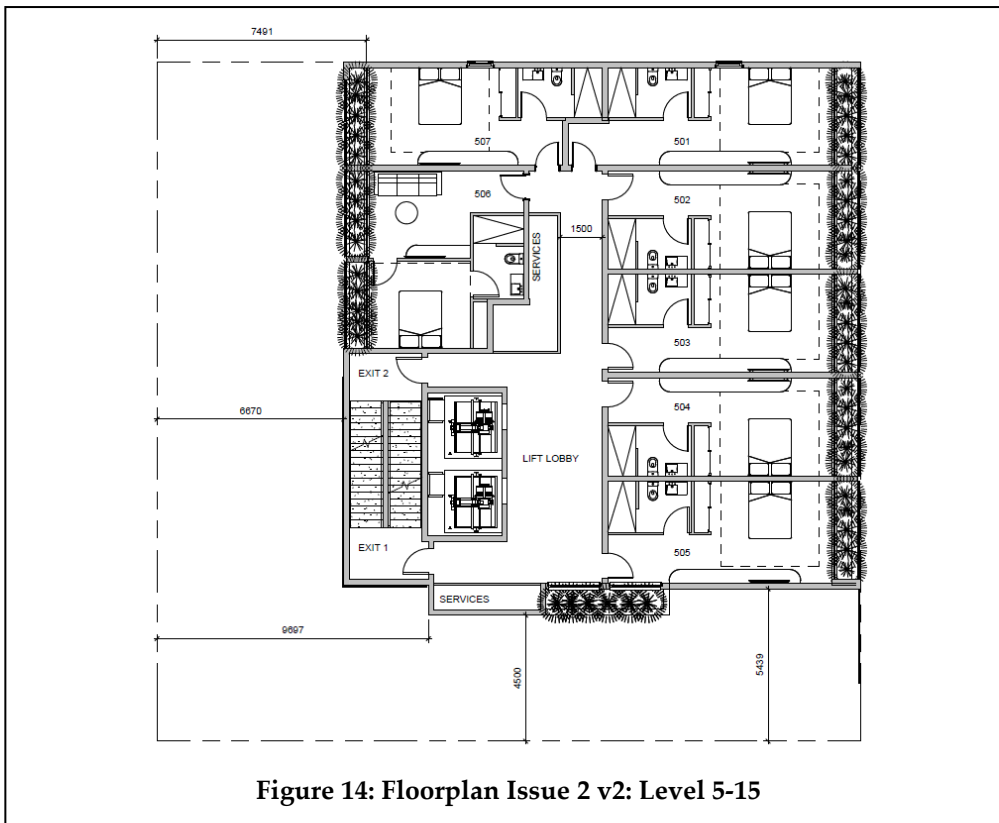


Figure 13: Floorplan Issue 2 v2: Level 4



2 INSTRUMENTATION AND PROCEDURE

2.1 Instrumentation

The following instruments were used to measure the ambient noise levels:

- Convergent Instruments Noise Sentry RT device (Palmer Acoustics NS7)
- B & K 4231 Calibrator (serial number 2153030)

The sound level measuring equipment was field-calibrated before and after the measurements and was found to be within 0.2dB of the reference signal. The equipment used in this assessment hold calibration certificates from an accredited NATA calibration laboratory.

2.2 Procedure

2.2.1 *Ambient Noise*

The NS7 Data Logger was placed at a height of 4.2m, attached to a pole, south of the current site. The logger measured LA90 levels (Ambient Noise), in 15 minute intervals, for a period of three days.

2.2.2 *Road Traffic Noise*

The NS7 Data Logger used for the Ambient Noise, also measured LA10 levels (Road Traffic Noise), in 15 minute intervals, for a period of three days.

These LA10 levels measured on site are verified through Predictor modelling. Once verified, the future traffic is calculated and a prediction of the future Road Traffic Noise is deduced, via the noise model Predictor.

2.2.3 *Railway Noise*

The B & K Sound Level Meter measured the LA_{max} levels of a total of 6 trains. This data was then averaged and used to classify the site within the relevant noise category. As this was found to be a Category 0 site, no further modelling or mitigation methods were conducted.

2.2.4 *Mechanical Plant*

The development design establishes the location of the mechanical plant to be on the roof of the residential apartment. However, the precise equipment and siting are unknown. The applicable criteria derived in this report, are considered readily achievable through appropriate plant siting. An assessment of the plant noise can be conducted – if required – at the Building Approval stage once the equipment and layout has been finalised.

3 DATA MEASUREMENTS

Ambient Noise and Road Traffic Noise was obtained from the NS7 Data Logger, which measured levels from 16th to 19th of September 2025. The weather during the logging period had no interference of rain or wind. The most present noise during the logging period is traffic noise from Campbell Street (43 metres from site) and Abbotsford Road (137 metres from site).

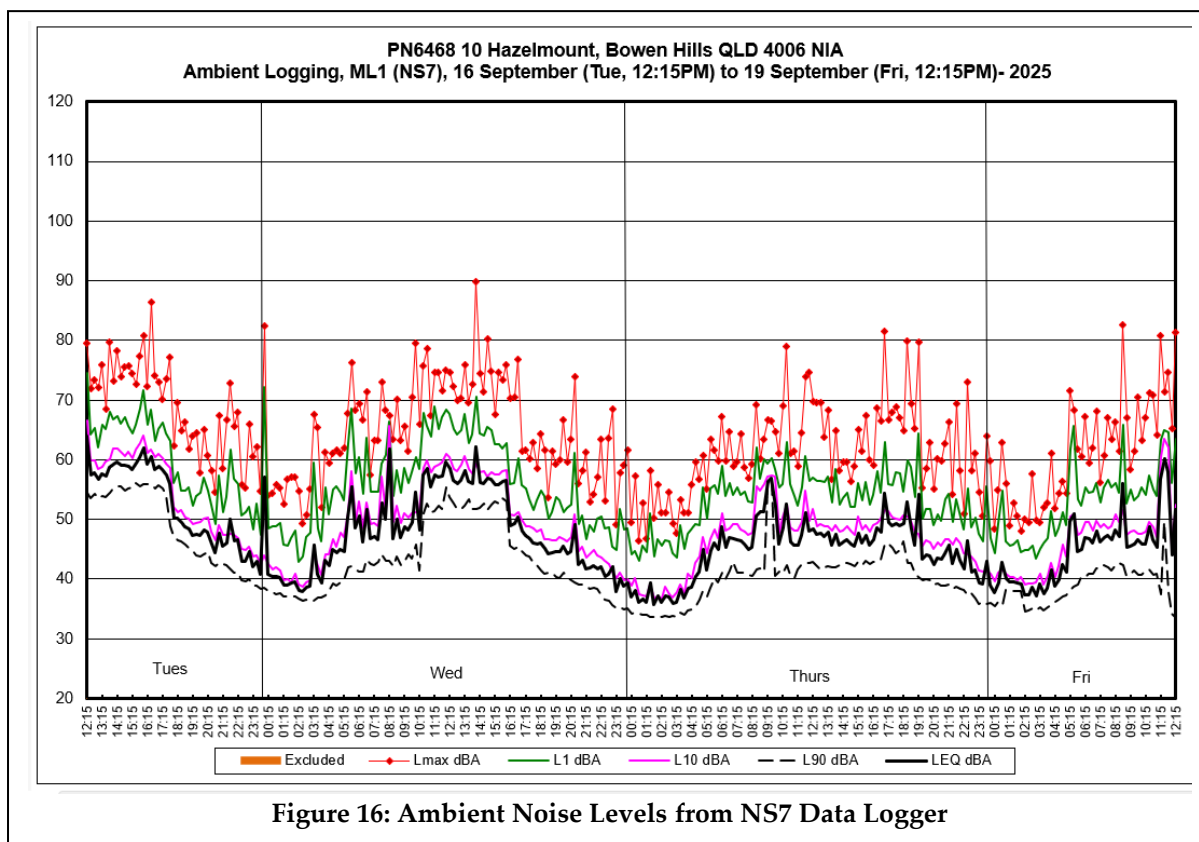


Table 1: Measured Noise Levels at ML1 (Weekdays) Day Evening Night

Measuring Location/ Dates	Time	Measured Noise Levels ¹ dB(A) ²					
		L _{Amax} ³	L _{A01} ⁴	L _{A10} ⁵	L _{Aeq} ⁶	L _{A90} ⁷	RBL
ML1 16 to 19 September 2025	Day: 7 am to 6 pm	69	60	54	52	46	42
	Evening: 6 pm to 10 pm	63	54	48	46	42	39
	Night: 10 pm to 7 am	58	50	43	42	37	35

¹ Average noise levels throughout the period, with the exception of L_{A90} which is the average below the median noise levels for the period.

² dB(A) decibels, A-weighted

³ L_{Amax} refers to the maximum a-weighted sound pressure level occurring during the sampling period

⁴ L_{A01} for a specified time interval, means the A-weighted sound pressure level that is equalled for 1% of the interval

⁵ L_{A10} for a specified time interval, means the A-weighted sound pressure level that is equalled or exceeded for 10% of the interval

⁶ L_{Aeq} for a specified time interval, means the time average A-weighted sound pressure level, within the meaning given by AS1055.1 for the interval

⁷ L_{A90} for a specified time interval, means the A-weighted sound pressure level that is equalled or exceeded for 90% of the interval

3.1 Ambient Noise Levels

Table 2: Measured Ambient Noise Levels at ML1 (Weekdays) 18hours

Noise Descriptor	Time Period	Measured Levels dB(A)
LA90 (18 hours)	6am to 12am	44
LA90 (8hours)	10pm to 6pm	37

3.2 Road Traffic Noise Levels

Table 3: Measured Road Traffic Noise Levels at ML1 (Weekdays)

Noise Descriptor	Time Period	Measured Levels dB(A)
LA10 (18 hours)	6am to 12am	51
Maximum LAeq (Day)	6am to 10pm	60
Maximum LAeq (Night)	10pm to 6am	50

3.3 Railway Noise Levels

Table 4: Measured Single Event LAmax Noise Levels at ML2

Date	Time	Type of Train	Single Event Maximum Noise LAmax Measurements
16/9/25	12:48:08 PM	EMU	66.2
16/9/25	1:08:40 PM	EMU	69
16/9/25	1:16:01 PM	EMU	66.4
16/9/25	1:18:21 PM	EMU	67.6
16/9/25	1:20:38 PM	EMU	67.5
16/9/25	1:23:09 PM	EMU	62.1
Average:			66.5
Average + Façade Affected Correction (+2.5):			68.96 ≈ 69

4 REGULATIONS AND STANDARDS

To establish the Noise Criteria, the regulations and standards from the Brisbane City Council 2014 (BCC 2014), State Developmental Assessment Provision (SDAP), the Queensland Development Code MP4.4 (QDC MP4.4) and the Environmental Protection Act 1994 (EPA 1994) were applied.

4.1 Brisbane City Council 2014 (BCC)

Table 5: Site Description for Residential Development

Zone	Development Code	Overlay Code
Emerging Community Zone	Multiple Dwelling Code	Transport Noise Corridor Overlay Code

The following tables were extracted from the BCC 2014 Section 9.3.14 Multiple dwelling code.

4.1.1 Multiple Dwelling in Emerging Community Zone

Table 6: Performance Outcomes - Extracted from Table 9.3.14.3A

Additional requirements for sites with an area of 7,000m ² or greater, or for 20 or more dwellings if in the Emerging community zone	
PO39 Development contributes to contained, sustainable and functional communities and provides housing to suit residents through different life-cycle stages at a scale and density appropriate for the site's location and commensurate with ease of access to services, facilities and high quality public transport through: - inclusion of dwelling types, tenures, mix and forms consistent with the outcomes of the zones, zone precincts, neighbourhood plans and overlays applicable to the site; - retaining or respecting the character and environmental values of the site; - reflecting local streetscape forms, features and character; - contributing to the desired character and form of the locality; - the establishment or extension of public streets and pathways; - the provision of <u>parks</u> and other public spaces as appropriate to the scale of development; - buildings that address existing streets; <u>building height</u> and <u>setback</u> transitions to an adjoining existing <u>dwelling house</u> and areas of lower density residential development. Note—A structure plan prepared in accordance with the <u>Structure planning planning scheme policy</u> can assist in demonstrating achievement of this performance outcome. A structure plan must be prepared where in the Emerging community zone	AO39 Development is designed and sited in compliance with a structure plan prepared in accordance with the <u>Structure planning planning scheme policy</u>.

4.1.2 Transport Noise Corridor Overlay Code (Road)

Table 7: Mechanical Plant Criteria - Extracted from Table 8.2.24.3

Performance outcomes	Acceptable outcomes
PO1 Development provides outdoor space for passive recreation in a manner where transport noise has been minimised.	AO1 Development ensures that each dwelling: - has a balcony or outdoor recreation area shielded by the building from direct transport noise; or - with a balcony exposed to transport noise has a solid gap-free balustrade.

4.1.3 Mechanical Plant in Multiple Dwelling code

Table 8: Mechanical Plant Criteria - Extracted from Table 9.3.14.3A

Safety, privacy and amenity	
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: $L_{Aeq,adj,T}$ emitted from mechanical plant is not greater than the rating background level plus 3 at a <u>sensitive use</u> not associated with the development. Note— Where T is - Day (7am to 6pm): 11hr, - Evening (6pm to 10pm): 4hr, - Night (10pm to 7am): 9hr. Where- $L_{Aeq,adj,T}$ 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 <u>Noise impact assessment planning scheme policy</u>. - The rating background level is determined in accordance with the methodology described in the <u>Noise impact assessment planning scheme policy</u>. Note— A noise impact assessment report prepared in accordance with the <u>Noise impact assessment planning scheme policy</u> can assist in demonstrating achievement of this performance outcome.	AO22 Development ensures mechanical plant is <u>acoustically screened</u> from nearby <u>sensitive uses</u> .

4.1.3.1 Mechanical plant criteria for noise assessment

Based on **Table 7** of the BCC 2014 guidelines, the criterion for a mechanical plant is Rating Background Level (RBL) plus 3.

Table 9: Mechanical Plant Criteria for Noise Impact Assessment

Time Period	Measured RBL L90 dB(A)	Noise Criteria LAeq,adj,T
Day (7am to 6pm): 11hr	42	45
Evening (6pm to 10pm): 4hr	39	41
Night (10pm to 7am): 9hr	35	38

These noise levels are to be corrected for tonality or impulsiveness as per AS1055.

4.2 State Developmental Assessment Provision (SDAP)

4.2.1 Railway Noise

The following railway noise criteria was extracted from SDAP: State Code 2.

Table 10: Railway Criteria for Residential Buildings – Extracted from Table 2.4
Environmental Emissions

Performance Outcomes	Acceptable Outcomes
Reconfiguring a Lot	
Involving the creation of 5 or fewer new residential lots adjacent to a railway or type 2 multi-modal corridor	
PO39 Development minimises free field noise intrusion from a railway.	AO39.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: - to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); - in accordance with: - Civil Engineering Standard Specification QR-CTS-Part 41 – Part 41, Design and Construction of Noise Fences/Barriers, Queensland Rail, 2018; - Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; - Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO39.2 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. OR AO39.3 Development provides a solid gap-free fence or other solid gap-free structure along the full extent of the boundary closest to a railway.

The following Tables are extracted from SDAP Reference tables:

Table 11: Extracted from *Table 1: Maximum building façade acoustic levels*

Applicable use	Acoustic levels
1.1: Accommodation activity	a. ≤ 65 dB(A) Leq (24 hour) facade corrected AND b. ≤ 87 dB(A) (single event maximum sound pressure level) facade corrected

Table 12: Extracted from *Table 2: Maximum free field acoustic levels*

Applicable use	Acoustic Levels
2.1: Private open space for residential lots	a. ≤ 62 dB(A) Leq (24 hour) free field
2.2: Private open space for an accommodation activity (including allotments created for a future accommodation activity)	AND b. ≤ 84 dB(A) (single event maximum sound pressure level) free field

Table 13: Extracted from *Table 3: Maximum internal acoustic levels*

Applicable use	Acoustic levels
3.1: Habitable rooms in an accommodation activity (excluding uses addressed in QDC MP4.4)	≤ 45 dB(A) single event maximum sound pressure level

4.3 Queensland Development Code MP4.4 (QDC MP4.4) (SARA)

Under QDC MP4.4 Schedule 1, the noise categories for both road and railway are outlined in **Tables 14 and 15**. These classifications are then reviewed in accordance with QDC MP4.4 Schedule 3 to determine the appropriate design guidelines for meeting acoustic standards.

4.3.1 Road Traffic Noise

Table 14: Road Noise Categories

Noise Category	Level of transport noise * ($L_{A10, 18hr}$) for State-controlled roads and designated local government roads
Category 0	≤ 57 dB(A)
Category 1	58 – 62 dB(A)
Category 2	63 – 67 dB(A)
Category 3	68 – 72 dB(A)
Category 4	≥ 73 dB(A)

4.3.2 Railway Noise

Table 15: Rail Noise Categories

Noise Category	Single Event Maximum Noise L_{Amax} for Railway
Category 0	≤ 69 dB(A)
Category 1	70 – 74 dB(A)
Category 2	75 – 79 dB(A)
Category 3	80 – 84 dB(A)
Category 4	≥ 85 dB(A)

4.4 Environmental Protection Act 1994 (Mechanical Plant)

The development will incorporate air conditioning, although the specific model(s), siting and installation have not been determined at this stage. State requirements are set out under Section 440U of the Environmental Protection Act 1994; in that Act, noise from air conditioning must not exceed the following noise levels:

- Between 10pm and 7am: 3 dB(A) above the background level
- From 7am to 10pm: 5 dB(A) above the background level

Further, the Act states that the background level means the background A-weighted sound pressure level under the prescribed standard measured as LA_{90} , T.

These noise levels are to be corrected for tonality or impulsiveness as per AS1055.

5 ROAD TRAFFIC NOISE ASSESSMENT

Road traffic noise on the proposed development have been predicted for the 2035 (10-year) design horizon using a calibrated road traffic noise model, based on the measured LA10 (18-hour) levels.

5.1 Current Road Traffic Noise

5.1.1 Category

This category was extracted from the BCC 2014 and QDC MP4.4, under **Table 15**

Noise Category	Level of transport noise * (LA10, 18hr) for State-controlled roads and designated local government roads
Category 1	58 – 62 dB(A)
Category 2	63 – 67 dB(A)

5.1.2 Measured Data

The following data was extracted from the measured ML1 data logger, which monitored noise levels from 16th to 19th of September 2025.

Table 16: Measured Road Traffic Noise Levels

Road Traffic Noise Descriptor	Measured Level dB(A) - Offset from LA10 (18 Hour)	
LA10 (18 hour) ⁸	50.8 ≈	51
Maximum LAeq (day) ⁹ Offset	51 + 9.35 =	60
Maximum LAeq (night) ¹⁰ Offset	51 - 0.39 =	50

5.2 Future Traffic Volume

The existing and future flows for Campbell Street and Abbotsford Road have been sourced from the State Planning Policy interactive mapping system (SPP IMS) for the period of 2017 and 2025. The percentage of heavy vehicles provided for the 2017 statistics has been assumed to remain constant until 2035.

5.2.1 Campbell Street Traffic Flow

Table 17: Existing and Future Traffic Flow on Campbell Street

Road	AADT ¹¹			Heavy Vehicles (%)	Speed Zone (km/h)
	2017	2025	2035		
Campbell Street	12,685	17,495	26,147	3.2	60

5.2.2 Abbotsford Road Traffic Flow

Table 18: Existing and Future Traffic Flow on Abbotsford Street

Road	AADT			Heavy Vehicles (%)	Speed Zone (km/h)
	2017	2025	2035		
Abbotsford Road	23,524	29,112	37,999	3.0	60

⁸ LA10 (18 hour) for a specified time interval, means the arithmetic average of 18 individual LA10(1hour) levels measured between 6:00 am and midnight on the day

⁹ LAeq (day) for a specified time interval, means the maximum time average A-weighted sound pressure level, within the meaning given by AS1055.1, for the interval 6:00 am to 10:00 pm

¹⁰ LAeq (night) for a specified time interval, means the maximum time average A-weighted sound pressure level, within the meaning given by AS1055.1, for the interval 10:00 pm to 6:00 am

¹¹ Annual average daily traffic volume

5.3 Verification of Road Traffic Noise Model

An Environmental Noise Modelling and Mapping Software – Predictor-LimA computer model was developed using the parameters presented in **Table 19** to predict the road traffic noise levels at the proposed site. This program uses the algorithms from the Calculation of Road Traffic Noise UK Department of Transport (1992) traffic noise prediction model. To determine the validity of the model, the measured noise levels have been compared to the predicted noise levels for the existing scenario. All acoustically significant buildings and topographical features have been included in the modelling.

Table 19: Prediction Model Inputs

Parameter	Campbell Street and Abbott Street
18 hour road traffic volume ($=0.94 \times \text{AADT}$)	17,495
Traffic composition (%CV)	3.2%
Traffic speed (km/h)	60
CoRTN correction for QLD roads (Except Pacific Motorway, Logan Motorway to Nerang)	-1.7dB(A) (1m in front of building façade)
Road gradient	Incorporated into the model
Receiver height (m)	4.2m (relative)
Road surface	Standard DGA-Bitumen
Distance from road to receiver	35m from Campbell Street and

5.3.1 Comparison of Prediction Levels with Measured Noise Levels.

Using the inputs extracted from the SPP IMS and Predictor modelling and its current parameters, a value of **52** was extracted from the ML1 position as shown in **Figure 18**. This value was CoRTN corrected as it was close to a building façade and compared with the measured data extracted from the data logging at ML1. The difference produced was **0.5dB**, verifying the validity of the data measured.

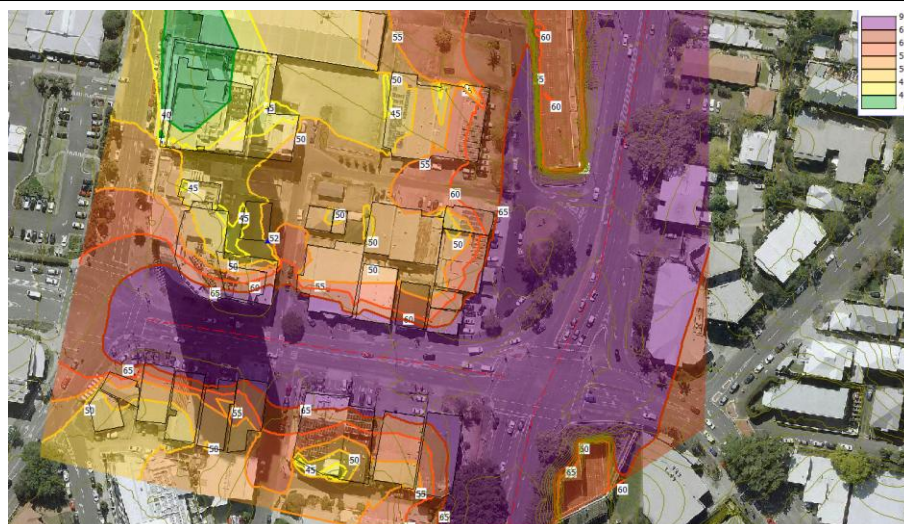


Figure 18: Verification of Road Traffic Noise Model

Table 20: Prediction Model Verification with Measured Data

Receptor location	Predicted Level (CoRTN corrected) L_{A10} (18 hour)	Measured level L_{A10} (18 hour)	Difference
ML1	$52 - 1.7$ (CoRTN) = 50.3	50.8	0.5 dB

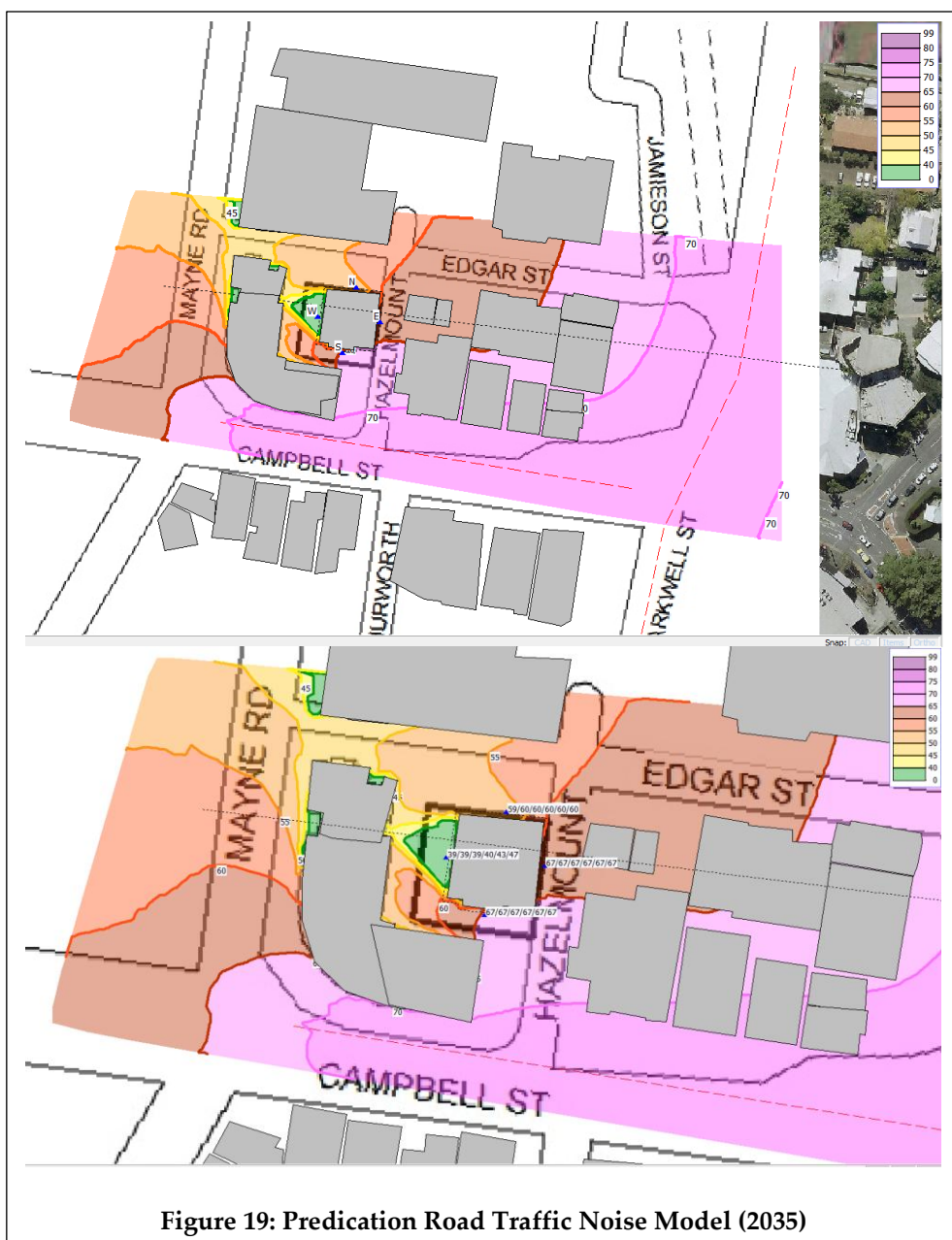
5.4 Predicted Future Road Traffic Noise Emission

Table 21: Inputs for Road Traffic Prediction for Campbell Street (2035)

Parameter	Campbell Street
18-hour road traffic volume (= 0.94 x AADT)	26,147
Traffic composition (%CV)	3.2%
Traffic speed (km/h)	60

Table 22: Inputs for Road Traffic Prediction for Abbotsford Road (2035)

Parameter	Abbotsford Road
18-hour road traffic volume (= 0.94 x AADT)	37,999
Traffic composition (%CV)	3.0%
Traffic speed (km/h)	60



6 RAILWAY NOISE ASSESSMENT**6.1 Current Railway Noise****6.1.1 Category**

This category was extracted from the SPP IMS and QDC MP4.:

Noise Category	Single Event Maximum Noise L_{Amax} for Railway
Category 0	≤ 69 dB(A)
Category 1	70 – 74 dB(A)

6.1.2 Measured Data

The following data was extracted from the measured ML2 B&K Sound Level Meter, which monitored noise levels from 12:30pm to 1:30pm on the 16th of September 2025. The distance from ML2 (on ground level) to the railway was 127 metres, and the railway is at least 5 metres below ground level.

Table 23: Measured Railway Noise Levels at ML2 (Weekdays)

Noise Descriptor	Time Period	Measured Levels dB(A)	Category
L_{Amax} (Single Event)	12:30pm to 1:30pm	69	0

6.1.3 Distance Attenuation

To calculate the full effects of railway noise levels to the site, the measured data is distance attenuated from the rail tracks to the proposed building area. The Sound Power Level of the averaged L_{Amax} frequency bands between 6 trains in **Appendix B**, was distance attenuated from the railway to the site location. The distance between the railway and site is 127 metres. Calculations are shown below.

Table 24: Sound Power Levels of Measured Railway Noise

Sound Power Level (SWL) Hz	63	125	250	500	1000	2000	dBLin	dB(A)
Averaged L_{Amax} (Single Event)	69	68	64	62	57	50	72	63

Table 25: Distance Attenuation of Railway Noise to Site

SWL dB(A)	Distance (m)	Distance Attenuation dB(A), adj, T
63	127	41

6.2 Predicted Future Railway Noise Emission

The Railway tracks at Bowen Hills station are situated 5 metres below ground level and because of its position at a station, trains slow down, minimising noise to a Category 0.

After distance attenuation to Category 0, Railway noise levels dropped to close to **41 dB(A)**; without the account for additional buildings as barriers. When taken into consideration these buildings and intervening traffic, Railway noise is low and masked and hence needs no further evaluation.

There are no acoustic requirements or building recommendations needed for the QDC Category 0 Railway.

7 MECHANICAL PLANT ASSESSMENT

To assess the mechanical plant the most conservative noise criteria is used, which is found under the BCC 2014 guidelines in **Table 9** as shown below

Time Period	Measured RBL L90 dB(A)	Noise Criteria LAeq,adj,T
Day (7am to 6pm): 11hr	42	45
Evening (6pm to 10pm): 4hr	39	41
Night (10pm to 7am): 9hr	35	38

These noise levels are to be corrected for tonality or impulsiveness as per AS1055.

However, this assessment will be made once schematics of the mechanical plant is established.

8 DEVELOPMENT GUIDANCE

Only Road Traffic Noise mitigations are used in the following development guide. This is due to Railway Noise falling under a Category 0, meaning no acoustic building requirements are necessary. However, standard building procedures still apply.

In accordance with MP4.4 Schedules 1 and 2, we recommend the following Rw Requirements for Noise Mitigation

Table 26: Minimum Rw Requirements for each Building Façade.

Residential Building Façade	Height of Level	LA10 (18 hour) (dB(A))	Noise Category	Minimum Rw for each component					
				Glazing (≤ 1.8m ²)	Glazing (≥ 1.8m ²)	External Walls	Roof	Floor	Entrance Doors
East	16.5	65	Category 2	32	35	41	N/R	45	N/R
East	19.5	66	Category 2	32	35	41	N/R	45	N/R
East	22.5	67	Category 2	32	35	41	N/R	45	N/R
East	25.5	67	Category 2	32	35	41	N/R	45	N/R
East	28.5	67	Category 2	32	35	41	N/R	45	N/R
East	31.5	68	Category 3	35	38	47	N/R	45	N/R
East	34.5	68	Category 3	35	38	47	N/R	45	N/R
East	37.5	67	Category 2	32	35	41	N/R	45	N/R
East	40.5	67	Category 2	32	35	41	N/R	45	N/R
East	43.5	67	Category 2	32	35	41	N/R	45	N/R
East	46.5	67	Category 2	32	35	41	N/R	45	N/R
East	49.5	67	Category 2	32	35	41	N/R	45	N/R
North	16.5	56	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
North	19.5	57	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
North	22.5	58	Category 1	24	27	35	N/R	N/R	N/R
North	25.5	59	Category 1	24	27	35	N/R	N/R	N/R

North	28.5	59	Category 1	24	27	35	N/R	N/R	N/R
North	31.5	59	Category 1	24	27	35	N/R	N/R	N/R
North	34.5	60	Category 1	24	27	35	N/R	N/R	N/R
North	37.5	60	Category 1	24	27	35	N/R	N/R	N/R
North	40.5	60	Category 1	24	27	35	N/R	N/R	N/R
North	43.5	60	Category 1	24	27	35	N/R	N/R	N/R
North	46.5	60	Category 1	24	27	35	N/R	N/R	N/R
North	49.5	60	Category 1	24	27	35	N/R	N/R	N/R
South	16.5	68	Category 3	35	38	47	N/R	45	N/R
South	19.5	68	Category 3	35	38	47	N/R	45	N/R
South	22.5	68	Category 3	35	38	47	N/R	45	N/R
South	25.5	68	Category 3	35	38	47	N/R	45	N/R
South	28.5	68	Category 3	35	38	47	N/R	45	N/R
South	31.5	68	Category 3	35	38	47	N/R	45	N/R
South	34.5	68	Category 3	35	38	47	N/R	45	N/R
South	37.5	67	Category 2	32	35	41	N/R	45	N/R
South	40.5	67	Category 2	32	35	41	N/R	45	N/R
South	43.5	67	Category 2	32	35	41	N/R	45	N/R
South	46.5	67	Category 2	32	35	41	N/R	45	N/R
South	49.5	67	Category 2	32	35	41	N/R	45	N/R
West	16.5	40	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	19.5	40	Category 0	N/R	N/R	N/R	N/R	N/R	N/R

West	22.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	25.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	28.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	31.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	34.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	37.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	40.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	43.5	40	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	46.5	43	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	49.5	47	Category 0	N/R	N/R	N/R	N/R	N/R	N/R

8.1 Building Recommendations

As the Roof and Entrance Doors are internal and not affected by external Road Traffic noise, no additional acoustic treatment is required. Only Levels 4 to 15 were affected by Road Traffic Noise. The following table outlines construction guidance for the residential development.

Table 27: Building Recommendations that meet Rw Requirements

Building Level	Building Component	Building Recommendation
Category 3 East Facade (Level 9 & 10) South Facade (Level 4 to 10)	Glazing	(Glazing Area $\geq 1.8\text{m}^2$) - Minimum 14.38mm thick laminated glass, with full perimeter acoustically rated seals OR - Double glazing consisting of one pane of minimum 5mm thick glass and one pane of minimum 6mm thick glass with at least 44mm air gap, and full perimeter acoustically rated seals
		(Glazing Area $\leq 1.8\text{m}^2$) Minimum 10.38mm thick laminated glass, with full perimeter acoustically rated seals.
	External Walls	- Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) 50mm thick mineral insulation or 50mm thick glass wool insulation with a density of 11kg/m³ or 50mm thick polyester insulation with a density of 20kg/m³ in the cavity. OR - Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) at least 13mm thick cement render on each face OR - Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³ positioned between studs; and (iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs. OR - Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging.

Category 2 <u>East Facade</u> (Level 4 to 8 & Level 11 to 15) <u>South Facade</u> (Level 11 to 15)	Floor	- Concrete slab at least 100mm thick - OR - Tongued and grooved boards at least 19mm thick with (i) <i>timber joists not less than 175mm x 50mm; and</i> (ii) <i>mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/m3 positioned between joists and laid on plasterboard at least 10mm thick fixed to underside of joists; and</i> (iii) <i>mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/m3 laid over entire floor, including tops of joists before flooring is laid; and</i> (iv) <i>secured to battens at least 75mm x 50mm; and</i> (v) <i>the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.</i>
	Glazing	(Glazing Area $\geq 1.8m^2$) Minimum 10.38mm thick laminated glass, with full perimeter acoustically rated seals.
	Glazing	(Glazing Area $\leq 1.8m^2$) Minimum 6.38mm thick laminated glass with full perimeter acoustically rated seals.
	External Walls	- Two leaves of clay brick masonry at least 110mm thick with cavity not less than 50mm between leaves - OR - Single leaf of clay brick masonry at last 110mm thick with: (i) <i>a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and</i> (ii) <i>mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m3 positioned between studs; and</i> (iii) <i>One layer of plasterboard at least 10mm thick fixed to outside face of studs</i> - OR - Single leaf of brick masonry at least 110mm thick with at least 13mm thick render on each face - OR - Concrete brickwork at least 110mm thick - OR - In-situ concrete at least 100mm thick - OR - Precast concrete at least 100mm thick and without joints.
	Floor	- Concrete slab at least 100mm thick - OR - Tongued and grooved boards at least 19mm thick with (vi) <i>timber joists not less than 175mm x 50mm; and</i> (vii) <i>mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/m3 positioned between joists and laid on plasterboard at least 10mm thick fixed to underside of joists; and</i> (viii) <i>mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/m3 laid over</i>

		<i>entire floor, including tops of joists before flooring is laid; and</i> <i>(ix) secured to battens at least 75mm x 50mm; and</i> <i>(x) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.</i>
Category 1 <u>North Facade</u> (Level 6 – 15)	Glazing	▪ Minimum 4mm thick glass with full perimeter acoustically rated seals ▪ Minimum 4mm thick glass with standard weather seals
	External Walls	▪ Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR ▪ Minimum 6mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90mm deep timber stud or 92mm metal stud, standard plasterboard at least 13mm thick internally.
Category 0 <u>North Facade</u> (Level 4 & 5) <u>West Facade</u> (Level 4 to 15)	No additional acoustic treatment required – standard building assessment provisions apply	

9 CONCLUSION AND RECOMMENDATIONS

We conclude:

- The site is impacted by Road Traffic Noise derived from Campbell Street and Abbotsford Road. The noise levels produced range between a Category 0 to 3.
- Railway noise from the Bowen Hills station does not affect the Residential Development as noise remains within Category 0. No further acoustic treatment are required.
- Mechanical Plant will be assessed once schematics are finalised.

To ensure compliance with the requirement of the SDAP for Road Traffic Noise, the BCC Planning Scheme 2014 and the QDC MP4.4 performance codes we recommend the following:

- ✓ Follow the construction guidance provided in **Table 26** Rw Requirements and **Table 27** Building Recommendations.

Subject to the recommended acoustic treatments, it is the opinion of Palmer Acoustics (Australia) Pty Ltd that the development will comply with the requirements in SDAP, QDC MP4.4 and BCC Planning Scheme.

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Acoustic Engineer

Reviewed by:



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Principal Engineer

APPENDIX A: EXTENSION OF DATA MEASUREMENTS

Single Event LAmax Railway Octave

Frequency (Hz)	Time					
	12:48:08 PM	1:08:40 PM	1:16:01 PM	1:18:21 PM	1:20:38 PM	1:23:09 PM
20	63.0	64.0	66.0	67.0	62.0	60.9
25	73.0	62.9	62.0	64.9	64.0	59.0
31.5	55.0	74.0	62.0	63.0	63.0	56.0
40	59.9	76.0	64.9	68.0	62.0	58.9
50	65.0	91.0	67.0	69.9	64.9	61.9
63	54.9	89.9	62.0	66.9	66.0	58.0
80	56.0	80.0	63.9	63.9	71.0	59.0
100	64.9	79.9	65.9	64.9	60.0	58.0
125	68.9	69.0	67.0	66.9	62.9	55.9
160	58.0	65.0	66.9	64.9	69.0	52.9
200	63.0	63.9	68.0	68.0	59.0	53.0
250	61.0	59.9	63.9	65.9	59.0	57.9
315	54.9	58.9	65.9	66.9	57.0	53.9
400	60.9	59.9	63.0	64.0	58.9	52.0
500	61.9	59.9	62.9	65.0	56.0	51.9
630	61.9	60.9	56.0	59.0	58.0	53.0
800	53.9	55.0	53.9	56.9	58.9	53.9
1000	51.0	54.9	53.0	54.9	59.0	57.0
1250	59.0	52.0	50.0	52.0	62.0	55.0
1600	50.9	49.9	48.0	50.0	58.0	53.9
2000	43.0	48.0	45.0	47.0	56.9	48.0
2500	43.9	48.0	43.0	44.0	55.0	43.0
3150	39.0	49.0	41.9	42.0	53.0	40.0
4000	40.9	48.0	38.9	38.0	50.0	40.0
5000	46.9	46.0	36.0	36.0	50.0	33.0
6300	46.9	41.9	33.9	33.0	48.0	29.0
8000	48.9	36.0	32.9	30.0	46.0	26.9
10000	46.9	32.0	28.9	26.9	43.9	23.0
12500	36.9	27.0	21.9	23.0	42.0	18.9
16000	26.9	20.9	15.9	17.9	37.0	13.9
20000	20.9	14.0	12.0	14.9	34.9	11.0

Distance Attenuation Calculation

This spreadsheet was developed for informative and training purposes only.

Input data

Conversion type : **SWL to SPL**
Input data weighting : **dB(Z) (Lin)**
Input data bands : **Octave**
Distance from mic to source = **10** m
Length of line source = **10** m
Directivity Correction = **3** dB

$$SWL = SPL + 10 \log_{10}(4\pi d^2 + 2\pi d L) - DI$$

SWL = Sound power level (dB)
SPL = Sound pressure level (dB)
L = Length of moving line source (m)
d = Distance from receiver to source (m)
DI = Directivity Correction (dB)
Note: only valid in far-field

Octave sound power level in dB(Z) (Lin)

Frequency (Hz)	31.5	63	125	250	500	1000	2000	4000	8000	#####	-	-	-	-	-	-	-	-	-
SWL	64.6	68.8	67.6	63.8	62.1	57.4	50.5	45.1	39.3	24.6									

Output data

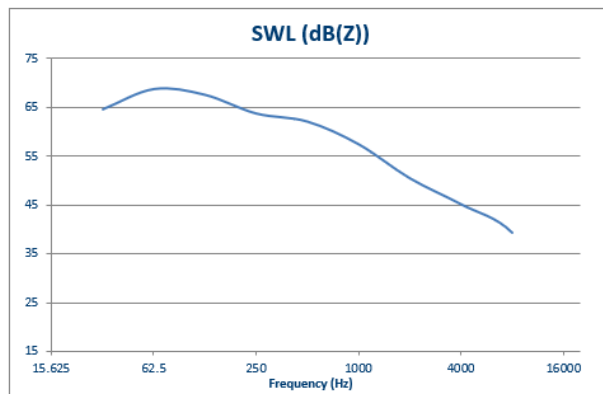
Octave SWL (dB(Z))																			
Frequency (Hz)	31.5	63	125	250	500	1000	2000	4000	8000	#####	0	0	0	0	0	0	0	0	0
SWL (dB(Z))	65	69	68	64	62	57	50	45	39	25	0	0	0	0	0	0	0	0	0

Linear sound pressure level
43.4 dB(Z)

Linear sound power level
73.2 dB(Z)

A-weighting sound pressure level
33.3 dB(A)

A-weighting sound power level
63.0 dB(A)



Calculation of noise at an affected place using distance attenuation formula

$$SPL_x = SPL_y - 20 \log(D_x/D_y)$$

Where:

SPL_x: is the sound level at the complainant property
D_x: is the distance from source to the nearest and/or complainant property
SPL_y: is the measured sound level (adj, T)
D_y: is the distance (m) from source to the measurement location

Input
(to be calculated)

127 m

63 dB(A)

10 m

Sound level at receiver is

41 dB(A), adj, T

Calculations for Rw Requirements for each Building Façade

Rw Multi Unit				Queensland Development Code Mandatory Part 4.4 – Buildings in a Transport Noise Corridor (“QDC MP4.4”)						
JOB:				Category is determined based on L10, 18hr value at façade, Table 1, Schedule 3 QDC MP4.4						
Project:	6468			L10, 18hr value is façade adjusted						
Date:	22/10/25			Categories carry deemed to satisfy solutions, Scedhule 2 MP4.4						
				No allowance for building construction is mandated by QDC MP4.4						
				(N/R = No Requirements for Category 0)						
Minimum Rw Required for each component (Schedule 1, QDC MP4.4)										
Façade	Height Receivers	Ext L10, 18hr dB(A)	Rounded Ext L10, 18hr dB(A)	Noise Category	Glazing (<1.8m2)	Glazing (>1.8m2)	Walls	Roof/Ceiling	Floors	Entrance Doors
East	16.5	65.1	65	Category 2	32	35	41	38	45	33
East	19.5	65.9	66	Category 2	32	35	41	38	45	33
East	22.5	66.7	67	Category 2	32	35	41	38	45	33
East	25.5	67.2	67	Category 2	32	35	41	38	45	33
East	28.5	67.4	67	Category 2	32	35	41	38	45	33
East	31.5	67.5	68	Category 3	35	38	47	41	45	33
East	34.5	67.5	68	Category 3	35	38	47	41	45	33
East	37.5	67.4	67	Category 2	32	35	41	38	45	33
East	40.5	67.4	67	Category 2	32	35	41	38	45	33
East	43.5	67.2	67	Category 2	32	35	41	38	45	33
East	46.5	67.1	67	Category 2	32	35	41	38	45	33
East	49.5	66.9	67	Category 2	32	35	41	38	45	33
North	16.5	56.1	56	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
North	19.5	57.1	57	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
North	22.5	58.2	58	Category 1	24	27	35	35	N/R	28
North	25.5	58.9	59	Category 1	24	27	35	35	N/R	28
North	28.5	59.1	59	Category 1	24	27	35	35	N/R	28
North	31.5	59.3	59	Category 1	24	27	35	35	N/R	28
North	34.5	59.5	60	Category 1	24	27	35	35	N/R	28
North	37.5	59.6	60	Category 1	24	27	35	35	N/R	28
North	40.5	59.8	60	Category 1	24	27	35	35	N/R	28
North	43.5	59.8	60	Category 1	24	27	35	35	N/R	28
North	46.5	59.9	60	Category 1	24	27	35	35	N/R	28
North	49.5	60	60	Category 1	24	27	35	35	N/R	28
South	16.5	67.8	68	Category 3	35	38	47	41	45	33
South	19.5	68	68	Category 3	35	38	47	41	45	33
South	22.5	68	68	Category 3	35	38	47	41	45	33
South	25.5	67.9	68	Category 3	35	38	47	41	45	33
South	28.5	67.8	68	Category 3	35	38	47	41	45	33
South	31.5	67.6	68	Category 3	35	38	47	41	45	33
South	34.5	67.5	68	Category 3	35	38	47	41	45	33
South	37.5	67.3	67	Category 2	32	35	41	38	45	33
South	40.5	67.1	67	Category 2	32	35	41	38	45	33
South	43.5	66.9	67	Category 2	32	35	41	38	45	33
South	46.5	66.8	67	Category 2	32	35	41	38	45	33
South	49.5	66.6	67	Category 2	32	35	41	38	45	33
West	16.5	39.7	40	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	19.5	39.5	40	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	22.5	39.4	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	25.5	39.2	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	28.5	39	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	31.5	38.9	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	34.5	38.7	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	37.5	38.5	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	40.5	38.9	39	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	43.5	40.2	40	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	46.5	43	43	Category 0	N/R	N/R	N/R	N/R	N/R	N/R
West	49.5	46.6	47	Category 0	N/R	N/R	N/R	N/R	N/R	N/R

Queensland Development Code Mandatory Part 4.4 – Buildings in a Transport Noise Corridor (“QDC MP4.4”)

Category is determined based on L10, 18hr value at façade, Table 1, Schedule 3 QDC MP4.4

L10, 18hr value is façade adjusted

Categories carry deemed to satisfy solutions, Scedhule 2 MP4.4

No allowance for building construction is mandated by QDC MP4.4

(N/R = No Requirements for Category 0)

APPENDIX B: MP4.4 "DEEMED TO SATISFY"

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 <i>habitable room</i> is greater than 1.8m ²)
			35 (where total area of glazing for a <i>habitable room</i> is less than or equal to 1.8m ²)
		External walls	47
		Roof	41
		Floors	45
		Entry doors	33

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MP 4.4
Buildings in a Transport Noise Corridor

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 2	30	Glazing	35 (where total area of glazing for a <i>habitable room</i> is greater than 1.8m ²)
			32 (where total area of glazing for a <i>habitable room</i> 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 <i>habitable room</i> is greater than 1.8m ²)
			24 (where total area of glazing for a <i>habitable room</i> is less than or equal to 1.8m ²)
		External walls	35
		Roof	35
Category 0		Entry Doors	28
		No additional acoustic treatment required – standard building assessment provisions apply.	

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MP 4.4
Buildings in a Transport Noise Corridor

Schedule 2

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
Glazing	43	Double glazing consisting of two panes of minimum 5mm thick glass with at least 100mm air gap and full perimeter <i>acoustically rated seals</i> .
	38	Minimum 14.38mm thick laminated glass, with full perimeter <i>acoustically rated seals</i> ; OR Double glazing consisting of one pane of minimum 5mm thick glass and one pane of minimum 6mm thick glass with at least 44mm air gap, and full perimeter <i>acoustically rated seals</i>
	35	Minimum 10.38mm thick laminated glass, with full perimeter <i>acoustically rated seals</i> .
	32	Minimum 6.38mm thick laminated glass with full perimeter <i>acoustically rated seals</i> .
	27	Minimum 4mm thick glass with full perimeter <i>acoustically rated seals</i>
	24	Minimum 4mm thick glass with standard weather seals

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MP 4.4
Buildings in a Transport Noise Corridor

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
External walls	52	Two leaves of clay brick masonry, at least 270mm in total, with subfloor vents fitted with noise attenuators.
	47	Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) 50mm thick mineral insulation or 50mm thick glass wool insulation with a density of 11kg/m ³ or 50mm thick polyester insulation with a density of 20kg/m ³ in the cavity. OR Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) at least 13mm thick cement render on each face OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m ³ positioned between studs; and (iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs. OR Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging.

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Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	41	Two leaves of clay brick masonry at least 110mm thick with cavity not less than 50mm between leaves OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³ positioned between studs; and (iii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Single leaf of brick masonry at least 110mm thick with at least 13mm thick render on each face OR Concrete brickwork at least 110mm thick OR In-situ concrete at least 100mm thick OR Precast concrete at least 100mm thick and without joints.

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	35	Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Minimum 6mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90mm deep timber stud or 92mm metal stud, standard plasterboard at least 13mm thick internally.
Roof	45	Concrete or terracotta tile or sheet metal roof with sarking, <i>acoustically rated plasterboard</i> ceiling at least 13mm thick fixed to ceiling joists, cellulose fibre insulation at least 100mm thick with a density of at least 45kg/m³ in the cavity. OR Concrete or terracotta tile or sheet metal roof with sarking, 2 layers of <i>acoustically rated plasterboard</i> at least 16mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m³ or polyester insulation at least 50mm thick with a density of at least 20kg/m³ in the cavity.
	41	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m³ or polyester insulation at least 50mm thick with a density of at least 20kg/m³ in the cavity. OR Concrete suspended slab at least 100mm thick.
	38	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity, mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³.

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.
Floors	51	Concrete slab at least 150mm thick.
	45	Concrete slab at least 100mm thick OR Tongued and grooved boards at least 19mm thick with: (i) timber joists not less than 175mm x 50mm; and (ii) mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/m ³ positioned between joists and laid on plasterboard at least 10mm thick fixed to underside of joists; and (iii) mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/m ³ laid over entire floor, including tops of joists before flooring is laid; and (iv) secured to battens at least 75mm x 50mm; and (v) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.
Entry Doors	35	Solid core timber not less than 45mm thick, fixed so as to overlap the frame or rebate of the frame by not less than 10mm, with full perimeter <i>acoustically rated seals</i> .
	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with full perimeter <i>acoustically rated seals</i> and constructed of - (i) solid core, wood, particleboard or blockboard not less than 45mm thick; and/or (ii) acoustically laminated glass not less than 10.38mm thick.

Component of building's external envelope	Minimum R_w	Acceptable forms of construction
	28	Fixed so as to overlap the frame or rebate of the frame, constructed of - (i) Wood, particleboard or blockboard not less than 33mm thick; or (ii) Compressed fibre reinforced sheeting not less than 9mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4kg/m ² ; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter <i>acoustically rated seals</i> .

Schedule 3

The objective of the *noise assessment* is to clearly demonstrate that the *noise category* that is applicable to a particular part of or entire building, or site. The criteria for determining the relevant *noise category* are given below in Table 1:

Table 1 – Noise category levels

Noise Category	Level of transport noise* ($L_{A10, 18hr}$) for State-controlled roads and designated local government roads	Single event maximum noise* (L_{Amax}) for railway land
Category 4	≥ 73 dB(A)	≥ 85 dB(A)
Category 3	68 – 72 dB(A)	80 – 84 dB(A)
Category 2	63 – 67 dB(A)	75 – 79 dB(A)
Category 1	58 – 62 dB(A)	70 – 74 dB(A)
Category 0	≤ 57 dB(A)	≤ 69 dB(A)

* measured at 1 m from the façade of the proposed or existing building.