Transport for NSW

M1 Pacific Motorway extension to Raymond Terrace

Submissions Report - Appendix D

June 2022

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M1 Pacific Motorway extension to Raymond Terrace

Appendix D

Supplementary report - noise and vibration

June 2022

Executive summary

Transport for New South Wales (Transport) proposes to construct the M1 Pacific Motorway extension to Raymond Terrace (the project). Approval is sought under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* and Part 9, Division 1 of the *Environment Protection and Biodiversity Conservation Act 19*99.

In accordance with the Secretary's Environmental Assessment Requirements (SEARs), an environmental impact statement (EIS) was prepared by Transport in July 2021 *M1 Pacific Motorway extension to Raymond Terrace Environmental Impact Statement* (Transport for NSW 2021a) to assess the potential impacts of the project. The EIS was exhibited by the Department of Planning, Industry and Environment (DPIE) for 28 days from 28 July 2021 to 24 August 2021.

The *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) was prepared in support of the EIS for the project. The purpose of the assessment was to assess potential noise and vibration impacts from construction and operation of the project, and where required, identify mitigation measures. The assessment was also prepared to address the SEARs issued by DPIE for the project.

Following exhibition of the EIS, receipt of submissions and further consultation with stakeholders a number of refinements have been made to the publicly-exhibited project. The main design refinements that potentially influence noise and vibration impacts include:

- Extension of ancillary facility AS3 and AS13
- Removal of ancillary facility AS16
- Reduction in size of ancillary facilities AS5, AS6, AS7 and AS9
- Extension of southbound entry ramp merge lane onto the M1 Pacific Motorway southbound carriageway at Black Hill, which also results in additional relocation of existing Noise Barrier NB.01
- Modification to the design of Noise Barrier NB.03 at Tarro to avoid clashes with utilities and drainage
- Minor changes to the construction footprint to cater for a refined utility strategy.

This supplementary noise and vibration report has been prepared to respond to the submissions received and to assess the potential impacts of the refinements made to the project following public exhibition of the EIS. The following points summarise the outcomes of this supplementary report:

- The Sweetwater Grove development in Tomago (previously identified as the 'Tomago Village Van Park') has been re-assessed as a residential development for operational traffic noise, where previously it was nominated as a commercial caravan park for the EIS. The assessment identified that a noise barrier was not a reasonable and feasible mitigation option and therefore, receivers that are resident in permanent dwellings and are identified for additional noise mitigation would be eligible for consideration of at-property treatment
- Noise monitoring data and corresponding meteorological has been reviewed and rating background levels have been re-established, resulting in updated construction noise management levels. Further justification of the appropriateness of the noise monitoring methodology and data has been included, in response to EIS submissions.
- Extended construction hours have been revised and further detailed justification and description provided
- Standard construction noise and vibration mitigation measures are to be considered as part of the project's overall construction works. Further information on specific construction noise and vibration mitigation measures to be implemented in locations where sensitive receivers are close to the construction works, such as Black Hill, Tarro, Tomago and Heatherbrae, are also presented in this supplementary report

- Discussion on how the design of the project provides benefits in reducing operational traffic noise impacts, including maximum noise levels, to noise sensitive receivers. Additionally, noise management options in the form of noise barriers and/or at-property treatment for mitigating general traffic noise, as presented in the EIS, would also be beneficial for reducing maximum noise levels
- Outcomes of the assessment of construction noise impacts to sensitive receivers due to the refinements to the ancillary facilities and utility strategy are generally similar to those presented in the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b)
- The extension of the southbound entry ramp merge lane onto the M1 Pacific Motorway resulted in some sensitive receivers being identified for additional noise mitigation. The existing noise barrier would to be relocated; however, increasing the height of the noise barrier was determined to be not reasonable and feasible
- Refinements to the alignment of Noise Barrier NB.03 resulted in no additional receivers identified for consideration of at-property treatment compared to the EIS.

The refinements explored in this supplementary noise and vibration report are expected to produce outcomes for the project that are consistent with the impacts described in the EIS. The construction and operation impacts of the refinements have been assessed, and no additional environmental management measures have been identified as a result of these refinements.

Clarifications and additional information are also presented in response to EIS submissions and agency consultation, which has resulted in updated construction noise management levels, reduced extended construction hours and additional detail regarding likely construction noise mitigation measures. An additional environmental management measure has been identified which includes additional noise modelling prior to construction to validate Rating Background Levels and ground-truthing to identify permanent residences at Sweetwater Grove that qualify for at-property treatment.

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1 Introduction and background

1.1 The project

Transport for New South Wales (Transport) proposes to construct the M1 Pacific Motorway extension to Raymond Terrace (the project). The project would connect the existing M1 Pacific Motorway at Black Hill and the Pacific Highway at Raymond Terrace within the City of Newcastle and Port Stephens Council local government areas (LGAs). The project location is shown in **Figure 1-1**.

The project would include the following key features (see **Figure 1-2**):

- A 15 kilometre motorway comprised of a four lane divided road (two lanes in each direction)
- Motorway access from the existing road network via four new interchanges at:
  - Black Hill: connection to the M1 Pacific Motorway
  - Tarro: connection and upgrade (six lanes) to the New England Highway between John Renshaw Drive and the existing Tarro interchange at Anderson Drive
  - Tomago: connection to the Pacific Highway and Old Punt Road
  - Raymond Terrace: connection to the Pacific Highway.
- A 2.6 kilometre viaduct over the Hunter River flood plain including new bridge crossings over the Hunter River, the Main North Rail Line, and the New England Highway
- Bridge structures over local waterways at Tarro and Raymond Terrace, and an overpass for Masonite Road in Heatherbrae
- Connections and modifications to the adjoining local road network
- Traffic management facilities and features
- Roadside furniture including safety barriers, signage, fauna fencing and crossings and street lighting
- Adjustment of waterways, including Purgatory Creek at Tarro and a tributary of Viney Creek
- Environmental management measures including surface water quality control measures
- Adjustment, protection and/or relocation of existing utilities
- Walking and cycling considerations, allowing for existing and proposed cycleway route access
- Permanent and temporary property adjustments and property access refinements
- Construction activities, including establishment and use of temporary ancillary facilities, temporary access tracks, haul roads, batching plants, temporary wharves, soil treatment and environmental controls.

A more detailed description of the project incorporating the refinements identified in **Section 1.2** is presented in Appendix A of the *M1 Pacific Motorway extension to Raymond Terrace Submissions Report* (Transport for NSW, 2022).

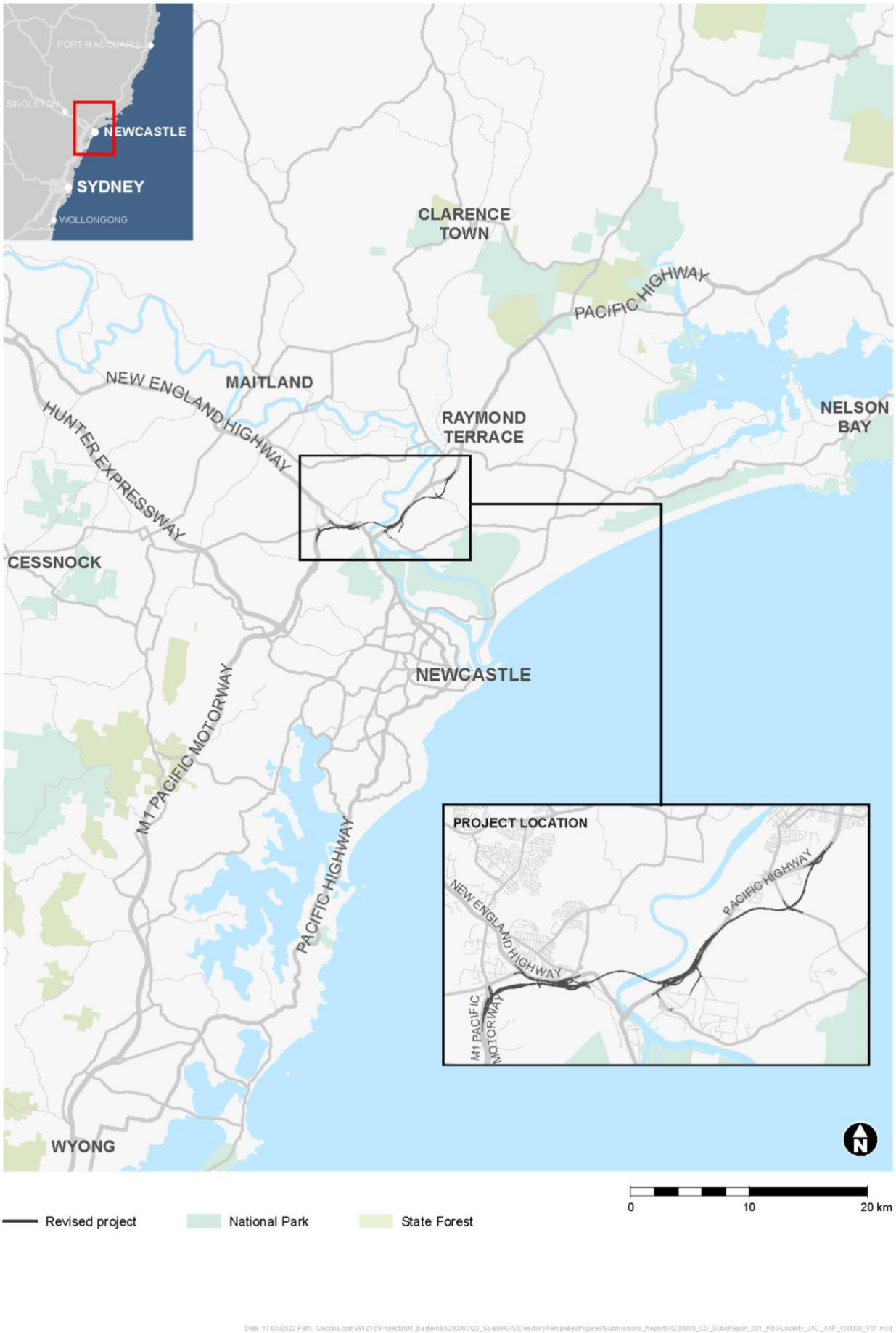

Figure 1-1 Regional context of the project

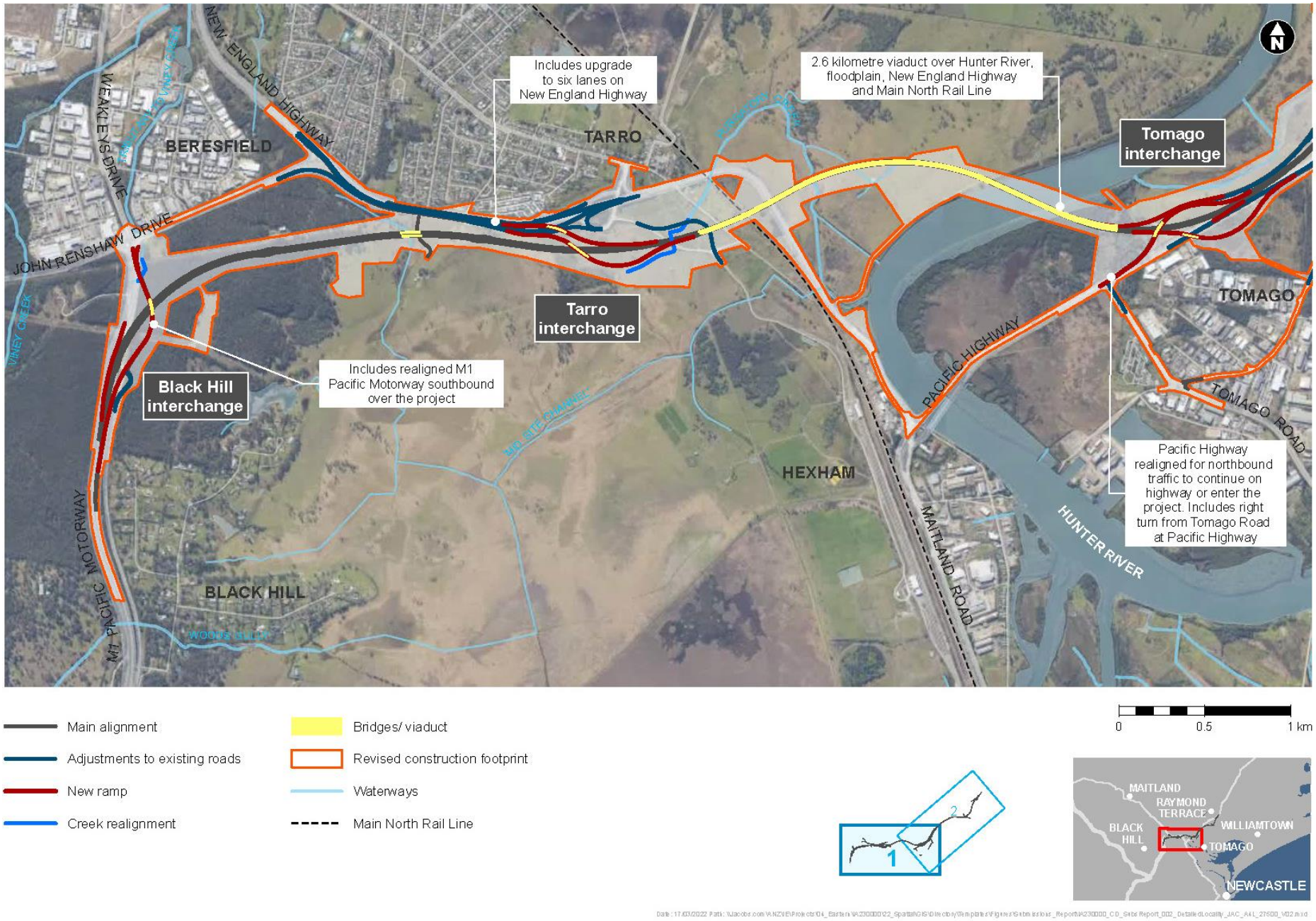

Figure 1-2 Project key features (map 1 of 2)

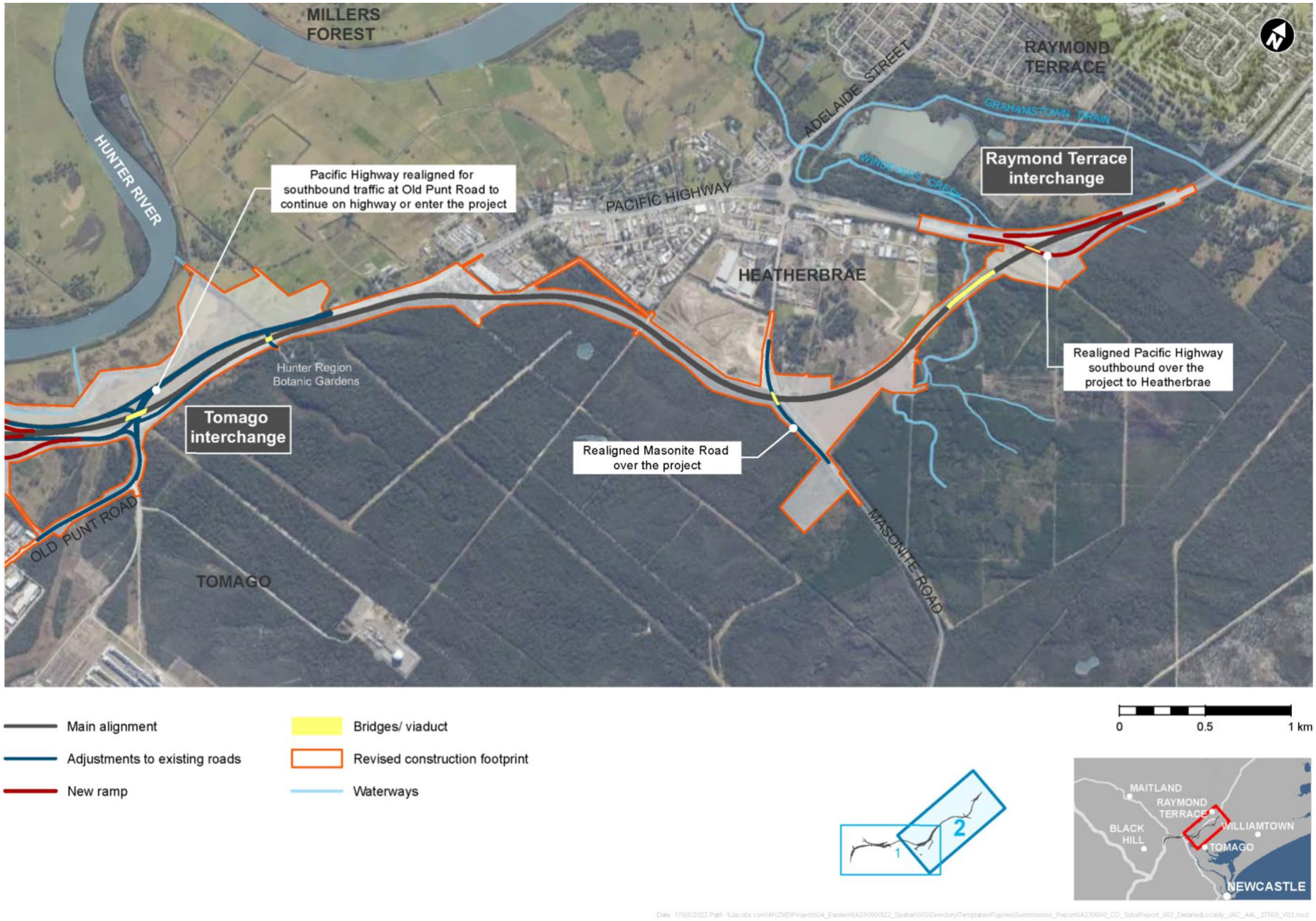

Figure 1-2 Project key features (map 2 of 2)

1.2 Project refinements

Transport has refined a number of aspects of the project as exhibited in the environmental impact statement (EIS). These refinements have arisen through the ongoing review of the concept design and construction methodology, identification of opportunities to reduce environmental impact, consultation with landowners and government agencies, and in response to issues raised during the EIS exhibition period. The project refinements are described below.

Design refinements

- Southbound M1 Pacific Motorway merge – a 200 metre extension of the merge lane for southbound traffic from the John Renshaw Drive/Weakleys Drive intersection to allow for improved capacity and safety
- Utilities strategy – key changes include grouping of utilities at Tarro and Tomago into utility corridors and extension of the construction footprint at Beresfield and Hexham to accommodate utility relocations
- Cycleway strategy – improvements to facilitate incorporation with the Richmond Vale Rail Trail and removal of shared use path on the new Masonite Road bridge (BR at Heatherbrae
- Drainage design at Heatherbrae – minor changes to basin locations and extension of drainage lines to minimise property and drainage impacts on adjacent properties
- Water quality basins – lining of temporary and permanent water quality basins which interface with ground water.

Construction refinements

- Ancillary facilities and site access – minor changes to the size, location and access arrangements of some ancillary facilities
- Earthworks management – identification of a borrow pit and sites for beneficial reuse of materials within the construction footprint.

Construction staging

- Staged project opening – the project would be delivered via two packages of work, the Southern (Black Hill to Tomago) and Northern (Heatherbrae bypass) works. The Northern section would likely have a shorter construction duration and could potentially be opened to traffic before the Southern section.

Project footprint refinements

- Consultation with landowners and the design and construction refinements to reduce property and biodiversity impacts have resulted in minor changes to the construction and operational project footprints.

1.3 Purpose of the document

The *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) was prepared in support of the EIS for the project. The purpose of the working paper was to provide a detailed assessment of the noise and vibration impacts that may result from the construction and operation of the project.

The assessment was prepared to address the Secretary's Environmental Assessment Requirements (SEARs) as described in Section 1.4 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b).

During the exhibition of the EIS several submissions were made in relation to noise and vibration matters. These submissions have been addressed in the *M1 Pacific Motorway extension to Raymond Terrace Submissions Report (*Transport for NSW, 2022).

This supplementary noise and vibration supplementary report has been prepared to also assess the potential impacts from project refinements identified in **Section 1.2.** Where further clarification or additional information is required to provide a detailed response to the submission, these matters have been included in this supplementary report and an overview is presented in **Chapter 2**.The assessment of potential noise and vibration impacts resulting from these project refinements are presented in **Chapter 3** (assessment of potential construction impacts) and **Chapter 4** (assessment of potential operational impacts).

This supplementary report only includes additional detail or information that has changed since the submission of the EIS and should be read in conjunction with the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) included in the EIS.

2 Clarifications and additional information

This section identifies minor errors, discrepancies and general clarifications identified either through further review by Transport or agency sought clarification prior to the receipt of formal submissions or following EIS exhibition during stakeholder consultation.

The clarifications sought by the Department of Planning and Environment (DPE) which have been addressed in this supplementary report include:

- Justification on the use of long term unattended traffic noise monitoring results from 2016 (**Section 2.1**)
- The Tomago Village Van Park to be reassessed as a residential development (**Section 2.2**)
- Further justification of proposed extended construction hours (**Section 2.3.2**).

2.1 Existing environment

Information presented regarding the existing environment in Chapter 4 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) for the EIS included:

- Noise sensitive receivers and noise catchment areas
- Existing background noise environment
- Existing road traffic noise levels.

During exhibition of the EIS, a submission from the NSW EPA (SE-26812009) requested further information on the existing noise environment presented in Chapter 4 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). Additional consultation with agencies has also resulted in further information being requested on the existing noise environment and the methodology presented in the EIS for analysing background and traffic noise levels.

As outlined in Section Chapter 4 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b), the project traverses large open land spaces with minimal nearby residential receivers. The project is located further than 500 metres away from any residential receivers for about 70 per cent (about 10 kilometres) of its length.

2.1.1 Noise monitoring locations

Long term unattended noise monitoring locations

In addition to the information provided in Section 3.4.1 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport, 2021b), further details of the long term unattended noise monitoring locations used to establish rating background levels (RBLs) are presented in **Table 2-1** along with information on the dominant noise source and the location of the noise monitor relative to the nominated address.

The background noise monitoring at these locations was undertaken between 1 June and 15 July 2018 for 15 days. Noise monitoring locations are shown in **Appendix A**.

Table 2-1 Long term unattended noise monitoring locations for RBLs

ID	NCA	Address	Details
L01	NCA01A	23 Cahill Close, Black Hill	Noise monitor located in the rear yard facing Lenaghans Drive and the M1 Pacific Motorway and in the free-field. Noise environment dominated by distant traffic noise and natural sounds (e.g. insects and birds).

ID	NCA	Address	Details
L02	NCA03	54 Weakleys Drive, Beresfield	Noise monitor located in the front yard facing Weakleys Drive and in the free-field. Noise environment dominated by traffic noise from Weakleys Drive and distant traffic noise from the New England Highway.
L03	NCA07	51 New England Highway, Black Hill	Noise monitor located on northern side of dwelling and in the free-field. Noise environment dominated by distant traffic noise from the New England Highway and natural sounds (e.g. insects and birds).
L04	NCA04A	1/15 Quarter Sessions Road, Tarro	Noise monitor located on the western end of the Palm Valley Village property, facing the New England Highway and in the free-field. Noise environment dominated by traffic noise from the New England Highway.
L05	NCA05A	11 Anderson Drive, Tarro	Noise monitor located in the front yard facing Anderson Drive and in the free-field. Noise environment dominated by traffic noise from the New England Highway.
L06	NCA06	61 Redbill Drive, Woodberry	Noise monitor located in the front yard facing Redbill Drive and in the free-field. Noise environment dominated by general neighbourhood noise, local traffic and distant slightly audible traffic noise and train noise.
L07	NCA08	179 Old Maitland Road, Hexham	Noise monitor located in the front yard facing Old Maitland Road and 1m from the facade. Noise environment dominated by general neighbourhood noise, distant industrial noise from nearby industrial premises and distant traffic noise from the Pacific Highway.
L08	NCA09	838 Tomago Road, Tomago	Noise monitor located in the front yard facing Tomago Road and in the free-field. Noise environment dominated by traffic noise from Tomago Road and the Pacific Highway.
L09	NCA14A	2213 Pacific Highway, Heatherbrae	Noise monitor located in the front yard facing the Pacific Highway and 1m from the facade. Noise environment dominated by traffic noise from the Pacific Highway.
L10	NCA14B	14 Elizabeth Avenue, Raymond Terrace	Noise monitor located in the rear yard and in the free-field. Noise environment dominated by traffic noise from the Pacific Highway and natural sounds (e.g. insects and birds).
L11	NCA12	2264 Pacific Highway, Heatherbrae	Noise monitor located in the front yard facing the Pacific Highway and in the free-field. Noise environment dominated by traffic noise from the Pacific Highway.

Further details of the long term unattended noise monitoring locations used to establish traffic noise levels are provided in **Table 2-2**. The traffic noise monitoring was undertaken between 15 March and 24 March 2016 (i.e. nine days) to establish traffic noise levels used for the noise model validation process.

Stakeholder consultation carried out following the exhibition of the EIS identified that there was uncertainty as to whether there were sufficient noise monitoring locations to correctly evaluate source noise levels and propagation loss for the operational traffic noise model.

It is noted that in accordance with the Model Validation Guideline (Roads and Maritime Services, 2018) traffic noise monitoring was conducted at different locations with varying distances, including locations behind existing purpose-built traffic noise barriers, to allow the evaluation of propagation loss for affected receivers impacted by the project.

Table 2-2 Long term unattended noise monitoring locations for traffic noise

ID	NCA	Address	Details
L13	NCA01A	11 Cahill Close, Black Hill	Noise monitor located in the rear yard facing Lenaghans Drive and the M1 Pacific Motorway (behind existing timber noise wall) and in the free-field. Noise environment dominated by traffic noise from the M1 Pacific Motorway.
L14	NCA01B	23 Walter Parade, Black Hill	Noise monitor located in the rear yard, in the free-field and in a rural setting. Noise environment dominated by distant traffic noise from the M1 Pacific Motorway and natural sounds (e.g. insects and birds).
L15	NCA04A	70 New England Highway, Tarro	Noise monitor located in the open grass area, approximately 15 m from the New England Highway and in the free-field. Noise environment dominated by traffic noise from the New England Highway.
L16	NCA04A	44 Sapphire Drive, Tarro	Noise monitor located in the rear yard facing the New England Highway (behind existing timber noise wall) and in the free-field. Noise environment dominated by traffic noise from the New England Highway.
L17	NCA04B	11 Central Avenue, Tarro	Noise monitor located in the front yard facing Central Avenue, in the free-field and in a suburban setting. Noise environment dominated by general neighbourhood noise, occasional local traffic noise and distant traffic noise from the New England Highway.
L18	NCA06	Proposed interchange at Tarro	Noise monitor located in a vegetated area, approximately 25m east of the New England Highway and in the free-field. Noise environment dominated by traffic noise from the New England Highway.
L19	NCA14A	2207 Pacific Highway, Heatherbrae	Noise monitor located in the front yard facing the Pacific Highway and in the free-field. Noise environment dominated by traffic noise from the Pacific Highway.
L20	NCA13	Pacific Highway (north of Raymond Terrace Interchange)	Noise monitor located in a vegetated area, approximately 10m west of the Pacific Highway and in the free-field. Noise environment dominated by traffic noise from the Pacific Highway.

As described in **Table 2-2** above and Figure 4-1 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b), reproduced in **Appendix A**, locations L15, L18 and L20 are located in free-field locations and within 30 metres of the existing roads (New England Highway and the Pacific Highway). A review of the survey notes at the traffic noise monitoring locations confirmed that traffic noise was the main contributor to the noise environment at these locations.

Two noise monitoring locations L13 and L16 were used to understand traffic noise levels and propagation loss due to noise barriers, both were located behind existing noise barriers.

Traffic noise monitoring at L14 and L17 are at distances well removed from the existing sources of traffic noise. Monitoring location L14 was located at a distance of greater than one kilometre from the M1 Pacific Motorway and is representative of areas in a rural setting, while L17 is representative of areas in a suburban setting. These locations allowed for the validation of propagation loss over large distances.

Therefore, based on the traffic noise monitoring at the nominated locations, the performance of the traffic noise model in predicting traffic noise levels at receivers behind noise barriers and at large distances from the road source was confirmed.

Table 3-30 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport, 2021b) presents the noise validation results and demonstrates that the traffic noise model validates well (within ± 1dB(A)) at these locations and predicted traffic noise levels are representative of future impacts from the project.

Short term attended noise measurement locations

Where long term unattended noise monitoring was not available due to access, security and/or extraneous noise issues, short term attended noise measurements were conducted concurrently with the long term noise monitoring. Short term attended measurement locations were strategically grouped with corresponding long term monitoring locations where the ambient noise environments had similar characteristics between the two locations (e.g. traffic noise contribution from the same road source). Noise monitoring locations are shown in **Appendix A**.

Furthermore, the short-term measurement locations were chosen to allow for noise catchment areas (NCAs) to be further divided into sub-NCAs for assessment purposes.

In addition to the information provided in Section 3.4.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) further details of the short term attended noise measurement locations are provided in **Table 2-3**. The information provided in **Table 2-3** also provides information on the dominant noise source and the location of the noise monitor relative to the nominated address.

Measurements were undertaken on Thursday 7th and Friday 8th June 2018, concurrently with the long term noise monitoring presented in **Table 2-1**.

Table 2-3 Short term attended noise measurement locations

ID	NCA	Address	Details
L01A	NCA01B	24 Walter Parade, Black Hill	Noise environment dominated by distant traffic noise from the M1 Pacific Motorway. Measured noise levels from this location compared to results from long term unattended monitoring location L01 to determine correlation
L04A	NCA04B	22 Lenox Street, Beresfield	Noise environment dominated by general neighbourhood noise, local traffic and distant slightly audible traffic noise from the M1Pacific Motorway and the New England Highway. Measured noise levels from this location compared to results from long term unattended monitoring location L06 to determine correlation
L05A	NCA05B	49 Beresford Avenue, Beresfield	Noise environment dominated by general neighbourhood noise, local traffic and distant slightly audible industrial hum. Measured noise levels from this location compared to results from long term unattended monitoring location L06 to determine correlation
L10A	NCA14C	15 Brown Street, Raymond Terrace	Noise environment dominated by distant traffic noise from the Pacific Highway, occasional local traffic and natural sounds (e.g. insects and birds) and. Measured noise levels from this location compared to results from long term unattended monitoring location L10 to determine correlation
L12	NCA14C	53 Martens Avenue, Raymond Terrace	Noise environment dominated by traffic noise from the Pacific Highway and natural sounds (e.g. insects and birds). Measured noise levels from this location compared to results from long term unattended monitoring location L10 to determine correlation

The measured short term results were compared to the concurrent results of the corresponding long term monitoring to determine a correlation between the two measurement locations. This procedure is used to establish the equivalent noise levels over the long term monitoring period at the short term monitoring location.

To illustrate this procedure, assume the following example:

> *Say a noise level of 52dB(A) was measured at the short term location (Location A) and over exactly the same short term period a noise level of 58dB(A) was measured at the long term location (Location B), where the characteristics of the ambient noise environment at both locations are similar. That means that noise levels at Location A are generally 6dB(A) lower than at Location B. If at Location B a daytime noise level of 57dB(A) was measured over a 7 day period, then the daytime noise levels at Location A would be expected to be 51dB(A).*

2.1.2 Measured noise levels

Meteorology during noise monitoring

Section 3.4 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport, 2021b) outlined the methodology used to quantify the existing noise environment, including how noise monitoring data was corrected for weather conditions.

Periods of unattended noise monitoring affected by extraneous noise, wind (greater than five metres per second) or rain were excluded from the recorded data in accordance with the NSW *Noise Policy for Industry* (NPfI) (EPA, 2017). Determination of extraneous meteorological conditions was based on data provided by the Bureau of Meteorology (BOM), at an Automatic Weather Station (AWS) location considered representative of the noise monitoring location(s).

A further review of the weather data used in determining extraneous meteorological conditions revealed that the wind data was adjusted using superseded correction factors to account for the height difference between the BOM weather station, where wind speed and direction is recorded at a height of 10 metres above ground level, and the microphone location, which is typically 1.5 metres above ground level (and less than three metres). The wind data was adjusted using correction factors stated in Australian Standard AS1170.2-1989, which has since been superseded by AS1170.2-2011. However, it is noted that the correction factors presented in the superseded standard are omitted in the current Australian standard and therefore, correction factors for the wind data have been updated based on the most recent correction factors presented in Table C.1 of International Standard ISO 4354:2009 '*Wind actions on structures*'.

Using the updated weather data, results from the long term unattended noise monitoring in June 2018 were re-analysed to re-establish the RBLs during the unattended noise monitoring (refer to **Table 2-6**)

It is noted that the re-established RBLs supersedes those presented in Section 4.3 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). Therefore, the construction noise management levels which are determined based on RBLs have been updated and construction noise impacts re-assessed accordingly. The re-assessed construction noise impacts are presented in **Section 3.3**.

Rating background levels

Details of the measurements and the measured noise levels at the short term attended locations first noted in **Table 2-3**, are presented in **Table 2-4**.

Table 2-4 Summary of measured noise levels at short term attended locations

ID	Address	Date	Time	Measured noise levels, dB(A)	
				L_{A90}	L_{Aeq}
L01A	24 Walter Parade, Black Hill	7/06/2018	1:15pm – 1:30pm	42	46
		7/06/2018	11:00pm – 11:15pm	47	50
L04A	22 Lenox Street, Beresfield	7/06/2018	2:00pm – 2:15pm	43	53
		7/06/2018	11:45pm – 12:00am	44	46

ID	Address	Date	Time	Measured noise levels, dB(A)	
				L_{A90}	L_{Aeq}
L05A	49 Beresford Avenue, Beresfield	7/06/2018	2:30pm – 2:45pm	47	59
		8/06/2018	12:00am – 12:15am	41	51
L10A	15 Brown Street, Raymond Terrace	7/06/2018	3:30pm – 3:45pm	50	55
		8/06/2018	12:15am – 12:30am	41	50
L12	53 Martens Avenue, Raymond Terrace	7/06/2018	3:45pm – 4:00pm	49	55
		8/06/2018	12:30am – 12:45am	43	50

The RBLs from the re-analysed data for the long term monitoring locations identified in **Table 2-1** and the short term measurement locations identified in **Table 2-3** are presented in **Table 2-5**.

It is noted that in Section 4.3 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b), presented established RBLs for the morning (6am to 7am) and evening (6pm to 7pm) shoulder periods, to allow construction noise assessments for these periods. However, changes to the proposed extended construction hours (see **Section 2.3.2**) have resulted in no noisy construction activities to occur during the shoulder periods. Therefore, the RBLs for the previously nominated shoulder periods are not presented in **Table 2-5**.

Table 2-5 Summary of background noise monitoring results

ID	NCA	Address	Measured RBL, dB(A)		
			Day [1]	Evening [2]	Night [3]
L01	NCA01A	23 Cahill Close, Black Hill	56	53	47
L01A	NCA01B	24 Walter Parade, Black Hill [4]	46	43	37
L02	NCA03	54 Weakleys Drive, Beresfield	40	41	37
L03	NCA07	51 New England Highway, Tarro	53	49	45
L04	NCA04A	1/15 Quarter Sessions Road, Tarro	57	54	46
L04A	NCA04B	22 Lenox Street, Beresfield [4]	46	46	44
L05	NCA05A	11 Anderson Drive, Tarro	50	44	37
L05A	NCA05B	49 Beresford Avenue, Beresfield [4]	46	46	44
L06	NCA06	61 Redbill Drive, Woodberry	40	40	38
L07	NCA08	179 Old Maitland Road, Hexham	41	43	41
L08	NCA09	838 Tomago Road, Tomago	53	53	46
L09	NCA14A	2213 Pacific Highway, Heatherbrae	52	49	41
L10	NCA14B	14 Elizabeth Avenue, Raymond Terrace	40	41	37
L10A	NCA14C	15 Brown Street, Raymond Terrace [4]	45	45	42
L11	NCA12	2264 Pacific Highway, Heatherbrae	62	52	42

ID	NCA	Address	Measured RBL, dB(A)		
			Day [1]	Evening [2]	Night [3]
L12	NCA13	53 Martens Avenue, Raymond Terrace	45	45	42

Notes:
1. Day: 7.00am to 6.00pm Monday to Saturday and 8.00am to 6.00pm Sundays & Public Holidays
2. Evening: 6.00pm to 10.00pm Monday to Sunday and Public Holidays
3. Night: 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays
4. Background noise levels for locations L01A, L04A, L05A, L10A and L12 based on correlation with nominated long term monitoring locations with similar noise environments

As discussed in **Section 2.1.1** previously, the noise monitoring data at each nominated location were reviewed and any data impacted by extraneous noise, wind (greater than five metres per second) or rain were excluded from the measured data and RBLs were determined in accordance with Fact Sheet B of the NSW NPfI. It is noted that seven days' worth of data for each assessment period (i.e. day, evening and night periods) is required in order to establish the representative overall RBLs for each assessment period.

A review of the monitoring results for each of the 2018 monitoring locations (i.e. Locations L01 to L11) confirmed that Locations L01, L02, L04, L07, L08, L10 and L11 had less than seven days of data for the day, evening and/or night assessment periods.

It should be noted that loggers L01, L02, L07, L08, and L10 were located within noise catchments that have few or no sensitive residential receivers or are in a transition zone at the southern or northern limits of the project. All locations that had less than seven days of data were in locations where the noise environment was typically dominated by traffic noise from existing major roads.

Section B1.3 of the NPfI states the following:

> *"Exception: re-monitoring may not be required, where monitoring contains weather-affected data, if it can be ascertained that the affected samples are not within the expected 'quieter' times of an assessment period (day/evening/night); that is, those time periods where the lowest 10th percentile background noise level might occur."*

Based on the above, a review of the monitoring data and output graphs for the seven identified monitoring locations was undertaken to determine the 'quieter' times for each affected assessment period. Once determined, any weather affected data outside of the 'quieter' times of each affected assessment period were kept and the RBLs were re-established.

Keeping the weather affected data would not affect the lowest 10th percentile, because the lowest 10th percentile has not changed and will remain the same. What this process does is allow more days to be considered as "valid" by not removing days where the number of excluded data samples exceed the allowable limit for the corresponding day, evening and/or night periods. So in the end there are at least 7 "valid" days of data.

The re-established RBLs for the majority of the identified monitoring locations were identical to the RBLs presented in **Table 2-5** for the three assessment periods. At Location L11, the re-established RBL for the night time assessment period was 1 dB(A) higher than the RBL presented in **Table 2-5**. Therefore, the use of the RBLs presented in **Table 2-5** would be conservative.

At Location L07, the re-established RBL for the night time assessment period was determined to be 3 dB(A) lower than the RBL presented in **Table 2-5**, i.e. the re-established night time RBL was determined to be 38 dB(A). Therefore, the re-established night time RBL has been used for Location L07.

Table 2-6 presents the RBLs previously presented in the EIS, and the re-analysed and re-established RBLs, which supersedes the EIS RBLs and have been used to re-establish construction noise management levels (NMLs) accordingly, as presented in **Section 3.1**.

Given that the noise monitoring data has been further reviewed and RBLs have been re-established based on the analysis procedures of Section B1.3 of the NPfI, the re-analysed and re-established RBLs presented in **Table 2-6** are valid and applicable.

Summaries of the daily background noise levels used to determine the re-established RBLs and the corresponding graphical recorded outputs (noise -vs- time graphs) from the 2018 long term noise monitoring at the monitoring locations listed are presented in **Appendix A**.

Table 2-6 Summary of final background noise monitoring results

ID	NCA	Address	RBL from EIS, dB(A)			Re-analysed & re-established RBL, dB(A)		
			Day[1]	Evening[2]	Night[3]	Day[1]	Evening[2]	Night[3]
L01	NCA01A	23 Cahill Close, Black Hill	54	53	45	56	53	47
L01A	NCA01B	24 Walter Parade, Black Hill [4]	44	43	35	46	43	37
L02	NCA03	54 Weakleys Drive, Beresfield	37	40	37	40	41	37
L03	NCA07	51 New England Highway, Tarro	53	51	46	53	49	45
L04	NCA04A	1/15 Quarter Sessions Road, Tarro	57	54	46	57	54	46
L04A	NCA04B	22 Lenox Street, Beresfield [4]	46	43	35	46	46	44
L05	NCA05A	11 Anderson Drive, Tarro	50	44	37	50	44	37
L05A	NCA05B	49 Beresford Avenue, Beresfield [4]	43	37	30	46	46	44
L06	NCA06	61 Redbill Drive, Woodberry	38	40	38	40	40	38
L07	NCA08	179 Old Maitland Road, Hexham	41	43	44	41	43	43[5]
L08	NCA09	838 Tomago Road, Tomago	53	52	47	53	53	46
L09	NCA14A	2213 Pacific Highway, Heatherbrae	53	49	41	52	49	41
L10	NCA14B	14 Elizabeth Avenue, Raymond Terrace	37	40	37	40	41	37
L10A	NCA14C	15 Brown Street, Raymond Terrace [4]	42	45	42	45	45	42
L11	NCA12	2264 Pacific Highway, Heatherbrae	63	52	43	62	52	42
L12	NCA13	53 Martens Avenue, Raymond Terrace	42	45	42	45	45	42

Notes:

1. Day: 7.00am to 6.00pm Monday to Saturday and 8.00am to 6.00pm Sundays & Public Holidays
2. Evening: 6.00pm to 10.00pm Monday to Sunday and Public Holidays
3. Night: 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays
4. Background noise levels for locations L01A, L04A, L05A, L10A and L12 based on correlation with nominated long term monitoring locations with similar noise environments
5. Night time RBL for Location L07 has been re-established based on Section B1.3 of the NPfI.

Traffic noise levels

Similarly, the traffic noise levels measured at the monitoring locations presented in **Table 2-2** were reviewed and periods affected by adverse weather conditions were excluded. Furthermore, any unusual extraneous events (e.g. spikes in levels in the data) identified were reviewed (e.g. through sound recordings) to determine the nature of the extraneous event. Where it was determined that the event was due to non-traffic noise (e.g. dogs barking, bird noise, etc), the data was excluded.

It is noted that more than seven consecutive days of traffic noise monitoring was conducted at each of the monitoring locations presented in **Table 2-2**. A review of the processed traffic noise data (i.e. after excluding for adverse weather and/or extraneous noise events) indicated that traffic noise was a feature at the monitoring locations and traffic noise levels during the excluded periods were typically similar to the corresponding non-excluded periods on other days. Therefore, the final traffic noise levels presented in the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) are considered valid.

The main purpose of the traffic noise monitoring results at each monitoring location was for the validation of the traffic noise model prepared for the project.

The validation process for each monitoring location was as follows:

1. Determine measured overall Day $L_{Aeq,15hr}$ and Night $L_{Aeq,9hr}$ traffic noise levels after excluding data affected by adverse weather (i.e. wind >5m/s and rain)
2. Review hourly traffic data obtained from the concurrent traffic surveys and exclude the periods of traffic data that correspond to the periods of excluded noise data identified in Step 1. The resulting traffic data would correspond to the exact periods where noise data is applicable
3. The existing road surfaces were confirmed to be dense graded asphalt (DGAC) and therefore, a pavement correction of 0 dB(A) was applied to the validation traffic noise model in accordance with Table 3 of the *Noise Model Validation Guideline*
4. Enter the established 'clean' traffic data into the validation noise model and model the Day $L_{Aeq,15hr}$ and Night $L_{Aeq,9hr}$ traffic noise levels
5. Compare the modelled Day $L_{Aeq,15hr}$ and Night $L_{Aeq,9hr}$ traffic noise levels to the monitored overall Day $L_{Aeq,15hr}$ and Night $L_{Aeq,9hr}$ traffic noise levels established in Step 1
6. Determine if the traffic noise model validates; that is, difference between modelled and monitored traffic noise levels are within ±2dB(A).

The above validation process was carried out for each of the traffic noise monitoring locations presented in **Table 2-2**. Therefore, the main purpose of the traffic noise monitoring, together with the concurrent traffic volume classification and speed surveys, was to assist in the noise model validation process.

Results of the noise model validation presented in Section 3.6.5 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) confirms that the traffic noise model prepared for the project was appropriate.

During stakeholder consultation carried out following the EIS exhibition, additional information was sought to confirm the suitability of the 2016 traffic noise monitoring data. The traffic noise levels obtained from the 2016 noise monitoring results were used for noise model validation purposes only and, given that traffic counting surveys were conducted concurrently with the noise monitoring, the noise model validation process and outcomes are valid.

As outlined in the Section 3.4.1 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b), the COVID-19 pandemic has dramatically impacted traffic volumes, making it impossible to collect more recent traffic noise data that would be representative of "typical" pre-pandemic periods.

In relation to the road fleet and land use in the area, the traffic volumes on the road are generally consistent and progressively growing over time across the network. The noise assessment has subsequently used the future traffic growth from the traffic modelling, to determine traffic noise impacts

from the proposed year of opening (2028) and 10 years after opening (2038), in accordance with the requirements of the NSW *Road Noise Policy* (RNP – Department of Environment, Climate Change and Water, 2011).

The impacts of growth through the project area are generally as a result of broader land use growth throughout the Hunter Region when considering the location of the project in the broader road network. To date, there have been no major land use changes in the project area that would materially change the traffic growth rates seen over time or the heavy vehicle fleet seen across the project area road network. Similarly, there have been no major developments that would result in changes to background noise levels, and generally the noise environment is still dominated by traffic noise and/or general industrial noise in each NCA.

To inform the traffic modelling, traffic surveys were carried out between 10 October 2016 and 23 October 2017 to gain an understanding of daily traffic volumes and traffic composition. It is noted that these traffic surveys were separate to those carried out concurrently with the traffic noise monitoring in March 2016.

2.2 Tomago Village Van Park

Section 4.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) provided details on noise sensitive receivers in each noise catchment area (NCA). For the operational noise assessment presented in the EIS, the Tomago Village Van Park located in NCA09 was not classified as a residential noise sensitive receiver as it was understood at the time that the caravan park did not accommodate permanent residents. However, the caravan park is now known as 'Sweetwater Grove' with permanent residents residing within the development. Therefore, the Sweetwater Grove development has been reclassified as a residential noise sensitive development and has been assessed for operational noise impacts accordingly.

It should be noted that it is currently unknown which buildings within the Sweetwater Grove development accommodate permanent residents. Therefore, for assessment purposes all buildings within the development have been considered as permanent residences and traffic noise impacts have been assessed accordingly. Detailed review and ground truthing should be undertaken during detailed design to identify which buildings are permanent residences and would qualify for at-property treatment.

Operational noise impacts on the noise sensitive receivers at the Sweetwater Grove development have been predicted with quieter pavement surfaces. As described in Section 6.3.1 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) and for the purpose of this assessment, the following quieter pavements for the sections of the project potentially impacting the Sweetwater Grove development have been considered:

- Low noise diamond grinding (LNDG) of the concrete pavements along sections of the main carriageways of the project, which would reduce the noise from the concrete pavement equivalent to that of DGA (i.e. 0 dB(A) pavement correction compared to +3 dB(A) pavement correction for concrete).

Detailed noise modelling results for the sensitive receivers within the Sweetwater Grove development and the assessment against the *Noise Criteria Guideline* (NCG – Roads and Maritime Services, 2015) requirements are provided in **Appendix B**.

The results for the number of receiver buildings within the Sweetwater Grove development impacted upon and triggered as qualifying for consideration of additional noise mitigation in accordance with the *Noise Mitigation Guideline* (NMG) (Roads and Maritime Services, 2015), for the design year 2038 due to the 'With project' scenario, are summarised in **Table 2-7**.

Based on the results presented in **Table 2-7**, 24 receiver buildings have been identified for consideration of additional noise mitigation and more than four identified receiver buildings are closely spaced. Receiver buildings identified are presented in **Appendix B.** In the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) no receivers were previously identified for additional noise mitigation.

A noise barrier along the main carriageways of the project has been investigated through the NMG barrier analysis to determine if it would be a reasonable and feasible noise mitigation options for the 24 receiver buildings. The NMG barrier analysis results for the proposed noise barrier are detailed in **Appendix B** and summarised in **Table 2-8**. The location of the proposed noise barrier is presented in **Figure 2-1**.

The results of the NMG noise barrier analysis indicate that a noise barrier is not a reasonable noise mitigation options as the existing roads (i.e. Pacific Highway and Tomago Road) not associated with the project are the mina contributors to the traffic noise impacts experienced at the affected receivers. Therefore, a noise barrier used to reduce traffic noise impacts from the project would not provide acoustic benefits to impacted receivers (i.e. no receivers would achieve a 2dB(A) benefit from a noise barrier). However, all of the residential receivers that have been triggered (i.2. 24 residential receiver buildings) for additional noise mitigation would be considered for at-property treatment.

Table 2-7 Number of receiver buildings within Sweetwater Grove impacted due to the project for design year 2038

NCA [1]	Total Number of receiver buildings assessed	Day period – number of receiver buildings				Night period – number of receiver buildings				Requiring consideration of additional noise mitigation [6]
		Exceed NCG noise criteria level [2]	> 2 dB(A) Increase and exceed NCG criteria [3,4]	Exceed cumulative noise limit	Experience acute noise levels (≥ 65 dB(A)) [5]	Exceed NCG noise criteria level [2]	> 2 dB(A) Increase and exceed NCG criteria [3,4]	Exceed cumulative noise limit	Experience acute noise levels (≥ 60 dB(A)) [5]	
NCA09	136	115	2	19	0	121	0	22	0	24

Notes:
1. Sweetwater Grove development located within NCA09
2. NCG noise criteria level based on 'New Road' criteria as established in EIS
3. Greater than 2 dB(A) increase based on comparison between 'With project' scenario and 'Do minimum' scenario for the design year 2038
4. Exceedance of NCG noise criteria AND increase of more than 2 dB(A) are required to be eligible for noise mitigation
5. Acute noise levels due to contribution from the project only
6. A receiver building qualifies for noise mitigation if it falls under any of the three NMG noise mitigation triggers (i.e. greater than 2 dB(A) increase, exceed cumulative or acute noise) or a multiple of triggers
7. An individual receiver building is considered as a single receiver for the purposes of this assessment; i.e. one double-storey residential building = one receiver building.

Table 2-8 Summary of NMG noise barrier analysis

Barrier ID	NMG noise barrier analysis						Alternative barrier height (metres) [2, 3]	Comments
	Barrier considered	Approx. length (metres)	Design height (metres) [1]	Total number of benefitting receivers [2, 3]	Triggered receivers with no barrier [4]	Remaining triggered receivers with design barrier [3]		
NB.04	New	449	-	0	0	0	-	A noise barrier in this location would not provide acoustic benefits to impacted receivers as no receivers would achieve a 2dB(A) benefit from a noise barrier. The main contributors of traffic noise impacts at the affected receivers would be from non-project roads (i.e. Pacific Highway southwest of Tomago Road, and Tomago Road). Therefore, a noise barrier at this location is not reasonable.

Notes:

1. Calculated noise barrier height following the process described in Section 8 of the NMG without considering urban design, visual impacts and/or engineering constraints
2. Receiver considered to be benefitting if proposed noise barrier provides more than 2dB(A) reduction in noise compared to no noise barrier
3. Receiver counts based on receiver points, where a receiver point is representative of each habitable floor level of a residence. For example, a double storey residence would be represented by two receiver points
4. Only benefitting receivers that are also triggered for additional noise mitigation are considered

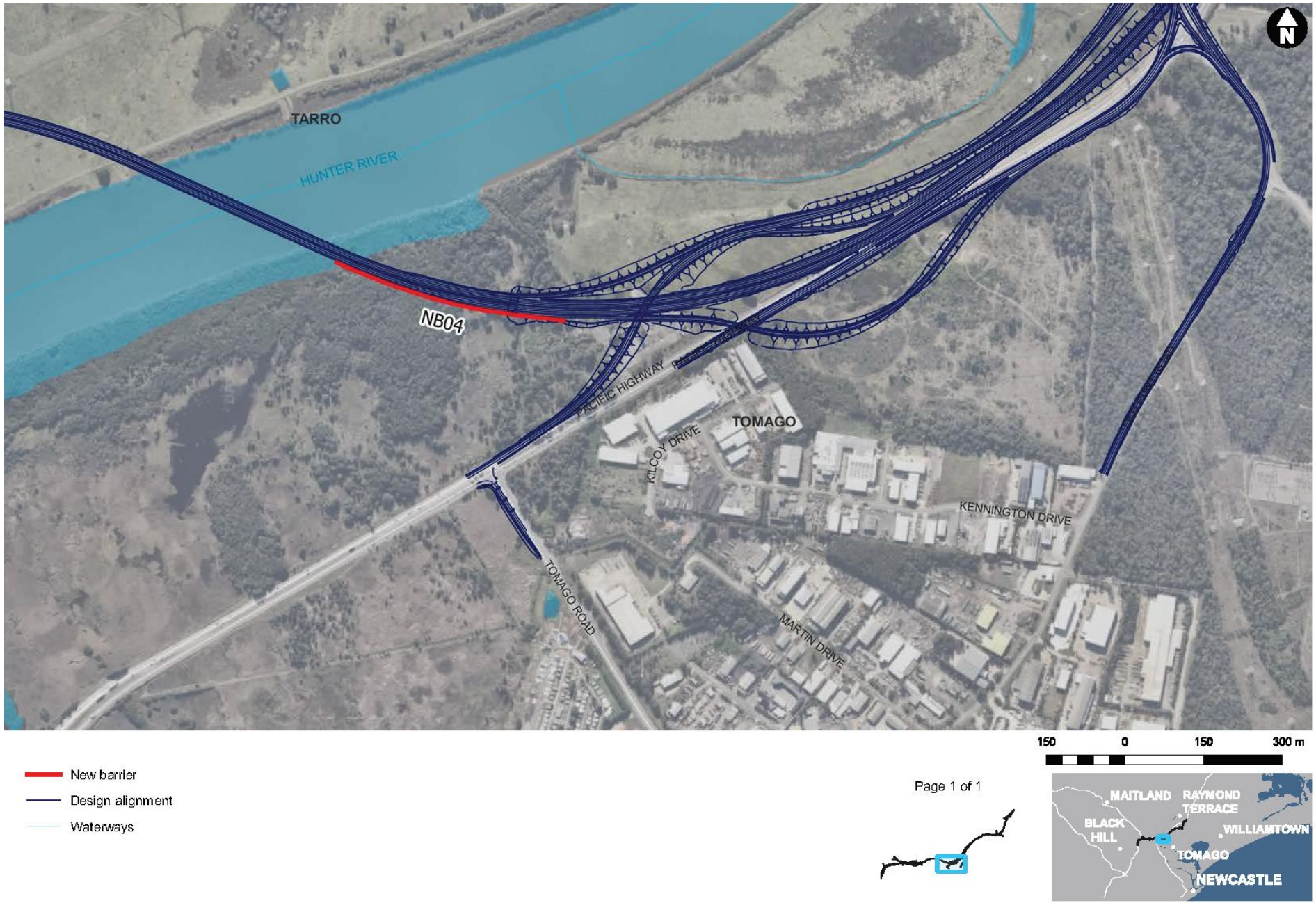

Figure 2-1 Proposed noise barrier in Tomago considered for NMG analysis

2.3 EIS Submissions

Eight of the 58 formal submissions received during the exhibition of the EIS, required further clarification on noise and vibration matters, presented in **Table 2-9.**

Table 2-9 Clarification provided based on EIS submission

Stakeholder	Issue	How addressed in this report
Public (SE-26397012)	Concerns were raised regarding the modelling of noise impacts from heavy vehicles (trucks) and their higher source noise levels compared to cars.	Noise from trucks have been considered in the noise prediction modelling as described in **Section 2.3.1** and **Section 2.3.4.**
Public (SE-26479251)	Concerns raised around construction noise impacts.	The property of concern is outside of the 940 metre construction study area identified in Section 3.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). Details on the design and implementation reasonable and feasible noise mitigation requirements are described in **Section 2.3.4**.
Public (SE-26495280)	Concerns raised around construction and operational traffic noise from the new bypass carriageways near Black Hill, and the design and implementation of noise barriers to mitigate traffic noise.	Construction noise impacts were assessed for the noise catchment areas in Black Hill in Section 5 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). The process in assessing construction noise to the Black Hill area is described in **Section 2.3.1**. The requirements for the assessment of operational traffic noise impacts due to the new bypass carriageways and the process in determining and designing noise barriers have been considered as described in **Section 2.3.1.**
Public (SE-26620425)	Concerns raised around construction and operational traffic noise from the project's connection to the M1 Pacific Motorway at Black Hill, and the design and implementation of noise barriers to mitigate traffic noise.	Construction noise impacts were assessed for the noise catchment areas in Black Hill in Section 5 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). The process in assessing construction noise to the Black Hill area is described in **Section 2.3.1**. The requirements for the assessment of operational traffic noise impacts due to the project's connection to the M1 Pacific Motorway and the process in determining and designing noise barriers have been considered as described in **Section 2.3.1**.

Stakeholder	Issue	How addressed in this report
Public (SE-26626011)	Concerns raised around operational traffic noise for residences in the Black Hill area and the design and implementation of noise barriers to mitigate traffic noise.	The requirements for the assessment of operational traffic noise impacts to residential receivers in the Black Hill area and the process in determining and designing noise barriers have been considered as described in **Section 2.3.1.**
NSW EPA (SE-26812009)	Concerns raised about: • Noise monitoring • Extended construction working hours • Out of hours construction work • Construction noise, vibration and blasting management and mitigation • Maximum noise level mitigation for operational road noise	Details for noise monitoring are provided in **Chapter 2.1**. Updates and further details on extended construction working hours and out of hours construction work are described in **Section 2.3.2** and **Section 2.3.3**. Detailed information for construction noise, vibration and blasting management and mitigation are described in **Section 2.3.4**. Further information on the mitigation of maximum noise levels is provided in **Section 2.3.5**.
Richmond Vale Rail Trail (SE-26814993)	Raised a suggestion that noise barriers and other mitigation measures be refined over time and be installed as soon as possible to mitigate noise impacts to residential and other (non-residential) sensitive receivers.	Details on the design and implementation reasonable and feasible noise mitigation requirements are described in **Section 2.3.4**.
Black Hill Environment Protection Group & Buttai Community Development Group (SE-26818593)	Raised a suggestion that noise barriers and other mitigation measures be refined over time and be installed as soon as possible.	Details on the design and implementation reasonable and feasible noise mitigation requirements are described in **Section 2.3.4**.

2.3.1 Black Hill noise impacts

Operational noise modelling of heavy vehicles

Section 3.6 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) discusses the noise modelling methodology and the use of a method developed by the United Kingdom Department of Environment entitled Calculation of Road Traffic Noise (1988) known as the 'CoRTN88 method'.

It is noted that the traffic noise model prepared for the project utilises the CoRTN88 method to predict traffic noise levels for free flowing traffic, including cars and trucks, and a modified method has further been incorporated in the model which enables an accurate prediction of noise from high truck exhausts. In addition, the noise modelling includes the prediction and assessment of operational traffic noise impacts to receivers up to 600 metres either side of the project roads.

In preparing the traffic noise model, traffic noise monitoring (see **Section 2.1**) and traffic surveys were conducted concurrently with the noise monitoring. In addition, traffic classification counts to confirm the breakdown of heavy vehicles during the surveys, were also collected. With the noise monitoring and traffic classification survey results, the noise model was validated to confirm that the prediction of traffic noise from cars and heavy vehicles at the sensitive receivers was accurately represented.

Therefore, noise from trucks during the day and night periods have been considered in the noise prediction modelling.

Construction noise impacts at Black Hill

Section 3.5 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) discusses the construction noise and vibration assessment methodology. Construction noise predictions are based on the ISO 9613 noise prediction algorithms which are incorporated into the Cadna-A computer noise modelling software used for this project. Construction noise was predicted to receivers within 940 metres either side of the project's construction footprint. Sensitive receivers within this study area have been assessed for construction noise impacts.

Noise sensitive receivers at Black Hill are located in Noise Catchment Areas NCA01A and NCA01b, as per Figure 4-1 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). Predicted noise impacts in these NCA's during construction are outlined in **Section 3.3**, which identifies that there are no expected exceedances of the NML in these areas during daytime (**Table 3-2**), daytime out-of-hours (**Table 3-3**) or evening (**Table 3-4**) periods.

Some night work is expected to be required within the existing M1 Pacific Motorway corridor to allow for work to be carried out safely where it is close to traffic. During night periods, there are anticipated to be minor exceedances to the NML's during certain activities, as outlined in **Table 3-5**.

Mitigation measures in accordance with the *Construction Noise and Vibration Guideline* (CNVG) (Roads and Maritime Services, 2016), as outlined in **Section 2.3.4** would be implemented for the project to reduce the impact of construction noise.

Additional noise monitoring would be carried out prior to construction to validate the Rating Background Levels adopted for the project during construction. Management measures relevant to noise and vibration for the project are provided in **Table 5-1**.

Operational noise impacts and mitigation

Section 2.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) lists the noise policies, guidelines and standards relevant to the assessment of operational traffic noise from the project. The NSW *Road Noise Policy* (RNP – Department of Environment, Climate Change and Water, 2011) presents the applicable traffic noise criteria to be used for the assessment, which includes a 'Relative Increase Criteria' (RIC). According to the RNP, the RIC are primarily intended to protect existing quiet areas from excessive changes in amenity due to traffic noise from a road project, which would apply to the existing rural residential receivers in Black Hill.

Furthermore, the NMG provides guidance in determining reasonable and feasible noise mitigation measures for receivers predicted to exceed the traffic noise criteria stipulated in the RNP, including the RIC. Section 6.3 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) presents the reasonable and feasible noise mitigation outcomes determined in accordance with the NMG, which takes into consideration the existing rural-residential setting for receivers within the Black Hill area. The reasonable and feasible noise mitigation measures that would be implemented for the project will be refined and finalised during the detailed design phase of the project. Where possible, the final noise mitigation measures will be implemented in the early stages of the construction of the project, which would further assist in reducing construction noise impacts.

Noise mitigation in the form of noise barriers were considered and the final recommended noise barriers were presented in Section 6.3.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). In addition to the previously recommended noise barriers, this report further investigates the reasonableness and feasibility of increasing the height of a relocated barrier due to the design change related to the extension of the southbound entry ramp merge lane onto the M1 Pacific Motorway southbound carriageway in Black Hill. Results of the investigation are presented in **Section 4.1**.

Although in some sections of the project noise barriers would provide visual benefits, it was determined that the required minimum noise benefits could not be achieved, and the implementation of a noise barrier was not considered reasonable. Existing noise barriers located along the M1 Pacific Motorway which are outside of the project's extent would not be considered under the project's design; rather, these barriers would fall under the NSW Noise Abatement Program. It is noted that thick vegetation would provide minimal or no noise benefits, only visual benefits. Also, acoustically there are no benefits in using concrete versus timber as noise wall materials as both materials would shield / block the noise sufficiently and any noise experienced at a receiver would be noise travelling / diffracted over the noise wall.

2.3.2 Proposed extended construction work hours

Submissions received from the NSW EPA did not support the proposed extended construction work hours nominated in Section 3.5.3 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). In response to the NSW EPA submissions, the proposed extended construction work hours have been updated / reduced and details are provided in this section.

The proposed extended construction work hours, which have been reduced compared to those nominated in the EIS, include an extra hour at the start of each day from Monday to Saturday and an extra four hours at the end of Saturday, as shown in **Table 2-10**. Based on the updated extended construction work hours, no work is anticipated to occur during the previously nominated shoulder periods. The extended construction work hours would apply across the project.

Table 2-11 presents a summary of the updated proposed construction hours, based on an approved 'extended hours' project scenario.

Table 2-10 Extended construction work hours

Day	Start time	Finish time	Construction activities during extended hours
Monday to Friday	6.00am	6.00pm	• 6am to 7am: construction activities (e.g. toolbox meetings, preparation of equipment) that do not result in noise levels above the relevant construction noise management level at the nearest affected residential receiver • 7am to 6pm: general construction activities
Saturday	7.00am	5.00pm	General construction activities
Sunday and public holidays	No extended hours proposed		Nil

Table 2-11 Standard and updated extended construction hours and out-of-hours work periods under an approved ‘extended hours’ project scenario

Hour commencing	12 am	1 am	2 am	3 am	4 am	5 am	6 am	7 am	8 am	9 am	10 am	11 am	12 pm	1 pm	2 pm	3 pm	4 pm	5 pm	6 pm	7 pm	8 pm	9 pm	10 pm	11 pm
Monday																								
Tuesday																								
Wednesday																								
Thursday																								
Friday																								
Saturday																								
Sunday																								
Public Holiday																								

Key: ☐ Standard construction hours ■ Extended construction hours ■ Out-of-hours work (day) ■ Out-of-hours work (evening) ■ Out-of-hours work (night)

The ICNG recognises there are some situations where construction work may need to be carried out outside of the recommended standard construction hours. This includes public infrastructure works that shorten the length of the project and are supported by the affected community.

As outlined in **Section 3.3** and presented in **Table 3-3**, construction noise during the extra four hours at the end of Saturday (i.e. daytime out-of-hours) is predicted to have similar impacts to those during standard working hours. Construction noise during the extended hours are typically less than the NML or just noticeable (i.e. <5dB above NML) for most construction activities and at NCAs where receivers are well removed from the construction works.

To justify the extended working hours, the following have been considered:

- An overall construction period reduction of three to six months
- To ensure the health and safety of the public and construction crews during construction
- To minimise disruption to existing traffic flows during the day
- To allow workers to arrive on site and carry out safety inductions and inspections prior to general construction activities commencing at 7am
- Majority of construction work would be away from sensitive receivers.

In addition, the benefits of extended working hours would include the following:

- Reducing the volume of traffic on roads during peak hours due to construction staff and construction vehicles travelling to and from the construction site outside of peak traffic periods
- Less disruption to sensitive receivers, the community, local business, motorists, pedestrians and cyclists as work would be completed earlier than currently planned
- Enable greater flexibility in project scheduling. This would enable the contractor to make allowances for adverse weather and potential flooding events.

The proposed extended construction hours would apply to normal construction activities. If required, blasting would only be carried out during the recommended ICNG standard construction hours.

2.3.3 Out-of-hours work

To ensure the health and safety of the public and construction crews and to minimise disruption to existing traffic flows, some construction activities would need to be carried out outside of standard working hours and extended construction hours. These construction activities would be carried out during evening and night time periods, defined as ‘out-of-hours work’. Out-of-hours work would be implemented with strategies to safely complete works alongside reduced traffic volumes. The activities that may need to be carried out during out-of-hours and relevant justifications are provided in **Table 2-12**.

Table 2-12 Justification for out-of-hour activities

Out-of-hours activity	Justification
Delivery of oversized plant and materials	Delivery of oversize and/or overmass equipment and materials to construction sites could occur after hours for safety reasons and to avoid disruptions and increase of heavy vehicles on the existing road network during peak volume. Such activities would be carried out in line with NSW Police, NSW Traffic Management Centre and Transport for NSW requirements.
Installation of temporary traffic management controls and carrying out revised temporary traffic arrangements (traffic switches, etc) on existing roads	Upgrades to existing roads and provision for construction site accesses requires installation of traffic management controls such as signage and concrete barriers. These activities require works on major and local roads. As such, these activities must occur out-of-hours when traffic volumes are lower, to protect the health and safety of the public and construction crews and to minimise disruption to existing traffic flows. This work would be carried out in accordance with Transport for NSW and local council requirements.

Out-of-hours activity	Justification
Utility modifications, relocations and protection	Some utilities are located adjacent to or across major and local roads requiring lane closures, and therefore would be completed out-of-hours when traffic volumes are lower, to protect the health and safety of the public and construction crews, and to minimise disruption to existing traffic flows. For some utilities, work is only permitted during a shutdown period coordinated with the utility authority. Where the utility authority only allows works to be carried out during a shutdown period, works would be coordinated with the utility authority and may occur out-of-hours. Generally, this occurs only when cutovers of new utilities are required in order to minimise impacts to nearby residents of disruptions to water, power, sewer, gas and telecommunications services.
Operation of concrete and asphalt batching plants within ancillary facilities	Concrete and asphalt batching plants would be required to support out-of-hours works and project construction.
Construction work interfacing with the M1 Pacific Motorway, New England Highway and the Pacific Highway, including construction of noise walls, overbridge piers for the M1 Pacific Motorway entry and exit ramps, ramp tie-ins with the M1 Pacific Motorway and State Roads, cross drainage below existing roads, pavement, surfacing, line markings, kerbs and traffic islands, traffic signs and signals	This work would require lane closures or traffic switches and, in some cases, total closure of roads with temporary detours in place. Completing or installing these items at night when traffic flows are low would minimise disruption to National Land Transport Networks and other traffic and minimise any potential safety conflict between construction personnel and traffic. Such activities would be carried out in accordance with NSW Traffic Management Centre and Transport for NSW requirements.
Bridge construction and associated work over the Main North Rail Line and existing roads (including establishing temporary protection work, installation of girders, sealing of joints, establishing temporary screens to enable construction to continue on the deck, and removal of temporary work)	For bridge construction that can be carried out offline of the existing road network, construction can be carried out during normal working hours. Where bridge construction is required over the existing road network, activities would be carried out as out-of-hours work to ensure health and safety of public and construction workers, and to minimise disruption to motorists. Where bridge construction is required over the existing rail network, activities be carried out during a rail shutdown, coordinated with the rail authority. The shutdowns typically occur four times per year over a continuous 48-72 hour period. Out-of-hour work would be required during these shutdowns to enable all required work to be completed prior to the rail network becoming operational again. For the bridge over Hunter Region Botanic Gardens access road (B09), the access road would need to be closed for lifting of the girders. As the Gardens is only open during normal working hours, there is not expected to be any issues with closing the road out-of-hours. Any closures would be managed in consultation with Hunter Region Botanic Gardens.
Any work that does not cause noise emissions to be audible at any sensitive receiver	In locations where sensitive receivers are not susceptible to noise emissions, out-of-hours work would result in schedule benefits, flexibility in regard to programming of work around the various constraints of the project, such as capitalising on dry periods and thereby maximising construction on the floodplain and reducing the impact to the existing road network by carrying out additional work during out-of-hours.

Out-of-hours activity	Justification
Emergency work to avoid the loss of lives, property and/or to prevent environmental harm.	To protect the health and safety of the public and construction crews any emergency work should be carried immediately which may include out-of-hours.

Out-of-hours construction activities would be supported by out-of-hours operation of ancillary facilities. The exact timing of out-of-hours work would depend on construction activities, construction techniques and constraints imposed by the relevant authorities (utility authorities or road/motorway operators) and would be subject to the requirements of the construction contractor.

The periods in which the construction works are expected to be carried out are shown in **Table 2-14**. At this early stage of the project, out-of-hours work have been assumed for a number of construction scenarios, with the anticipated duration of each activity also provided in the table, noting that noisy activities would not occur at full capacity for the entire duration and would not be carried out every day.

Furthermore, given that most of the construction works are outside of the existing road and rail networks and operational assets (e.g. utilities), out-of-hours work would usually be required only when construction works are to interface with the networks and assets.

Extended and out-of-hours work would be managed through the implementation of a Construction Noise and Vibration Management Plan (as per management measure NV01 in the EIS).

The project has been broken into sections to describe the nature of construction work, quantity of expected out of hours work and estimated construction program:

- **S1 – Black Hill interchange and cutting**
  - Indicative 40 shifts of Out of Hours night work to occur during construction affecting NCA01A, NCA01B, NCA02, NCA04A and NCA07 in this part of the project. Works consisting primarily of traffic management, utility works, asphalt pavement and finishing work. Work associated with clearing, grubbing and demolition would primarily occur during standard construction hours; however, short intermittent periods of minor pavement demolition work would occur and would be targeted to occur during OOHW Period 1 (Evening).
- **S2 – Tarro interchange**
  - Indicative 180 shifts of out of hours night work to occur primarily associated with the upgrade of the New England Highway and construction of Tarro interchange and associated bridges. NCA04A, NCA04B, NCA05A, NCA05B and NCA07 potentially affected by the construction works.
  - Where possible, upgrade work to the New England Highway would occur during standard construction hours however where lane closures or traffic detours are required the work would be performed outside standard construction hours.
- **S3 – Viaduct**
  - Indicative 15 Out of Hours night work for bridgework over railway and New England Highway. NCA05A, NCA06, NCA07, NCA08 and NCA09 potentially affected by the construction works.
- **S4 – Tomago interchange**
  - Out of hours night work would be required at Tomago interchange, associated with utility works, traffic management and pavement. However, this work would typically be carried out in NCA10 and NCA11 where there are no sensitive residential receivers located.

- **S5 – Heatherbrae bypass and Raymond Terrace interchange**
  - Out of hours night work would be required at Raymond Terrace interchange, associated with utility work, traffic management and pavement. A small number of sensitive residential receivers in NCA13, NCA14A and NCA14B would be potentially affected however the majority of receivers in these NCA's are located at least 500 metres from the project. Industrial and commercial receivers in NCA12 and NCA14A would also be affected.

Construction work program

Construction of the project is expected to start in 2023, with completion expected in 2028, subject to funding and approval. The indicative construction program for the project, as presented in Table 3-24 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) has been expanded to show the major construction works area of the project and the anticipated duration for each construction scenario in each major works area. The updated indicative construction program is presented in **Table 2-13**.

Table 2-13 Indicative construction program

Scenario	2023				2024				2025				2026			2027					2028	
	Q				Q				Q				Q			Q					Q	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
S1 – Black Hill interchange and cutting																						
Pre-construction and site establishment																						
Ancillary facility (establishment)																						
Ancillary facility (operation)																						
Batch plant operation																						
Clearing, grubbing and demolition																						
Utility works																						
Bulk earthworks (cuttings)																						
Blasting (if required)																						
Bulk earthworks (fill)																						
Concrete pavement (including pavement drainage)																						
Asphalt pavement (including pavement drainage)																						
Piling for bridges and bridge approaches																						
Bridge work (excluding piling)																						
Roadside furniture and finishing work																						
S2 – Tarro interchange																						
Pre-construction and site establishment																						

Scenario	2023				2024				2025				2026				2027					2028	
	Q				Q				Q				Q				Q					Q	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	1	2
Ancillary facility (establishment)																							
Ancillary facility (operation)																							
Clearing, grubbing and demolition																							
Bulk earthworks (fill)																							
Concrete pavement (including pavement drainage)																							
Asphalt pavement (including pavement drainage)																							
Piling for bridges and bridge approaches																							
Bridge work (excluding piling)																							
Roadside furniture and finishing work																							
S3 – Viaduct																							
Pre-construction and site establishment																							
Ancillary facility (establishment)																							
Ancillary facility (operation)																							
Batch plant operation																							
Utility works																							
Piling for bridges and bridge approaches																							
Bridge work (excluding piling)																							
Roadside furniture and finishing work																							
S4 – Tomago interchange																							
Pre-construction and site establishment																							
Ancillary facility (establishment)																							
Ancillary facility (operation)																							
Batch plant operation																							
Clearing, grubbing and demolition																							
Utility works																							
Bulk earthworks (cuttings)																							

Scenario	2023				2024				2025				2026			2027				2028	
	Q				Q				Q				Q			Q				Q	
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
Bulk earthworks (fill)																						
Concrete pavement (including pavement drainage)																						
Asphalt pavement (including pavement drainage)																						
Piling for bridges and bridge approaches																						
Bridge work (excluding piling)																						
Roadside furniture and finishing work																						
S5 – Heatherbrae bypass and Raymond Terrace interchange																						
Pre-construction and site establishment																						
Ancillary facility (establishment)																						
Ancillary facility (operation)																						
Batch plant operation																						
Clearing, grubbing and demolition																						
Utility works																						
Bulk earthworks (cuttings)																						
Bulk earthworks (fill)																						
Concrete pavement (including pavement drainage)																						
Piling for bridges and bridge approaches																						
Bridge work (excluding piling)																						
Roadside furniture and finishing work																						

Based on the proposed construction scenarios, construction work hours (standard, extended and out-of-hours) and construction program, indicative details of the construction work are shown in **Table 2-14**, which is an update of Table 3-25 presented in the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). **Table 2-14** includes updates to the indicative duration where now it represents the duration experienced by receivers in each NCA and not the total duration for the project, and anticipated work periods have been updated for some construction scenarios.

In accordance with **Table 2-12**, out of hours work may also be undertaken where that work does not cause noise emissions to be audible at any sensitive receiver.

Table 2-14 Construction scenarios, indicative work durations and periods

ID	Scenario	Indicative duration (months)[1]	Work period			Comments
			Day	Evening	Night	
1	Pre-construction and site establishment	4				Out of hours work associated with installing temporary traffic management devices and adjustments line marking. This work would occur along the M1 Pacific Motorway at Black Hill, New England Highway at Tarro, and Pacific Highway at Tomago and Heatherbrae.
2	Ancillary facility (establishment)	2		–	–	Undertaken during day period.
3	Ancillary facility (operation)	55				The operation of some ancillary facilities would include out of hours work to support justified out of hours construction activities.
4	Batch plant operation	40				On site batch plants would provide bridge, pavement and general concrete needs during construction, including supporting justified out of hours work.
5	Clearing, grubbing and demolition	4		–	–	Undertaken during day period.
6	Utility works	18				Out of hours work limited to utility work associated with the existing road network and shutdowns for work on operational assets.
7	Bulk earthworks (cuttings)	9		–	–	Undertaken during day period.
8	Blasting	3		–	–	Undertaken during day period.
9	Bulk earthworks (fill)	32		–	–	Undertaken during day period.
10	Mainline concrete pavement (including pavement drainage)	12		–	–	Undertaken during day period.
11	Asphalt pavement (including pavement drainage)	12				Out of hours work limited to widening and tie-in to existing road network or infrequent out of hours work periods for extended asphalt laying.
12	Bridge work (excluding piling)	26				Infrequent out of hours work for extended concrete pours, or where bridge work is not audible to nearby sensitive receivers (e.g. floodplain and river bridge construction).

ID	Scenario	Indicative duration (months)[1]	Work period			Comments
			Day	Evening	Night	
13	Piling for bridges and bridge approaches	10		–	–	Undertaken during day period.
14	Roadside furniture and finishing work	28				Out of hours works limited to where work is required to be carried out on existing road network.
15	Traffic management and control	48				Traffic management and control for all out of hours work on existing road network.
16	Landscaping	8		–	–	Undertaken during day period.
17	Cross drainage	12				Out of hours work limited to installation of cross drainage beneath the existing road network.

Notes: 1. Indicative duration of work experienced by receivers in each NCA, where identified in **Table 2-13**

2.3.4 Construction noise and vibration mitigation measures

Responses were received in the public submissions regarding construction noise and vibration mitigation measures presented in the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b).

This section presents further information on construction noise and vibration mitigation measures to be considered during the construction of the project, including both standard measures in accordance with the guidelines and specific noise mitigation measures such as noise screens, construction programming and early installation of operational traffic noise mitigation.

Standard construction noise and vibration mitigation measures

Noise mitigation measures in accordance with the *Construction Noise and Vibration Guideline* (CNVG) (Roads and Maritime Services, 2016) would be implemented for the project, where applicable. Appendix B of the CNVG presents the standard noise and vibration mitigation measures, identifying potentially feasible and reasonable construction noise and vibration mitigation and management measures, which are reproduced in **Table 2-15** below.

The CNVMP to be prepared during detailed design would document in more detail how all mitigation and management measures are to be implemented. Mitigation and management measures would be confirmed during detailed design, and appropriate measures would be finalised when preparing site specific construction noise and vibration impact statements (CNVIS).

Table 2-15 CNVG recommended standard mitigation measures

Action required	Applies to	Details
Management measures		
Implementation of any project specific mitigation measures required	Airborne noise	Implementation of any project specific mitigation measures required, as per Chapter 8 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b).
Implement community consultation or notification measures	Airborne noise Ground-borne noise & vibration	Community engagement and consultation will occur prior to and during construction of the project. Notification will include detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night time period, any operational noise benefits from the works (where applicable) and contact telephone number. Notification will be provided within a sufficient timeframe prior to the start of works through the following: • Website (If required) • Contact telephone number for community • Email distribution list (if required) • Community drop in session (if required by approval conditions).
Site inductions	Airborne noise Ground-borne noise & vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • All project specific and relevant standard noise and vibration mitigation measures • Relevant licence and approval conditions • Permissible hours of work • Any limitations on Peak noise generating activities • Location of nearest sensitive receivers • Construction employee parking areas • Designated loading/unloading areas and procedures • Site opening/closing times (including deliveries) • Environmental incident procedures.

Action required	Applies to	Details
Behavioural practices	Airborne noise	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Verification	Airborne noise Ground-borne noise & vibration	Where specified under Appendix C of the CNVG, a noise verification program is to be carried out for the duration of the works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions.
Attended vibration measurements	Ground-borne vibration	Where required, attended vibration measurements would be carried out at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.
Update Construction Environmental Management Plans	Airborne noise Ground-borne noise & vibration	The construction environment management plan (CEMP) must be regularly updated to account for changes in noise and vibration management issues and strategies.
Building condition surveys	Vibration	Where required, undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage.
Source controls		
Construction hours and scheduling	Airborne noise Ground-borne noise & vibration	Where feasible and reasonable, construction will be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels will be scheduled during less sensitive time periods.
Construction respite period during normal hours and out-of-hours work	Ground-borne noise & vibration Airborne noise	See **Table 2-16** for details on the following respite measures: • Respite Offers (RO) • Respite Period 1 (R1) • Respite Period 2 (R2) • Duration Respite (DR)
Equipment selection	Airborne noise Ground-borne noise & vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits. Ensure plant including any silencers are well maintained.
Plant noise levels	Airborne-noise	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix H of the CNVG. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturer's specifications or Appendix H of the CNVG.
Rental plant and equipment.	Airborne-noise	The noise levels of plant and equipment items are to be considered in rental decisions should be checked against the noise management levels.

Action required	Applies to	Details
Use and siting of plant.	Airborne-noise	The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.
Plan worksites and activities to minimise noise and vibration.	Airborne noise Ground-borne vibration	Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noisy activities should be scheduled for standard working hours. If the work cannot be carried out during the day, it should be completed before 11:00 pm. Where practicable, work should be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters. If programmed night work is postponed, the work should be re-programmed and the approaches in this section apply again.
Reduced equipment power	Airborne noise Ground-borne vibration	Use only the necessary size and power.
Non-tonal and ambient sensitive reversing alarms	Airborne noise	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work. Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.
Minimise disturbance arising from delivery of goods to construction sites.	Airborne noise	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Avoid or minimise out of hours movements where possible.
Blasting regime	Airborne noise Ground-borne vibration	The noise and vibration impacts of blasting operations can be minimised by: • Choosing the appropriate blast charge configurations • Ensuring appropriate blast-hole preparation • Optimising blast design, location, orientation and spacing • Selecting appropriate blast times, and • Utilising knowledge of prevailing meteorological conditions.

Action required	Applies to	Details
Engine compression brakes	Construction vehicles	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
Path controls		
Shield stationary noise sources such as pumps, compressors, fans etc.	Airborne noise	Stationary noise sources would be enclosed or shielded where feasible and reasonable while ensuring that the occupational health and safety of workers is maintained. Appendix D of AS 2436:2010 lists materials suitable for shielding.
Shield sensitive receivers from noisy activities.	Airborne noise	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.
Receptor control		
Structural surveys and vibration monitoring	Ground-borne vibration	Pre-construction surveys of the structural integrity of vibration sensitive buildings may be warranted. At locations where there are high-risk receptors, vibration monitoring should be conducted during the activities causing vibration.
See **Table** 2-16 for additional measures	Airborne noise Ground-borne vibration	In some instances, additional mitigation measures may be required.

Additional construction noise mitigation measures

Following the implementation of all reasonable and feasible mitigation measures, it is not always possible for the noise impacts to achieve the recommended NMLs or vibration criteria for all impacted receivers. Where this is the case, Appendix C of the CNVG provides details of additional mitigation measures that would be implemented to manage the noise and vibration impacts from the project. These additional mitigation measures are shown in **Table 2-16**.

Table 2-16 CNVG additional mitigation measures

Additional mitigation measure	Details
Notification (letterbox drop or equivalent)	Advanced warning of works and potential disruptions can assist in reducing the impact on the community. The notification may consist of a letterbox drop (or equivalent) detailing work activities, time periods over which these will occur, impacts and mitigation measures. Notification should be a minimum of five working days prior to the start of works.
Specific notifications (SN)	Specific notifications are letterbox dropped (or equivalent) to identified stakeholders no later than seven calendar days ahead of construction activities that are likely to exceed the noise objectives. The specific notification provides additional information when relevant and informative to more highly affected receivers than covered in general letterbox drops.
Phone calls (PC)	Phone calls detailing relevant information made to affected stakeholders within seven calendar days of proposed work. Phone calls provide affected stakeholders with personalised contact and tailored advice, with the opportunity to provide comments on the proposed work and specific needs.
Individual briefings (IB)	Individual briefings are used to inform stakeholders about the impacts of high noise activities and mitigation measures that will be implemented. Project representatives will visit identified stakeholders at least 48 hours ahead of potentially disturbing construction activities. Individual briefings provide affected stakeholders with personalised contact and tailored advice, with the opportunity to comment on the project.
Respite offers (RO)	Respite offers will be considered where there are high noise and vibration generating activities near receivers. As a guide, work will be carried out in continuous blocks that do not exceed three hours each, with a minimum respite period of one hour between each block. The actual duration of each block of work and respite will be flexible to accommodate the usage of and amenity at nearby receivers. The purpose of such an offer is to provide residents with respite from an ongoing impact. This measure is evaluated on a project-by-project basis and may not be applicable to all projects.
Respite period 1 (R1)	Out of hours construction noise in ‘out of hours period 1’ will be limited to no more than three consecutive evenings per week except where there is a duration respite. For night work these periods of work will be separated by not less than one week and no more than six evenings per month.
Respite period 2 (R2)	Night time construction noise in ‘out of hours period 2’ will be limited to two consecutive nights except for where there is a duration respite. For night work these periods of work will be separated by not less than one week and six nights per month. Where possible, high noise generating works shall be completed before 11 pm.
Duration respite (DR)	Respite offers and respite periods 1 and 2 may be counterproductive in reducing the impact on the community for longer duration projects. In this instance and where it can be strongly justified it may be beneficial to increase the work duration, number of evenings or nights worked through duration respite so that the project can be completed more quickly. The project team will engage with the community where noise levels are expected to exceed the NML to demonstrate support for duration respite.
Alternative accommodation (AA)	Alternative accommodation may be offered to residents living in close proximity to construction works that are likely to experience highly intrusive noise levels. The specifics of the offer will be identified on a project-by-project basis. Additional aspects for consideration shall include whether the highly intrusive activities occur throughout the night or before midnight.
Verification (V)	Verification of construction noise and vibration levels will occur to ensure the actual impacts are consistent with the predicted levels. Appendix F of the CNVG contains further details about verification of Noise and Vibration levels as part of routine checks of noise levels or following reasonable complaints.

The additional mitigation measures reference tables from Appendix C of the CNVG are presented in **Table 2-17**, identifying the mitigation measures that are recommended for various noise or vibration exceedances.

Table 2-17 Triggers for additional noise mitigation measures

Predicted $L_{Aeq(15minute)}$ airborne noise level at receiver			Additional mitigation measures type[1]	Noise level at which additional mitigation measures are applicable
Perception	**dB(A) above RBL**	**dB(A) above NML**		
All hours				
75 dB(A) or greater (highly noise affected)			N, V, PC, RO	HNA
Standard hours: Mon – Fri (7am – 6pm), Sat (8am – 1pm), Sun/Public Holiday (Nil)				
Noticeable	5 to 10	0	-	NML
Clearly Audible	10 to 20	<10	-	NML
Moderately Intrusive	20 to 30	10 to 20	N, V	NML+10
Highly Intrusive	>30	>20	N, V	NML+20
OOHW Period 1: Mon – Fri (6 pm – 10 pm), Sat (7 am – 8 am & 1 pm – 10 pm), Sun/Public Holiday (8 am – 6 pm)				
Noticeable	5 to 10	<5	-	NML
Clearly Audible	10 to 20	5 to 15	N, R1, DR	NML+5
Moderately Intrusive	20 to 30	15 to 25	V, N, R1, DR	NML+15
Highly Intrusive	>30	>25	V, IB, N, R1, DR, PC, SN	NML+25
OOHW Period 2: Mon – Fri (10 pm – 7 am), Sat (10 pm – 8 am), Sun/Public Holiday (6 pm – 7 am)				
Noticeable	5 to 10	<5	N	NML
Clearly Audible	10 to 20	5 to 15	V, N, R2, DR	NML+5
Moderately Intrusive	20 to 30	15 to 25	V, IB, N, PC, SN, R2, DR	NML+15
Highly Intrusive	>30	>25	AA, V, IB, N, PC, SN, R2, DR	NML+25

Notes:
1. The additional mitigation measures have used the following abbreviations: AA = Alternative Accommodation, RO = Respite offer, R1 = Respite Period 1, R2 = Respite Period 2, DR = Duration Respite, V = Verification, PC = Phone calls, IB = Individual briefings, SN = Specific notifications, N = Notification, HA = Highly Affected (> 75 dB(A) - applies to residences only).
2. Table from Table C.1 of the CNVG.

The requirement for additional mitigation measures for airborne noise impacts would be determined during later stages of the project when specific information and details regarding the construction works is known.

The potential impacts from construction works, particularly where evening or night-time works are required, will be assessed as part of the CNVISs before any works begin. These CNVISs provide a detailed assessment of the potential impacts and define the site-specific environmental management measures to be used to control the construction noise and vibration impacts.

Additional construction vibration mitigation measures

Where applicable **Table 2-18** below, reproduced from Appendix C of the CNVG, would be used to determine the appropriate additional vibration mitigation measures.

Table 2-18 Triggers for additional vibration mitigation measures

Predicted vibration level at receiver	Additional mitigation measures type	
Perception	**Type[1]**	**Apply to[2]**
Standard hours: Mon – Fri (7am – 6pm), Sat (8am – 1pm), Sun/Public Holiday (Nil)		
Predicted vibration exceeds maximum levels for human comfort	V, N, RP	All
OOHW Period 1: Mon – Fri (6 pm – 10 pm), Sat (7 am – 8 am & 1 pm – 10 pm), Sun/Public Holiday (8 am – 6 pm)		
Predicted vibration exceeds maximum levels for human comfort	V, IB. N, RO, PC, RP, SN	All
OOHW Period 2: Mon – Fri (10 pm – 7 am), Sat (10 pm – 8 am), Sun/Public Holiday (6 pm – 7 am)		
Predicted vibration exceeds maximum levels for human comfort	AA, V, IB. N, PC, RP, SN	All

Notes: 1. The additional mitigation measures have used the following abbreviations:
AA = Alternative Accommodation, V = Validation of predicted level, PC = Phone calls, IB = Individual briefings, SN = Specific notifications, N = Notification drops, RP = Respite Period
2. All affected receivers
3. Table from Appendix C3 of the Roads and Maritime CNVG.

Specific noise mitigation measures

In addition to the standard noise mitigation measures outlined above, a range of specific noise mitigation measures may be considered for the proposed construction works. These should be reviewed and incorporated where reasonable and feasible as part of the CNVMP.

Noise screens

Temporary noise screens will be considered for construction works predicted to be moderately intrusive to highly intrusive, where feasible and reasonable. The screens should be located as close as practicable to the work area to provide shielding of the plant / construction works to sensitive receivers. These can be in the form of temporary screens installed for the period of the works, or mobile acoustic screens which move along with the noise generating plant.

In addition, noise screens in the form of hoarding around ancillary sites should be considered where reasonable and feasible and where an ancillary site is close to sensitive receivers. In particular, ancillary facilities AS4 and AS3b should consider the use of noise screens / hoarding to aid in mitigating noise impacts to residential receivers in Tarro.

Temporary noise screens can provide 5 to 10 dB noise reduction but only where they can break line of sight between the noise source and the impacted receiver.

Construction programming

Some construction works associated with the project cover large areas. Receivers at one end of the construction works area might not be noise impacted while works are carried out at the other end of the works area. For example, works undertaken for the Tarro interchange and near receivers at the eastern end of NCA4A would not impact receivers at the western end of the same NCA.

Therefore, where possible scheduling of works within an overall works area would be beneficial for NCAs in Black Hill, Tarro, Tomago and Heatherbrae, and will be considered to allow the management of respite to noise affected receivers.

Limiting the timing of noise intensive works

Where out of hours work is required and justified, it may be feasible and reasonable to program higher noise impact works during the parts of the out of hours work period when ambient noise levels are higher. For example, where feasible and reasonable, higher noise impact works should

be programmed to occur in the evening period and lower noise impact works to occur in the night period.

Early installation of operational traffic noise mitigation

Early installation of noise mitigation measures required for operational traffic noise from the project would assist in reducing the impacts of noise during construction. For example, early installation of noise barriers identified in the detailed operational noise assessment would also provide mitigation of construction noise for the sensitive receivers located behind the noise barriers. It should be noted that the benefit of installing barriers early may be outweighed by the need to conduct that work during night periods (such as piling for the noise wall footings), because temporary traffic relocations required to undertake the work safely during the day period would occur later in the construction period due to staging constraints.

Additionally, early installation of at-property treatment for residential receivers identified as being eligible for at-property treatment would provide noise mitigation to those receivers, particularly during out of hours construction works.

Summary of benefits from specific noise mitigation measures

Table 2-19 presents a summary of the specific noise mitigation measures listed and which NCAs would experience noticeable benefits from these measures.

Table 2-19 NCAs benefitting from specific noise mitigation measures

NCA	Specific noise mitigation measures considered			
	Noise screens	Construction programming	Limiting timing of noise intensive works	Early installation of operational noise mitigation[1]
NCA01A	✓	✓	✓	✓
NCA01B	✓	✓	✓	-
NCA03	-	-	-	-
NCA04A	✓	✓	✓	✓
NCA04B	✓	✓	✓	✓
NCA05A	✓	✓	✓	✓
NCA05B	-	-	✓	✓
NCA06	-	-	-	-
NCA07	✓	✓	✓	✓
NCA08	✓	-	✓	-
NCA09	✓	✓	✓	✓
NCA012	✓	✓	✓	✓
NCA013	✓	✓	✓	✓
NCA014A	✓	✓	✓	✓
NCA014B	✓	-	✓	✓
NCA014C	✓	-	✓	-

Notes: 1. Operational noise mitigation measures include noise barriers and/or at-property treatment

2.3.5 Community consultation during construction

Detailed information regarding consultation with stakeholders and the community is provided in Section 6 of the *M1 Pacific Motorway extension to Raymond Terrace Environmental Impact Statement* (Transport for NSW 2021a). A draft Community Consultation Framework is also provided in Appendix E of the document.

Consultation with stakeholders and the community was carried out in 2004 and 2005 during the route selection stage, from 2014 to 2019 during the concept design and environment assessment stages of the project, and more recently during the public display of the EIS.

Consultation with stakeholders and the community is ongoing and will continue during the construction stages. As detailed in Section 6.4.2 of the *M1 Pacific Motorway extension to Raymond Terrace Environmental Impact Statement* (Transport for NSW 2021a), consultation with stakeholders and the community during construction (including detailed design) will focus on providing updates on activities and program, responding to enquiries and concerns in a timely manner, and minimising potential impacts where possible.

To manage complaints, a dedicated community relations team will handle and investigate complaints during delivery of the project. Procedures for managing complaints are detailed in Section 6.4.2 of the *M1 Pacific Motorway extension to Raymond Terrace Environmental Impact Statement* (Transport for NSW 2021a)

2.3.6 Maximum noise level mitigation

A submission from the NSW EPA requested further information regarding the mitigation of maximum (L_{Amax}) noise levels. Section 6.3 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) presents the noise mitigation options considered for L_{Aeq} traffic noise impacts, which would also provide mitigation benefits in reducing L_{Amax} noise levels.

The mitigation options presented, in order of preference, include:

- Road design
- Quieter pavement surfaces
- Noise barriers
- At-property treatment.

The project is typically located in semi-rural areas such as Black Hill, where there are a minimal number of residential receivers impacted. In more populated areas like Tarro, most residential receivers are currently highly impacted by traffic and/or rail noise.

Compared to the existing roads, the design of the project would lead to flat road grades and free flowing traffic at constant motorway speeds. With this in mind, occurrences of trucks accelerating and/or decelerating would be greatly reduced, which in turn reduces maximum noise level events.

Furthermore, the project has been designed to move traffic further away from noise sensitive residential receivers. This is the case for the areas of Tarro, Tomago and Heatherbrae. By moving the traffic (noise source) away from the sensitive receivers, noise levels including L_{Amax} levels would reduce. Also, with traffic using the new motorway, traffic volumes on the existing roads (i.e. New England Highway and Pacific Highway) would reduce and the number of maximum noise level events would also reduce. As a rule of thumb, where the distance between a noise source and receiver is doubled, a 3 dB(A) reduction in traffic noise would be experienced at the noise sensitive receiver.

Maximum noise levels experienced at sensitive residential receivers would typically be due to truck engines and truck exhausts during passby events. With this in mind, the use of quieter pavements would provide minimal benefits for L_{Amax} noise levels. However, the implementation of noise barriers would reduce L_{Amax} noise levels at the sensitive receivers, more so if line of sight to the noise source (i.e. truck engine and/or exhaust stack) is broken, which would typically provide a minimum of 5 dB(A) noise reduction at the sensitive receiver.

Table 6-5 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) presents details of the NMG noise barrier analysis to determine if the three noise barriers considered are reasonable and feasible options. From the table, the two barriers along the northern side of the New England Highway (NB.02 and NB.03) used to protect the residential receivers in the Tarro area are at heights of between 3.8 and 4 metres. Based on the height of truck exhaust stack outlets being typically 3.6 metres above the ground, the two barriers nominated would break line of sight between the noise source and the receivers. Therefore, the proposed noise barriers would provide maximum noise level reductions to the sensitive receivers in the Tarro area.

Where noise barriers are not reasonable and feasible or the proposed noise barriers do not provide enough noise benefits to reduce L_{Aeq} traffic noise levels, sensitive receivers have been identified for at-property treatment. At-property treatment would aid in further reducing noise impacts to internal areas of residential buildings. With this in mind, internal L_{Amax} noise levels within residential dwellings would also reduce.

3 Assessment of potential construction impacts

3.1 Construction noise management levels

As discussed in **Section 2.1**, RBLs have been re-established and as a result the construction noise management levels for residential receivers have also been re-established accordingly.

The re-established NMLs and sleep disturbance screening levels for residential receivers are presented in **Table 3-1**.

Table 3-1 Re-established NMLs and sleep disturbance screening levels for residential receivers

NCA[1]	Monitoring location	$L_{Aeq(15\ minute)}$ NML, dB(A)				Sleep disturbance screening level (RBL + 15dB)[6]
		Standard hours (RBL + 10dB)	Out-of-hours (RBL + 5dB)			
		Day[2]	Day[3]	Evening[4]	Night[5]	
NCA01A	L01	66	61	58	52	62
NCA01B	L01A	56	51	48	42	52
NCA03	L02	50	45	45[7]	42	52
NCA04A	L04	67	62	59	51	61
NCA04B	L04A	56	51	51	49	59
NCA05A	L05	60	55	49	42	52
NCA05B	L05A	56	51	51	49	59
NCA06	L06	50	45	45	43	53
NCA07	L03	63	58	54	50	60
NCA08	L07	51	46	46[7]	46[7]	58
NCA09	L08	63	58	58	51	61
NCA12	L11	72	67	57	47	57
NCA13	L12	55	50	50	47	57
NCA14A	L09	62	57	54	46	56
NCA14B	L10	50	45	45[7]	42	52
NCA14C	L10A	55	50	50	47	57

Notes:
1. NCA02, NCA10 and NCA11 comprise of commercial and industrial type receivers and are not presented in this table
2. Day standard construction hours: 7.00am to 6.00pm Monday to Friday and 8.00am to 1.00pm Saturday
3. Day out-of-hours: 7.00am to 8.00am and 1.00pm to 5.00pm Saturday
4. Evening: 6.00pm to 10.00pm Monday to Sunday and Public Holidays.
5. Night: 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays.
6. Sleep disturbance assessed for night time period only
7. Where the evening RBL is higher than the day RBL, the day RBL is adopted. Where the night RBL is higher than the evening RBL, the evening RBL is adopted
8. Caravan parks assessed as residential type receivers.

3.2 Design refinements

3.2.1 Extension of ancillary facility AS3

The proposed design refinement includes an extension of the AS3 site, from 6.7 hectares to 10.7 hectares, with the new portion of the ancillary facility named AS3b (about 4 hectares) and located about 150 metres to the west of the AS3 site on the northern side of the main alignment (refer to **Figure 3-1**).

This extension is anticipated to support the delivery of materials and workers and would be utilised for laydown, stockpiling, a small satellite office and parking.

3.2.2 Extension of ancillary facility AS13

The proposed design refinement includes an extension of the existing AS13 site from 1.3 hectares to 2.3 hectares, to occupy the entire area between the project and the Pacific Highway (refer to **Figure 3-1**). Access and utilisation of the site would remain unchanged.

3.2.3 Removal of ancillary facility AS16

The proposed design refinement includes the removal of AS16 located at Masonite Road Heatherbrae, reducing the project construction footprint by approximately 24.9 hectares (refer to **Figure 3-1**). The removal of AS16 would also avoid the requirement for an associated access point on Masonite Road.

3.2.4 Access refinements to ancillary facilities

To improve construction vehicle access some refinements are proposed to access arrangements of eight ancillary facilities. These are described below:

- AS3b – the construction access route off the westbound New England Highway would be extended for about 350 metres to the east to allow access to AS3b
- AS10/11 – additional access from Tomago Road via the Pacific Highway/Tomago Road intersection. The additional site access would utilise the already proposed Pacific Highway access point as identified in the EIS
- AS14/15 – addition of right in/right out turn movements to and from the Pacific Highway to the already identified left in/left turn movements at this access point
- AS17/18/19 - addition of right in/right out turn movements to and from Masonite Road to the already identified left in/left turn movements at these access points.

The location of the revised ancillary facilities is shown in **Figure 3-1**.

3.2.5 Utility strategy

The construction footprint has been extended to support the refined utility strategy. This has resulted in additional utility relocations within existing road corridors at:

- John Renshaw Drive between Weakleys Drive and New England Highway, and
- New England Highway and Pacific Highway (including northbound Hexham Bridge) between AS8 and Tomago Road.

The location of the additional utility relocations are shown in **Figure 3-2**.

Construction noise assessment due to additional utility relocation work is presented in **Section 3.3**.

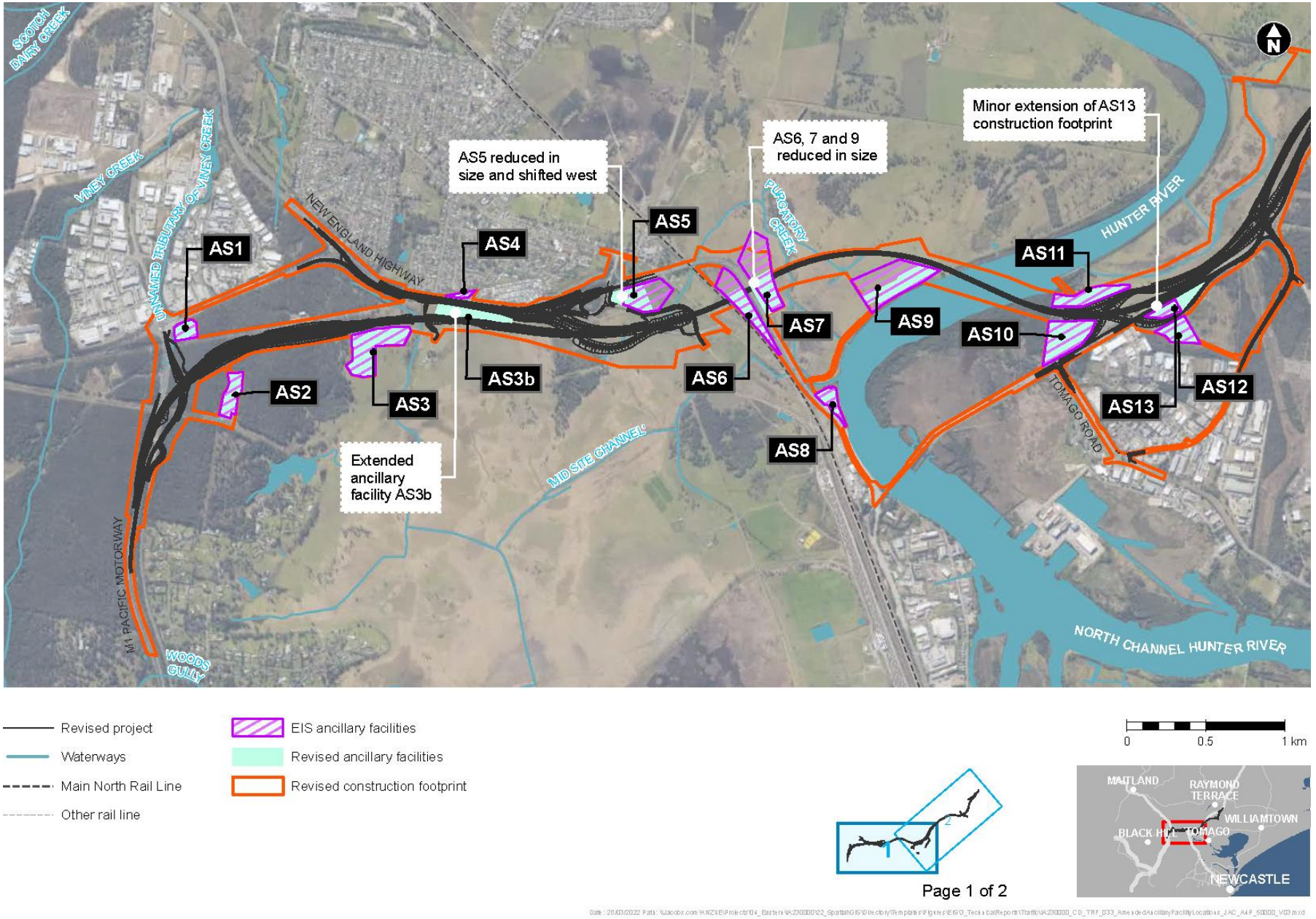

Figure 3-1 Refined ancillary facility locations (map 1 of 2)

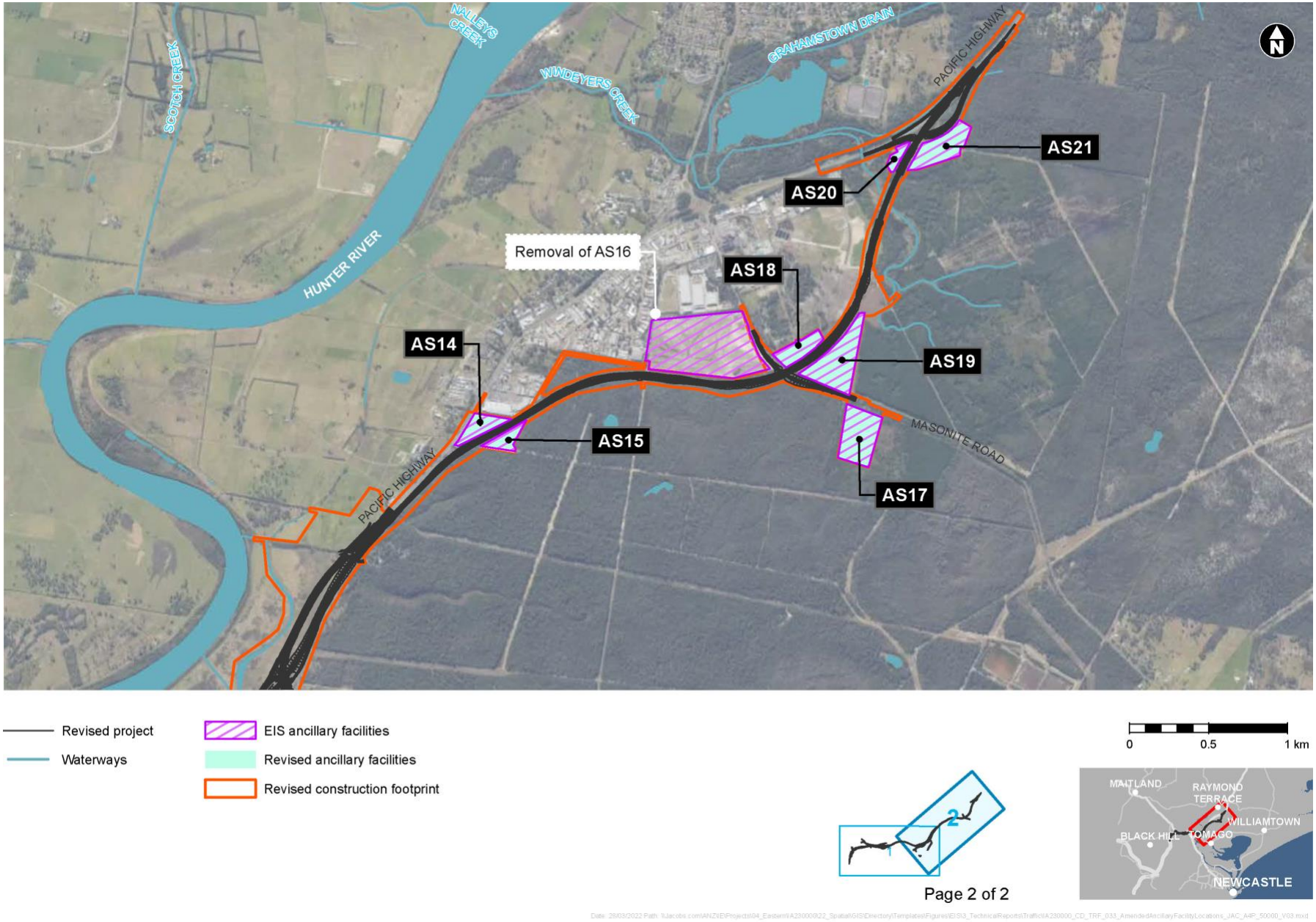

Figure 3-1 Refined ancillary facility locations (map 2 of 2)

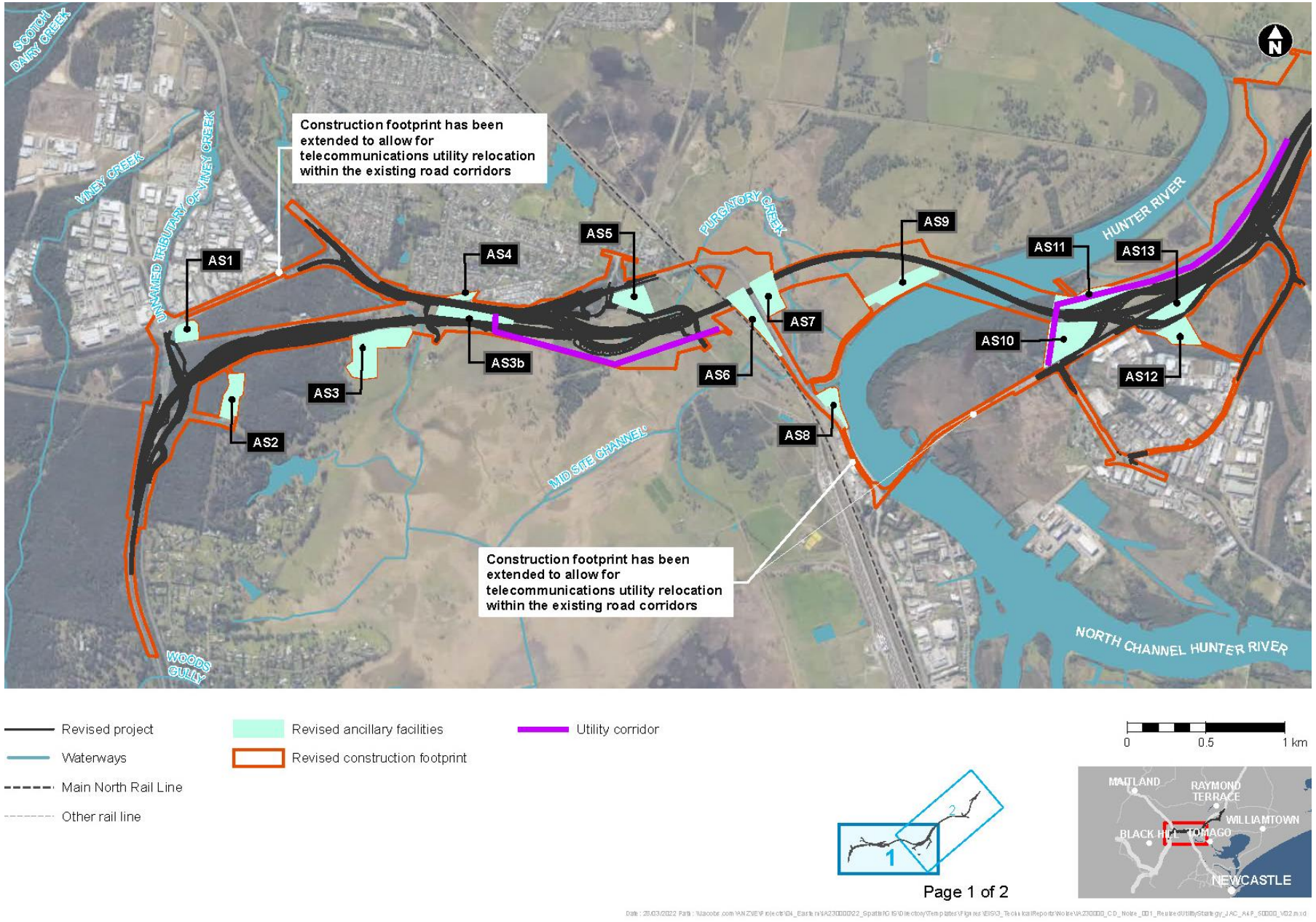

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Figure 3-2 Revised utility strategy (map 1 of 2)

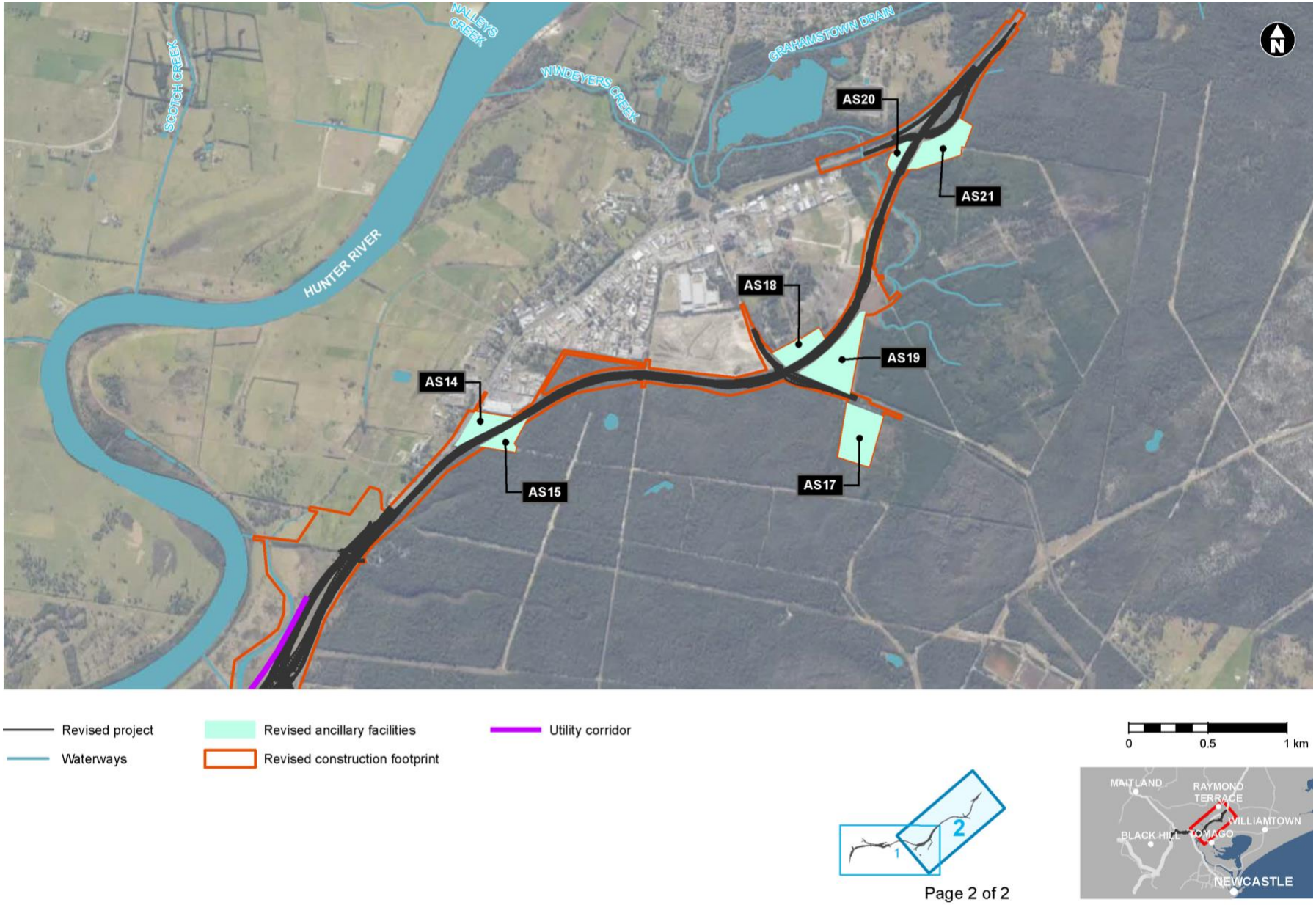

Figure 3-2 Revised utility strategy (map 2 of 2)

3.3 Re-assessment of construction noise impacts

As discussed in **Section 4.1**, the NMLs have been re-established and therefore, the construction noise assessment presented in Section 5.3.1 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) for residential receivers have been re-assessed.

The updated assessment, **Table 3-2** to **Table 3-5**, present the unmitigated construction noise impacts to residential receivers and the likely community perceptions in the nominated NCAs for each of the construction scenarios during standard construction hours, extended construction hours and out of hours are presented in the tables below.

It is noted that the re-assessed construction noise impacts presented in the tables below include the refinement of the ancillary facilities described previously and the utility strategy works.

The use of 'Peak' and 'Typical' to describe the construction impacts for the various scenarios, Section 5.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) presented the following explanation:

> *worst-case activities only occur for part of the work period and for assessment purposes have been categorised as 'peak impact'. For the period where noise intensive work is not occurring and the activities are typical for the work period, it has been categorised as 'typical impact'*

Therefore, based on the above a peak impact represents a worst-case situation where all plant and equipment associated with the work scenario are operating concurrently. As all plant and equipment would not operate concurrently and continuously throughout the duration of the construction works, a situation where the plant and equipment likely to be used most of the time would represent a typical impact.

For example, during construction works for the relocation of utilities, equipment may include jackhammers, concrete saws, excavators, dump trucks, concrete trucks, delivery trucks, handheld tools, backhoe and/or light vehicles. A peak impact would be due to all these plant and equipment operating concurrently. However, this would not be a common occurrence and typically only some of these plant items (e.g. jackhammer, excavator, dump truck and concrete truck) are assumed to be operating at the same time, allowing for the assessment of typical impacts. In some situations, the difference between a peak impact and a typical impact may be due to only one plant item, resulting in the difference in noise between the two to be minimal.

Table 3-2 Predicted construction noise exceedances during standard daytime construction hours

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NCA12	NCA13	NCA14A	NCA14B	NCA14C
Key:	○ Noticeable (no exceedance)		● Clearly audible (1 dB to 10 dB)			◆ Moderately intrusive (11 dB to 20 dB)								■ Highly intrusive (> 20 dB)				
1	Pre-construction and site establishment	Peak impact	○	○	○	◆	●	○	○	○	●	●	●	○	○	●	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
2	Ancillary facility – establishment	Peak impact	○	○	○	◆	●	○	○	○	○	◆	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	◆	○	○	○	○	○	○
3	Ancillary facility – operation	Peak impact	○	○	○	●	○	○	○	○	○	◆	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	◆	○	○	○	○	○	○
4A	Batch plant operation (concrete batch plant)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4B	Batch plant operation (asphalt batch plant)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5	Clearing, grubbing, and demolition	Peak impact	○	○	○	■	●	○	○	○	●	●	●	○	○	●	○	○
		Typical impact	○	○	○	◆	●	○	○	○	●	●	●	○	○	●	○	○
6	Utility works	Peak impact	○	○	○	■	●	○	○	○	●	●	●	○	○	●	○	○
		Typical impact	○	○	○	◆	●	○	○	○	●	●	●	○	○	●	○	○
7	Bulk earthworks – cuttings	Peak impact	○	○	○	○	●	○	○	○	○	○	○	○	○	●	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
9	Bulk earthworks – fill	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NCA12	NCA13	NCA14A	NCA14B	NCA14C
10	Concrete pavement (including pavement drainage)	Peak impact	○	○	○	○	○	○	○	○	●	○	○	○	○	●	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
11	Asphalt pavement (including pavement drainage)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
12	Bridge work (excluding piling)	Peak impact	○	○	○	◆	●	○	○	○	○	●	●	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
13	Piling for bridges and bridge approaches	Peak impact	○	○	○	■	●	○	○	○	○	●	●	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	●	○	○	○	○	○
14	Roadside furniture and finishing work	Peak impact	○	○	○	◆	●	○	○	○	○	○	●	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
15	Traffic management and control	Peak impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
16	Landscaping	Peak impact	○	○	○	◆	○	○	○	○	○	○	●	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
17	Cross drainage	Peak impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○

Note: NCA02, NCA10 and NCA11 comprise of commercial and industrial receivers and hence, are not included this table

Table 3-2 shows that residential receivers are potentially impacted during standard construction hours as follows:

- The highest impacts are during the ‘peak impact’ activities, which is due to all plant and equipment operating concurrently including noise intensive equipment such as rock hammers or concrete saws. For most scenarios, the ‘peak impact’ activities would only occur for a relatively short period. Noise levels and impacts during the ‘typical impact’ activities would occur more often and are lower and affect fewer receivers
- The highest impacts at residential receivers are generally in catchments where receivers are located close to the construction footprint. This includes NCA04A and NCA08, which are directly to the north and west of the construction footprint, respectively. Receivers in NCA04A are within suburban areas and are therefore densely distributed, resulting in relatively large number of receivers being impacted by construction noise in this NCA
- ‘Highly intrusive’ noise levels (i.e. greater than 20 dB exceedance) are predicted in NCA04A during clearing, grubbing and demolition work, utility works and bridge piling work when ‘peak impact’ activities are being carried out. This would be expected as residential receivers in NCA04A are close to the construction footprint at the proposed interchange at Tarro
- Noise impacts from batch plant operations (concrete and asphalt), bulk earthworks (fill) and asphalt pavement work are not predicted to exceed the NMLs at any residential receivers in all NCAs during peak or typical impact activities. Noise impacts from bulk earthworks (cuttings) and concrete pavement work are not predicted to exceed the NMLs at any residential receivers during typical activities
- Clearing, grubbing and demolition work, and utility work generally impact the highest amount of residential receivers and with the highest exceedances. This is due to these works being carried out over the entire length of the project
- Construction noise impacts are predicted to be ‘Noticeable’ (i.e. no exceedance of NML) at all residential receivers in NCA01A, NCA01B, NCA03, NCA05A, NCA05B, NCA06, NCA12, NCA13, NCA14B and NCA14C for all construction work scenarios during standard construction work hours.

Outcomes are generally similar to those presented in the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b).

Table 3-3 Predicted construction noise exceedances during daytime out-of-hours

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NCA12	NCA13	NCA14A	NCA14B	NCA14C
Key:	○ Noticeable (< 5 dB)		● Clearly audible (5 dB to 15 dB)					◆ Moderately intrusive (16 dB to 25 dB)						■ Highly intrusive (> 25 dB)				
1	Pre-construction and site establishment	Peak impact	○	○	○	◆	●	○	○	○	●	●	●	○	○	●	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
2	Ancillary facility – establishment	Peak impact	○	○	○	◆	●	○	○	○	○	◆	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	◆	○	○	○	○	○	○
3	Ancillary facility – operation	Peak impact	○	○	○	●	●	○	○	○	○	◆	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	◆	○	○	○	○	○	○
4A	Batch plant operation (concrete batch plant)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4B	Batch plant operation (asphalt batch plant)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5	Clearing, grubbing, and demolition	Peak impact	○	○	○	■	●	●	○	○	●	●	●	○	○	●	●	○
		Typical impact	○	○	○	◆	●	○	○	○	●	●	●	○	○	●	○	○
6	Utility works	Peak impact	○	○	○	■	●	○	○	○	●	●	●	○	○	●	○	○
		Typical impact	○	○	○	◆	●	○	○	○	●	●	●	○	○	●	○	○
7	Bulk earthworks – cuttings	Peak impact	○	○	○	○	●	○	○	○	○	○	○	○	○	●	●	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
9	Bulk earthworks – fill	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	●	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NCA12	NCA13	NCA14A	NCA14B	NCA14C
10	Concrete pavement (including pavement drainage)	Peak impact	○	○	○	○	●	○	○	○	●	○	○	○	○	●	●	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
11	Asphalt pavement (including pavement drainage)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
12	Bridge work (excluding piling)	Peak impact	○	○	○	◆	●	○	○	○	○	●	●	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	●	○	○	○	○	○
13	Piling for bridges and bridge approaches	Peak impact	○	○	○	■	●	●	○	○	○	●	●	○	○	○	●	○
		Typical impact	○	○	○	◆	●	○	○	○	○	●	●	○	○	○	○	○
14	Roadside furniture and finishing work	Peak impact	○	○	○	◆	●	○	○	○	○	●	●	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
15	Traffic management and control	Peak impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
16	Landscaping	Peak impact	○	○	○	◆	●	○	○	○	○	●	●	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
17	Cross drainage	Peak impact	○	○	○	◆	●	○	○	○	○	○	●	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○

Note: NCA02, NCA10 and NCA11 comprise of commercial and industrial receivers and hence, are not included this table

Table 3-3 above show that residential receivers are impacted during the extended daytime out-of-hours period as follows:

- Similar to the impacts during 'standard working hours', the highest impacts are during the 'peak impact' activities, however for most scenarios, the 'peak impact' activities would only occur for a relatively short period. Noise levels and impacts during the 'typical impact' activities would occur more often and are lower and affect fewer receivers
- The highest impacts at residential receivers are generally in catchments where receivers are located close to the construction footprint. This includes NCA04A, NCA04B and NCA08, which have receivers directly adjacent to the New England Highway at Tarro and Hexham. In addition, receivers in NCA04A and NCA04B are within suburban areas and are therefore densely distributed, resulting in relatively large number of receivers being impacted by construction noise
- 'Highly intrusive' noise levels (i.e. greater than 25 dB exceedance of NML) are predicted in NCA04A during clearing, grubbing and demolition work, utility work and bridge piling work when peak impact activities are being carried out
- Noise impacts from batch plant operations (concrete and asphalt), bulk earthworks (fill) and asphalt pavement work are predicted to be 'Noticeable' (i.e. less than 5 dB exceedance of NML) at all residential receivers in all NCAs during peak or typical impact activities. Noise impacts from bulk earthworks (cuttings) and concrete pavement work are predicted to be 'Noticeable' at all residential receivers during typical impact activities
- Pre-construction site establishment work, clearing, grubbing and demolition work, utility work and bridge piling work generally impact the highest number of residential receivers and result in the highest exceedances. This is due to these works being carried out over the entire length of the project
- Construction noise impacts are predicted to be 'Noticeable' at all residential receivers in NCA01A, NCA01B, NCA03, NCA05B, NCA06, NCA12, NCA13 and NCA14C for all construction work scenarios during the daytime out-of-hours period
- When compared to standard construction hours, the daytime out-of-hours period would typically have similar impacts at residential receivers. Some NCAs may experience additional construction noise impacts, however, the additional impacts are considered to be 'Noticeable' only. Therefore, noise impacts from the proposed construction work scenarios during the daytime out-of-hours period would be similar to the impacts during standard construction hours.

Outcomes are generally similar to those presented in the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b).

Table 3-4 Predicted construction noise exceedances during evening construction hours

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NCA12	NCA13	NCA14A	NCA14B	NCA14C
Key:	○ Noticeable (< 5 dB) ● Clearly audible (5 dB to 15 dB) ◆ Moderately intrusive (16 dB to 25 dB) ■ Highly intrusive (> 25 dB)																	
1	Pre-construction and site establishment	Peak impact	○	○	○	■	●	●	○	○	●	●	●	○	○	●	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
2	Ancillary facility – establishment[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Ancillary facility – operation	Peak impact	○	○	○	●	●	○	○	○	○	◆	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	●	○	○	○	○	○	○
4A	Batch plant operation (concrete batch plant)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4B	Batch plant operation (asphalt batch plant)	Peak impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5	Clearing, grubbing, and demolition[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Utility works	Peak impact	○	○	○	■	●	●	○	○	●	●	●	○	○	●	○	○
		Typical impact	○	○	○	■	●	●	○	○	●	●	●	○	○	●	○	○
7	Bulk earthworks – cuttings[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Bulk earthworks – fill[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NCA12	NCA13	NCA14A	NCA14B	NCA14C
10	Concrete pavement (including pavement drainage)[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Asphalt pavement (including pavement drainage)	Peak impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
12	Bridge work (excluding piling)	Peak impact	○	○	○	◆	●	●	○	○	○	○	●	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	●	○	○	○	○	○
13	Piling for bridges and bridge approaches[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Roadside furniture and finishing work	Peak impact	○	○	○	◆	●	●	○	○	●	○	●	○	○	●	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
15	Traffic management and control	Peak impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	○
16	Landscaping[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Cross drainage	Peak impact	○	○	○	◆	●	○	○	○	●	○	●	○	○	●	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○

Notes:
1. As per **Table** 2-14 works for construction scenario would not occur during the evening and night periods
2. NCA02, NCA10 and NCA11 comprise of commercial and industrial receivers and hence, are not included this table

Table 3-5 Predicted construction noise exceedances during night time construction hours

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NC012	NCA13	NCA14A	NCA14B	NCA14C
Key:	○ Noticeable (< 5 dB)		● Clearly audible (5 dB to 15 dB)					◆ Moderately intrusive (16 dB to 25 dB)						■ Highly intrusive (> 25 dB)				
1	Pre-construction and site establishment	Peak impact	●	○	○	■	●	◆	○	○	●	●	◆	○	○	◆	●	○
		Typical impact	○	○	○	■	○	●	○	○	●	○	●	○	○	●	○	○
2	Ancillary facility – establishment[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Ancillary facility – operation	Peak impact	○	○	○	◆	●	●	○	○	○	◆	○	○	○	●	○	○
		Typical impact	○	○	○	◆	○	●	○	○	○	●	○	○	○	●	○	○
4A	Batch plant operation (concrete batch plant)	Peak impact	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4B	Batch plant operation (asphalt batch plant)	Peak impact	○	○	○	○	○	●	○	○	●	○	○	○	○	○	○	○
		Typical impact	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
5	Clearing, grubbing, and demolition[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Utility works	Peak impact	●	●	○	■	●	◆	○	○	●	●	◆	○	○	◆	●	○
		Typical impact	●	○	○	■	●	◆	○	○	●	●	◆	○	○	◆	●	○
7	Bulk earthworks – cuttings[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Bulk earthworks – fill[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ID	Scenario	Activity	NCA01A	NCA01B	NCA03	NCA04A	NCA04B	NCA05A	NCA05B	NCA06	NCA07	NCA08	NCA09	NC012	NCA13	NCA14A	NCA14B	NCA14C
10	Concrete pavement (including pavement drainage)[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	Asphalt pavement (including pavement drainage)	Peak impact	○	○	○	●	●	●	○	○	○	○	●	○	○	○	○	○
		Typical impact	○	○	○	●	○	●	○	○	○	○	●	○	○	○	○	○
12	Bridge work (excluding piling)	Peak impact	○	○	○	■	●	●	○	○	○	○	●	○	○	●	○	○
		Typical impact	○	○	○	■	●	●	○	○	○	○	●	○	○	○	○	○
13	Piling for bridges and bridge approaches[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	Roadside furniture and finishing work	Peak impact	○	○	○	■	●	●	○	○	●	○	●	○	○	●	○	○
		Typical impact	○	○	○	■	○	●	○	○	●	○	●	○	○	●	○	○
15	Traffic management and control	Peak impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
		Typical impact	○	○	○	◆	○	○	○	○	○	○	○	○	○	○	○	○
16	Landscaping[1]	Peak impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Typical impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17	Cross drainage	Peak impact	○	○	○	■	●	●	○	○	●	○	●	○	○	●	○	○
		Typical impact	○	○	○	■	●	●	○	○	●	○	●	○	○	●	○	○

Notes:
1. As per **Table 2-14** works for construction scenario would not occur during the evening and night periods
2. NCA02, NCA10 and NCA11 comprise of commercial and industrial receivers and hence, are not included this table

The above tables show that residential receivers are impacted during out-of-hours construction work as follows:

- Similar to impacts during 'standard working hours' and the daytime out-of-hours period, the highest impacts are during the 'peak impact' activities, however for most scenarios, the 'peak impact' activities would only occur for a relatively short period. Noise levels and impacts during the 'typical impact' activities would occur more often, are lower and affect fewer receivers
- The highest impacts at residential receivers are generally in catchments where receivers are located close to the construction footprint. This includes NCA04A and NCA05A, which are directly to the north of the New England Highway at Tarro
- During the evening period, 'Highly intrusive' noise levels (i.e. greater than 25 dB exceedance of NML) are predicted in NCA04A during the following scenarios:
  - Pre-construction and site establishment during peak and typical impact activities
  - Utility work during peak and typical impact activities.
- Noise impacts during the evening period from batch plant operations (concrete and asphalt) are predicted to be 'Noticeable' at all residential receivers in all NCAs during peak or typical impact activities
- During the night time period, 'Highly intrusive' noise levels are predicted in NCA04A during the following scenarios:
  - Pre-construction and site establishment during peak and typical impact activities
  - Utility work during peak and typical impact activities
  - Bridge work (non-piling) during peak and typical impact activities
  - Roadside furniture and finishing work and cross drainage work during peak and typical impact activities.
- During out-of-hours, the following activities generally impact the highest number of residential receivers and with the highest exceedances; pre-construction site establishment work, utility work, bridge work (non-piling), roadside furniture and finishing work, and cross drainage work
- Construction noise impacts are predicted to be 'Noticeable' at all residential receivers in NCA03, NCA05B, NCA06, NCA12, NCA13 and NCA14C for all construction work scenarios during the evening and night time construction periods. During the evening period, all residential receivers in NCA01A, NCA01B and NCA14B also have 'Noticeable' noise impacts
- As indicated in **Table 2-14**, construction works would not be undertaken during the evening and night periods for the following scenarios:
  - Ancillary facility establishment
  - Clearing, grubbing and demolition
  - Bulk earthworks (cuttings)
  - Bulk earthworks (fill)
  - Mainline concrete pavement (including pavement drainage)
  - Piling for bridges and bridge approaches
  - Landscaping.

Outcomes are generally similar to those presented in the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b).

4 Assessment of potential operational noise impacts

This chapter includes an assessment of the operational impacts of the project refinements.

4.1 Southbound entry ramp to M1 Pacific motorway

As part of the updated design, the southbound entry ramp merge lane onto the M1 Pacific Motorway southbound carriageway in Black Hill is proposed to be extended compared to the existing design. As a result of the ramp extension the existing noise wall located on the eastern side of the M1 Pacific Motorway would need to be relocated.

The NMG states the following for existing noise barriers:

> *"The benefit provided by existing noise barriers (walls and mounds) must be taken into account when determining if a residence qualifies for consideration of treatment. Where road widening has expanded over the existing noise barrier footprint then the top of barrier height should be moved to an adjacent and suitable new barrier location as part of the build scenario.*
>
> *If four or more closely spaced residences qualify then noise barrier design identified using Section 8, should be completed assuming that the existing barrier does not exist.*
>
> *Where residences qualify for consideration of treatment, the aim is to conduct a full barrier design assessment with height ranges between 0 metre and the maximum height and assuming that the existing barrier does not exist.*
>
> *If the outcome of the assessment is a barrier height greater than the existing barrier then the additional noise reduction provided needs to be evaluated. If the barrier has been relocated due to widening then the higher barrier should be recommended. Otherwise, where the additional noise reduction is greater than 2.0dBA then an increase in barrier height is considered to be reasonable as it achieves a noticeable reduction in noise level."*

Therefore, noise modelling was undertaken in accordance with the NMG for the receivers impacted by the relocated noise barrier, namely the receivers within NCA01A and NCA01B. Detailed noise modelling results for the sensitive receivers within NCA01A and NCA01B and the assessment against the NCG requirements are provided in **Appendix C**.

Based on the detailed noise modelling results, eight receiver buildings have been identified for consideration of additional noise mitigation and more than four identified receiver buildings are closely spaced.

Therefore, a NMG barrier analysis assessment was undertaken to determine if it would be reasonable and feasible to increase the height of the relocated noise barrier.

The NMG barrier analysis results for the relocated noise barrier are detailed in **Appendix C** and summarised in **Table 4-1**. The location of the relocated noise barrier is presented in **Figure 4-1**.

It is noted that the results for the relocated noise barrier replaces the results for noise barrier NB.01 presented in Table 6-5 of Section 6.3.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b).

Table 4-1 Summary of NMG noise barrier analysis

Barrier ID	NMG noise barrier analysis						Alternative barrier height (metres) [2, 3]	Comments
	Barrier considered	Approx. length (metres)	Design height (metres) [1]	Total number of benefitting receivers [2, 3]	Triggered receivers with no barrier [4]	Remaining triggered receivers with design barrier [3]		
NB.01	Existing barrier (relocated)	490	-	16	3	3	Retain relocated existing noise barrier	A barrier in this location would not provide acoustic benefits to impacted receivers as the number of receivers identified for at-property treatment would not reduce by two thirds at any barrier height (i.e. no initial design barrier height). Therefore, the existing noise barrier with the same top of barrier height is to be relocated. Increasing the height of the relocated barrier in this location is not reasonable and feasible and is not recommended.

Note:
1. Calculated noise barrier height following the process described in Section 8 of the NMG without considering urban design, visual impacts and/or engineering constraints
2. Receiver considered to be benefitting if proposed noise barrier provides more than 2dB(A) reduction in noise compared to no noise barrier
3. Receiver counts based on receiver points, where a receiver point is representative of each habitable floor level of a residence. For example, a double storey residence would be represented by two receiver points
4. Only benefitting receivers that are also triggered for additional noise mitigation are considered.

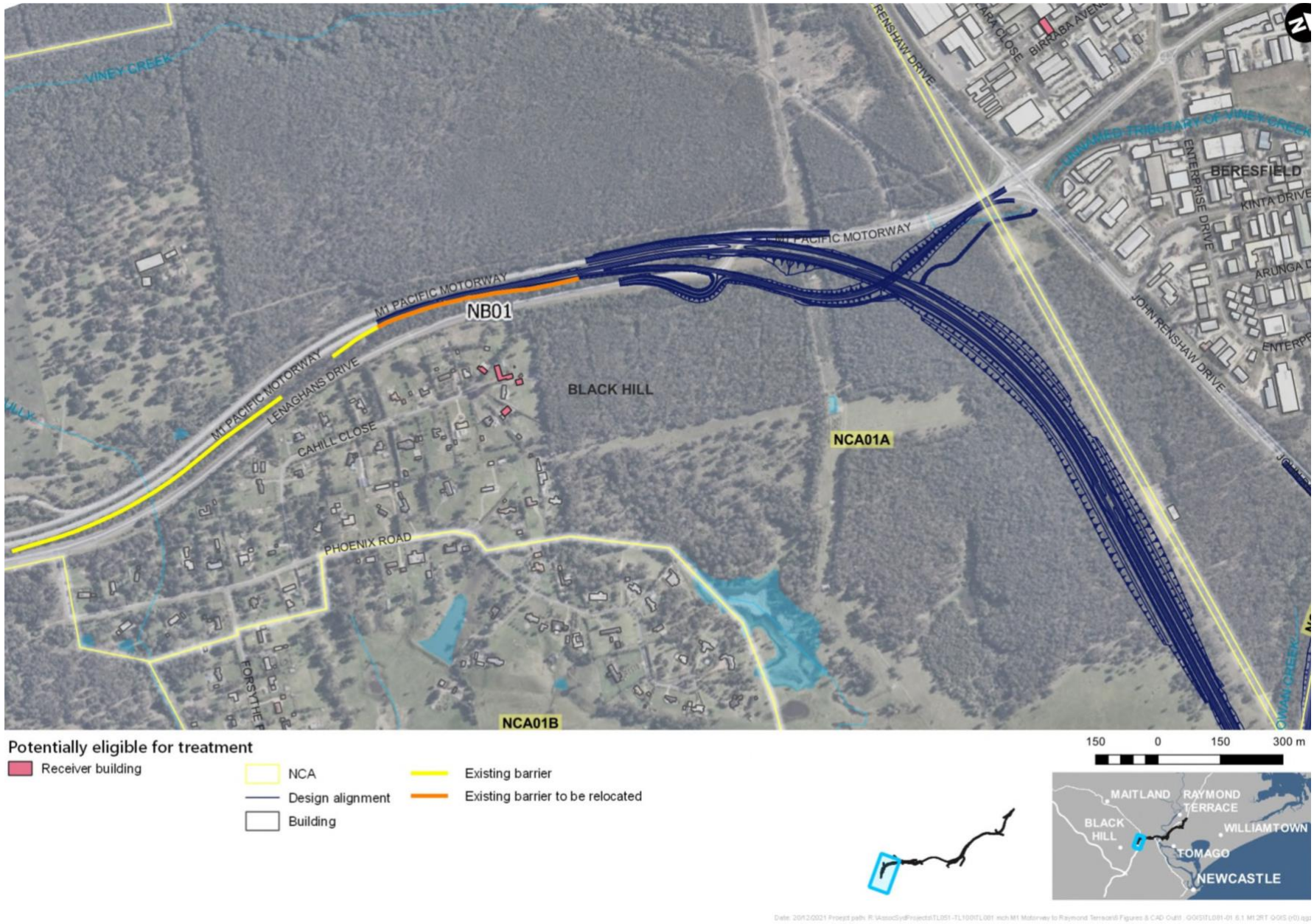

Figure 4-1 Proposed relocated noise barrier in Black Hill for southbound entry ramp extension

As the NMG noise barrier analysis results indicate that a noise barrier is not a reasonable noise mitigation option, all the residential receivers that have been triggered (i.e. four residential receiver buildings) for additional noise mitigation would be considered for at-property treatment.

Receiver buildings identified as potentially eligible for at-property treatment are presented in **Appendix C**.

4.2 Design modification for noise barrier NB.03

Noise barrier NB.03 was previously recommended in Section 6.3.2 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b). Nose barrier NB.03 is located on the northern side of the New England Highway in Tarro and was originally designed to be a continuous noise barrier beginning from approximately 150 metres east of Quarter Sessions Road and continuing up the off-ramp to Anderson Drive.

Due to drainage and vegetation clearing constraints, the design of NB.03 has been modified, which results in a break in the noise barrier near the beginning of the off-ramp to Anderson Drive. **Figure 4-2** shows the modified noise barrier NB.03.

As a result of the modified noise barrier design, noise modelling was undertaken for the modified design to determine if additional impacted receivers would be identified for consideration of at-property treatment.

Results of the model indicate that the two sections of the noise barrier would need to incorporate an overlap of at least two times the gap between the two sections.

With the modified noise barrier NB.03, it was determined that the receiver buildings identified for consideration of at-property treatment presented in Appendix D.17 of the *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper* (Transport for NSW, 2021b) would remain the same. That is, no additional receiver buildings were identified.

Therefore, the modified design for noise barrier NB.03 does not result in any changes to the noise assessment and mitigation outcomes for the affected sensitive receivers.

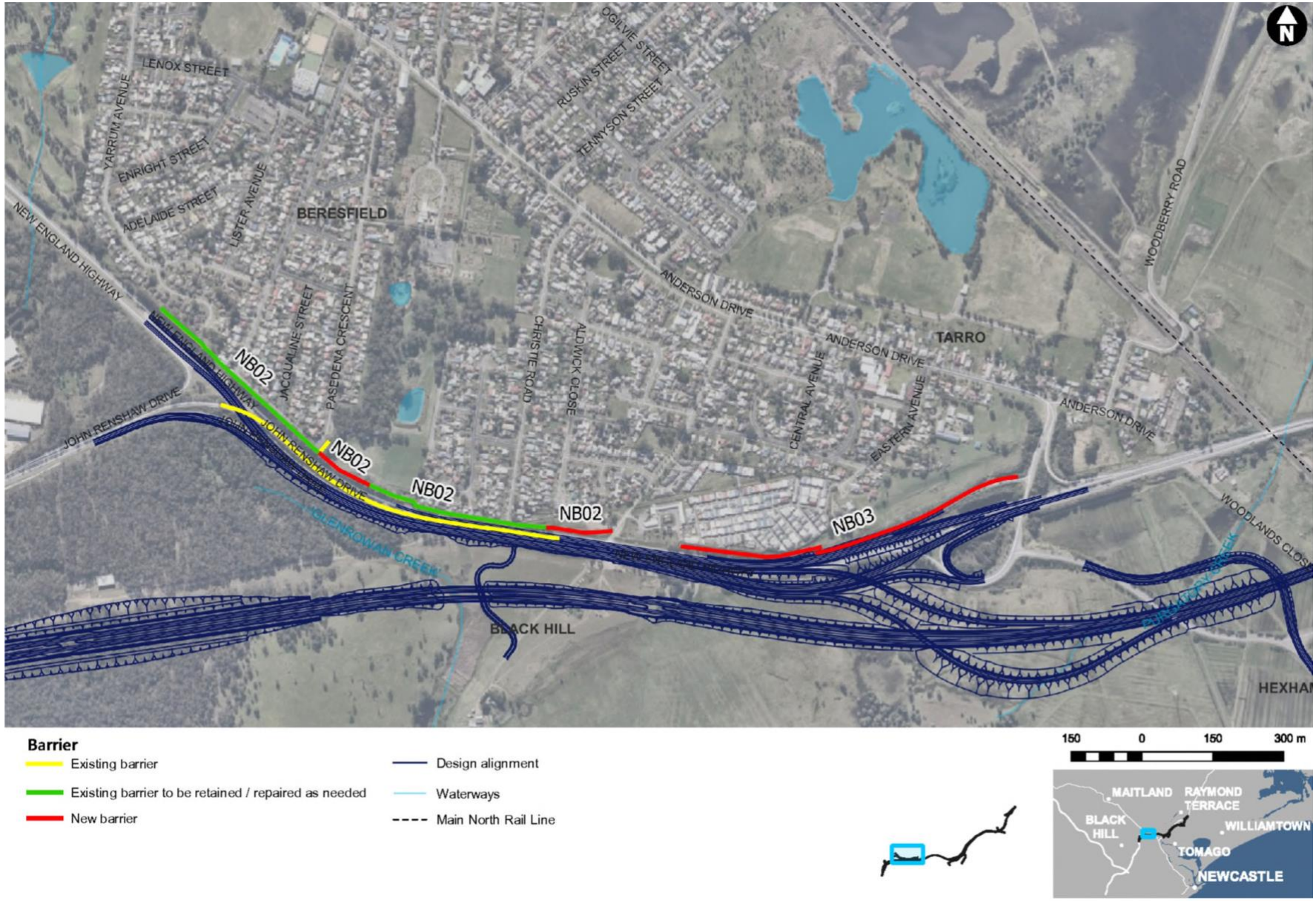

Figure 4-2 Proposed modified noise barrier NB.03 in Tarro extension

5 Revised environmental management measures

The *M1 Pacific Motorway extension to Raymond Terrace Environmental Impact Statement* (Transport for NSW 2021) for the project identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the responses raised in the public submissions and the changes to the project, the environmental management measures for the project (refer to Chapter 24 of the EIS) have been revised.

Additional and/or modified environmental management measures to those presented in the environmental impact statement are in ***italics*** and deleted measures, or parts of measures, have been struck out.

Table 5-1 presents the proposed changes to the noise and vibration environmental mitigation measures.

Table 5-1 Summary of revised environmental management measures – Noise and vibration

Impact	Reference	Environmental management measure	Responsibility	Timing
General construction noise and vibration	NV01	A Construction Noise and Vibration Management Plan (CNVMP) would be prepared for the project to mitigate and manage noise and vibration impacts. The CNVMP would include: • All potential significant noise and vibration generating activities associated with the activity • Measures to be implemented during construction to minimise noise and vibration impacts, such as restrictions on working hours, respite periods, staging, placement and operation of ancillary facilities, temporary noise barriers, haul road maintenance, and controlling the location and use of vibration generating equipment • ***Description of the approach that will be adopted for carrying out location and activity specific construction noise and vibration mitigation, to assist with designing and selecting of appropriate location-specific mitigation measures*** • A monitoring program to assess performance against relevant noise and vibration criteria • Process for the implementation of respite periods to provide residents with respite from ongoing impact • Arrangements for consultation with affected receivers, including notification and complaint handling procedures • Contingency measures to be implemented in the event of noncompliance with noise and vibration criteria.	Contractor	Prior to construction/ construction
	NV02	Where reasonable and feasible, implementation of recommended operational noise mitigation would be carried out within 12 months of construction activities commencing.	Transport / Contractor	Prior to construction/ construction
Vibration impacts to residential and commercial structures	NV03	Where vibration generating activities will be carried out within minimum working distances for cosmetic damage ***as defined and/or developed in accordance with Transport's Construction Noise and Vibration Guideline***, vibration monitoring will be carried out. Where monitoring indicates cosmetic damage criteria are exceeded, alternative low vibration work practices will be investigated and implemented.	Contractor	Construction
Vibration impacts to utilities	NV04	Where works are within 25m of utilities ***and are predicted to generate vibration within minimum safe working distances*** consultation will be carried out with the relevant utility authorities to establish site specific mitigation measures to manage potential vibration impacts.	Contractor	Construction

Impact	Reference	Environmental management measure	Responsibility	Timing
Vibration impacts to heritage structures	NV05	Heritage listed items within 100 metres of vibration intensive work are to be considered on a case by case basis and further investigation would be carried out during detailed design to confirm the structural integrity (i.e. structurally sound or unsound) of all potentially affected structures. Where items are considered sensitive to vibration, appropriate vibration criteria would be determined after detailed inspections have been completed.	Contractor	Prior to construction/ construction
Blasting	NV06	If blasting is to be included as part of the construction work, the CNVMP would include a Blast Management Plan (BMP). The BMP would be prepared in consultation with the EPA, demonstrating that all blasting and associated activities would be carried out in a manner that would not generate unacceptable noise and vibration impacts pose a substantial risk ***of*** impact to residences and sensitive receivers.	Contractor	Prior to construction/ construction
Operational road traffic noise impacts	NV07	Operational noise and vibration mitigation measures would be identified in an Operational Noise and Vibration Review (ONVR). Requirements for mitigation measures, including quieter noise pavements, noise barriers, and at-property treatments, would be reviewed as part of the ONVR and as the detailed design progresses. Detailed information on floorplans and facade construction for school classrooms, places of worship and childcare centres determined to exceed the applicable Noise Criteria Guideline (NCG) (Roads and Maritime Services, 2015) internal noise criteria will be obtained during design development. ***The ONVR will include a consideration of all sensitive receivers in the study area constructed prior to the approval (eg Sweetwater Grove).*** The implementation of treatments would be carried out in accordance with the Noise Mitigation Guideline (NMG) (Roads and Maritime Services, 2015). ***Where treatments are required for listed heritage items, Transport will engage with a suitably qualified heritage professional to ensure treatments are sympathetic.***	Transport / Contractor	Detailed design/ construction/ prior to operation
Operational road traffic noise impacts	NV08	Within 12 months of starting project operation, actual operational noise performance would be compared to predicted operational noise performance to analyse the effectiveness of the operational road traffic noise mitigation measures. Additional reasonable and feasible mitigation would be considered where any additional receivers are identified as qualifying for consideration of noise mitigation under the NMG.	Transport / Contractor	Operation

Impact	Reference	Environmental management measure	Responsibility	Timing
Impacts from Out of Hours Works	NV09	An Out of Hours Work Procedure will be included as part of the CNVMP. The procedure will follow the approach in Roads and Maritime's Construction Noise and Vibration Guideline (Roads and Maritime Services 2016b) and include, but not be limited to: • ***Details of works required outside standard construction hours and justifications of why the works are required outside standard construction hours*** • ***The noise and vibration impact assessment processes that will be followed to identify potentially affected receivers and clarify potential level of impacts*** • ***Details of the approval process (internal and external) for works proposed outside standard construction hours*** • Scheduling of noise intensive or high noise impact work to evening periods where feasible • Use of alternative plant and equipment and/or construction techniques to minimise noise • Notification and consultation requirements including preparation of a 'look ahead' program for likely out of hours work • Use of temporary noise barriers • Respite periods • Representative noise monitoring • Offers of reasonable and temporary alternative accommodation or an act of good will • Use of negotiated agreements • ***Community information sessions at regular intervals for residents or groups around the Tarro interchange affected by longer periods of OOHW.***	Contractor	Construction
Construction noise impacts	***NV10***	***Prior to construction, additional noise monitoring will be carried out to validate the Rating Background Levels adopted for the project during construction.***	***Transport/ Contractor***	***Prior to construction***

6 Conclusion

This supplementary report focused on providing responses to the submissions related to noise and vibration, as received during the exhibition of the EIS, and assessing the potential noise and vibration impacts from refinements to the project.

To respond to the submissions received, qualitative and quantitative assessments were completed to address responses relating to the Sweetwater Grove development (previously identified as the 'Tomago Village Van Park') in Tomago, operational noise impacts to sensitive receivers in Black Hill, re-analysed and re-established noise monitoring results and subsequent construction noise management levels, proposed extension of construction hours, construction noise and vibration mitigation measures, mitigating maximum noise levels, construction noise impacts for changes to some ancillary sites, operational noise assessment for the proposed extension of the southbound ramp onto the M1 Pacific Motorway and the design modification to noise barrier NB.03 proposed in the EIS.

Final rating background levels for all monitoring locations have been reviewed in detail and updated in accordance with the most current standards and in line with the applicable policy requirements.

As a result of the updated rating background level, construction noise management levels were re-established and construction noise impacts were re-assessed for the different construction scenarios. Results of the assessment indicated no significant differences to the outcomes presented in the EIS.

Traffic noise levels obtained during the 2016 noise monitoring have been used to validate the traffic noise model only and are considered appropriate for these purposes, in accordance with the relevant guidelines and procedures.

A noise barrier to mitigated operational traffic noise at the sensitive receiver within the Sweetwater Grove development in Tomago was determined to not be reasonable and feasible, and receivers identified for noise mitigation would be eligible for consideration of at-property treatment.

The proposed extension of the southbound ramp onto the M1 Pacific Motorway in Black Hill would result in the existing noise barrier to be relocated. It was determined that it would not be reasonable and feasible to increase the height of the relocated noise barrier. Therefore, receivers identified for noise mitigation would be eligible for consideration of at-property treatment.

7 References

International Organization for Standardization, 1996. *Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation. ISO 9613-2:1996*

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NSW Department of Climate Change and Water, 2011. *Road Noise Policy* (RNP)

NSW Environment Protection Authority, 2017. *Noise Policy for Industry* (NPfI)

Roads and Maritime Services, 2015. *Noise Criteria Guideline* (NCG)

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Roads and Maritime Services, 2016. *Noise Criteria Guideline Application Notes*

Standards Australia, 2016. *Guide to Noise Control on Construction, Demolition and Maintenance Sites. AS 2436:2010 (R2016)*

Standards Australia / Standards New Zealand, 2011. *Structural design actions. Part 2: Wind actions. AS/NZS 1170.2:2011*

Transport for NSW, 2021a. *M1 Pacific Motorway extension to Raymond Terrace Environmental Impact Statement*

Transport for NSW, 2021b. *M1 Pacific Motorway extension to Raymond Terrace Noise and Vibration Working Paper*

Transport for NSW, 2022. *M1 Pacific Motorway extension to Raymond Terrace Submissions Report*

UK Department of Transport, 1988. *Calculation of Road Traffic Noise* (CORTN)

Terms and acronyms

Term / Acronym	Description
Adverse weather	Weather effects that enhance noise (that is, wind and temperature inversions) that occur at a site for a significant period of time (that is, wind occurring more than 30 per cent of the time in any assessment period in any season and/or temperature inversions occurring more than 30 per cent of the nights in winter).
Ambient noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment period	The period in a day over which assessments are made.
Assessment point	A point at which noise measurements are taken or estimated.
A-weighted	See dB(A) below
Background noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L_{A90} noise level (refer below).
CNVMP	Construction noise and vibration management plan
CNVIS	Construction noise and vibration impact statement
CNVG	Construction Noise and Vibration Guideline (Roads and Maritime *Services*, 2016)
CTGM	Hunter Water Chichester Trunk Gravity Main
Decibel (dB)	The units that sound is measured in. The following are examples of the decibel readings of every day sounds: 0dB The faintest sound we can hear 30dB A quiet library or in a quiet location in the country 45dB Typical office space. Ambience in the city at night 60dB CBD mall at lunch time 70dB The sound of a car passing on the street 80dB Loud music played at home 90dB The sound of a truck passing on the street 100dB The sound of a rock band 110dB Operating a chainsaw or jackhammer 120dB Deafening
dB(A)	A-weighted decibels. The A- weighting noise filter simulates the response of the human ear at relatively low levels, where the ear is not as effective in hearing low frequency sounds as it is in hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter.
dB(C)	C-weighted decibels. The C-weighting noise filter simulates the response of the human ear at relatively high levels, where the human ear is nearly equally effective at hearing from mid-low frequency (63Hz) to mid-high frequency (4kHz), but is less effective outside these frequencies.

Term / Acronym	Description
ECRTN	Environmental Criteria for Road Traffic Noise (EPA, 1999)
Frequency	Frequency is synonymous to pitch. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
HNA	Highly noise affected
ICNG	Interim Construction Noise Guideline (DECC, 2009)
Impulsive noise	Having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent noise	The level suddenly drops to that of the background noise several times during the period of observation. The time during which the noise remains at levels different from that of the ambient is one second or more.
km/h	Kilometres per hour
L_{Amax}	The maximum A-weighted sound pressure level measured over a given period.
L_{AMin}	The minimum A-weighted sound pressure level measured over a given period.
L_{A1}	The A-weighted sound pressure level that is exceeded for 1 per cent of the time for which the given sound is measured.
L_{A10}	The A-weighted sound pressure level that is exceeded for 10 per cent of the time for which the given sound is measured.
L_{A90}	The level of noise exceeded for 90 per cent of the time. The bottom 10 per cent of the sample is the L_{A90} noise level expressed in units of dB(A).
L_{Aeq}	The A-weighted “equivalent noise level” is the summation of noise events and integrated over a selected period of time.
MIC	Maximum instantaneous charge
m/s	Metres per second
mm/s	Millimetres per second
NCA	Noise Catchment Area. Noise Catchment Areas are logical groupings of noise and vibration sensitive receivers for the project based on areas with a similar acoustic environment.
NCG	Noise Criteria Guideline (RMS, 2015)
NMG	Noise Mitigation Guideline (RMS, 2015)
NML	Noise management level
NPfI	Noise Policy for Industry (EPA, 2017)
OOHW or OOH	Out-of-hours work, which is construction work which take place outside of the standard construction hours specified by the NSW Environment Protection Authority (EPA) Interim Construction Noise Policy (ICNG) (2009).
RBL	Rating background level
Reflection	Sound wave changed in direction of propagation due to a solid object obscuring its path.
ROL	Road Occupancy Licence
RMS	Roads and Maritime Services

Term / Acronym	Description
RNP	Road Noise Policy (DECCW, 2011)
SEL	Sound Exposure Level (SEL) is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain L_{Aeq} sound levels over any period of time and can be used for predicting noise at various locations.
Sound	A fluctuation of air pressure which is propagated as a wave through air.
Sound absorption	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound level meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound pressure level (SPL or L_p)	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone. Reference for sound pressure level is conventionally chosen as 20 µPa (20 x 10^{-6} Pa) for airborne sound.
Sound power level (SWL or L_w)	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power. Reference for sound power level is conventionally chosen as 1pW (10^{-12} watts) for airborne sound.
TfNSW	Transport for NSW
Transport	Transport for NSW
Tonal noise	Containing a prominent frequency and characterised by a definite pitch.

Appendix A Noise monitoring

A.1 Noise monitoring locations and study areas

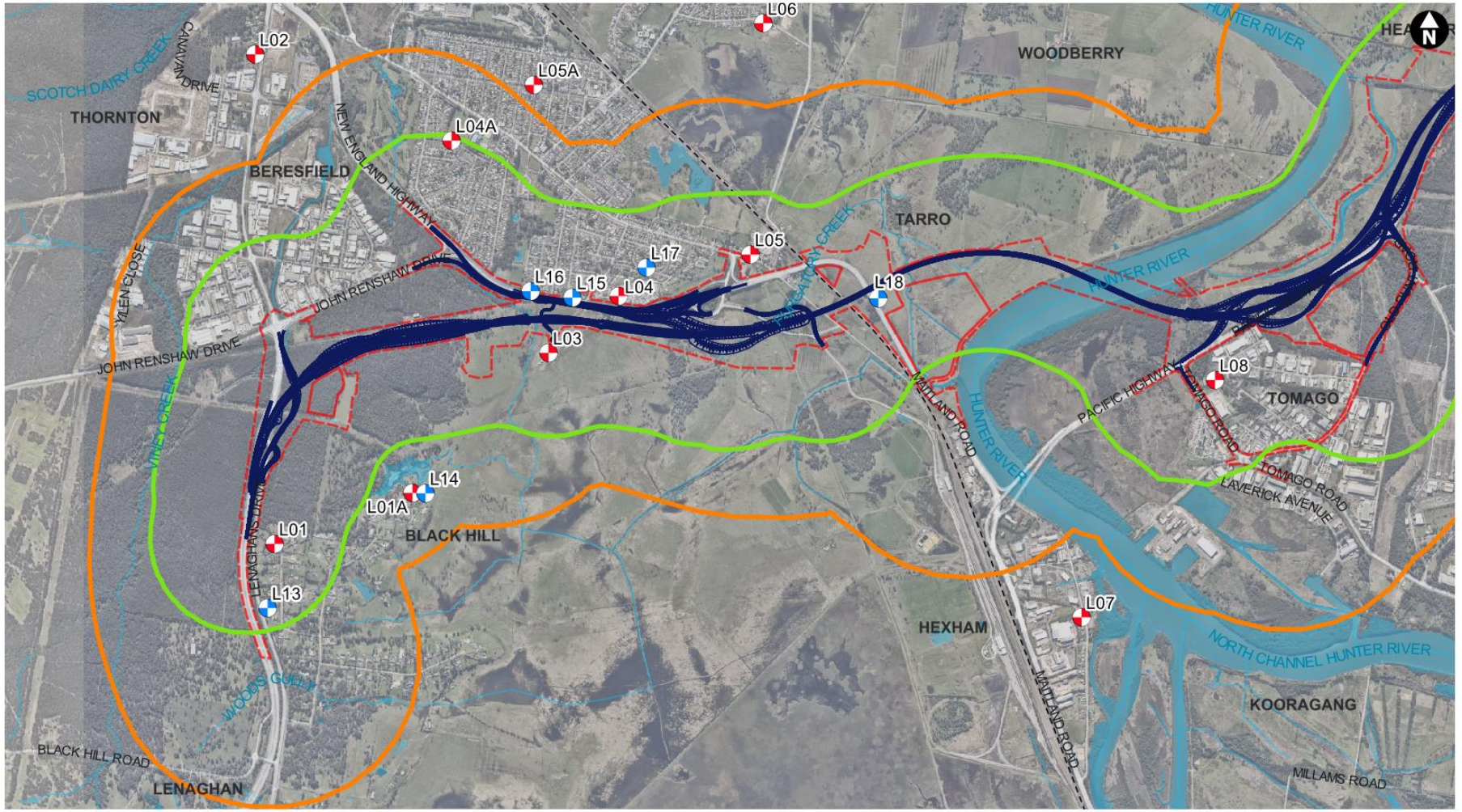

Figure TL081-01.6.2.1.1 Q49 (r0) Noise monitoring locations

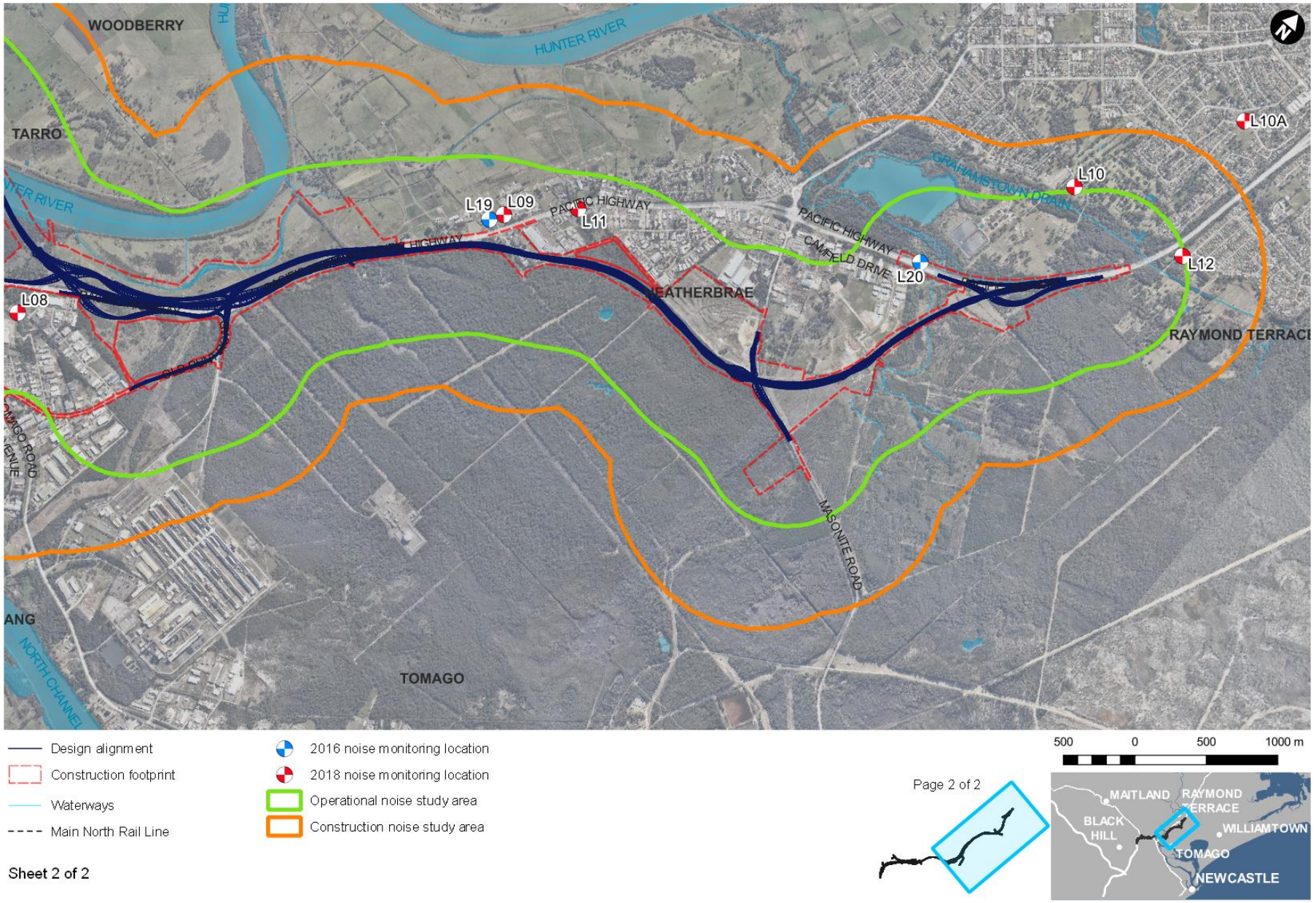

Figure TL081-01.6.2.1.1 Q49 (r0) Noise monitoring locations

A.2 Noise monitoring results

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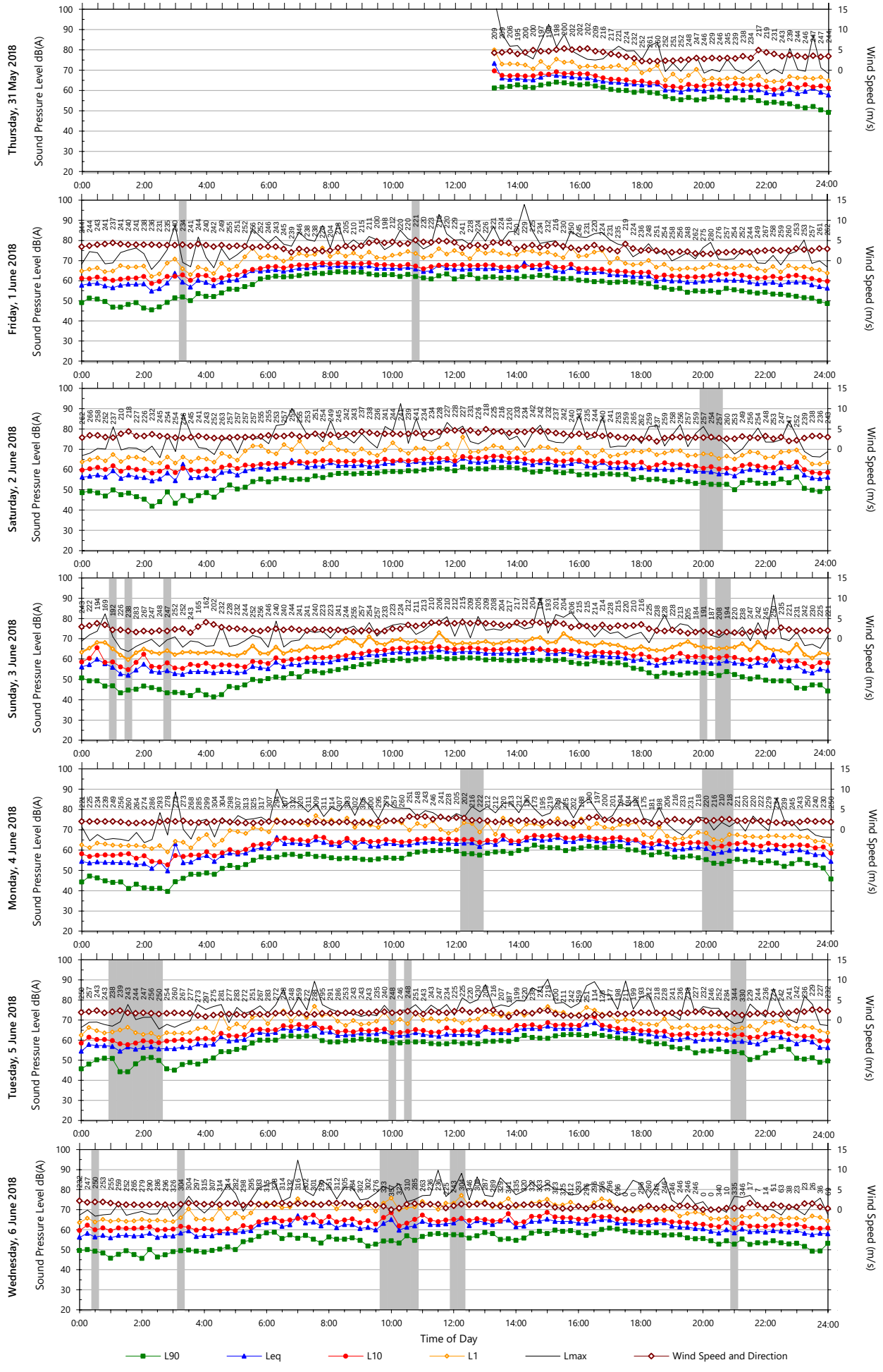
L01 - 23 Cahill Close, Black Hill

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	55	47	-	61	61
Friday-01-June-2018	60	54	45	66	60	59
Saturday-02-June-2018	57	-	43	63	-	57
Sunday-03-June-2018	56	-	41	63	-	59
Monday-04-June-2018	56	-	-	64	-	-
Tuesday-05-June-2018	58	52	47	65	61	60
Wednesday-06-June-2018	55	53	49	63	61	60
Thursday-07-June-2018	55	52	48	63	59	59
Friday-08-June-2018	53	53	-	62	59	-
Saturday-09-June-2018	51	-	-	58	-	-
Representative Noise Level[5]	**56**	**53**	**47**	**63**	**60**	**59**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



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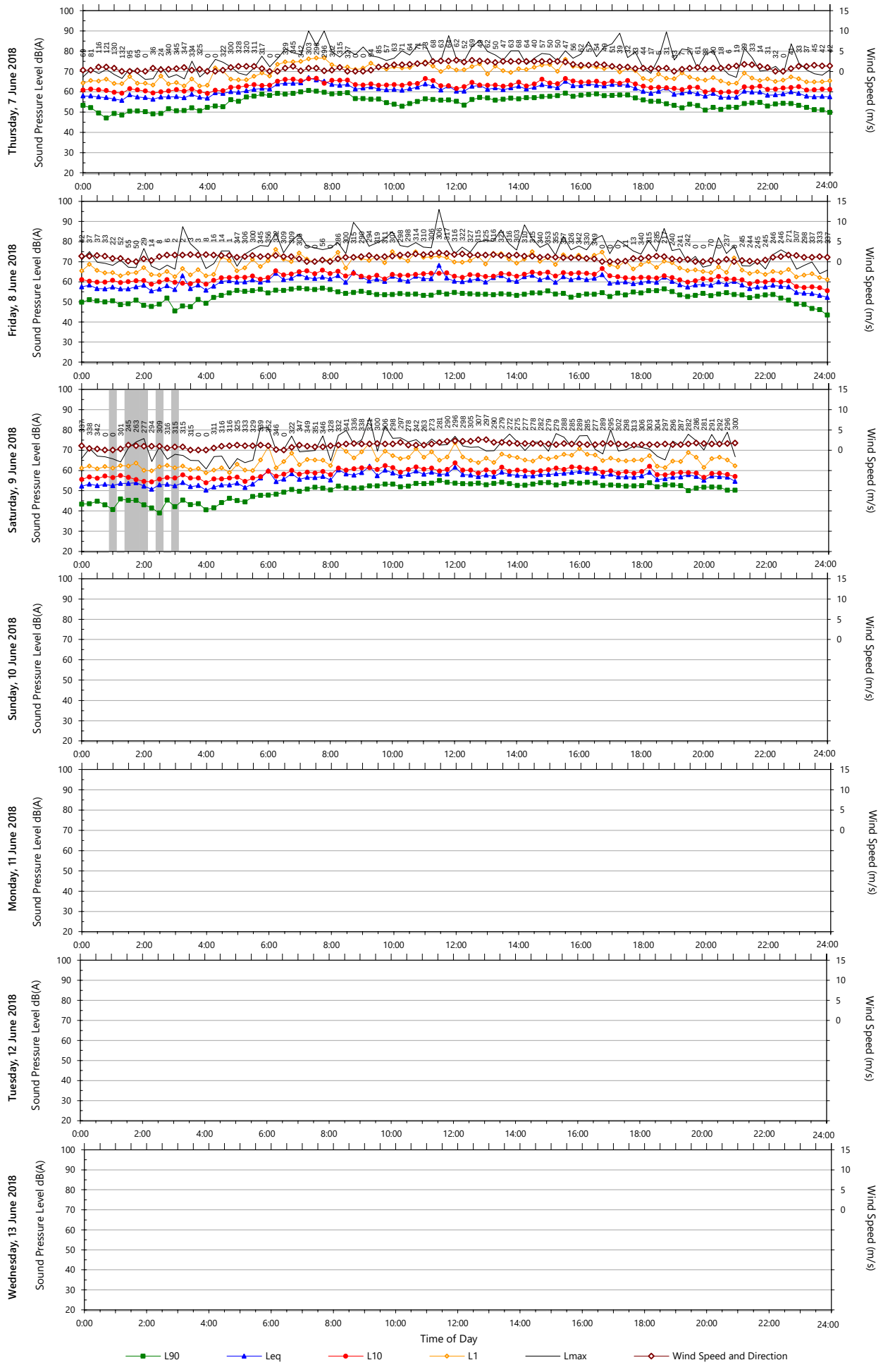

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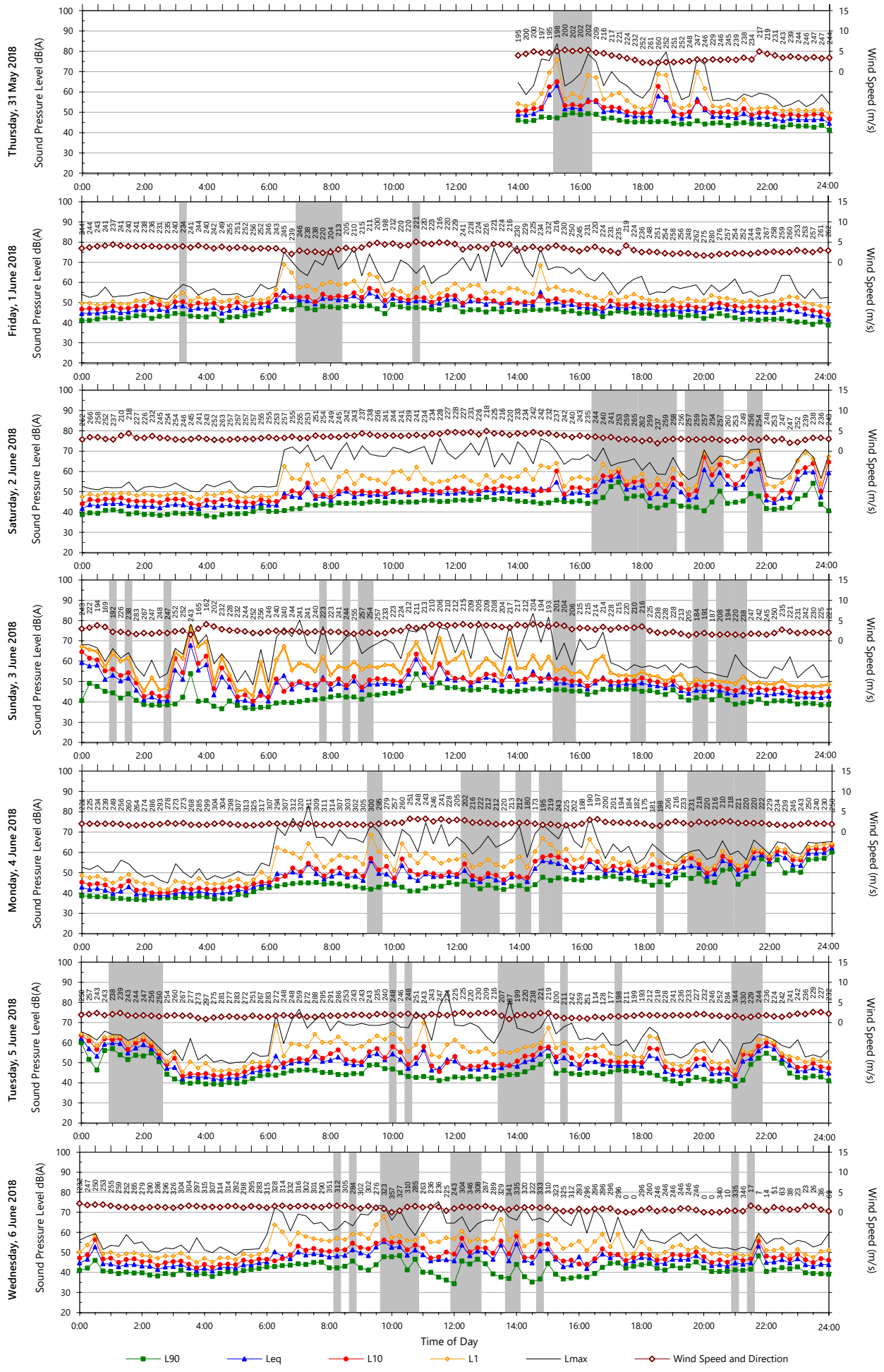
	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	44	42	-	52	48
Friday-01-June-2018	45	42	39	50	46	44
Saturday-02-June-2018	44	-	37	50	-	56
Sunday-03-June-2018	44	-	37	53	-	44
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	39	-	-	47
Wednesday-06-June-2018	-	41	39	-	47	47
Thursday-07-June-2018	40	40	37	50	47	45
Friday-08-June-2018	36	41	-	49	47	-
Saturday-09-June-2018	37	35	-	46	40	-
Sunday-10-June-2018	-	-	34	-	-	47
Monday-11-June-2018	-	38	35	-	44	41
Tuesday-12-June-2018	37	-	-	48	-	-
Representative Noise Level[5]	**40**	**41**	**37**	**50**	**47**	**49**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



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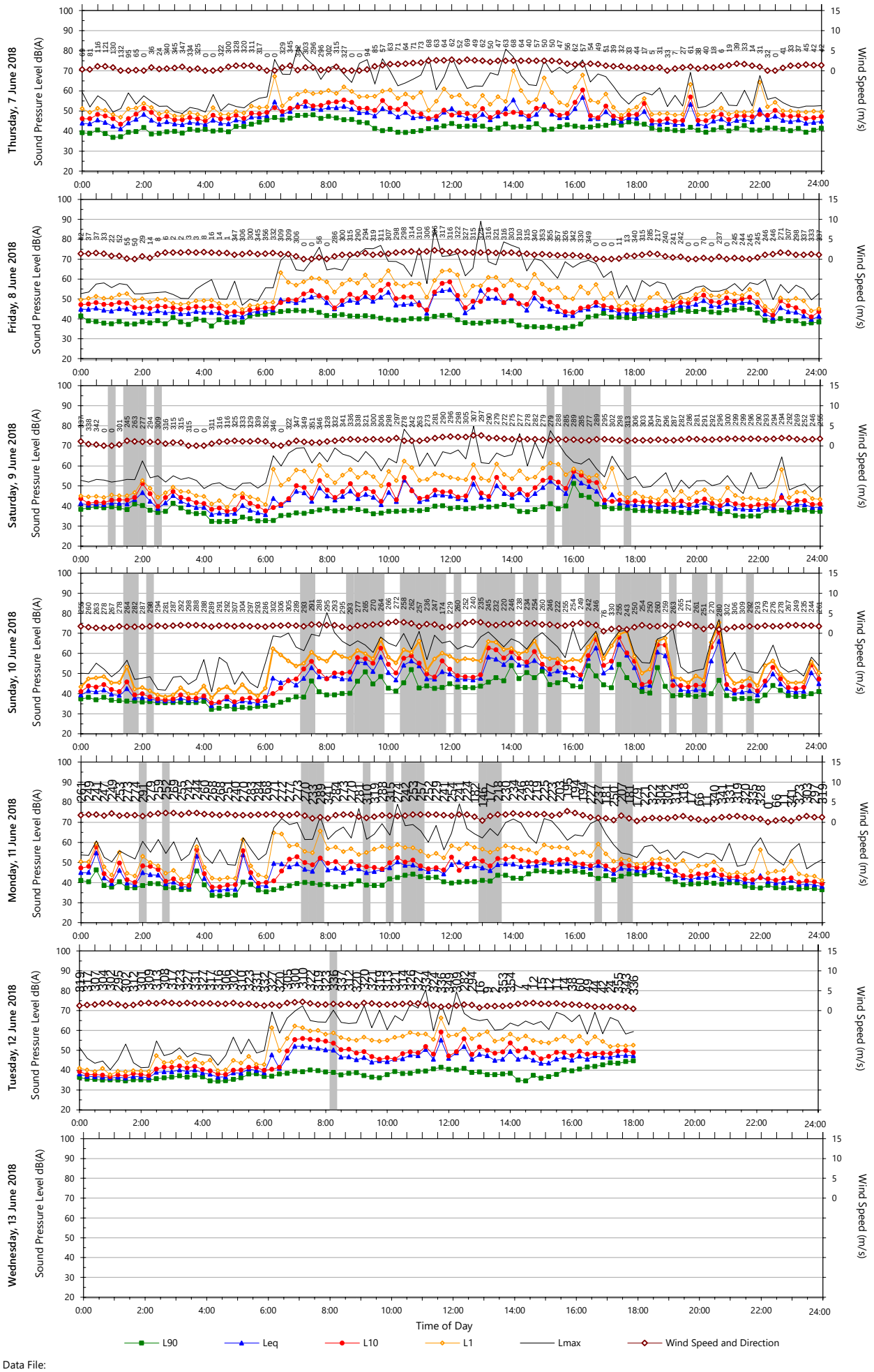

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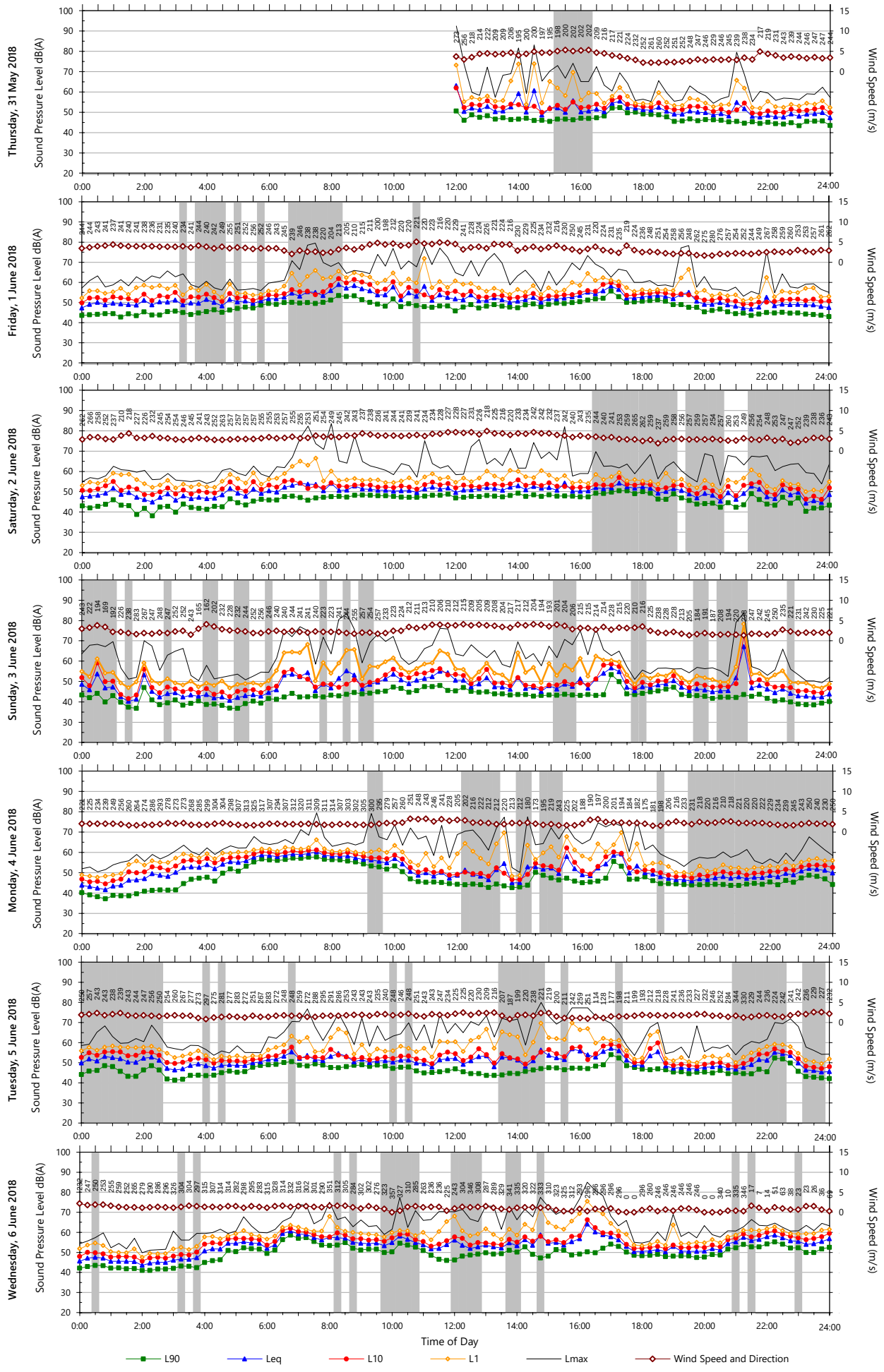
	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	45	-	-	50	-
Friday-01-June-2018	48	44	42	54	51	49
Saturday-02-June-2018	47	-	-	52	-	-
Sunday-03-June-2018	43	-	39	51	-	54
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	-	-	-	-
Wednesday-06-June-2018	-	48	48	-	54	57
Thursday-07-June-2018	53	54	50	58	58	58
Friday-08-June-2018	55	47	-	58	55	-
Saturday-09-June-2018	51	47	-	55	52	-
Sunday-10-June-2018	-	-	-	-	-	-
Monday-11-June-2018	-	51	45	-	55	55
Tuesday-12-June-2018	54	52	45	58	57	56
Wednesday-13-June-2018	56	51	47	59	56	56
Thursday-14-June-2018	55	53	-	59	58	-
Representative Noise Level[5]	**53**	**49**	**45**	**57**	**55**	**56**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



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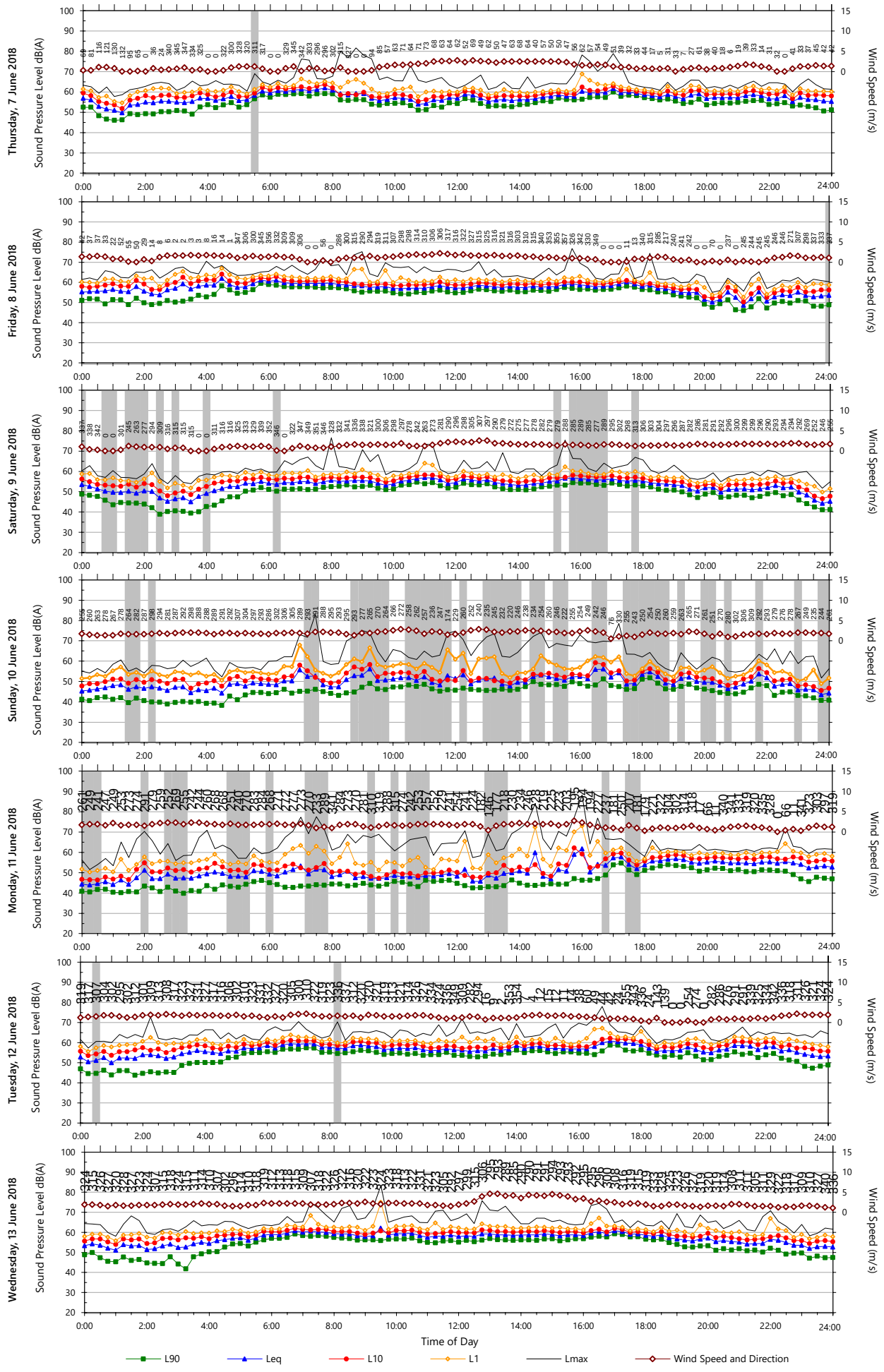

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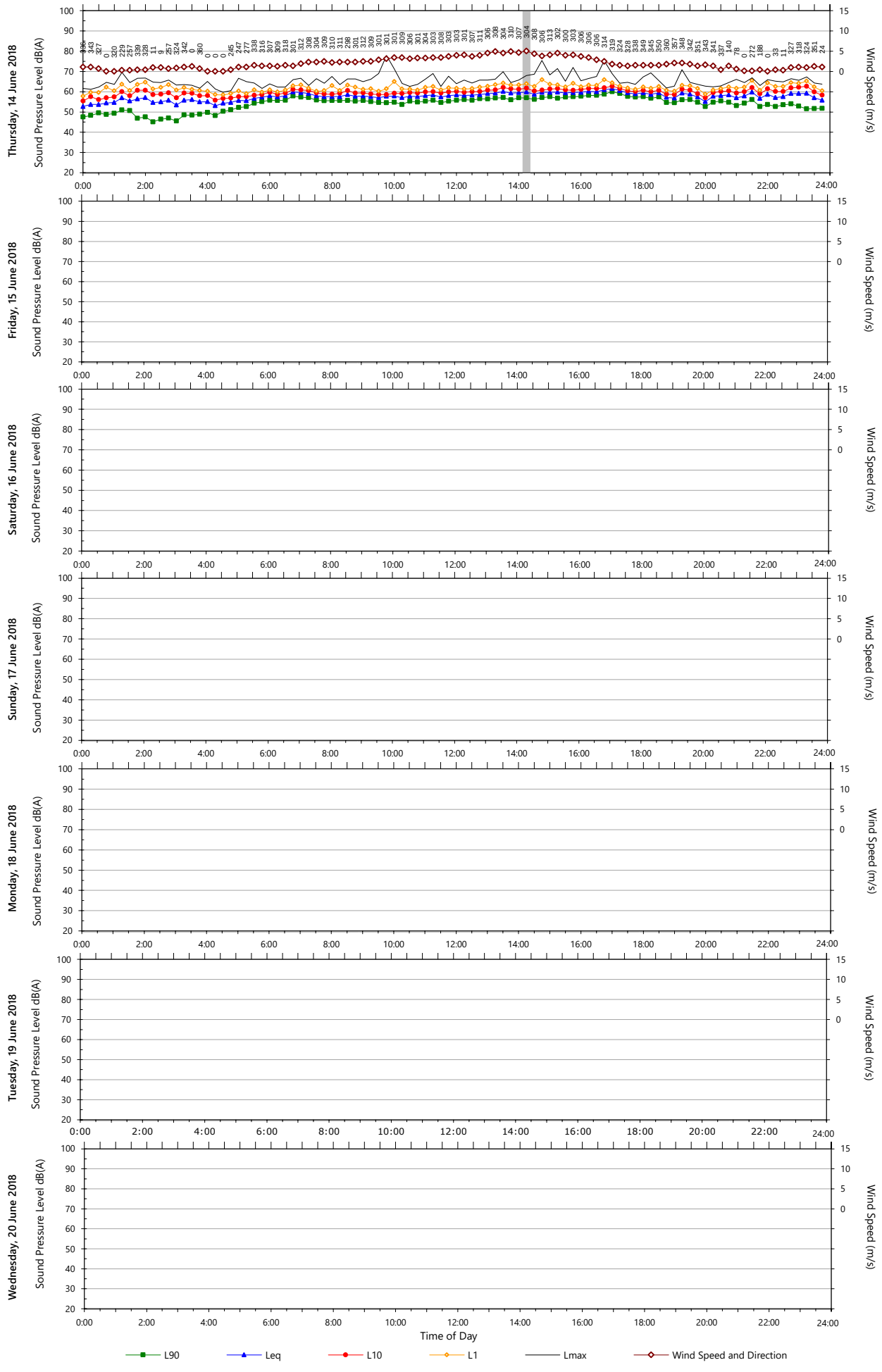

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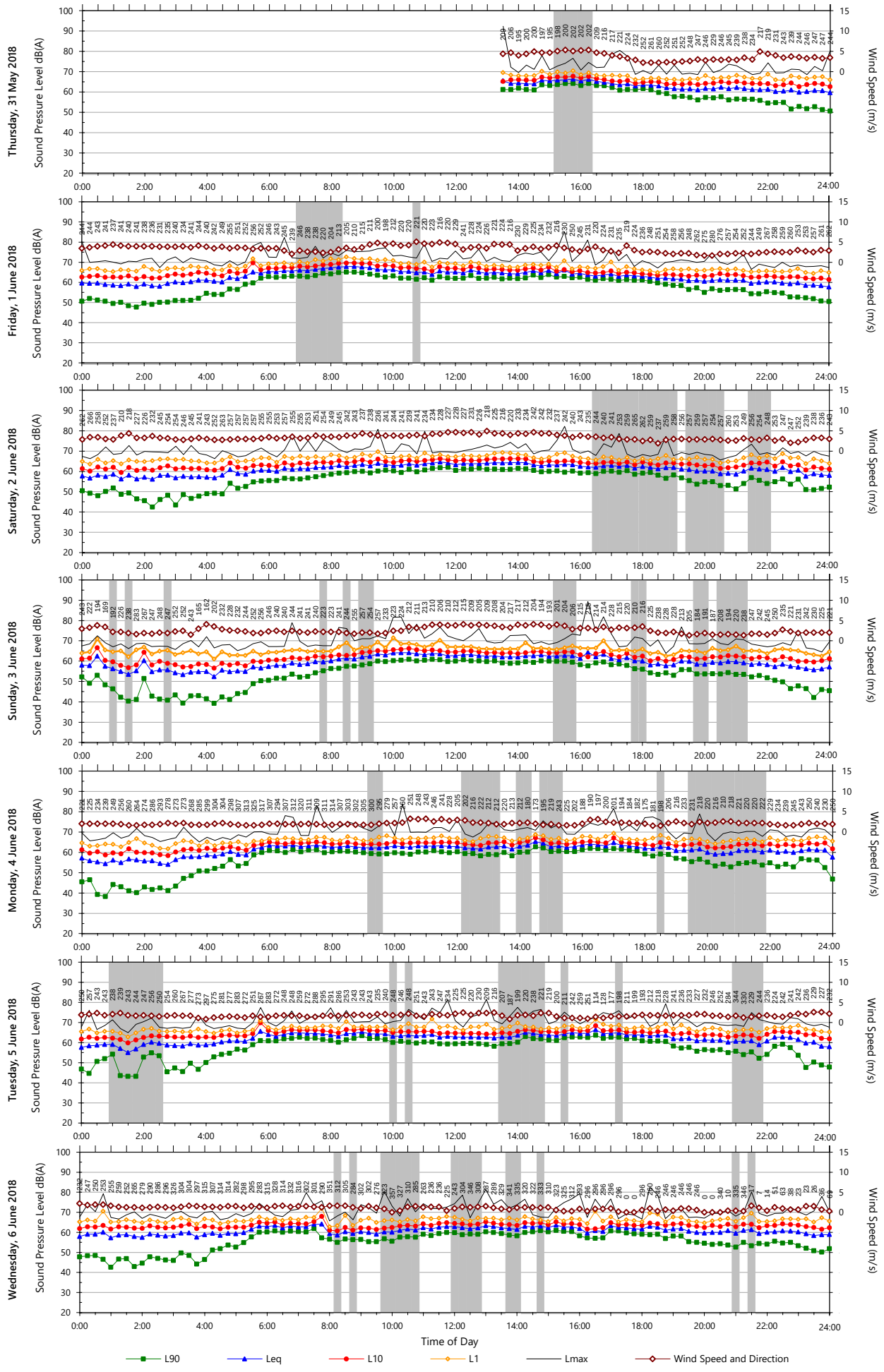
	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	56	50	-	62	62
Friday-01-June-2018	61	55	46	65	61	59
Saturday-02-June-2018	59	-	41	63	-	58
Sunday-03-June-2018	58	-	41	63	-	59
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	45	-	-	60
Wednesday-06-June-2018	-	54	48	-	61	61
Thursday-07-June-2018	57	54	49	62	60	60
Friday-08-June-2018	57	53	-	61	60	-
Saturday-09-June-2018	56	54	-	60	59	-
Sunday-10-June-2018	-	-	39	-	-	57
Monday-11-June-2018	-	54	44	-	60	58
Tuesday-12-June-2018	56	54	46	61	60	61
Wednesday-13-June-2018	-	-	-	-	-	-
Representative Weekday[5]	**57**	**54**	**46**	**63**	**61**	**60**
Representative Weekend[5]	**58**	**54**	**41**	**62**	**59**	**58**
Representative Noise Level[5]	**57**	**54**	**46**	**63**	**60**	**60**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



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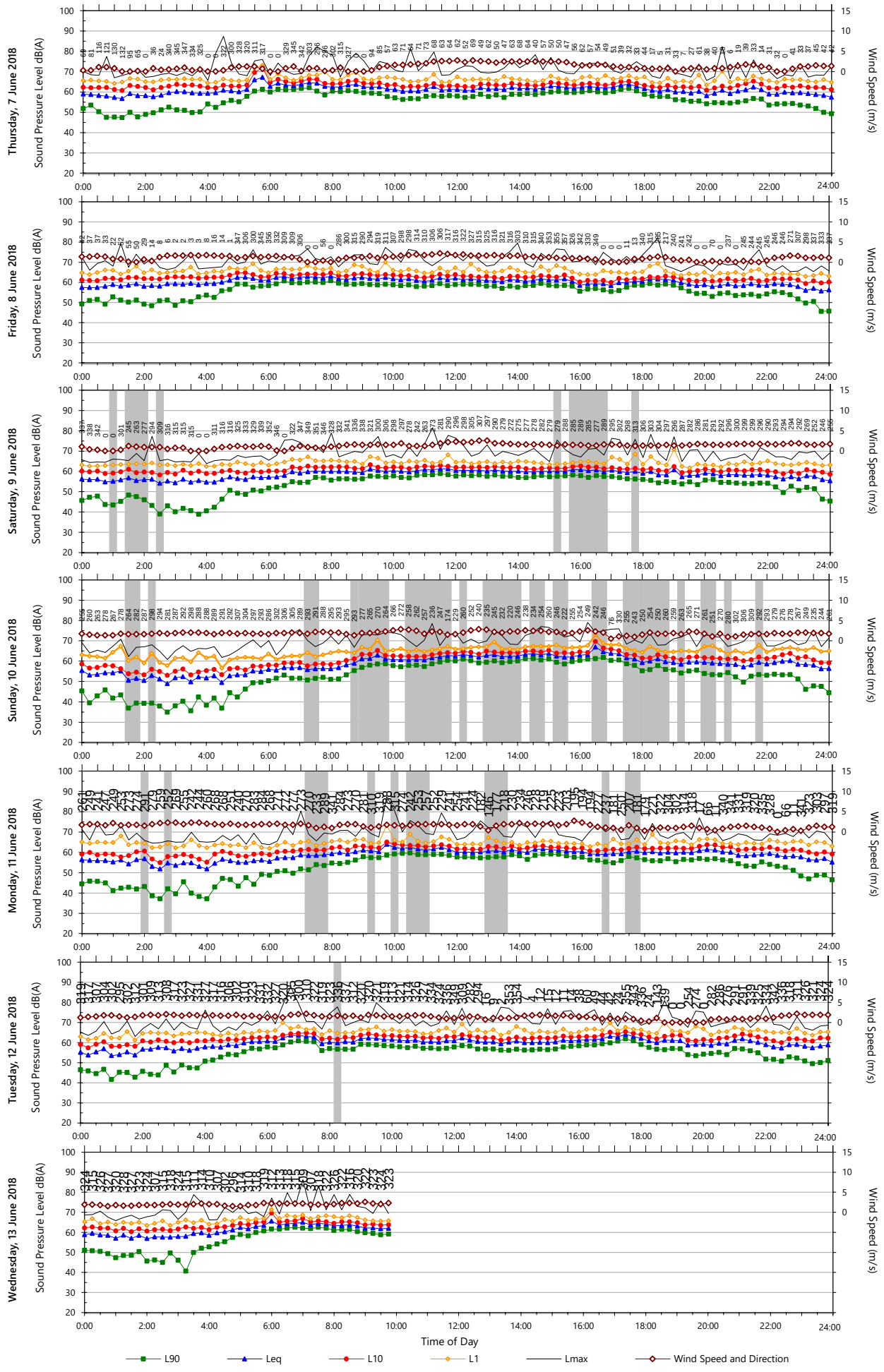

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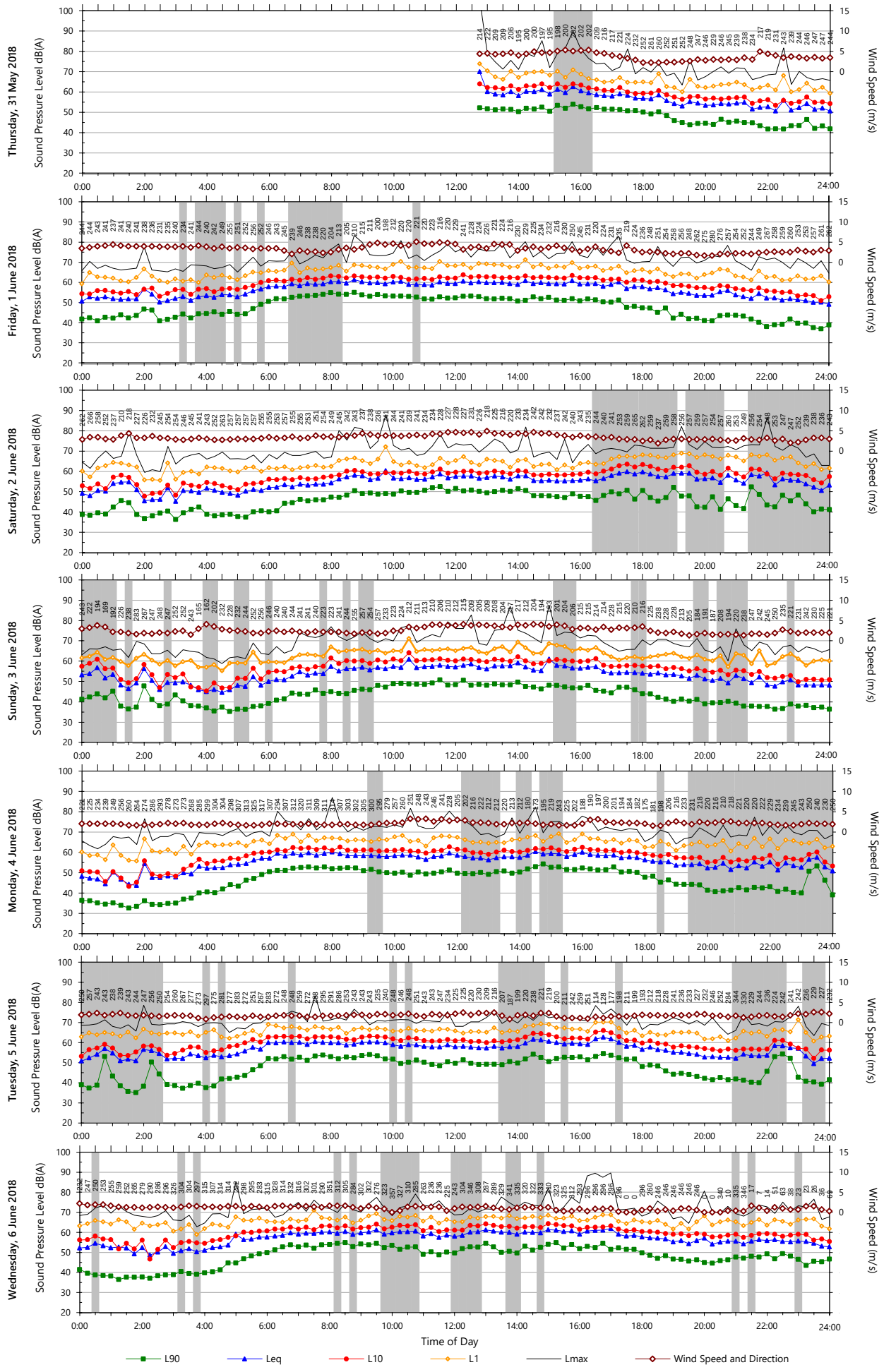
	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	44	-	-	55	-
Friday-01-June-2018	50	41	38	60	55	51
Saturday-02-June-2018	47	-	-	57	-	-
Sunday-03-June-2018	46	-	34	57	-	53
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	-	-	-	-
Wednesday-06-June-2018	-	45	43	-	56	56
Thursday-07-June-2018	51	48	45	60	56	56
Friday-08-June-2018	50	42	-	60	55	-
Saturday-09-June-2018	46	39	-	58	54	-
Sunday-10-June-2018	-	-	-	-	-	-
Monday-11-June-2018	-	42	35	-	53	53
Tuesday-12-June-2018	49	48	37	58	56	54
Wednesday-13-June-2018	52	44	38	59	55	54
Thursday-14-June-2018	51	45	37	59	55	54
Friday-15-June-2018	-	44	-	-	54	-
Saturday-16-June-2018	-	-	-	-	-	-
Representative Noise Level[5]	**50**	**44**	**37**	**59**	**55**	**54**

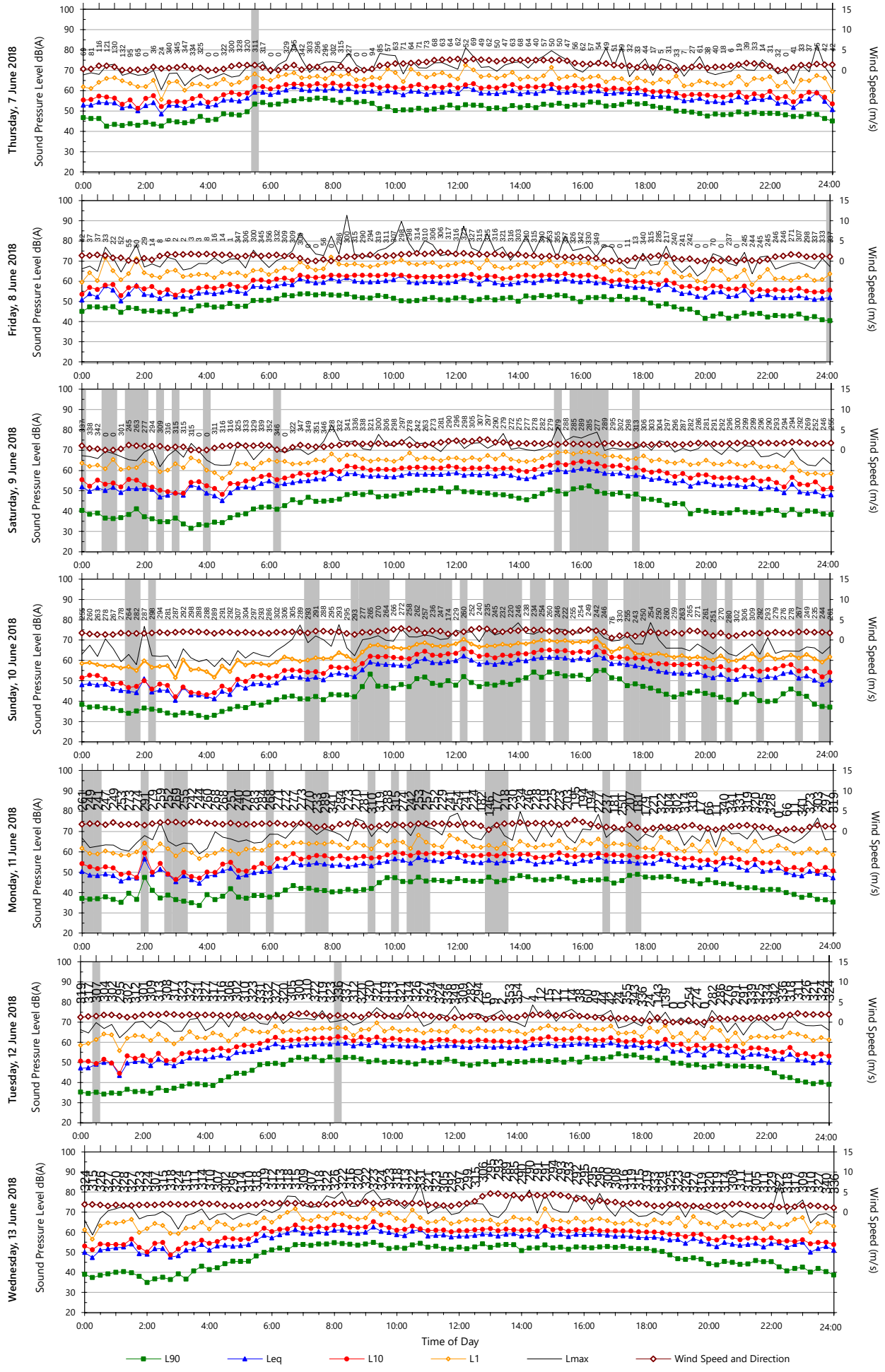
Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



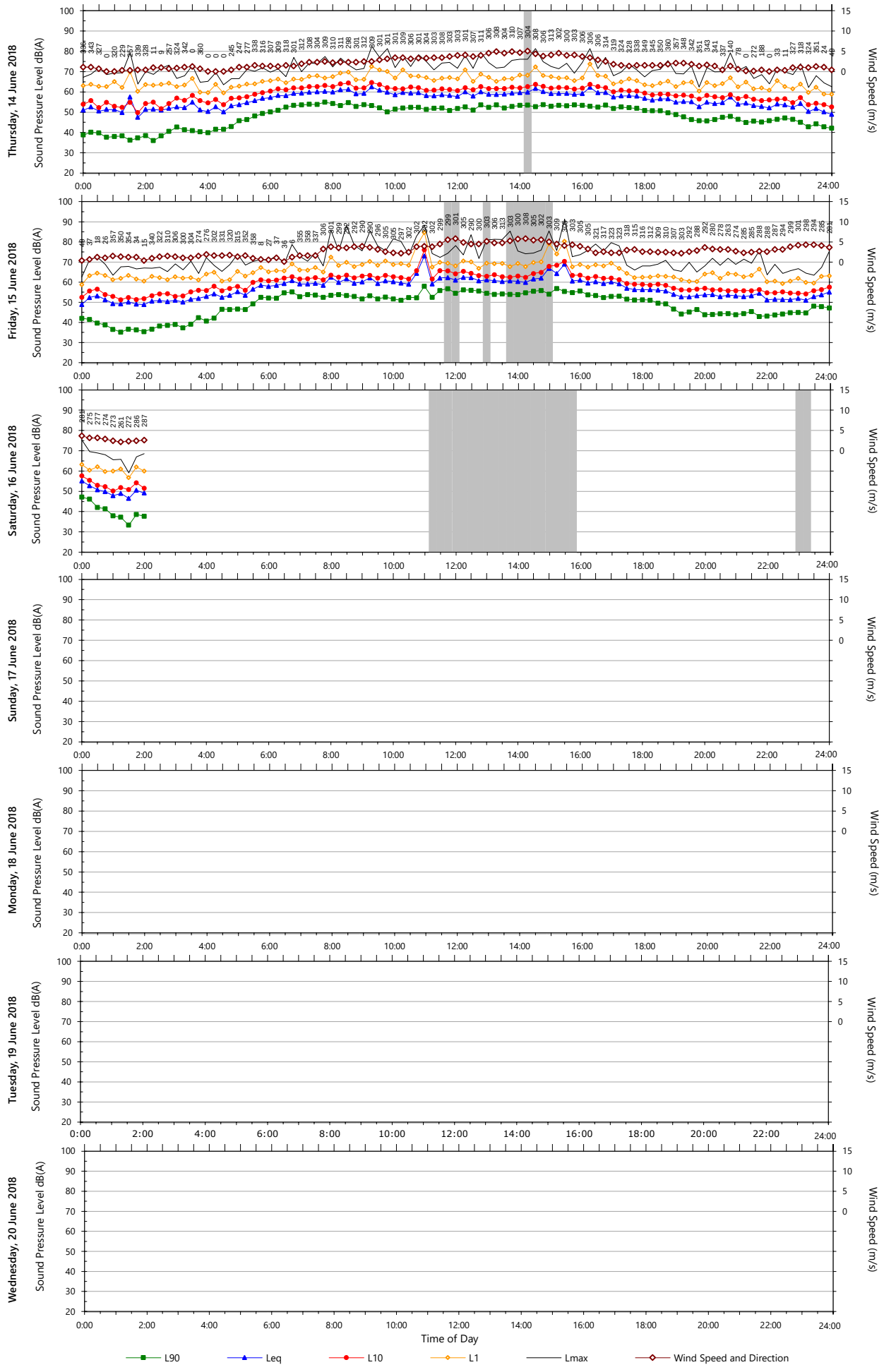
Data File:

Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)

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L06 - 61 Redbill Drive, Woodberry

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

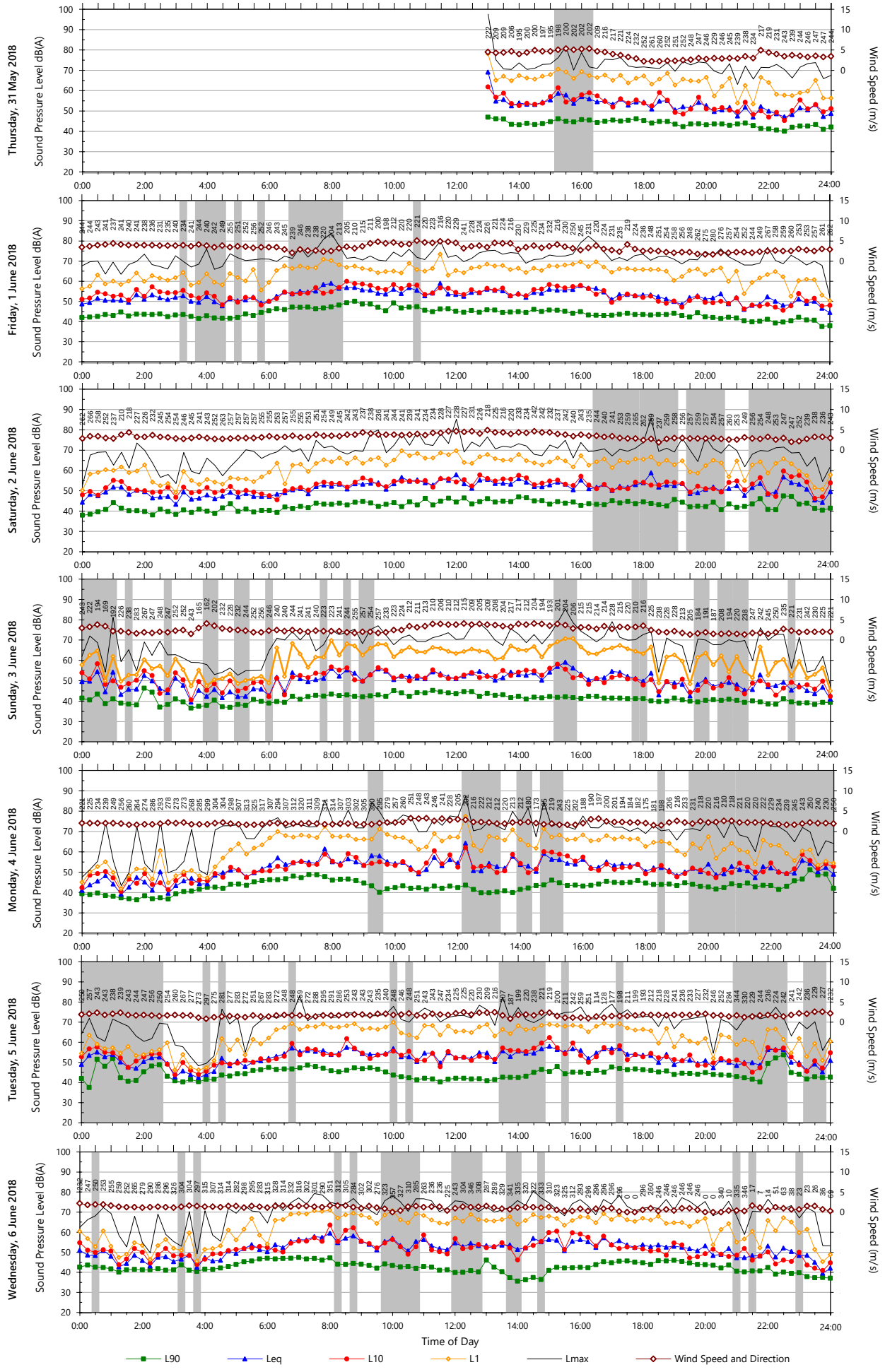
	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	42	-	-	52	-
Friday-01-June-2018	43	40	38	55	51	49
Saturday-02-June-2018	43	-	-	54	-	-
Sunday-03-June-2018	42	-	37	53	-	50
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	-	-	-	-
Wednesday-06-June-2018	-	41	37	-	52	50
Thursday-07-June-2018	37	36	34	60	51	49
Friday-08-June-2018	39	39	-	55	53	-
Saturday-09-June-2018	38	39	-	55	50	-
Sunday-10-June-2018	-	-	-	-	-	-
Monday-11-June-2018	-	40	38	-	49	47
Tuesday-12-June-2018	36	42	39	56	51	49
Wednesday-13-June-2018	43	41	38	55	51	50
Thursday-14-June-2018	-	-	-	-	-	-
Representative Noise Level[5]	**40**	**40**	**38**	**56**	**51**	**49**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

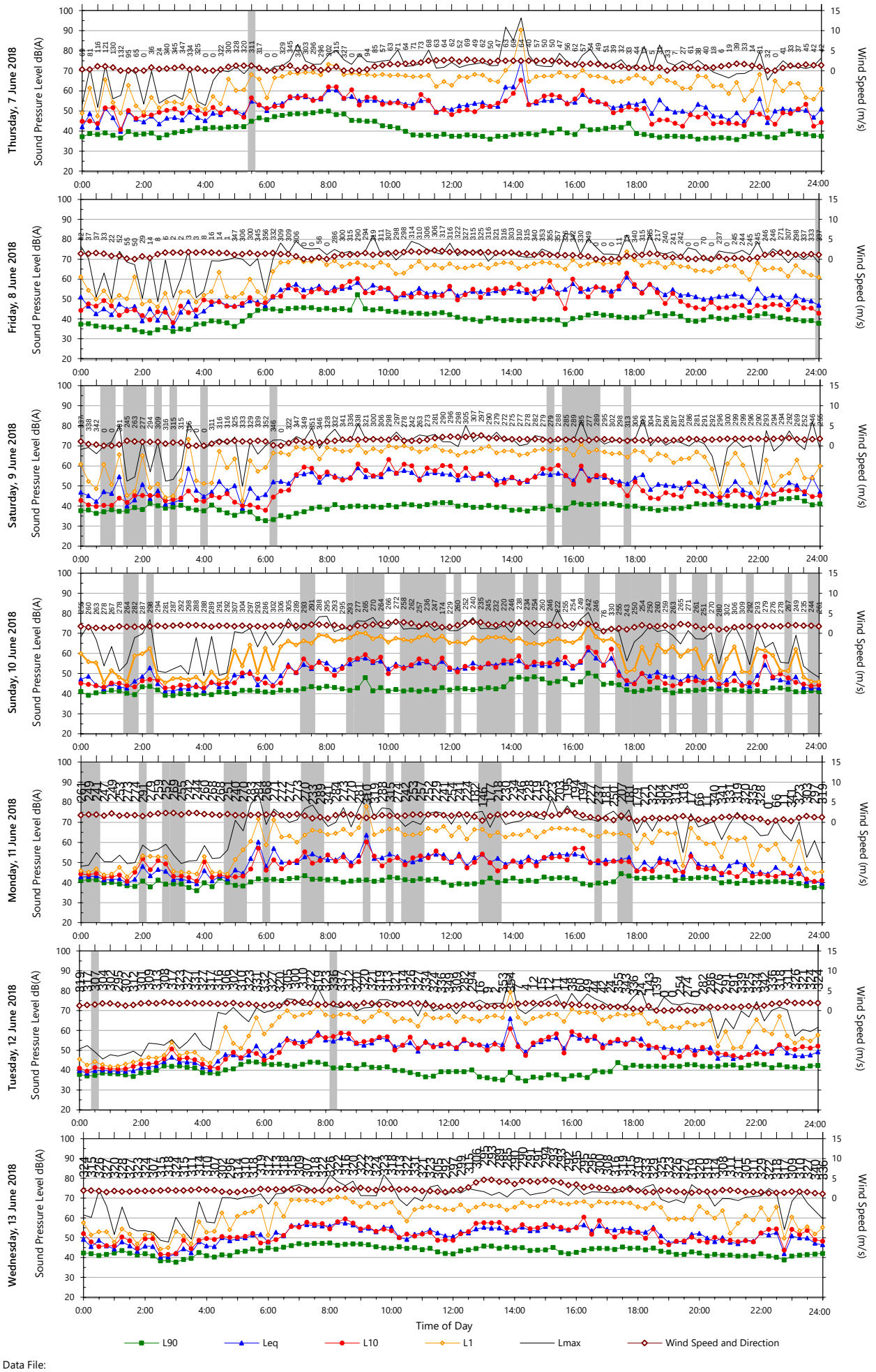
Unattended Monitoring Results

Location: L06 - 61 Redbill Drive, Woodberry



Data File:

Template: QTE-26 Logger Graphs Program (r32)

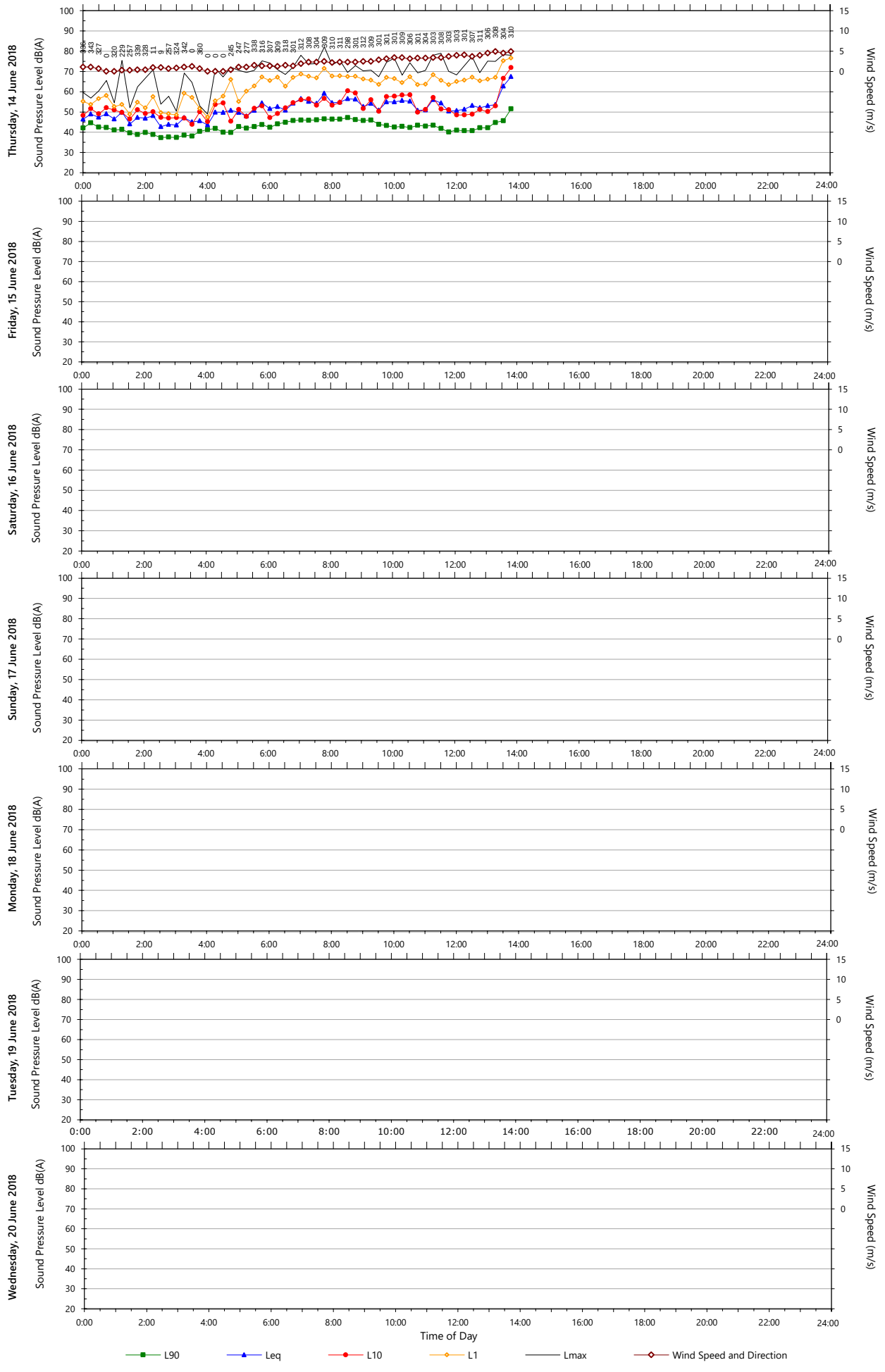


Data File:

Template: QTE-26 Logger Graphs Program (r32)

Unattended Monitoring Results

Location: L06 - 61 Redbill Drive, Woodberry



Data File:

Template: QTE-26 Logger Graphs Program (r32)

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L07 - 179 Old Maitland Road, Hexham

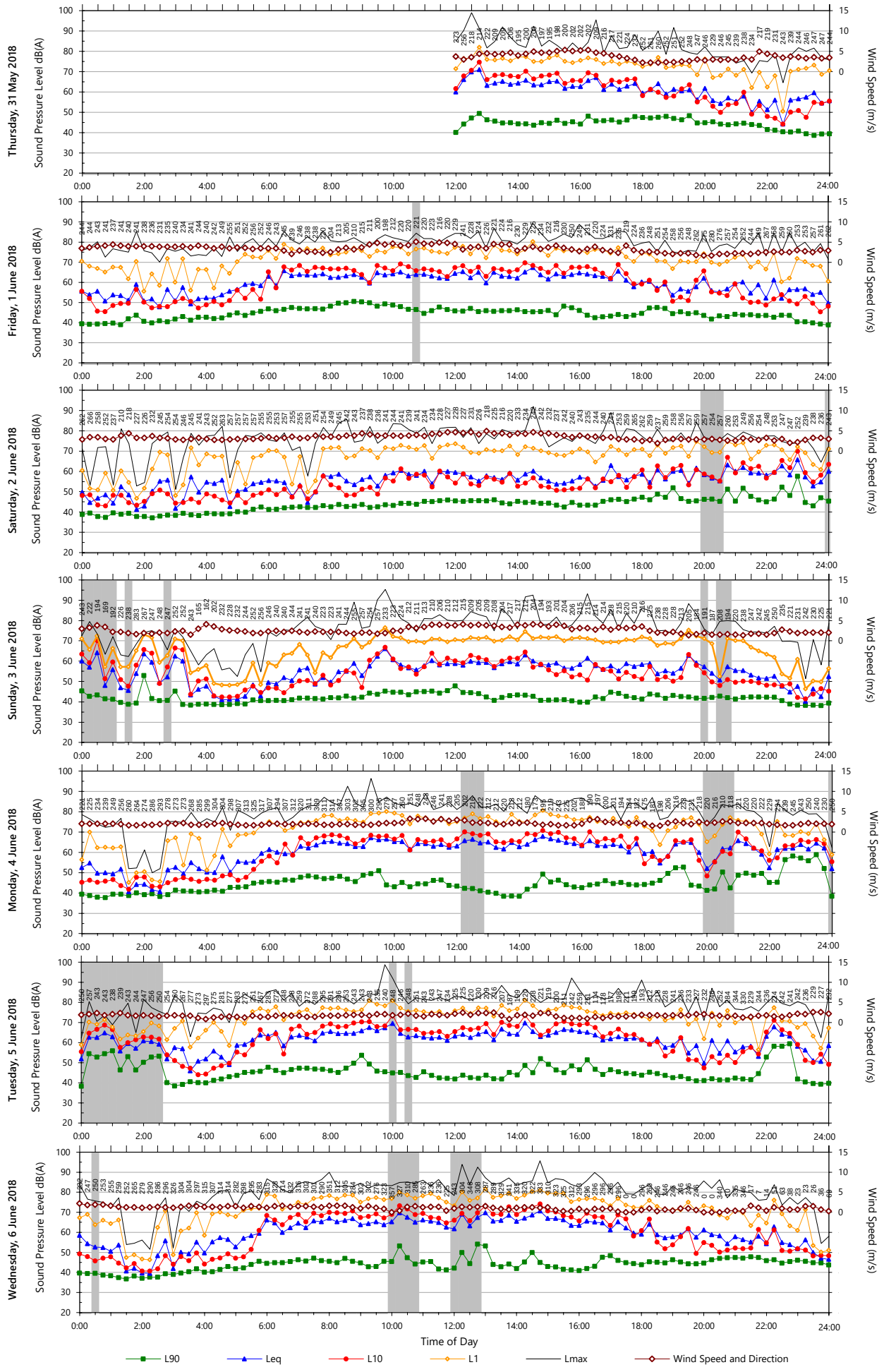
Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	44	39	-	59	58
Friday-01-June-2018	44	43	38	64	58	54
Saturday-02-June-2018	43	-	-	58	-	-
Sunday-03-June-2018	41	-	38	59	-	55
Monday-04-June-2018	40	-	-	64	-	-
Tuesday-05-June-2018	42	41	38	65	59	59
Wednesday-06-June-2018	42	44	44	66	59	57
Thursday-07-June-2018	41	45	44	65	60	58
Friday-08-June-2018	41	38	-	64	59	-
Saturday-09-June-2018	36	39	37	57	54	52
Sunday-10-June-2018	-	-	-	-	-	-
Representative Noise Level[5]	**41**	**43**	**38**	**63**	**59**	**57**

Notes:

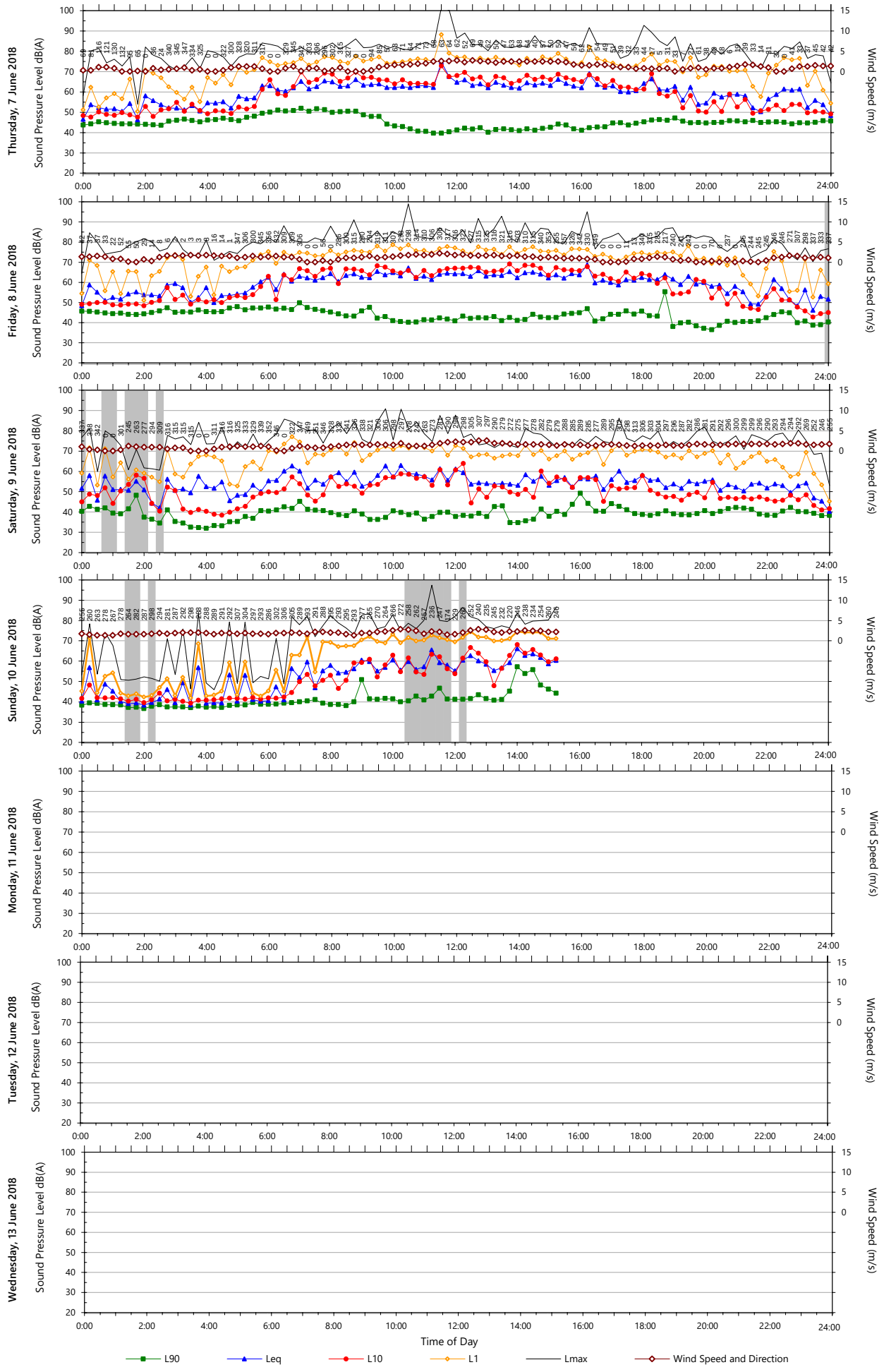
1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods

4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



Data File:

Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)

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L08 - 838 Tomago Road, Tomago

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

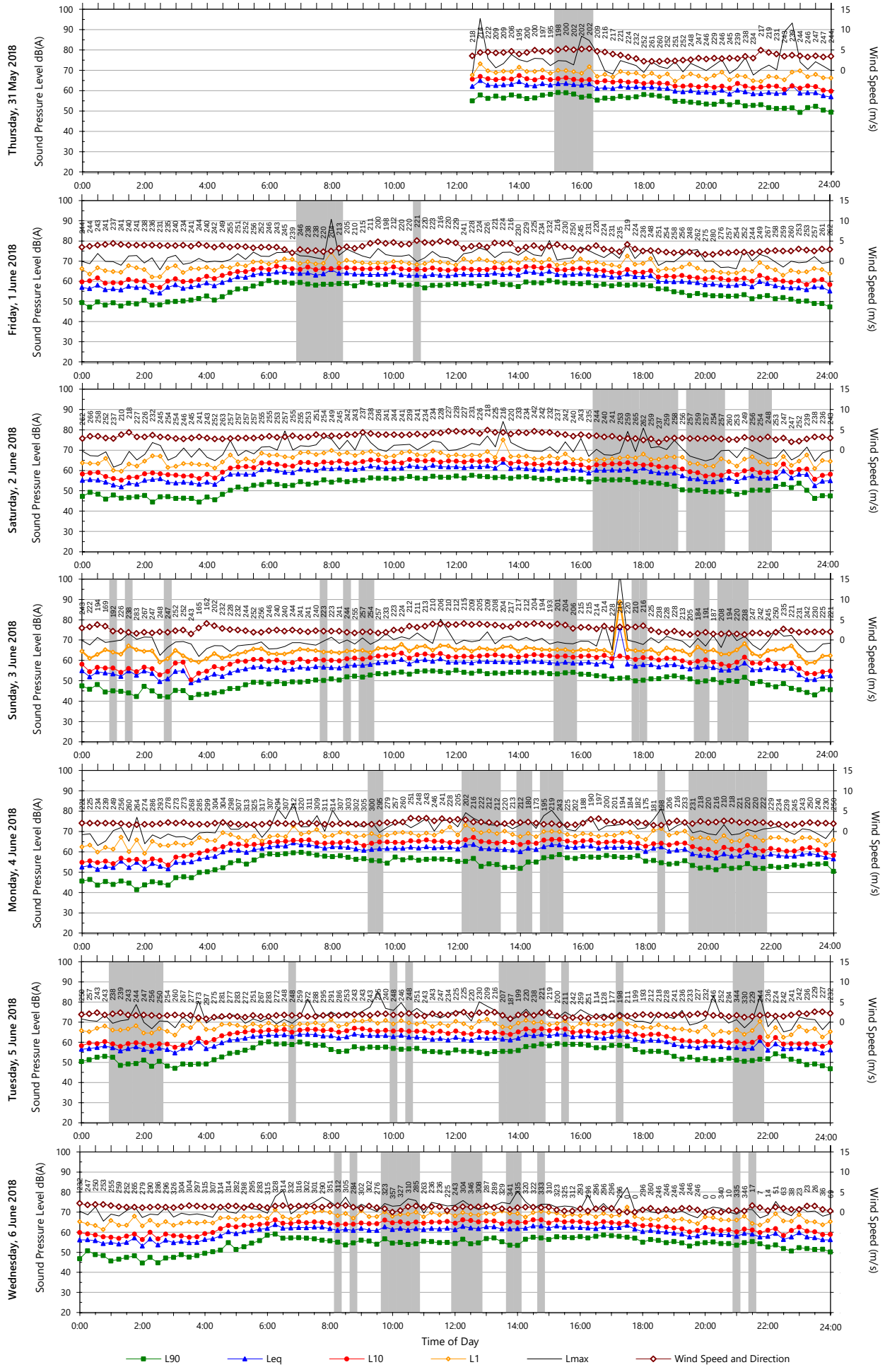
	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	53	48	-	60	60
Friday-01-June-2018	58	52	46	63	59	57
Saturday-02-June-2018	54	-	43	61	-	55
Sunday-03-June-2018	52	-	44	63	-	58
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	47	-	-	58
Wednesday-06-June-2018	-	53	49	-	59	59
Thursday-07-June-2018	53	51	51	63	59	61
Friday-08-June-2018	55	53	-	62	59	-
Saturday-09-June-2018	52	50	-	60	56	-
Sunday-10-June-2018	-	-	44	-	-	54
Monday-11-June-2018	-	51	44	-	58	57
Tuesday-12-June-2018	53	53	-	66	59	-
Representative Noise Level[5]	**53**	**53**	**46**	**63**	**59**	**58**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

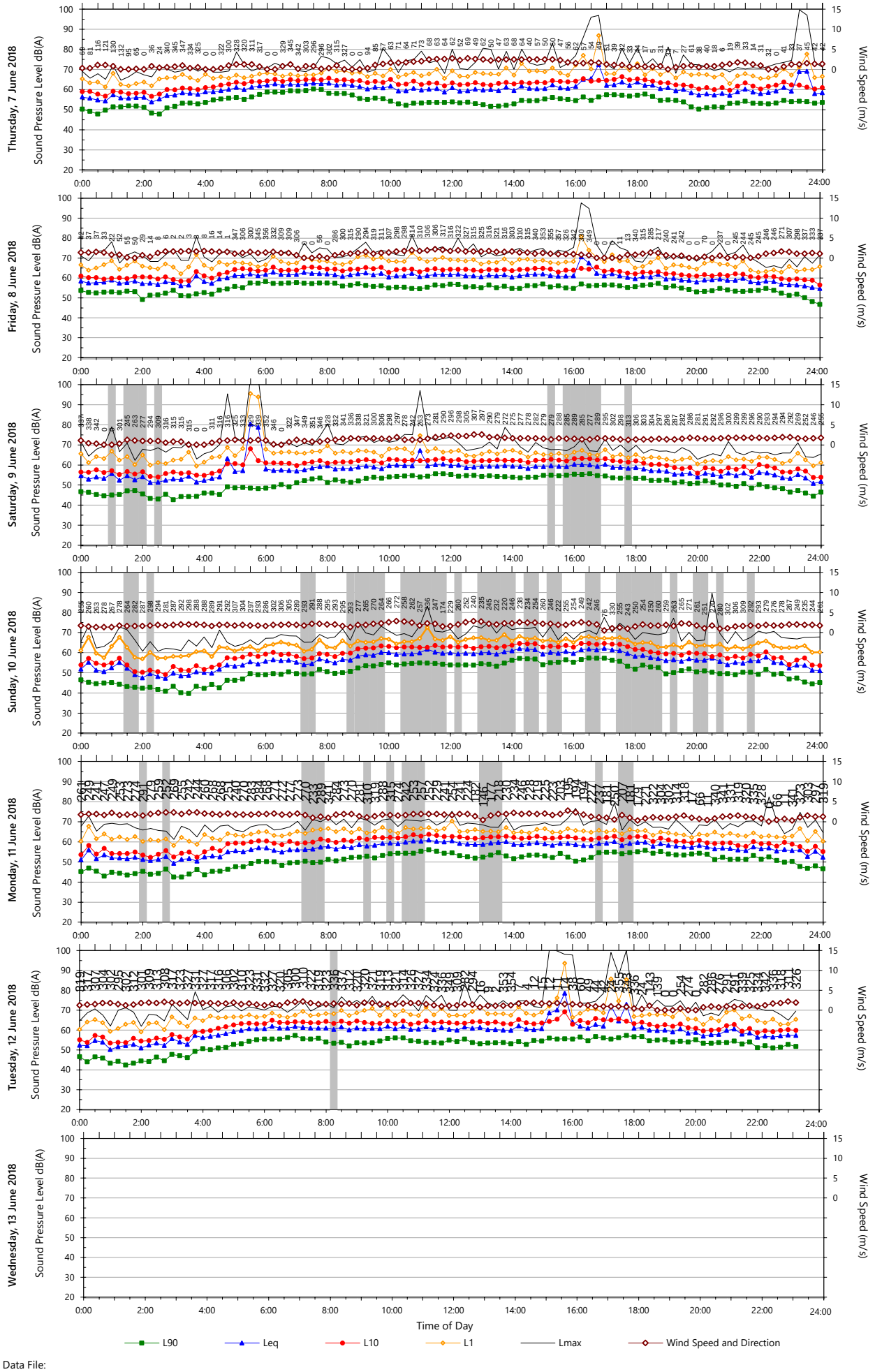
Unattended Monitoring Results

Location: L08 - 838 Tomago Road, Tomago



Data File:

Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)

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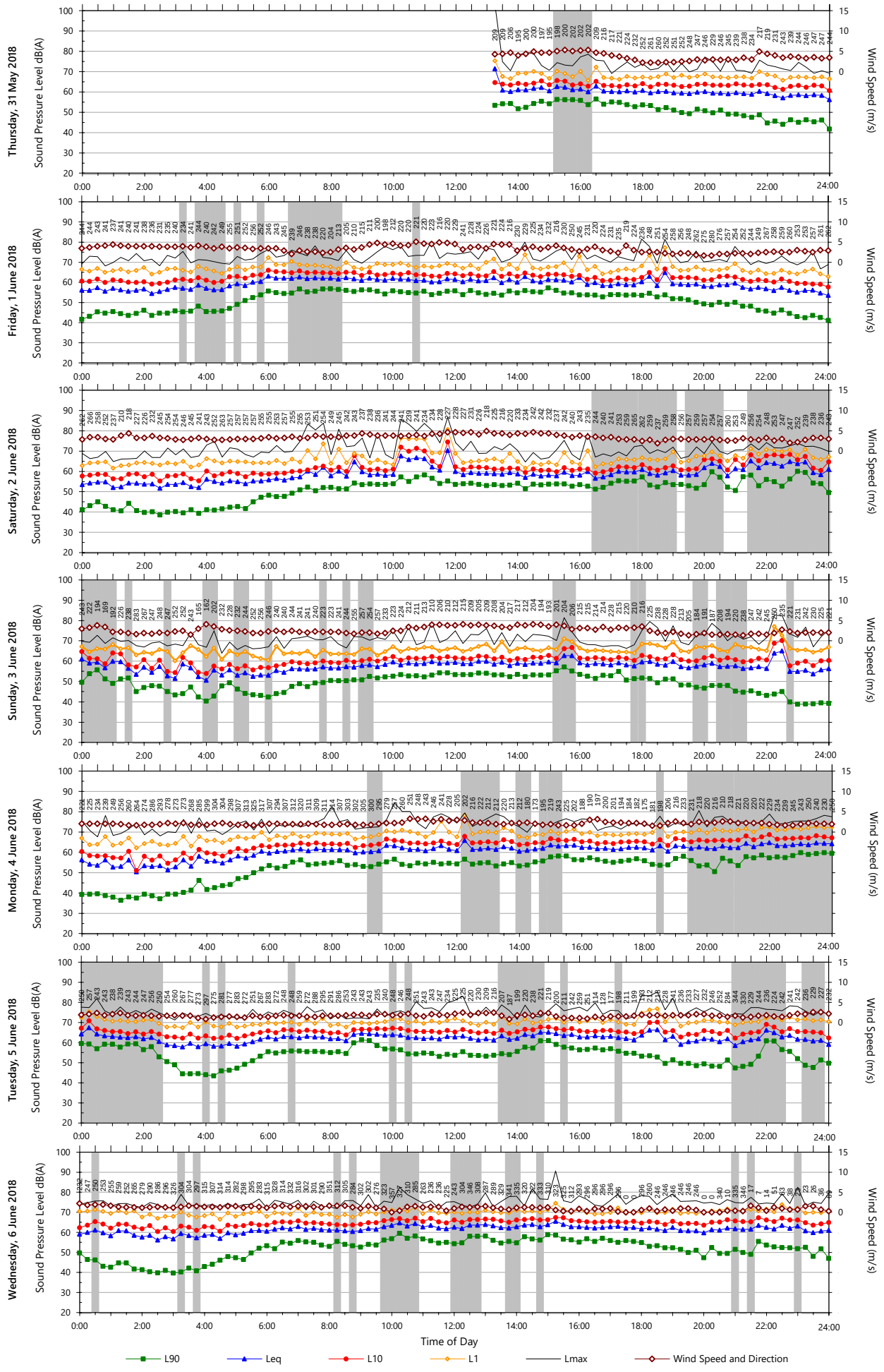
L09 - 2213 Pacific Highway, Heatherbrae

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	48	-	-	60	-
Friday-01-June-2018	54	47	40	61	60	55
Saturday-02-June-2018	52	-	-	62	-	-
Sunday-03-June-2018	52	-	38	59	-	58
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	-	-	-	-
Wednesday-06-June-2018	-	50	45	-	62	60
Thursday-07-June-2018	54	52	46	62	61	60
Friday-08-June-2018	53	51	-	61	61	-
Saturday-09-June-2018	52	44	-	61	57	-
Sunday-10-June-2018	-	-	-	-	-	-
Monday-11-June-2018	-	48	36	-	60	58
Tuesday-12-June-2018	53	49	41	62	61	59
Wednesday-13-June-2018	52	49	41	61	61	60
Thursday-14-June-2018	52	51	41	61	61	59
Friday-15-June-2018	-	49	-	-	61	-
Representative Noise Level[5]	**52**	**49**	**41**	**61**	**61**	**59**

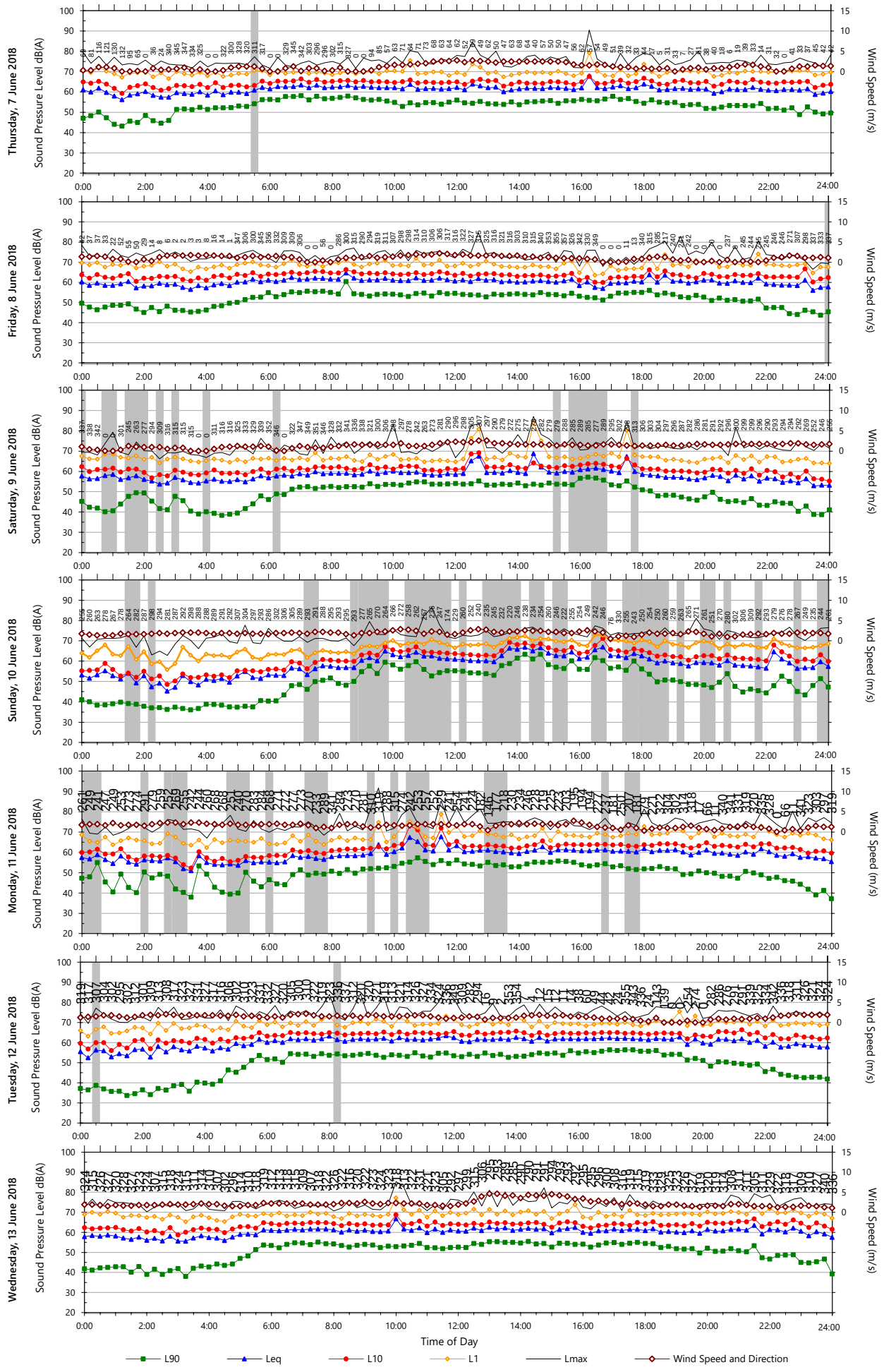
Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



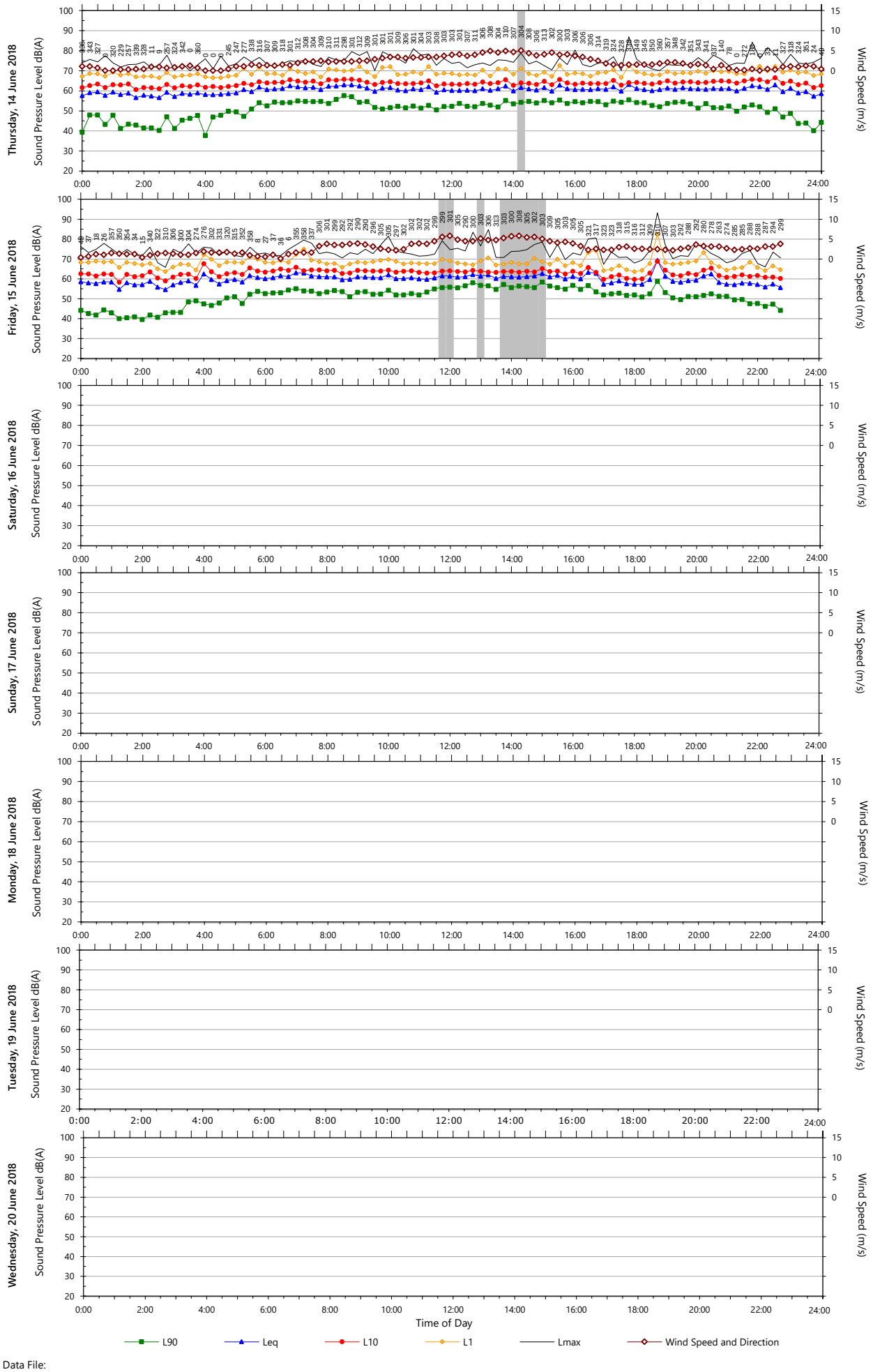
Data File:

Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)

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L10 - 14 Elizabeth Avenue, Raymond Terrace

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

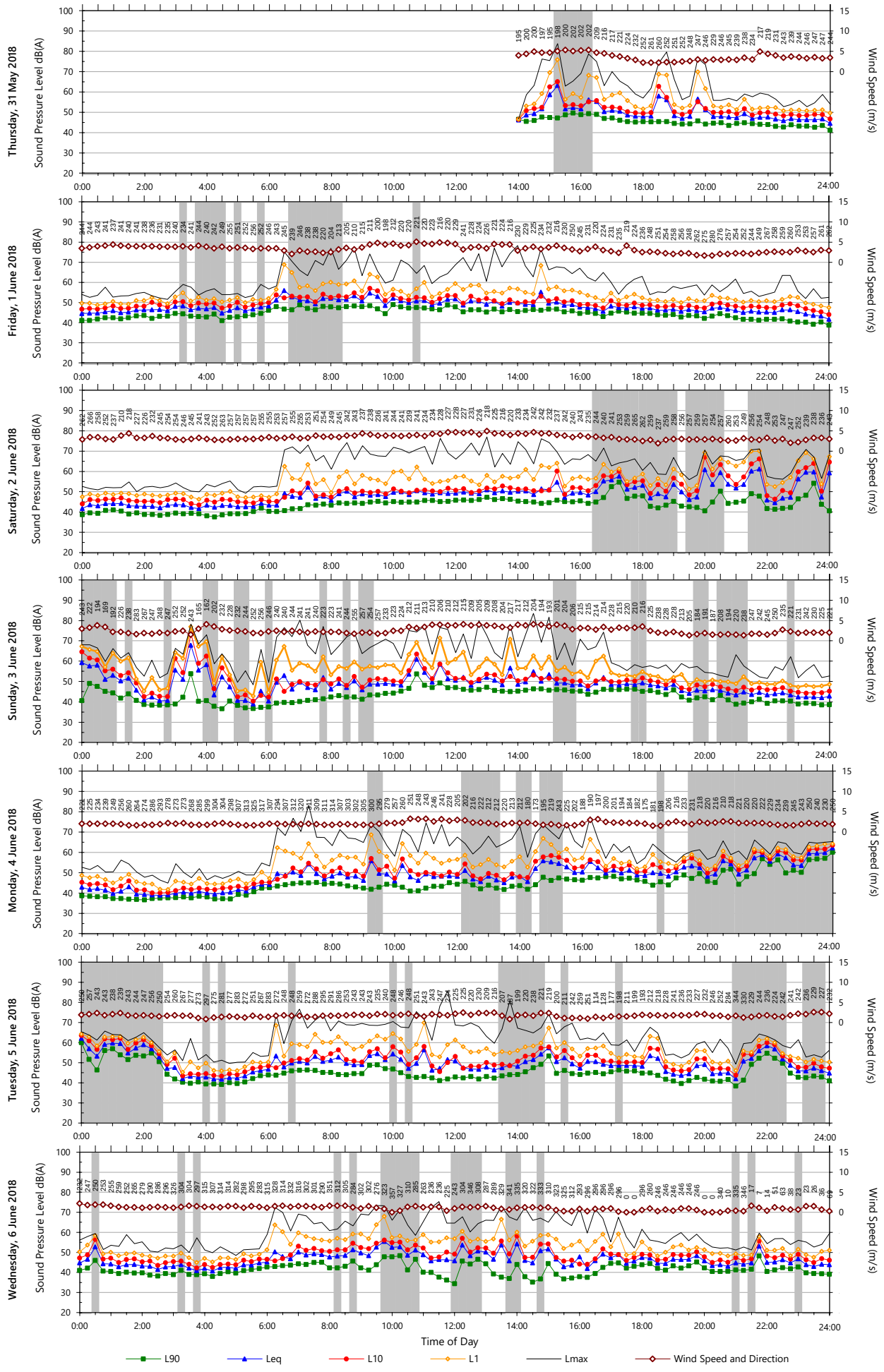
	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	44	-	-	52	-
Friday-01-June-2018	45	42	39	50	46	44
Saturday-02-June-2018	44	-	-	50	-	-
Sunday-03-June-2018	44	-	37	53	-	44
Monday-04-June-2018	-	-	-	-	-	-
Tuesday-05-June-2018	-	-	-	-	-	-
Wednesday-06-June-2018	-	41	39	-	47	47
Thursday-07-June-2018	40	40	37	50	47	45
Friday-08-June-2018	36	41	-	49	47	-
Saturday-09-June-2018	37	35	-	46	40	-
Sunday-10-June-2018	-	-	-	-	-	-
Monday-11-June-2018	-	38	35	-	44	42
Tuesday-12-June-2018	37	-	-	48	-	-
Representative Noise Level[5]	**40**	**41**	**37**	**50**	**47**	**44**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.

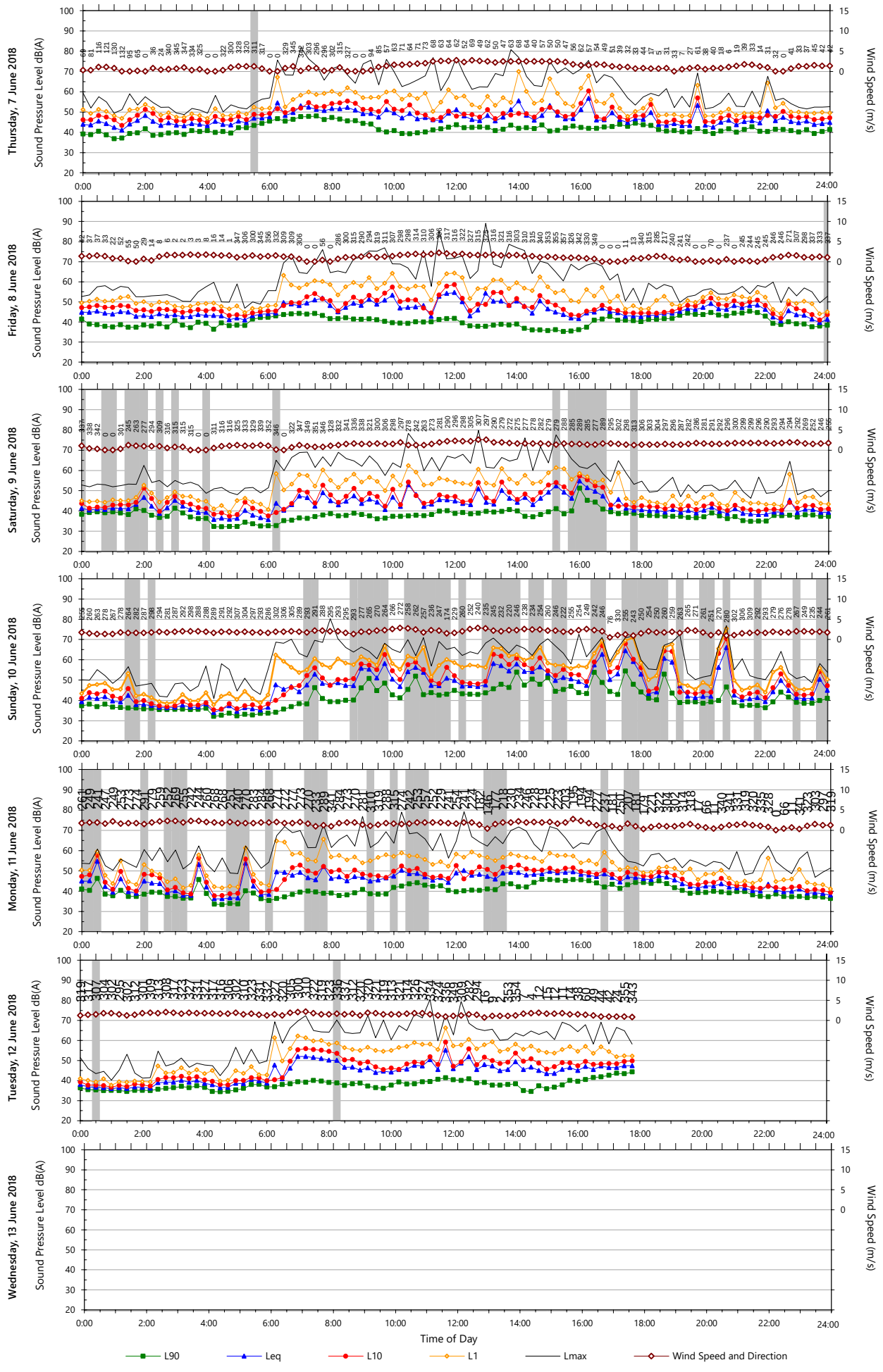
Unattended Monitoring Results

Location: L10 - 14 Elizabeth Avenue, Raymond Terrace



Data File:

Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)

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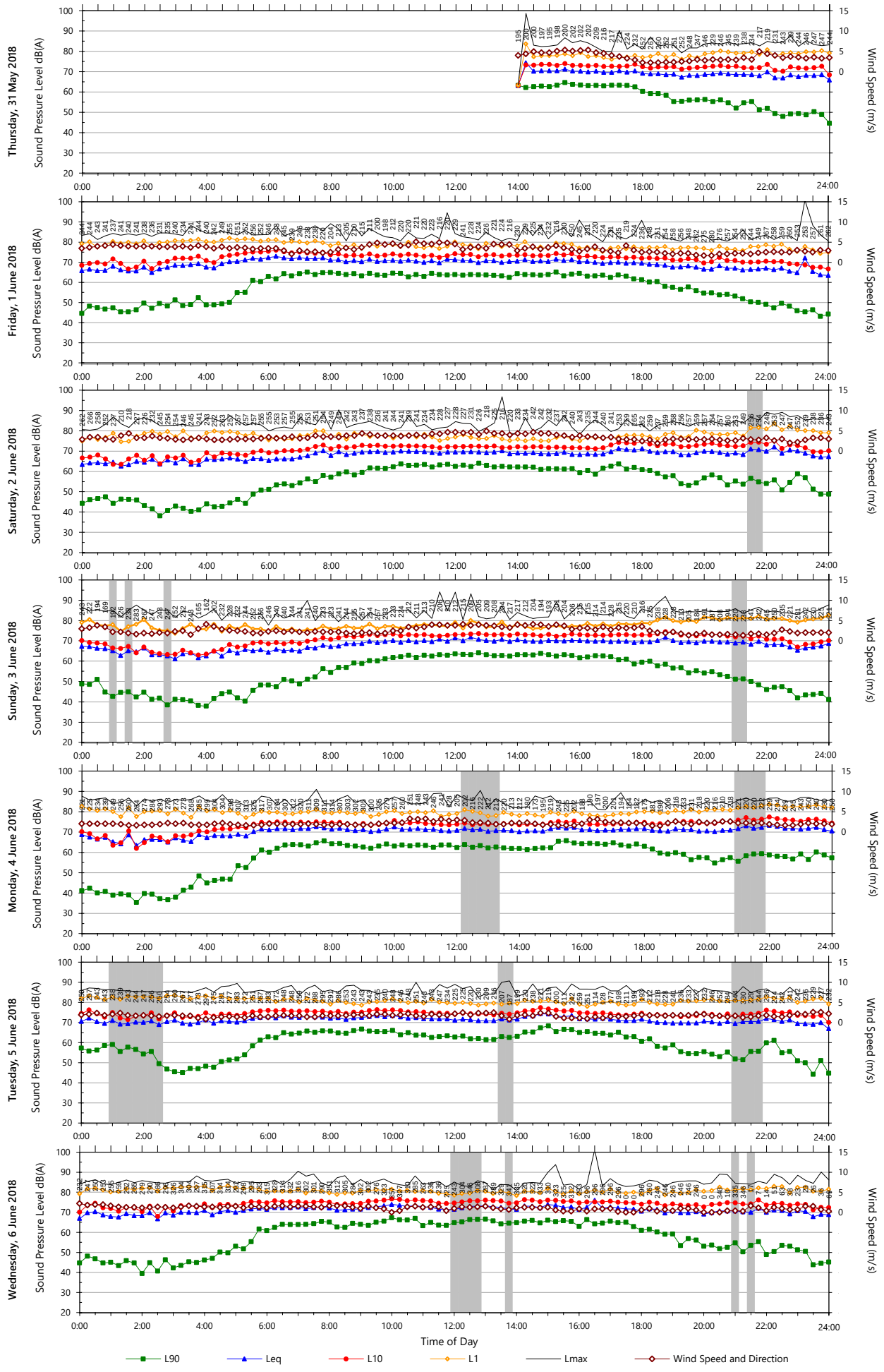
L11 - 2264 Pacific Highway, Heatherbrae

Background & Ambient Noise Monitoring Results - NSW 'Noise Policy for Industry', 2017

	L_{A90} Background Noise Levels[4]			L_{Aeq} Ambient Noise Levels		
Date	**Day[1]**	**Evening[2]**	**Night[3]**	**Day[1]**	**Evening[2]**	**Night[3]**
Thursday-31-May-2018	-	52	47	-	69	69
Friday-01-June-2018	63	50	41	71	67	66
Saturday-02-June-2018	58	53	41	69	69	66
Sunday-03-June-2018	59	49	38	70	70	68
Monday-04-June-2018	62	-	-	71	-	-
Tuesday-05-June-2018	62	-	43	72	-	70
Wednesday-06-June-2018	63	51	43	73	70	70
Thursday-07-June-2018	63	54	45	71	70	70
Friday-08-June-2018	63	57	-	71	68	-
Saturday-09-June-2018	61	-	-	70	-	-
Representative Noise Level[5]	**62**	**52**	**43**	**71**	**69**	**69**

Notes:

1. Day is 8:00am to 6:00pm on Sunday and 7:00am to 6:00pm at other times 2. Evening is 6:00pm to 10:00pm 3. Night is the remaining periods 4. Assessment Background Level (ABL) for individual days 5. Rating Background Level (RBL) for LA90 and logarithmic average for LAeq 6. Leq is calculated in the free field. 2.5dB is subtracted from results if logger is placed at façade 7. Number in brackets represents the measured (actual) RBL value, which is below the minimum policy value of 30 dB(A) during the evening or night period or 35 dB(A) during the day period.



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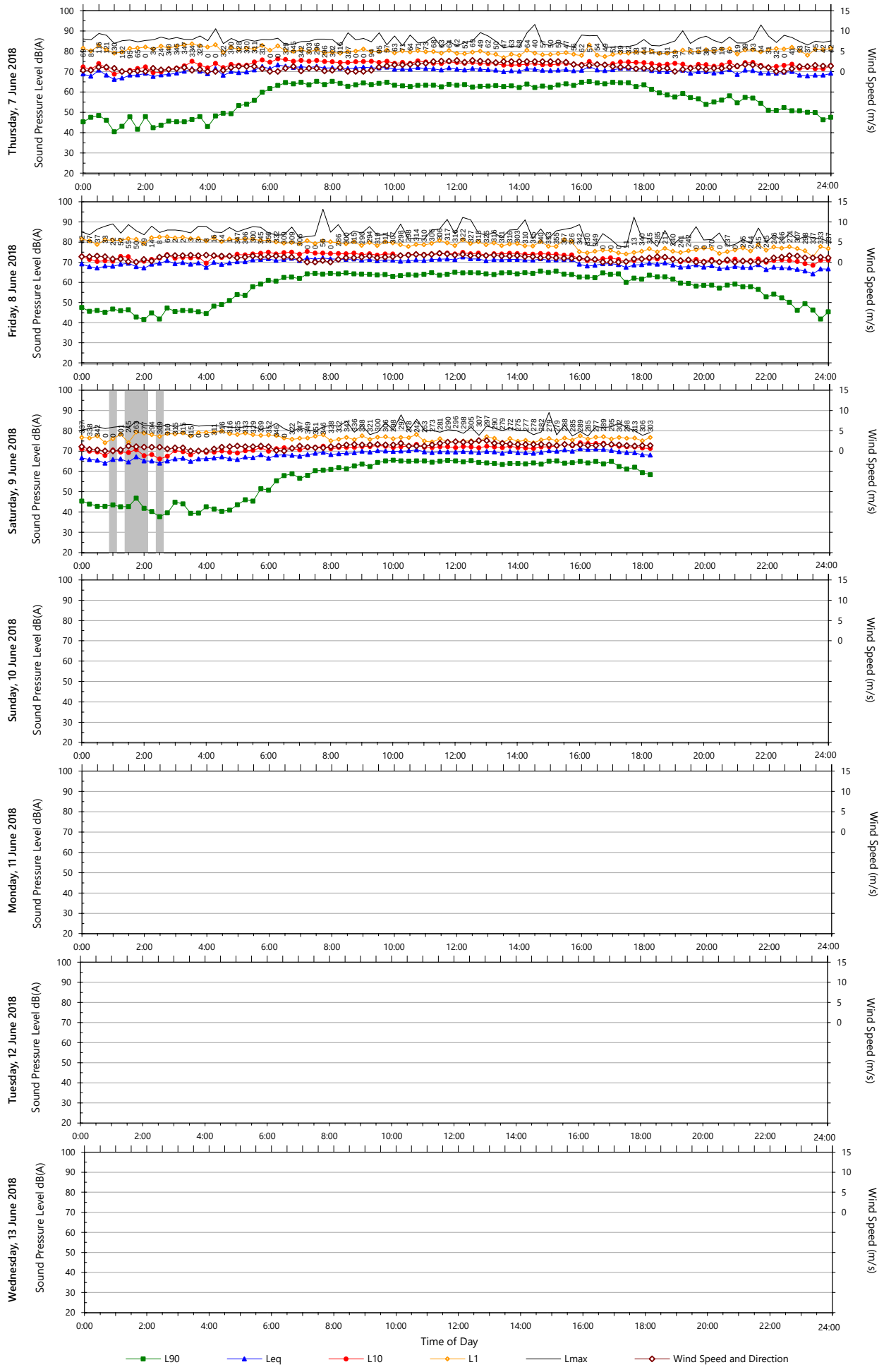
Template: QTE-26 Logger Graphs Program (r32)



Data File:

Template: QTE-26 Logger Graphs Program (r32)

Appendix B Tomago operational noise assessment

B.1 Receiver IDs

Figure TL081-01.6.2.1.1 Q53 (r0) Operational sensitive receiver type and receiver ID

B.2 Detailed predicted operational traffic noise

Predicted L_{Aeq} traffic noise levels at Sweetwater Grove, Tomago (with low noise pavement)

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA09	NCA09.RES.0001	Residential	GF	W	65	61	65	61	66	61	66	61	-0.2	-0.3	0.1	0	55	50	YES	YES	NO	YES	YES
NCA09	NCA09.RES.0001	Residential	GF	S	63	59	62	58	64	59	63	59	-1	-0.7	-0.4	-0.4	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.0001	Residential	GF	W	64	60	63	59	64	60	64	59	-1	-0.8	-0.4	-0.5	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.0001	Residential	GF	S	62	57	61	57	62	58	62	57	-0.9	-0.7	-0.4	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0001	Residential	GF	E	57	53	58	53	57	53	58	54	0.5	0.1	1	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0001	Residential	GF	N	58	53	57	53	58	54	58	53	-0.7	-0.7	-0.3	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0002	Residential	GF	SW	55	51	57	52	55	51	57	53	1.8	1.6	1.9	1.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0002	Residential	GF	SE	55	51	54	50	55	51	55	51	-0.5	-0.2	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0002	Residential	GF	NE	60	56	61	57	61	56	62	57	0.4	0.4	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0002	Residential	GF	NW	62	58	62	58	63	58	63	59	0	0.2	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0003	Residential	GF	SE	63	58	62	58	63	58	63	58	-0.7	-0.4	0	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0003	Residential	GF	NE	67	62	66	62	67	63	67	63	-0.5	-0.2	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0003	Residential	GF	NW	64	60	64	60	64	60	65	60	-0.1	0	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0003	Residential	GF	SW	57	53	58	54	58	53	59	54	0.7	0.7	1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0004	Residential	GF	SE	59	55	58	54	59	55	59	55	-0.7	-0.4	0	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0004	Residential	GF	NE	63	58	62	58	63	59	63	59	-0.6	-0.2	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0004	Residential	GF	NW	56	51	55	51	56	52	56	52	-0.5	-0.2	0.1	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0004	Residential	GF	SW	55	50	56	52	55	51	57	52	1.4	1.2	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0005	Residential	GF	SW	55	50	56	52	55	51	57	52	1.7	1.5	1.8	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0005	Residential	GF	SE	58	54	58	53	58	54	58	54	-0.6	-0.4	0	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0005	Residential	GF	NE	64	59	63	59	64	60	64	60	-0.5	-0.3	0.1	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0005	Residential	GF	NW	59	55	59	55	60	55	60	55	-0.6	-0.3	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0006	Residential	GF	SW	54	50	56	52	55	50	57	52	1.9	1.6	1.9	1.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0006	Residential	GF	SE	56	51	55	51	56	52	56	52	-0.5	-0.2	0.1	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0006	Residential	GF	NE	64	60	64	60	65	60	65	61	-0.5	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0006	Residential	GF	NW	58	54	58	53	58	54	58	54	-0.5	-0.3	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0007	Residential	GF	SW	54	50	56	51	55	50	56	52	1.8	1.7	1.9	1.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0007	Residential	GF	NE	65	60	64	60	65	61	65	61	-0.4	-0.1	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0007	Residential	GF	NW	56	52	55	51	56	52	56	52	-0.5	-0.3	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0008	Residential	GF	SW	54	50	56	51	54	50	56	52	2	1.8	2.1	2	55	50	NO	NO	NO	NO	YES
NCA09	NCA09.RES.0008	Residential	GF	SE	58	54	57	53	59	54	58	54	-0.8	-0.4	-0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0008	Residential	GF	NE	65	60	64	60	65	61	65	61	-0.4	-0.2	0.2	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0009	Residential	GF	NE	65	60	64	60	65	61	65	61	-0.4	-0.1	0.2	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0009	Residential	GF	NE	61	57	61	57	62	57	62	57	-0.6	-0.3	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0009	Residential	GF	NE	62	57	61	57	62	58	62	58	-0.6	-0.4	0	0	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA09	NCA09.RES.0009	Residential	GF	NW	55	51	57	52	56	51	58	53	1.6	1.4	1.8	1.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0009	Residential	GF	SW	57	52	56	52	57	53	57	53	-0.3	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0009	Residential	GF	SE	62	57	61	57	62	58	62	58	-0.6	-0.2	0	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0010	Residential	GF	SW	54	50	56	51	55	50	56	52	1.8	1.6	1.9	1.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0010	Residential	GF	SE	58	54	57	53	58	54	58	54	-0.6	-0.4	0	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0010	Residential	GF	NE	64	60	64	60	65	60	65	60	-0.5	-0.2	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0010	Residential	GF	NW	59	55	59	55	60	55	60	55	-0.5	-0.3	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0012	Residential	GF	S	55	50	54	50	55	51	55	51	-0.4	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0012	Residential	GF	E	59	54	58	54	59	55	59	55	-0.1	-0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0012	Residential	GF	N	61	57	62	57	62	57	63	58	0.5	0.4	0.8	0.8	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.0012	Residential	GF	W	60	56	61	57	61	56	62	57	0.9	0.8	1.2	1.2	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.0014	Residential	GF	S	55	51	55	50	55	51	55	51	-0.3	-0.3	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0014	Residential	GF	E	57	53	57	53	58	53	58	54	-0.3	0	0.3	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0014	Residential	GF	N	57	52	57	53	57	53	58	54	0.7	0.7	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0014	Residential	GF	W	54	50	54	50	55	50	55	51	0.1	0.1	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0015	Residential	GF	W	52	48	53	49	53	48	54	49	0.6	0.5	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0015	Residential	GF	S	52	48	52	48	53	48	53	49	-0.1	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0015	Residential	GF	E	57	52	57	52	57	53	57	53	-0.2	-0.1	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0015	Residential	GF	N	56	52	56	52	56	52	57	53	0.1	0.2	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0018	Residential	GF	W	52	48	53	48	52	48	54	49	0.8	0.6	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0018	Residential	GF	S	52	47	52	47	52	48	53	48	0	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0018	Residential	GF	E	55	51	55	51	56	51	56	52	-0.1	0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0018	Residential	GF	N	55	51	55	51	55	51	56	52	0.1	0.1	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0020	Residential	GF	W	53	49	54	50	54	49	55	50	0.9	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0020	Residential	GF	S	52	47	52	47	52	48	52	48	0	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0020	Residential	GF	E	54	49	54	50	54	50	55	51	0.3	0.4	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0020	Residential	GF	N	54	50	55	50	55	50	55	51	0.4	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0022	Residential	GF	W	53	48	54	49	53	49	54	50	1.2	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0022	Residential	GF	S	52	48	52	47	52	48	53	48	0	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0022	Residential	GF	E	53	49	54	50	54	49	55	50	0.5	0.4	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0022	Residential	GF	N	54	49	54	50	54	50	55	50	0.7	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0023	Residential	GF	W	52	48	53	49	53	48	54	49	1	0.7	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0023	Residential	GF	S	52	48	52	47	52	48	53	48	-0.1	-0.1	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0023	Residential	GF	E	53	49	54	49	54	49	55	50	0.6	0.5	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0023	Residential	GF	N	54	49	54	50	54	50	55	51	0.8	0.8	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0025	Residential	GF	W	52	48	54	49	53	48	54	50	1.3	1.1	1.6	1.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0025	Residential	GF	S	51	47	51	47	52	47	52	48	0.1	0	0.3	0.2	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0025	Residential	GF	E	53	49	54	49	53	49	54	50	0.5	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0025	Residential	GF	N	54	49	54	50	54	50	55	51	0.7	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0028	Residential	GF	W	51	47	52	48	52	47	53	48	1	0.9	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0028	Residential	GF	S	51	47	51	47	52	47	52	47	0.1	0	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0028	Residential	GF	E	53	49	54	49	53	49	54	50	0.5	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0028	Residential	GF	N	53	49	54	49	54	49	55	50	0.7	0.6	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0029	Residential	GF	W	52	48	53	48	53	48	54	49	0.9	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0029	Residential	GF	S	53	48	52	48	53	49	53	48	-0.3	-0.5	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0029	Residential	GF	E	53	48	53	49	53	49	54	50	0.7	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0029	Residential	GF	N	53	49	54	49	54	49	54	50	0.5	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0031	Residential	GF	W	51	47	52	48	52	47	53	49	1.2	1	1.5	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0031	Residential	GF	S	51	46	51	46	51	47	51	47	0.1	0	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0031	Residential	GF	E	52	48	53	48	52	48	54	49	1.1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0031	Residential	GF	N	53	49	55	50	54	50	56	51	1.6	1.3	1.7	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0033	Residential	GF	W	49	45	51	46	50	45	51	47	1.1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0033	Residential	GF	S	50	46	50	46	51	46	51	47	0.2	0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0033	Residential	GF	E	51	47	52	48	52	47	53	49	1.1	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0033	Residential	GF	N	52	47	53	48	52	48	53	49	0.9	0.6	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0035	Residential	GF	W	51	47	52	48	52	47	53	48	0.8	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0035	Residential	GF	E	51	47	52	48	52	47	53	49	0.9	0.7	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0035	Residential	GF	N	50	46	51	46	51	46	51	47	0.4	0.2	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0036	Residential	GF	W	50	46	51	47	50	46	52	47	1.1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0036	Residential	GF	S	51	46	51	46	51	47	52	47	0.1	0	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0036	Residential	GF	E	51	47	52	47	51	47	53	48	1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0037	Residential	GF	S	50	45	50	46	50	46	51	46	0.3	0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0037	Residential	GF	E	51	46	52	47	51	47	53	48	1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0037	Residential	GF	N	51	47	51	47	52	47	52	48	0.4	0.2	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0037	Residential	GF	W	50	45	51	46	50	46	51	47	1.2	0.9	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0038	Residential	GF	W	50	46	51	46	50	46	52	47	1.2	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0038	Residential	GF	S	51	46	51	46	51	47	51	47	0.1	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0038	Residential	GF	E	50	46	51	47	51	46	52	48	1.1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0038	Residential	GF	N	50	46	50	46	50	46	51	46	0.4	0.1	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0045	Residential	GF	E	50	46	51	47	50	46	52	47	1.2	1	1.6	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0045	Residential	GF	N	50	46	51	46	51	46	52	47	0.7	0.4	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0046	Residential	GF	W	55	50	55	50	55	51	55	51	-0.4	-0.5	-0.2	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0046	Residential	GF	S	55	51	55	50	56	51	55	51	-0.7	-0.8	-0.5	-0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0046	Residential	GF	E	50	46	51	47	50	46	52	48	1.3	1	1.6	1.5	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0047	Residential	GF	W	51	47	52	48	52	48	53	48	0.8	0.6	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0047	Residential	GF	S	50	46	50	46	50	46	51	46	0.3	0.1	0.5	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0047	Residential	GF	E	50	46	51	47	51	46	52	48	1	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0047	Residential	GF	N	51	47	52	47	51	47	52	48	0.6	0.5	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0048	Residential	GF	W	53	48	53	49	53	49	54	50	0.7	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0048	Residential	GF	S	49	45	50	46	50	46	51	46	0.7	0.4	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0048	Residential	GF	E	50	46	51	47	51	46	52	48	1.1	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0048	Residential	GF	N	52	47	52	48	52	48	53	48	0.5	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0049	Residential	GF	W	54	49	55	50	54	50	55	51	1.2	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0049	Residential	GF	S	52	47	52	47	52	48	52	48	-0.1	-0.3	0.2	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0049	Residential	GF	E	51	46	52	47	51	47	52	48	1	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0049	Residential	GF	N	52	48	52	48	52	48	53	49	0.5	0.4	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0050	Residential	GF	S	52	47	51	47	52	48	52	48	-0.1	-0.2	0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0050	Residential	GF	E	51	46	52	47	51	47	52	48	1	0.8	1.3	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0050	Residential	GF	N	51	46	51	46	51	47	51	47	0.2	0	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0050	Residential	GF	W	53	49	55	50	54	50	55	51	1.2	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0051	Residential	GF	W	54	49	55	50	54	50	56	51	1.2	1	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0051	Residential	GF	S	51	46	51	46	51	47	51	47	0.2	0.1	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0051	Residential	GF	E	51	47	52	48	52	47	53	49	0.8	0.7	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0051	Residential	GF	N	53	49	54	50	54	49	55	51	1	0.8	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0052	Residential	GF	S	51	47	51	47	52	47	52	48	0	-0.1	0.3	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0052	Residential	GF	E	51	47	52	48	52	47	53	49	1.1	1	1.6	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0052	Residential	GF	N	53	49	55	50	54	49	55	51	1.2	1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0052	Residential	GF	W	52	47	53	48	52	48	53	49	1	0.8	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0053	Residential	GF	NW	54	50	55	51	54	50	56	51	1.2	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0053	Residential	GF	SW	52	48	52	48	53	48	53	48	-0.1	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0053	Residential	GF	SE	52	48	53	48	52	48	54	49	0.8	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0053	Residential	GF	NE	54	49	55	50	54	50	56	51	1.3	1.1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0054	Residential	GF	W	55	51	56	51	55	51	57	52	1.1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0054	Residential	GF	S	53	48	53	48	53	49	53	49	-0.2	-0.3	0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0054	Residential	GF	E	51	47	52	48	52	47	53	49	0.9	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0054	Residential	GF	N	54	49	55	50	54	50	55	51	0.9	0.8	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0055	Residential	GF	W	55	51	56	52	56	51	57	53	1.1	0.8	1.4	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0055	Residential	GF	S	53	48	53	48	53	49	53	49	0	-0.1	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0055	Residential	GF	E	55	50	55	51	55	51	56	52	0.8	0.6	1.1	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0055	Residential	GF	N	57	52	57	53	57	53	58	54	0.9	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0056	Residential	GF	W	55	50	56	51	55	51	57	52	1.2	1	1.4	1.4	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA09	NCA09.RES.0056	Residential	GF	S	53	48	53	48	53	49	53	49	0	-0.1	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0056	Residential	GF	E	55	50	55	50	55	51	56	51	0.1	0.2	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0056	Residential	GF	N	54	50	56	51	55	50	56	52	1.4	1.2	1.6	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0057	Residential	GF	W	57	52	58	53	57	53	59	54	1.2	1	1.6	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0057	Residential	GF	S	56	51	55	51	56	52	56	52	-0.4	-0.2	0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0057	Residential	GF	E	59	55	59	55	60	55	60	55	-0.5	-0.2	0.1	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0057	Residential	GF	N	61	57	61	57	61	57	62	58	0.3	0.3	0.7	0.7	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.0058	Residential	GF	W	57	53	58	53	57	53	58	54	0.8	0.6	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0058	Residential	GF	S	53	48	53	48	53	49	53	49	-0.1	-0.2	0.2	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0058	Residential	GF	E	55	51	56	51	55	51	56	52	0.7	0.6	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0058	Residential	GF	N	59	54	59	55	59	55	60	55	0.5	0.4	1	0.9	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.0059	Residential	GF	W	57	53	58	54	57	53	59	55	1.4	1.2	1.7	1.6	55	50	NO	YES	NO	NO	YES
NCA09	NCA09.RES.0059	Residential	GF	S	51	47	51	47	51	47	52	48	0.2	0	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0059	Residential	GF	E	52	48	53	48	53	48	54	49	0.6	0.5	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0059	Residential	GF	N	57	53	59	54	58	53	59	55	1.2	1	1.4	1.4	55	50	NO	YES	NO	NO	YES
NCA09	NCA09.RES.0060	Residential	GF	W	55	51	57	52	55	51	57	53	2	1.7	2	2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0060	Residential	GF	S	53	49	53	48	54	49	54	49	-0.2	-0.3	0	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0060	Residential	GF	E	52	48	53	48	53	48	54	49	0.6	0.5	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0060	Residential	GF	N	51	47	51	47	52	47	52	47	-0.2	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0061	Residential	GF	W	56	52	56	52	56	52	57	53	0.3	0.3	0.7	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0061	Residential	GF	S	52	47	52	48	52	48	53	48	0.4	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0061	Residential	GF	E	55	51	56	51	55	51	56	52	0.4	0.4	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0061	Residential	GF	N	57	53	59	54	58	53	59	55	1.2	1.2	1.6	1.5	55	50	NO	YES	NO	NO	YES
NCA09	NCA09.RES.0062	Residential	GF	W	56	51	57	52	56	52	58	53	1.3	1.1	1.6	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0062	Residential	GF	E	54	50	54	50	54	50	55	51	0.1	0.2	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0062	Residential	GF	N	51	47	51	47	52	47	52	47	-0.2	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0063	Residential	GF	W	54	50	55	50	54	50	56	51	0.8	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0063	Residential	GF	S	51	46	51	47	51	47	52	47	0.3	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0063	Residential	GF	E	53	49	54	49	54	49	54	50	0.3	0.3	0.7	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0064	Residential	GF	W	55	51	55	51	55	51	56	51	0.2	0	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0064	Residential	GF	S	53	49	53	49	54	49	54	49	-0.1	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0064	Residential	GF	E	53	49	54	49	54	49	54	50	0.3	0.4	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0064	Residential	GF	N	51	47	51	47	51	47	52	47	0.1	0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0065	Residential	GF	W	54	50	55	50	55	50	55	51	0.1	-0.1	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0065	Residential	GF	S	55	51	55	50	56	51	55	51	-0.4	-0.4	-0.2	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0065	Residential	GF	E	52	48	53	49	53	48	54	49	0.8	0.7	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0065	Residential	GF	N	54	50	55	51	54	50	56	52	1.3	1.1	1.6	1.6	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0066	Residential	GF	W	55	51	57	52	56	51	57	53	1.3	1.1	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0066	Residential	GF	S	53	49	53	49	54	49	54	49	-0.2	-0.2	0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0066	Residential	GF	E	52	48	53	49	53	48	54	49	0.7	0.6	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0066	Residential	GF	N	55	51	56	52	56	51	57	52	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0067	Residential	GF	W	55	51	57	52	56	51	57	53	1.5	1.2	1.6	1.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0067	Residential	GF	S	54	50	54	49	55	50	55	50	-0.4	-0.5	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0067	Residential	GF	E	54	49	54	50	54	50	55	50	0	0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0067	Residential	GF	N	55	50	56	51	55	51	56	52	1	1	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0068	Residential	GF	W	55	51	57	52	56	51	57	53	1.5	1.2	1.6	1.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0068	Residential	GF	S	54	50	54	50	55	50	55	50	-0.4	-0.4	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0068	Residential	GF	E	53	49	53	49	53	49	54	50	0.5	0.6	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0068	Residential	GF	N	54	50	55	50	55	50	55	51	0.4	0.2	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0069	Residential	GF	W	55	51	57	52	56	51	57	53	1.6	1.3	1.7	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0069	Residential	GF	S	52	48	52	47	52	48	53	48	0	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0069	Residential	GF	E	52	48	53	48	52	48	53	49	0.6	0.5	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0069	Residential	GF	N	55	51	57	52	56	51	57	53	1.7	1.4	1.8	1.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0070	Residential	GF	W	55	50	57	52	55	51	57	53	1.7	1.5	1.8	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0070	Residential	GF	S	53	49	53	48	53	49	53	49	-0.3	-0.4	0	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0070	Residential	GF	E	52	48	53	48	52	48	53	49	0.6	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0070	Residential	GF	N	52	48	52	47	52	48	53	48	0	-0.1	0.3	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0071	Residential	GF	W	55	51	56	52	56	51	57	52	0.9	0.7	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0071	Residential	GF	S	54	49	54	49	54	50	54	50	-0.2	-0.3	0	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0071	Residential	GF	E	52	48	53	49	53	48	54	50	1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0071	Residential	GF	N	55	50	56	51	55	51	56	52	0.8	0.6	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0072	Residential	GF	N	56	52	57	53	57	52	58	54	1.3	1.1	1.5	1.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0072	Residential	GF	W	55	50	56	51	55	51	56	52	1	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0072	Residential	GF	S	54	50	54	50	55	50	55	50	0	0	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0072	Residential	GF	E	52	48	53	49	53	48	54	49	0.5	0.5	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0073	Residential	GF	W	50	46	51	47	51	46	52	48	0.9	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0073	Residential	GF	S	55	51	55	50	55	51	55	51	-0.3	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0073	Residential	GF	E	53	49	54	49	54	49	54	50	0.2	0.2	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0073	Residential	GF	N	54	50	55	51	55	50	56	52	1.1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0074	Residential	GF	W	54	50	56	51	55	50	56	52	1.3	1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0074	Residential	GF	S	56	51	55	51	56	52	56	51	-0.5	-0.4	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0074	Residential	GF	E	51	46	51	47	51	47	52	48	0.5	0.4	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0074	Residential	GF	N	54	50	55	51	55	51	56	51	0.6	0.5	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0075	Residential	GF	S	56	52	56	52	57	52	57	52	-0.5	-0.4	-0.1	-0.1	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA09	NCA09.RES.0075	Residential	GF	E	56	52	56	52	57	52	57	53	-0.2	0	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0075	Residential	GF	N	55	51	55	51	56	51	56	52	-0.2	-0.1	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0075	Residential	GF	W	52	48	53	48	53	48	53	49	0.6	0.4	0.9	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0076	Residential	GF	S	55	51	55	51	55	51	56	51	-0.3	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0076	Residential	GF	E	58	54	58	53	58	54	58	54	-0.2	-0.1	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0076	Residential	GF	N	58	54	58	54	58	54	59	54	0	0.2	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0076	Residential	GF	W	52	47	53	49	52	48	54	49	1.4	1.2	1.7	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0077	Residential	GF	W	55	50	56	51	55	51	56	52	1.2	1	1.4	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0077	Residential	GF	S	52	48	53	48	53	48	53	49	0.1	0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0077	Residential	GF	E	51	46	52	47	51	47	52	48	0.9	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0077	Residential	GF	N	56	52	57	52	56	52	57	53	0.4	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0078	Residential	GF	W	54	50	55	51	55	50	56	52	1.3	1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0078	Residential	GF	S	55	50	55	50	55	51	55	51	-0.3	-0.2	0	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0078	Residential	GF	E	50	46	51	47	51	46	52	47	0.8	0.7	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0078	Residential	GF	N	52	48	52	48	53	48	53	49	-0.2	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0079	Residential	GF	W	51	47	52	48	52	48	53	48	0.8	0.6	1.1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0079	Residential	GF	S	56	52	56	51	56	52	56	52	-0.6	-0.4	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0079	Residential	GF	E	58	53	57	53	58	54	58	54	-0.4	-0.2	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0079	Residential	GF	N	55	51	55	51	55	51	56	51	-0.3	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0080	Residential	GF	W	54	50	55	51	54	50	56	51	1.1	0.9	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0080	Residential	GF	S	54	50	54	50	55	50	55	50	-0.4	-0.4	0	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0080	Residential	GF	E	55	51	55	51	55	51	56	51	-0.1	0	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0080	Residential	GF	N	56	52	57	52	57	52	57	53	0.2	0.2	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0081	Residential	GF	W	53	49	53	49	53	49	54	49	0.2	0	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0081	Residential	GF	S	56	51	55	51	56	52	56	51	-0.6	-0.6	-0.3	-0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0081	Residential	GF	E	57	53	57	53	58	53	58	54	-0.1	0	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0081	Residential	GF	N	57	53	57	53	58	53	58	54	0	0.1	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0082	Residential	GF	W	54	49	54	50	54	50	55	50	0.5	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0082	Residential	GF	S	54	50	54	50	55	50	55	50	-0.3	-0.3	0	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0082	Residential	GF	E	57	52	57	53	57	53	58	53	-0.1	0.2	0.5	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0082	Residential	GF	N	57	53	57	53	58	53	58	54	0	0.1	0.4	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0083	Residential	GF	W	55	50	55	51	55	51	56	52	0.8	0.6	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0083	Residential	GF	S	54	50	54	49	55	50	55	50	-0.2	-0.3	0.1	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0083	Residential	GF	E	56	51	56	51	56	52	56	52	0	0.3	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0083	Residential	GF	N	56	52	56	52	56	52	57	52	-0.1	-0.1	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0084	Residential	GF	W	55	51	56	51	56	51	56	52	0.5	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0084	Residential	GF	S	54	50	54	49	55	50	54	50	-0.7	-0.8	-0.5	-0.6	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0084	Residential	GF	E	52	48	53	48	52	48	54	49	0.6	0.6	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0084	Residential	GF	N	55	50	56	51	55	51	56	52	1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0085	Residential	GF	W	49	45	50	46	49	45	51	47	1.4	1.3	1.7	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0085	Residential	GF	S	51	47	51	47	52	47	52	47	-0.1	-0.2	0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0085	Residential	GF	E	51	47	52	47	51	47	53	48	1	0.8	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0085	Residential	GF	N	53	49	54	50	54	49	55	51	1.1	1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0086	Residential	GF	W	50	45	51	46	50	46	51	47	1.1	0.9	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0086	Residential	GF	S	53	48	52	47	53	49	53	48	-0.5	-0.7	-0.2	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0086	Residential	GF	E	50	46	51	47	51	46	52	48	0.8	0.6	1.1	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0086	Residential	GF	N	51	47	51	47	51	47	52	47	0.1	0	0.4	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0087	Residential	GF	W	56	51	56	52	56	52	57	52	0.8	0.6	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0087	Residential	GF	S	55	50	54	49	55	51	55	50	-0.7	-0.8	-0.4	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0087	Residential	GF	E	49	44	50	45	49	45	50	46	1	0.8	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0087	Residential	GF	N	53	48	52	48	53	49	53	49	-0.2	-0.3	0	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0088	Residential	GF	W	53	49	54	49	54	49	55	50	0.6	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0088	Residential	GF	S	53	49	53	48	53	49	53	49	-0.2	-0.4	0	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0088	Residential	GF	E	50	46	51	47	51	46	52	48	1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0088	Residential	GF	N	53	49	54	49	54	49	54	50	0.7	0.5	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0089	Residential	GF	W	56	52	57	52	56	52	58	53	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0089	Residential	GF	S	55	50	54	50	55	51	55	51	-0.5	-0.6	-0.3	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0089	Residential	GF	E	50	45	50	46	50	46	51	47	0.9	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0089	Residential	GF	N	55	50	56	51	55	51	56	52	1.1	1	1.3	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0090	Residential	GF	W	51	46	52	47	51	47	52	48	1.1	0.9	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0090	Residential	GF	S	52	48	52	47	53	48	53	48	-0.5	-0.7	-0.2	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0090	Residential	GF	E	50	46	51	47	50	46	52	47	1	0.9	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0090	Residential	GF	N	53	48	53	49	53	49	54	50	0.9	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0091	Residential	GF	W	56	52	57	53	57	52	58	53	1	0.7	1.1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0091	Residential	GF	E	49	45	50	46	50	45	51	47	1	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0091	Residential	GF	N	55	50	56	51	55	51	56	52	1	0.8	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0092	Residential	GF	W	56	52	57	53	57	52	58	53	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0092	Residential	GF	S	55	50	54	49	55	51	55	50	-0.7	-0.8	-0.5	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0092	Residential	GF	E	49	44	50	45	49	45	51	46	1.2	1	1.5	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0093	Residential	GF	W	55	50	55	51	55	51	56	52	0.8	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0093	Residential	GF	N	58	54	59	54	59	54	59	55	0.2	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0094	Residential	GF	S	55	50	55	50	55	51	55	51	-0.2	0	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0094	Residential	GF	E	59	55	59	55	60	55	60	56	-0.2	0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0094	Residential	GF	N	60	55	60	56	60	56	61	56	0.2	0.4	0.7	0.7	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0095	Residential	GF	W	53	49	54	50	54	50	55	50	0.9	0.7	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0095	Residential	GF	S	54	49	53	49	54	50	54	50	-0.3	-0.3	0	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0095	Residential	GF	E	53	48	52	48	53	49	53	49	-0.1	0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0096	Residential	GF	W	51	46	52	47	51	47	52	48	0.9	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0096	Residential	GF	S	54	50	54	50	54	50	54	50	-0.3	-0.2	-0.1	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0096	Residential	GF	E	58	54	58	54	59	54	59	55	-0.3	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0096	Residential	GF	N	57	53	57	53	58	53	58	54	-0.2	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0097	Residential	GF	W	54	49	55	51	54	50	56	51	1.5	1.3	1.6	1.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0097	Residential	GF	S	52	47	52	47	52	48	52	48	0	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0097	Residential	GF	E	53	48	53	49	53	49	54	49	0.2	0.2	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0097	Residential	GF	N	54	50	55	51	55	51	56	51	0.5	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0098	Residential	GF	W	52	48	53	48	52	48	53	49	0.6	0.4	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0098	Residential	GF	S	53	49	53	49	53	49	54	49	0.2	0	0.4	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0098	Residential	GF	E	57	52	56	52	57	53	57	53	-0.3	0	0.3	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0098	Residential	GF	N	56	52	56	52	57	52	57	52	-0.3	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0099	Residential	GF	W	53	49	55	51	54	49	56	51	1.9	1.6	2.1	2	55	50	NO	NO	NO	NO	YES
NCA09	NCA09.RES.0099	Residential	GF	S	51	47	51	47	52	47	52	48	0	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0099	Residential	GF	E	51	47	52	47	51	47	52	48	0.7	0.7	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0099	Residential	GF	N	54	49	55	51	54	50	56	51	1.6	1.4	1.7	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0100	Residential	GF	W	53	48	53	49	53	49	54	49	0.5	0.3	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0100	Residential	GF	S	51	46	51	46	51	47	52	47	0.3	0.2	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0100	Residential	GF	E	55	50	55	51	55	51	56	51	0.1	0.1	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0100	Residential	GF	N	54	50	55	51	55	50	56	51	0.6	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0101	Residential	GF	W	54	49	55	50	54	50	56	51	1.4	1.1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0101	Residential	GF	S	52	48	52	47	53	48	52	48	-0.2	-0.4	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0101	Residential	GF	E	49	45	50	46	50	45	51	47	1.2	1	1.5	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0101	Residential	GF	N	53	48	54	49	53	49	55	50	1.3	1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0102	Residential	GF	W	49	45	50	46	49	45	51	47	1.1	0.9	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0102	Residential	GF	S	52	47	51	47	52	48	52	47	-0.2	-0.4	0	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0102	Residential	GF	E	54	50	54	50	54	50	55	51	0.1	0.2	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0102	Residential	GF	N	51	46	51	47	51	47	52	47	0.4	0.3	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0103	Residential	GF	W	53	49	54	49	53	49	55	50	0.9	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0103	Residential	GF	S	51	47	51	47	52	47	52	48	0.1	0	0.4	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0103	Residential	GF	E	49	45	50	46	50	45	51	47	1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0103	Residential	GF	N	53	49	54	50	53	49	55	50	1.3	1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0104	Residential	GF	W	49	45	50	46	50	45	51	47	1.1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0104	Residential	GF	S	50	45	50	45	50	46	51	46	0.2	0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0104	Residential	GF	E	53	48	53	49	53	49	54	50	0.5	0.5	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0104	Residential	GF	N	52	48	53	49	53	48	54	49	0.6	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0105	Residential	GF	W	52	48	53	49	53	48	54	49	1	0.8	1.2	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0105	Residential	GF	S	51	46	51	46	51	47	52	47	0.1	0.1	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0105	Residential	GF	E	48	44	50	45	49	44	50	46	1.1	1	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0105	Residential	GF	N	50	46	50	46	51	46	51	46	0.1	0	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0106	Residential	GF	W	48	44	49	45	49	44	50	46	1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0106	Residential	GF	S	51	46	51	46	51	47	51	47	0	-0.2	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0106	Residential	GF	E	52	48	53	48	52	48	53	49	0.6	0.5	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0106	Residential	GF	N	51	47	51	47	51	47	52	48	0.5	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0107	Residential	GF	W	55	51	56	51	55	51	56	52	0.6	0.5	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0107	Residential	GF	S	51	46	51	46	51	47	52	47	0.3	0.2	0.6	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0107	Residential	GF	E	53	48	53	48	53	48	54	49	0.2	0.3	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0107	Residential	GF	N	57	52	57	53	57	53	58	53	0.2	0.2	0.7	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0108	Residential	GF	E	58	53	57	53	58	54	58	54	-0.6	-0.4	-0.1	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0108	Residential	GF	N	54	49	54	49	54	50	55	50	-0.1	0	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0108	Residential	GF	W	52	48	53	48	53	48	54	49	0.4	0.4	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0109	Residential	GF	E	57	52	56	52	57	53	57	53	-0.4	-0.2	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0110	Residential	GF	W	51	46	51	47	51	47	52	47	0.4	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0110	Residential	GF	S	51	46	51	46	51	47	52	47	0.2	0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0110	Residential	GF	E	55	50	54	50	55	51	55	51	-0.2	0	0.4	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0111	Residential	GF	W	54	50	54	50	54	50	55	51	0.5	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0111	Residential	GF	S	51	47	51	47	52	47	52	48	0	0	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0111	Residential	GF	N	51	47	52	47	52	47	53	48	0.6	0.5	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0112	Residential	GF	W	52	48	53	49	53	48	54	49	1.1	0.9	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0112	Residential	GF	S	51	47	51	47	52	47	52	47	-0.1	-0.1	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0112	Residential	GF	E	50	46	51	46	50	46	51	47	0.7	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0112	Residential	GF	N	52	47	52	48	52	48	53	48	0.5	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0113	Residential	GF	W	49	44	50	45	49	45	50	46	0.9	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0113	Residential	GF	E	52	48	53	49	53	48	54	49	0.4	0.4	0.8	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0113	Residential	GF	N	52	47	52	48	52	48	53	48	0.6	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0114	Residential	GF	W	53	48	53	49	53	49	54	50	0.9	0.7	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0114	Residential	GF	S	51	46	51	46	51	47	51	47	0.1	-0.1	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0114	Residential	GF	E	49	44	50	45	49	45	50	46	0.9	0.8	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0114	Residential	GF	N	52	47	52	48	52	48	53	48	0.7	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0115	Residential	GF	W	52	47	53	48	52	48	54	49	1.2	1	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0115	Residential	GF	S	52	47	52	47	52	48	52	48	-0.2	-0.3	0	-0.1	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0115	Residential	GF	E	49	45	50	45	49	45	51	46	0.9	0.8	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0115	Residential	GF	N	51	47	52	47	51	47	53	48	0.9	0.6	1.1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0116	Residential	GF	W	52	47	52	48	52	48	53	48	0.2	0.1	0.5	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0116	Residential	GF	S	53	48	52	48	53	49	53	48	-0.5	-0.7	-0.4	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0116	Residential	GF	E	52	47	52	48	52	48	53	48	0.4	0.4	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0117	Residential	GF	W	55	50	55	51	55	51	56	52	0.4	0.4	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0117	Residential	GF	S	50	46	50	46	51	46	51	47	0.2	0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0117	Residential	GF	E	59	54	58	54	59	55	59	55	-0.4	-0.2	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0117	Residential	GF	N	59	55	59	55	60	55	60	56	-0.2	-0.1	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0118	Residential	GF	W	54	49	54	50	54	50	55	51	0.5	0.4	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0118	Residential	GF	S	49	45	50	45	49	45	50	46	0.7	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0118	Residential	GF	E	54	50	54	50	54	50	55	51	-0.2	-0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0118	Residential	GF	N	51	47	51	47	51	47	52	48	0.5	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0119	Residential	GF	W	53	49	54	49	54	49	54	50	0.4	0.4	0.8	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0119	Residential	GF	S	50	45	50	45	50	46	51	46	0.3	0.2	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0119	Residential	GF	E	56	52	56	52	57	52	57	53	-0.3	-0.1	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0119	Residential	GF	N	58	54	58	54	58	54	59	54	-0.2	0	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0120	Residential	GF	W	51	46	52	47	51	47	53	48	1.2	1	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0120	Residential	GF	S	51	46	51	46	51	47	51	47	-0.1	-0.2	0.2	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0120	Residential	GF	E	50	46	51	47	51	46	52	48	0.8	0.7	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0121	Residential	GF	W	54	50	54	50	55	50	55	50	-0.1	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0121	Residential	GF	S	54	50	54	50	55	50	55	50	-0.4	-0.5	-0.2	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0121	Residential	GF	E	50	46	51	47	51	46	52	48	0.8	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0121	Residential	GF	N	51	46	52	47	51	47	52	48	0.9	0.8	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0122	Residential	GF	W	51	46	52	47	51	47	52	48	1	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0122	Residential	GF	S	53	48	53	48	53	49	53	49	0	0	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0122	Residential	GF	E	54	49	54	49	54	50	55	50	0.1	0.1	0.5	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0122	Residential	GF	N	50	46	50	46	50	46	51	46	0.1	0.1	0.4	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0123	Residential	GF	W	50	46	51	47	51	46	52	47	0.8	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0123	Residential	GF	S	50	46	51	46	51	46	51	47	0.2	0	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0123	Residential	GF	E	55	50	55	50	55	51	55	51	-0.1	0.1	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0123	Residential	GF	N	50	46	50	46	51	46	51	47	0.2	0.2	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0124	Residential	GF	S	54	50	54	49	54	50	55	50	-0.2	-0.2	0.2	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0124	Residential	GF	E	59	55	59	55	60	55	60	56	-0.4	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0124	Residential	GF	N	60	56	60	56	61	56	61	57	-0.1	0.1	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0124	Residential	GF	W	55	51	56	52	56	51	57	52	0.6	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0125	Residential	GF	W	54	49	54	49	54	50	55	50	0.3	0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.0125	Residential	GF	S	54	49	53	49	54	50	54	49	-0.7	-0.8	-0.6	-0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0125	Residential	GF	W	54	49	53	48	54	50	54	49	-0.8	-0.9	-0.5	-0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0125	Residential	GF	S	54	50	54	49	55	50	54	50	-0.6	-0.8	-0.4	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0125	Residential	GF	E	48	44	49	45	49	44	50	46	1.2	1	1.5	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0125	Residential	GF	N	52	47	53	48	52	48	54	49	1.2	1	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	W	48	44	49	45	48	44	50	45	1.2	0.9	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	S	54	50	54	49	55	50	54	50	-0.6	-0.7	-0.4	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	S	47	43	48	44	48	43	49	44	0.8	0.7	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	S	52	48	52	47	52	48	52	48	-0.4	-0.6	-0.2	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	E	49	44	49	45	49	45	50	45	0.6	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	E	48	44	49	44	48	44	49	45	0.7	0.5	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	E	51	46	52	47	51	47	53	48	0.9	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	N	53	48	53	49	53	49	54	50	0.9	0.7	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	N	50	46	51	47	50	46	52	47	1	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0126	Residential	GF	N	51	47	52	48	52	47	53	49	1	0.8	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0127	Residential	GF	W	58	54	59	54	58	54	59	55	0.7	0.6	1	1	55	50	NO	YES	NO	NO	YES
NCA09	NCA09.RES.0127	Residential	GF	S	54	50	54	50	54	50	55	50	0.3	0.2	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0127	Residential	GF	E	56	52	56	52	57	52	57	53	-0.1	0	0.5	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0127	Residential	GF	N	59	55	60	55	59	55	60	56	0.5	0.5	0.9	0.9	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.0128	Residential	GF	W	55	51	57	52	56	52	57	53	1.1	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0128	Residential	GF	S	53	49	53	48	54	49	54	49	-0.2	-0.3	0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0128	Residential	GF	E	52	48	53	48	53	48	53	49	0.4	0.4	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0128	Residential	GF	N	55	51	57	52	56	52	57	53	1.4	1.2	1.6	1.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0129	Residential	GF	W	56	52	58	53	57	52	58	54	1.5	1.3	1.7	1.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0129	Residential	GF	S	52	48	52	48	53	48	53	49	0	-0.1	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0129	Residential	GF	E	55	51	56	51	56	51	57	52	0.2	0.3	0.7	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0129	Residential	GF	N	58	53	59	54	58	54	59	55	1	0.9	1.3	1.3	55	50	NO	YES	NO	NO	YES
NCA09	NCA09.RES.0130	Residential	GF	W	55	51	56	52	56	51	57	52	1.1	0.9	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0130	Residential	GF	S	53	49	53	49	54	49	54	49	-0.3	-0.3	0	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0130	Residential	GF	E	58	54	58	54	59	54	59	55	-0.4	-0.2	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.0130	Residential	GF	N	58	53	57	53	58	54	58	54	-0.4	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T001	Residential	GF	N	60	56	61	56	60	56	61	57	1	0.8	1.2	1.2	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T001	Residential	GF	E	55	50	55	51	55	51	56	51	0.4	0.2	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T001	Residential	GF	S	53	49	53	49	54	49	54	49	0.3	0	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T001	Residential	GF	W	55	50	54	50	55	51	55	50	-0.6	-0.7	-0.3	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T001	Residential	GF	S	56	52	55	51	56	52	56	51	-0.7	-0.9	-0.5	-0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T001	Residential	GF	W	60	56	61	56	60	56	61	57	0.8	0.6	1	0.9	55	50	YES	YES	NO	NO	YES

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.T002	Residential	GF	N	55	50	55	50	55	51	55	51	0.1	-0.1	0.3	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T002	Residential	GF	E	53	49	54	49	53	49	54	50	0.5	0.4	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T002	Residential	GF	E	50	45	50	46	50	46	51	46	0.4	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T002	Residential	GF	E	51	47	52	47	52	47	53	48	0.6	0.4	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T002	Residential	GF	W	55	51	55	50	55	51	55	51	-0.4	-0.6	-0.2	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T002	Residential	GF	S	56	52	55	51	56	52	56	52	-0.5	-0.7	-0.3	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T002	Residential	GF	W	59	55	60	56	60	56	61	57	1	0.7	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T003	Residential	GF	E	52	48	53	48	52	48	54	49	0.7	0.5	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T003	Residential	GF	S	53	48	53	48	53	49	54	49	0.2	0.1	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T003	Residential	GF	W	55	50	54	50	55	51	55	50	-0.5	-0.7	-0.3	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T003	Residential	GF	S	56	51	55	51	56	52	56	51	-0.7	-0.9	-0.5	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T003	Residential	GF	W	59	55	60	56	60	56	61	57	0.9	0.7	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T004	Residential	GF	N	54	50	54	50	55	50	55	51	0.1	-0.1	0.2	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T004	Residential	GF	E	52	47	52	48	52	48	53	49	0.8	0.6	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T004	Residential	GF	E	49	45	50	45	50	45	51	46	0.5	0.4	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T004	Residential	GF	E	50	46	51	47	51	46	52	48	0.8	0.6	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T004	Residential	GF	S	53	48	53	48	53	49	54	49	0.3	0.1	0.4	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T004	Residential	GF	W	55	50	54	50	55	51	55	50	-0.6	-0.7	-0.4	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T004	Residential	GF	S	56	51	55	50	56	52	56	51	-0.6	-0.9	-0.5	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T004	Residential	GF	W	59	55	60	56	60	55	61	56	1	0.7	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T004	Residential	GF	W	59	55	60	55	59	55	60	56	1	0.7	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T004	Residential	GF	W	59	55	60	56	60	55	61	56	0.9	0.7	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T004	Residential	GF	N	59	55	60	56	60	55	61	56	0.9	0.7	1	0.9	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T004	Residential	GF	N	59	55	60	56	60	55	61	56	0.9	0.7	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T005	Residential	GF	N	52	48	52	47	52	48	52	48	-0.3	-0.5	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T005	Residential	GF	E	51	47	52	48	52	47	53	49	0.9	0.7	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T005	Residential	GF	E	49	45	50	45	49	45	50	46	0.5	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T005	Residential	GF	E	50	46	51	46	50	46	51	47	0.8	0.6	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T005	Residential	GF	W	59	55	60	56	60	55	61	56	0.9	0.8	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T006	Residential	GF	E	51	47	52	47	51	47	53	48	1	0.7	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T006	Residential	GF	E	48	44	49	44	49	44	50	45	0.6	0.4	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T006	Residential	GF	E	51	46	51	47	51	47	52	48	0.8	0.7	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T006	Residential	GF	S	53	48	53	48	53	49	53	49	0.2	0	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T006	Residential	GF	W	54	50	54	49	55	51	55	50	-0.5	-0.7	-0.3	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T006	Residential	GF	S	56	51	55	50	56	52	55	51	-0.7	-0.9	-0.6	-0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T006	Residential	GF	W	59	55	60	56	60	55	61	56	0.9	0.8	1.1	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T008	Residential	GF	N	54	50	54	50	55	50	55	51	0.1	-0.2	0.2	0.1	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.T008	Residential	GF	E	51	47	52	47	52	47	53	48	0.8	0.6	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T008	Residential	GF	E	50	45	50	46	50	46	51	46	0.4	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T008	Residential	GF	E	50	46	51	47	51	46	52	47	0.6	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T008	Residential	GF	S	52	48	52	48	53	48	53	48	0	-0.1	0.3	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T008	Residential	GF	W	59	55	60	55	59	55	61	56	1	0.7	1.2	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T009	Residential	GF	N	52	47	51	47	52	48	52	48	-0.3	-0.4	-0.1	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T009	Residential	GF	E	51	47	52	47	51	47	53	48	0.9	0.7	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T009	Residential	GF	E	49	44	49	45	49	45	50	46	0.6	0.4	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T009	Residential	GF	E	50	46	51	47	51	46	52	47	1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T009	Residential	GF	S	55	50	54	50	55	51	55	50	-0.5	-0.7	-0.4	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T009	Residential	GF	S	56	51	55	51	56	52	56	51	-0.6	-0.7	-0.4	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T009	Residential	GF	W	59	55	60	55	59	55	60	56	1	0.7	1.2	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T010	Residential	GF	E	50	46	51	47	51	46	52	48	1.1	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T010	Residential	GF	E	48	44	49	44	49	44	50	45	0.6	0.5	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T010	Residential	GF	E	49	45	50	46	50	45	51	47	0.9	0.7	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T010	Residential	GF	S	52	48	52	48	53	48	53	48	0	-0.2	0.1	0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T010	Residential	GF	W	59	54	60	55	59	55	60	56	1	0.7	1.2	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T011	Residential	GF	N	51	47	51	46	52	47	51	47	-0.4	-0.6	-0.3	-0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T011	Residential	GF	E	50	45	51	46	50	46	52	47	1.1	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T011	Residential	GF	E	48	44	49	44	49	44	49	45	0.7	0.5	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T011	Residential	GF	E	49	45	50	46	50	45	51	47	1	0.7	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T011	Residential	GF	W	55	50	54	50	55	51	55	50	-0.6	-0.7	-0.4	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T011	Residential	GF	S	56	51	55	50	56	52	56	51	-0.6	-0.8	-0.4	-0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T011	Residential	GF	W	59	54	60	55	59	55	60	56	1	0.8	1.2	1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T012	Residential	GF	E	49	45	50	46	50	45	51	47	1.1	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T012	Residential	GF	E	48	44	49	44	48	44	49	45	0.7	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T012	Residential	GF	E	49	44	50	45	49	45	50	46	0.9	0.6	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T012	Residential	GF	W	58	54	59	55	59	54	60	55	1.1	0.8	1.2	1.1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T014	Residential	GF	E	49	45	51	46	50	45	51	47	1.2	0.9	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T014	Residential	GF	E	48	43	48	44	48	44	49	45	0.8	0.6	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T014	Residential	GF	E	49	45	50	46	49	45	51	46	1.1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T014	Residential	GF	S	52	48	52	48	52	48	53	48	0.2	-0.1	0.3	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T014	Residential	GF	W	54	50	54	49	55	51	55	50	-0.5	-0.7	-0.4	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T014	Residential	GF	S	56	51	55	50	56	52	56	51	-0.5	-0.7	-0.3	-0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T014	Residential	GF	W	58	54	59	55	59	54	60	55	1.2	0.8	1.2	1.1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T015	Residential	GF	N	52	47	51	47	52	48	52	48	-0.4	-0.5	-0.2	-0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T015	Residential	GF	E	49	45	50	46	49	45	51	47	1.2	0.9	1.5	1.4	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.T015	Residential	GF	E	48	43	48	44	48	44	49	45	0.8	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T015	Residential	GF	E	49	44	49	45	49	45	50	46	0.9	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T015	Residential	GF	S	55	50	54	49	55	51	55	50	-0.7	-0.9	-0.5	-0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T015	Residential	GF	W	58	54	59	55	58	54	60	55	1.1	0.9	1.3	1.1	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T016	Residential	GF	N	61	57	62	57	61	57	62	58	0.7	0.6	1	0.9	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T016	Residential	GF	E	57	53	57	53	57	53	58	54	-0.1	0	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T016	Residential	GF	S	50	45	50	46	50	46	51	47	0.4	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T016	Residential	GF	E	50	46	50	46	50	46	51	47	0.5	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T016	Residential	GF	S	55	50	54	50	55	51	55	51	-0.2	-0.2	0.1	-0.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T016	Residential	GF	W	58	54	59	55	58	54	60	55	1.2	1	1.3	1.2	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T016	Residential	GF	W	57	53	59	54	58	54	59	55	1.2	0.9	1.2	1.1	55	50	NO	YES	NO	NO	YES
NCA09	NCA09.RES.T016	Residential	GF	W	60	56	61	57	61	56	62	57	0.8	0.6	1	0.9	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T017	Residential	GF	N	55	51	55	51	56	51	56	51	-0.3	-0.4	0	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T017	Residential	GF	E	54	49	54	49	54	50	55	50	0.1	0.1	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T017	Residential	GF	N	54	50	54	50	54	50	55	51	0.1	0.2	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T017	Residential	GF	E	52	47	52	48	52	48	53	49	0.5	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T017	Residential	GF	W	59	55	60	56	59	55	61	56	1.3	1.1	1.5	1.4	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T017	Residential	GF	W	59	55	60	56	60	55	61	57	1.2	0.9	1.4	1.3	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T017	Residential	GF	W	59	55	61	56	60	56	61	57	1.1	0.8	1.3	1.2	55	50	YES	YES	NO	NO	YES
NCA09	NCA09.RES.T018	Residential	GF	E	51	47	52	48	52	47	53	48	0.6	0.5	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T018	Residential	GF	S	50	46	51	46	51	46	51	47	0.3	0.2	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T018	Residential	GF	E	51	46	51	47	51	47	52	47	0.4	0.3	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T018	Residential	GF	S	51	46	51	47	51	47	52	47	0.4	0.2	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T018	Residential	GF	W	55	51	56	51	55	51	56	52	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T018	Residential	GF	W	53	48	53	49	53	49	54	50	0.9	0.7	1.1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T018	Residential	GF	W	57	53	58	54	57	53	59	54	1.2	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T019	Residential	GF	N	51	47	51	47	52	47	52	48	0.1	0	0.4	0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T019	Residential	GF	E	51	47	52	48	52	48	53	49	0.8	0.6	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T019	Residential	GF	N	51	47	52	48	52	47	53	49	0.8	0.6	1.1	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T019	Residential	GF	E	52	47	52	48	52	48	53	49	0.6	0.5	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T019	Residential	GF	W	55	51	56	51	55	51	57	52	0.9	0.7	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T019	Residential	GF	N	56	52	57	52	56	52	57	53	0.9	0.6	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T019	Residential	GF	W	56	51	57	52	56	52	57	53	0.8	0.7	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T020	Residential	GF	E	52	47	52	48	52	48	53	49	0.6	0.5	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T020	Residential	GF	S	50	45	50	46	50	46	51	46	0.4	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T020	Residential	GF	E	50	45	50	46	50	46	51	46	0.5	0.5	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T020	Residential	GF	S	51	47	51	47	51	47	52	47	0.2	0.2	0.5	0.5	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.T020	Residential	GF	W	53	48	54	49	53	49	54	50	1	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T020	Residential	GF	W	52	48	53	48	53	48	53	49	0.6	0.4	0.7	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T020	Residential	GF	W	55	50	56	51	55	51	56	52	0.9	0.6	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	N	51	47	51	47	52	47	52	48	0	-0.1	0.3	0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	E	51	46	52	47	51	47	52	48	0.8	0.6	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	N	51	47	52	48	52	47	53	48	0.8	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	E	51	46	51	47	51	47	52	48	0.8	0.6	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	W	54	50	55	50	54	50	56	51	1.1	0.8	1.4	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	W	53	48	54	49	53	49	54	50	1.1	0.9	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	W	54	50	55	51	54	50	56	51	1.1	0.9	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	W	55	50	56	51	55	51	56	52	1	0.8	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T021	Residential	GF	W	55	50	56	51	55	51	56	52	1	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	N	54	50	55	51	55	50	56	52	1.1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	E	52	47	53	48	52	48	53	49	1.1	1	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	E	50	46	51	47	50	46	52	47	0.9	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	S	49	45	50	45	50	45	50	46	0.5	0.4	0.8	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	NE	51	47	52	48	52	47	53	49	1.1	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	E	51	46	52	47	51	47	52	48	1	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	E	49	45	50	46	50	45	51	46	0.7	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	S	52	48	52	47	52	48	53	48	0	-0.3	0.1	0	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	W	54	50	55	50	54	50	56	51	1.1	0.9	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	W	53	49	54	50	54	49	55	50	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	W	54	50	55	51	55	50	56	52	1.2	1	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	W	52	48	53	48	52	48	53	49	0.6	0.4	0.8	0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	W	54	50	55	51	55	50	56	52	1.2	0.9	1.3	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T022	Residential	GF	W	54	49	55	50	54	50	55	51	1.2	0.9	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T023	Residential	GF	E	49	45	50	45	49	45	51	46	1.2	0.9	1.5	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T023	Residential	GF	S	48	44	49	44	49	44	50	45	0.7	0.5	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T023	Residential	GF	E	48	44	49	44	49	44	50	45	0.7	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T023	Residential	GF	W	54	50	55	50	55	50	56	51	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T023	Residential	GF	W	53	49	54	50	54	50	55	50	0.9	0.7	0.9	0.8	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T023	Residential	GF	W	54	49	55	50	54	50	56	51	1	0.8	1.3	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T024	Residential	GF	E	49	45	50	45	49	45	51	46	1	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T024	Residential	GF	E	49	45	50	46	50	45	51	47	0.9	0.7	1.2	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T024	Residential	GF	E	49	44	50	45	49	45	51	46	1.1	0.8	1.4	1.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T024	Residential	GF	S	50	46	51	46	51	46	51	47	0.5	0.4	0.6	0.6	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T024	Residential	GF	W	55	50	55	51	55	51	56	52	0.9	0.6	1	0.9	55	50	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day		Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA09	NCA09.RES.T024	Residential	GF	W	54	50	55	51	55	50	56	51	0.9	0.7	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T024	Residential	GF	W	54	50	55	50	55	50	56	51	1	0.6	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T025	Residential	GF	N	50	46	50	45	51	46	50	46	-0.4	-0.5	-0.2	-0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T025	Residential	GF	E	49	45	50	45	49	45	50	46	0.7	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T025	Residential	GF	E	49	45	50	45	49	45	50	46	0.7	0.6	1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T025	Residential	GF	E	48	44	50	45	49	44	50	46	1.2	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T025	Residential	GF	W	55	50	56	51	55	51	56	52	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T025	Residential	GF	N	54	50	55	50	55	50	55	51	0.6	0.4	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T025	Residential	GF	W	54	50	54	50	54	50	55	50	0.4	0.2	0.6	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T026	Residential	GF	E	48	44	49	45	49	44	50	46	1.2	0.9	1.4	1.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T026	Residential	GF	S	48	44	49	44	48	44	49	45	0.7	0.5	0.9	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T026	Residential	GF	E	48	43	49	44	48	44	49	45	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T026	Residential	GF	S	51	46	51	46	51	47	52	47	0.5	0.3	0.7	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T026	Residential	GF	W	56	51	56	52	56	52	57	52	0.5	0.3	0.6	0.5	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T026	Residential	GF	W	55	51	56	51	56	51	56	52	0.4	0.1	0.5	0.4	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T026	Residential	GF	W	55	50	56	51	55	51	56	52	0.9	0.7	1.1	1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	N	50	46	50	45	50	46	50	46	-0.4	-0.5	-0.1	-0.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	E	49	44	50	45	49	45	50	46	1.1	0.8	1.2	1.2	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	S	48	44	49	44	48	44	49	45	0.7	0.5	1	0.9	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	E	48	43	49	44	48	44	49	45	0.9	0.7	1.1	1.1	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	S	55	51	55	50	56	51	55	51	-0.6	-0.8	-0.5	-0.7	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	W	56	52	56	51	56	52	56	52	-0.3	-0.4	-0.1	-0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	S	56	52	56	51	56	52	56	52	-0.3	-0.5	-0.2	-0.3	55	50	NO	NO	NO	NO	NO
NCA09	NCA09.RES.T027	Residential	GF	W	57	52	57	53	57	53	58	53	0.5	0.3	0.7	0.6	55	50	NO	NO	NO	NO	NO

B.3 Noise Mitigation Guideline (NMG) barrier analysis for NB.04

RENZO TONIN & ASSOCIATES
inspired to achieve

Acoustics
Vibration
Structural Dynamics

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Project Title - M12RT Barrier Assessment

Project:	M12RT
Barrier ID:	NB.04
Chainage/location:	Tomago
NCA:	NCA09
Road:	M1 Motorway

Barrier length (m):	449
Number of benefitting receivers	0

Barrier analysis details

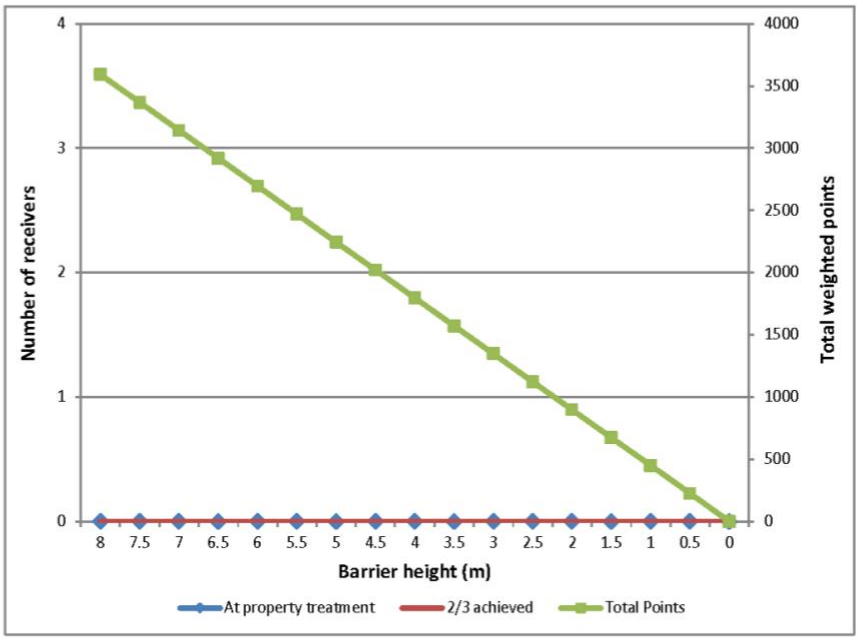
Maximum barrier	- - - -
Height (m)	N/A
Receivers requiring treatment	N/A
Insertion loss required, dB	10
Insertion loss achieved, dB	N/A

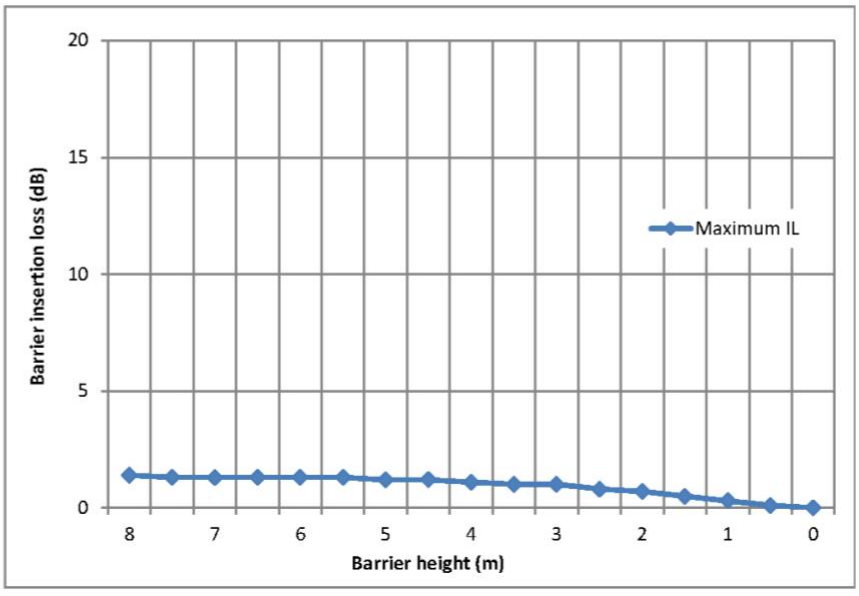
Initial design barrier	- - - -
Height (m)	N/A
Receivers requiring treatment	N/A

Design barrier	- - - -
Height (m)	N/A
Receivers requiring treatment	N/A
Insertion loss required, dB	5
Insertion loss achieved, dB	N.A

Alternative barrier	- - - -
Height (m)	N/A

Alternative barrier height based on non-acoustic feasible and reasonable considerations following the outcomes of the review of urban design, visual impact and engineering constraints





B.4 Receiver buildings identified for at property treatment

Figure TL081-01.6.2.1.1 Q51 (r0) Receiver buildings potentially eligible for consideration of treatment
Mitigated with low noise pavement and alternative barrier heights

Appendix C Operational noise assessment for design refinements

C.1 Detailed predicted operational noise levels for southbound entry ramp extension onto M1 Pacific Motorway in Black Hill

Predicted L_{Aeq} traffic noise levels at Black Hill with on-ramp extension (relocated existing noise wall & low noise pavement)

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA01A	NCA01A.RES.0002	Residential	Ground	W	53	49	52	47	54	49	53	48	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0002	Residential	Ground	S	53	48	51	46	53	48	52	47	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0002	Residential	Ground	E	50	45	49	44	50	46	50	45	-1	-1.2	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0002	Residential	Ground	N	52	48	51	47	52	48	52	47	-1	-1.3	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0003	Residential	Ground	W	55	50	53	49	55	50	54	49	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0003	Residential	Ground	S	53	49	52	47	54	49	53	48	-1.6	-2	-1.1	-1.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0003	Residential	Ground	E	48	43	47	42	48	44	48	43	-1	-1.2	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0003	Residential	Ground	N	52	48	51	46	52	48	52	47	-1.1	-1.4	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	N	55	50	53	49	55	51	54	50	-1.3	-1.6	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	N	55	51	54	49	55	51	55	50	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	N	55	51	54	50	56	51	55	50	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	W	55	51	54	49	55	51	55	50	-1.3	-1.6	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	N	55	51	54	49	55	51	55	50	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	W	57	53	56	51	58	53	57	52	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	S	57	53	56	51	58	53	57	52	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	E	56	52	54	50	56	52	55	50	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	S	57	53	56	51	57	53	56	52	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	E	56	52	54	50	56	52	55	50	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	S	57	52	55	51	57	53	56	51	-1.5	-1.8	-1	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0004	Residential	Ground	E	55	51	53	49	55	51	54	50	-1.4	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0005	Residential	Ground	N	56	52	55	50	56	52	55	51	-1.2	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0005	Residential	Ground	W	59	55	58	53	59	55	58	54	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0005	Residential	Ground	S	57	52	55	51	57	53	56	51	-1.5	-1.8	-1	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0005	Residential	Ground	E	56	52	55	50	56	52	55	51	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	W	60	56	59	54	60	56	59	55	-1.4	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	S	58	54	57	52	58	54	57	53	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	W	58	54	57	52	59	54	58	53	-1.6	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	S	58	54	57	52	58	54	57	53	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	E	53	49	52	48	53	49	53	49	-0.7	-1	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	N	57	53	56	51	57	53	57	52	-1.3	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	W	57	53	56	51	57	53	57	52	-1.2	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	Ground	N	57	53	56	51	57	53	57	52	-1.3	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	First	W	62	57	60	56	62	58	61	56	-1.4	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	First	S	60	56	58	54	60	56	59	54	-1.5	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	First	W	60	56	59	54	60	56	59	55	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	First	S	60	56	58	54	60	56	59	54	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0006	Residential	First	E	57	52	56	51	57	52	56	52	-1.1	-1.4	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	First	N	59	55	58	53	59	55	58	54	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	First	W	59	55	58	54	60	55	59	54	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0006	Residential	First	N	59	55	58	54	59	55	59	54	-1.3	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0007	Residential	Ground	N	54	50	53	49	54	50	54	49	-1	-1.3	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0007	Residential	Ground	W	57	53	56	51	57	53	56	52	-1.3	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0007	Residential	Ground	S	55	51	54	49	56	51	55	50	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0007	Residential	Ground	E	50	46	49	44	50	46	50	45	-1.4	-1.9	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0007	Residential	Ground	S	53	49	51	47	53	49	52	47	-1.6	-2	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0007	Residential	Ground	E	51	46	50	45	51	46	51	46	-0.5	-0.7	0	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	NE	52	47	51	46	52	48	51	47	-1.1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	NW	52	48	51	46	52	48	51	47	-1.1	-1.4	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	NE	52	47	51	46	52	47	51	47	-1.1	-1.4	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	NW	54	50	53	48	54	50	53	49	-1.3	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	SW	54	50	52	48	54	50	53	49	-1.5	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	NW	54	50	53	48	54	50	54	49	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	SW	54	50	53	48	54	50	53	49	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	SE	53	48	51	47	53	48	52	47	-1.4	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	SW	52	48	51	46	52	48	52	47	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	SE	52	48	51	47	53	48	52	47	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	SE	50	45	48	44	50	45	49	45	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0008	Residential	Ground	SE	52	47	51	46	52	48	51	47	-1.2	-1.5	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0009	Residential	Ground	W	55	50	53	49	55	50	54	49	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0009	Residential	Ground	S	54	50	52	48	54	50	53	49	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0009	Residential	Ground	W	55	50	53	49	55	51	54	50	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0009	Residential	Ground	S	54	50	52	48	54	50	53	48	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0009	Residential	Ground	E	51	46	50	45	51	47	50	46	-1	-1.2	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0009	Residential	Ground	N	53	48	52	47	53	49	53	48	-0.8	-1.1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	W	51	47	51	47	51	47	52	47	0.2	0	0.7	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	S	53	49	52	47	54	49	53	48	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	W	54	50	53	48	54	50	54	49	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	S	53	49	52	48	54	49	53	48	-1.3	-1.5	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	E	50	46	50	45	51	46	50	46	-0.8	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	S	50	46	49	45	51	46	50	45	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	E	52	47	51	47	52	47	52	47	-0.5	-0.7	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	N	52	48	52	47	52	48	52	48	-0.5	-0.7	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0015	Residential	Ground	E	52	47	51	47	52	47	52	47	-0.4	-0.6	0	-0.1	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0015	Residential	Ground	N	54	50	54	49	54	50	54	50	-0.5	-0.7	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	N	52	48	51	46	52	48	52	47	-1.3	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	W	58	54	57	53	58	54	58	54	-0.9	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	S	56	51	54	50	56	51	55	50	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	W	56	52	55	50	56	52	55	51	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	N	56	52	55	51	56	52	56	51	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	W	57	53	57	52	58	53	57	53	-0.9	-1.2	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	N	57	53	56	52	57	53	57	52	-0.9	-1.2	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	W	58	54	57	53	58	54	58	53	-0.8	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	S	57	52	55	51	57	52	56	51	-1.3	-1.5	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	W	58	54	57	53	58	54	58	53	-0.8	-1.1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	S	55	51	54	49	55	51	55	50	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	E	53	49	52	47	53	49	53	48	-1.1	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	S	53	48	51	47	53	48	52	47	-1.3	-1.6	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	E	53	48	52	47	53	49	52	48	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	S	53	49	52	47	53	49	52	48	-1.2	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	E	53	49	52	47	53	49	53	48	-1	-1.3	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	N	54	50	53	49	54	50	54	50	-0.5	-0.7	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	E	52	48	51	46	52	48	52	47	-0.9	-1.2	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	Ground	E	52	48	51	47	53	48	52	48	-0.9	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	N	60	55	59	54	60	55	60	55	-0.7	-0.9	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	W	60	56	59	55	60	56	60	55	-0.9	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	S	60	55	59	54	60	56	59	55	-0.8	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	W	59	55	59	54	60	55	59	55	-0.8	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	N	60	55	59	54	60	55	59	55	-0.8	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	W	60	55	59	54	60	55	59	55	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	N	60	55	59	54	60	55	59	55	-0.8	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	W	60	55	59	54	60	56	60	55	-0.8	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	S	60	55	59	54	60	55	59	55	-0.8	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	W	60	55	59	54	60	55	59	55	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	S	59	55	58	54	60	55	59	55	-0.8	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	E	59	55	58	54	59	55	59	54	-0.8	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	S	59	55	58	54	59	55	59	54	-0.9	-1.1	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	E	59	55	58	54	59	55	59	54	-0.9	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	S	59	55	58	54	59	55	59	54	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	E	59	55	58	54	59	55	59	54	-0.7	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	N	59	55	58	54	59	55	59	54	-0.8	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0016	Residential	First	E	59	55	59	54	60	55	59	55	-0.8	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0016	Residential	First	E	59	55	59	54	60	55	59	55	-0.7	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0017	Residential	Ground	NW	54	49	53	48	54	49	53	49	-1	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0017	Residential	Ground	SW	54	50	53	48	54	50	53	49	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0017	Residential	Ground	SE	52	48	51	47	53	48	52	47	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0017	Residential	Ground	NE	52	47	51	47	52	48	52	47	-0.7	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0018	Residential	Ground	NW	54	50	53	49	54	50	54	49	-0.9	-1.2	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0018	Residential	Ground	SW	54	50	53	49	55	50	54	49	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0018	Residential	Ground	SE	53	49	52	47	53	49	52	48	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0018	Residential	Ground	NE	52	48	51	47	52	48	52	47	-0.9	-1.1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	NE	52	48	51	47	53	48	52	48	-1	-1.3	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	SE	52	48	51	46	52	48	51	47	-1.2	-1.4	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	NE	53	49	52	48	54	49	53	48	-1.1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	NW	54	50	53	48	54	50	53	49	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	NE	53	49	52	48	54	49	53	48	-1.3	-1.5	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	NW	57	52	55	51	57	52	56	52	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	SW	56	52	55	50	56	52	55	51	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0019	Residential	Ground	SE	54	49	52	48	54	49	53	48	-1.4	-1.6	-0.7	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	W	58	54	57	53	58	54	58	53	-1	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	S	56	51	54	49	56	51	55	50	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	W	56	52	55	50	57	52	56	51	-1.5	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	S	55	51	54	49	55	51	54	50	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	E	50	46	49	44	50	46	50	45	-1.3	-1.6	-0.9	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	S	47	43	46	41	47	43	47	42	-1.2	-1.5	-0.7	-0.9	59	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	E	52	48	52	47	53	48	53	48	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	N	55	50	54	50	55	51	55	50	-0.6	-0.7	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	E	53	49	53	49	54	49	54	49	-0.1	-0.3	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	Ground	N	56	52	56	51	57	52	56	52	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	W	59	55	58	54	60	55	59	55	-0.9	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	S	57	53	56	51	57	53	56	52	-1.4	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	W	58	53	56	52	58	54	57	52	-1.4	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	S	57	52	55	51	57	52	56	51	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	E	54	49	53	48	54	50	53	49	-1.3	-1.5	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	S	52	47	50	46	52	47	51	46	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	E	55	51	55	50	56	51	55	51	-0.8	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	N	57	52	56	52	57	53	57	52	-0.6	-0.8	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0020	Residential	First	E	56	51	55	51	56	52	56	51	-0.4	-0.5	0.1	-0.2	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0020	Residential	First	N	58	54	57	53	58	54	58	53	-0.6	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	N	55	51	55	51	55	51	56	51	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	W	56	52	56	52	57	52	57	52	-0.4	-0.6	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	S	54	50	53	48	54	50	53	49	-1.2	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	W	53	49	52	47	53	49	53	48	-1.1	-1.3	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	N	53	49	52	47	53	49	53	48	-1	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	W	55	51	54	49	55	51	55	50	-1	-1.3	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	S	54	50	53	48	54	50	53	49	-1.2	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	E	51	47	50	46	52	47	51	46	-1	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	E	50	45	49	44	50	46	50	45	-0.7	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	S	52	48	51	46	52	48	52	47	-1.1	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0021	Residential	Ground	E	52	47	51	46	52	48	52	47	-0.7	-0.9	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0022	Residential	Ground	W	57	53	57	52	57	53	57	53	-0.2	-0.4	0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0022	Residential	Ground	S	54	49	52	48	54	50	53	49	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0022	Residential	Ground	E	51	47	51	46	52	47	51	47	-0.8	-1	-0.4	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0022	Residential	Ground	N	56	52	56	51	57	52	56	52	-0.6	-0.7	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	W	59	54	58	54	59	55	59	54	-0.6	-0.8	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	N	58	54	58	53	58	54	58	54	-0.6	-0.7	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	W	59	55	58	54	59	55	59	54	-0.6	-0.9	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	S	56	51	54	50	56	51	55	50	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	E	52	48	51	47	52	48	52	47	-0.9	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	N	56	52	55	51	56	52	56	51	-0.6	-0.7	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	W	54	50	54	49	54	50	54	50	-0.4	-0.6	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	N	53	49	52	48	53	49	53	48	-0.5	-0.8	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	E	52	48	52	47	52	48	52	48	-0.6	-0.9	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0023	Residential	Ground	N	58	53	57	53	58	54	58	53	-0.4	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0024	Residential	Ground	N	56	52	57	52	57	52	57	53	0.3	0	0.6	0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0024	Residential	Ground	W	56	51	56	52	56	52	57	52	0.5	0.4	1	0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0024	Residential	Ground	N	55	51	56	51	56	51	56	52	0.4	0.2	0.8	0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0024	Residential	Ground	W	55	51	55	51	56	51	56	51	-0.4	-0.5	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0024	Residential	Ground	S	53	48	52	47	53	49	52	48	-1	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0024	Residential	Ground	E	52	48	51	47	53	48	52	48	-0.9	-1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	NE	56	52	56	52	56	52	57	52	0.3	0.2	0.7	0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	NW	56	52	57	52	57	52	57	53	0.2	0	0.6	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	NE	56	52	56	52	56	52	57	52	0.2	0.1	0.6	0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	N	57	52	57	52	57	53	57	53	0	0	0.4	0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	NW	57	52	57	52	57	53	58	53	0	-0.1	0.4	0.2	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0026	Residential	Ground	W	56	52	56	52	56	52	57	52	0.2	0	0.7	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	SW	54	50	53	49	54	50	54	49	-1	-1.2	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	NW	56	51	56	51	56	52	57	52	0.1	0	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	SW	53	49	52	48	53	49	53	48	-1.1	-1.3	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	SE	51	47	50	46	52	47	51	46	-0.9	-1.1	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	S	52	47	51	46	52	48	52	47	-1	-1.2	-0.7	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	SE	53	48	52	47	53	49	52	48	-1	-1.1	-0.6	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	E	52	48	52	47	53	48	52	48	-0.7	-0.8	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0026	Residential	Ground	SE	52	48	51	46	52	48	52	47	-0.9	-1.1	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0027	Residential	Ground	N	55	50	54	50	55	51	55	50	-0.5	-0.6	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0027	Residential	Ground	E	53	48	52	47	53	48	53	48	-0.7	-0.9	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0027	Residential	Ground	N	58	54	58	54	58	54	59	54	0.1	-0.1	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0027	Residential	Ground	W	57	53	57	53	57	53	58	54	0.4	0.2	0.9	0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0027	Residential	Ground	S	53	49	52	48	53	49	53	48	-0.9	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0027	Residential	Ground	E	53	48	52	47	53	49	53	48	-0.7	-0.8	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	NW	59	55	59	54	59	55	59	55	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	SW	57	53	56	52	57	53	57	52	-1.2	-1.4	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	SE	54	50	53	49	54	50	54	49	-0.9	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	NE	58	54	59	55	59	54	60	55	1.1	0.9	1.4	1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	SE	56	52	58	53	56	52	59	54	1.8	1.6	2.1	2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	NE	59	54	58	54	59	55	59	54	-0.5	-0.6	0	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	NE	58	54	58	53	58	54	58	54	-0.6	-0.7	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0028	Residential	Ground	NE	58	54	58	53	59	54	58	54	-0.8	-1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0029	Residential	Ground	N	61	57	61	57	62	57	62	57	0	-0.1	0.4	0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0029	Residential	Ground	W	60	55	60	56	60	55	61	56	0.9	0.7	1.3	1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0029	Residential	Ground	S	56	52	56	51	56	52	56	52	-0.8	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0029	Residential	Ground	E	54	49	54	49	54	50	54	50	0.1	-0.1	0.5	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0030	Residential	Ground	W	59	55	58	54	60	55	59	54	-1.2	-1.3	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0030	Residential	Ground	E	57	53	59	54	58	53	59	55	1.2	1	1.6	1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0030	Residential	Ground	N	60	56	60	56	61	56	61	56	0.1	-0.1	0.5	0.2	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0031	Residential	Ground	N	61	57	61	56	61	57	61	57	0.1	-0.1	0.4	0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0031	Residential	Ground	N	62	58	62	57	62	58	62	58	0	-0.1	0.4	0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0031	Residential	Ground	W	62	57	62	58	62	58	63	58	0.5	0.3	0.8	0.6	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0031	Residential	Ground	N	62	58	62	57	62	58	62	58	0	-0.2	0.4	0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0031	Residential	Ground	W	63	59	63	59	63	59	64	59	0	-0.2	0.4	0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0031	Residential	Ground	S	57	53	56	51	57	53	57	52	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0031	Residential	Ground	E	54	49	53	48	54	49	54	49	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0031	Residential	Ground	S	53	49	52	47	53	49	53	48	-0.9	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0031	Residential	Ground	E	53	49	53	49	54	49	54	49	-0.3	-0.5	0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0032	Residential	Ground	N	58	54	57	53	59	54	58	53	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0032	Residential	Ground	W	60	56	59	55	60	56	60	56	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0032	Residential	Ground	S	57	53	56	51	58	53	57	52	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0032	Residential	Ground	E	54	50	54	49	54	50	54	50	-0.2	-0.5	0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	N	59	54	58	54	59	55	59	54	-0.7	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	W	60	55	59	54	60	55	59	55	-0.8	-1.1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	N	59	55	58	54	59	55	59	54	-0.7	-0.9	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	W	60	56	59	55	60	56	60	56	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	S	57	53	55	51	57	53	56	52	-1.4	-1.7	-0.9	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	E	55	50	54	50	55	51	55	50	-0.4	-0.7	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	E	54	49	54	49	54	50	54	50	0.2	-0.1	0.6	0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0033	Residential	Ground	E	54	50	54	50	54	50	55	50	0	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	N	58	54	58	53	59	54	58	54	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	W	59	55	58	54	59	55	59	54	-1	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	N	59	55	58	54	59	55	59	55	-0.8	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	NW	61	56	60	55	61	56	60	56	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	W	61	57	60	55	61	57	61	56	-0.9	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	SW	60	56	59	55	61	56	60	55	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	W	59	54	57	53	59	54	58	53	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	W	59	55	58	54	60	55	59	54	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	S	57	52	55	51	57	53	56	51	-1.5	-1.7	-1	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	SE	56	52	55	50	56	52	55	51	-1.5	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	E	53	49	52	47	53	49	52	48	-1.3	-1.7	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	NE	49	44	48	43	49	45	48	44	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	E	48	44	47	42	48	44	48	43	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	S	50	46	49	44	51	46	50	45	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	Ground	E	52	48	52	47	52	48	52	48	-0.1	-0.4	0.3	0	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	N	61	56	60	55	61	56	60	56	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	W	60	56	60	55	61	56	61	56	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	N	61	56	60	56	61	57	61	56	-0.8	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	NW	62	58	61	57	62	58	62	57	-0.7	-0.9	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	W	62	58	61	57	62	58	62	57	-0.7	-0.9	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	SW	61	57	60	56	62	57	61	56	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	W	60	55	58	54	60	55	59	54	-1.5	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	W	60	56	59	55	61	56	60	55	-1.3	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0034	Residential	First	S	58	54	57	52	58	54	57	53	-1.4	-1.7	-0.9	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	SE	58	53	56	52	58	53	57	52	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	E	56	51	54	50	56	51	55	50	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	NE	53	49	52	48	54	49	53	48	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	E	53	49	52	47	53	49	52	48	-1.3	-1.6	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	S	54	50	53	48	55	50	54	49	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0034	Residential	First	E	57	53	56	52	57	53	57	52	-0.6	-0.9	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	S	56	52	55	50	56	52	55	51	-1.4	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	E	55	51	54	50	55	51	55	50	-0.8	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	N	59	54	58	53	59	54	58	54	-1	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	W	57	53	56	52	58	53	57	53	-1	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	N	56	52	56	51	57	52	56	52	-0.8	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	E	56	52	56	51	57	52	56	52	-0.9	-1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	N	60	55	59	54	60	56	59	55	-0.9	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	W	61	57	60	56	61	57	61	56	-0.9	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	S	57	53	56	51	57	53	56	52	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	W	58	53	56	51	58	53	57	52	-1.5	-1.8	-1	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	S	57	53	55	51	57	53	56	52	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0035	Residential	Ground	E	54	50	53	48	54	50	54	49	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	N	59	54	58	53	59	55	58	54	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	W	60	56	59	54	60	56	59	55	-1.1	-1.5	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	N	60	55	58	54	60	55	59	55	-1.2	-1.4	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	W	62	57	60	56	62	57	61	56	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	S	59	55	57	53	59	55	58	53	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	E	56	51	55	50	56	52	55	51	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	N	55	51	54	50	55	51	55	50	-1	-1.3	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0036	Residential	Ground	E	55	50	54	49	55	51	54	50	-1	-1.3	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0048	Residential	Ground	N	52	47	51	46	52	48	51	47	-1.1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0048	Residential	Ground	E	51	47	50	45	51	47	50	46	-1.1	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0048	Residential	Ground	N	53	49	52	47	53	49	52	48	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0048	Residential	Ground	W	55	51	54	49	56	51	55	50	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0048	Residential	Ground	W	56	51	54	50	56	51	55	50	-1.4	-1.6	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0048	Residential	Ground	S	55	50	53	49	55	50	54	49	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0048	Residential	Ground	E	51	47	50	45	51	47	51	46	-1.2	-1.4	-0.7	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0049	Residential	Ground	W	55	51	54	50	55	51	55	50	-0.9	-1.2	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0049	Residential	Ground	S	54	49	52	48	54	50	53	48	-1.4	-1.7	-0.9	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0049	Residential	Ground	E	51	46	51	46	51	47	52	47	0.4	0.1	0.8	0.6	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0049	Residential	Ground	N	54	50	53	49	54	50	54	50	-0.8	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	N	59	55	59	54	59	55	59	55	-0.2	-0.3	0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	W	61	56	60	55	61	57	60	56	-0.9	-1.1	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	N	61	57	60	55	61	57	60	56	-0.9	-1.1	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	W	61	57	60	56	61	57	61	56	-1.1	-1.1	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	N	61	57	61	56	61	57	61	57	-0.5	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	W	62	58	62	57	62	58	62	58	-0.3	-0.5	0	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	S	57	53	56	51	57	53	56	52	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	E	54	50	54	49	54	50	54	50	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0050	Residential	Ground	E	54	50	54	49	54	50	55	50	-0.2	-0.4	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	N	58	54	58	54	58	54	59	54	0.3	0.1	0.7	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	W	59	55	59	54	59	55	59	55	-0.6	-0.9	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	S	57	53	56	52	58	53	57	53	-0.9	-1.1	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	W	59	55	58	54	59	55	59	54	-0.7	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	N	59	54	58	54	59	54	59	54	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	W	59	55	58	54	59	55	59	55	-0.7	-0.9	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	S	56	51	54	50	56	52	55	50	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	E	53	48	52	47	53	49	53	48	-0.9	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	E	52	48	52	47	53	48	52	48	-0.9	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0051	Residential	Ground	E	52	48	51	47	52	48	52	48	-0.8	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	N	58	53	57	53	58	54	58	53	-0.7	-0.8	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	W	54	50	53	49	54	50	54	49	-0.4	-0.7	0	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	N	53	49	53	48	53	49	54	49	0.1	-0.2	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	E	54	50	54	49	54	50	54	50	-0.5	-0.7	0	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	N	59	55	58	54	59	55	59	54	-0.6	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	W	59	55	59	55	59	55	60	55	0	-0.2	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	N	59	54	58	53	59	55	58	54	-1.1	-1.3	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	W	59	55	59	55	59	55	60	55	0	-0.1	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	S	53	49	52	47	54	49	53	48	-1.3	-1.7	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	E	50	46	49	44	50	46	50	45	-1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	E	49	45	48	44	50	45	49	45	-1	-1.2	-0.7	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	SE	54	49	54	49	54	49	55	50	0.4	0.2	0.8	0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	E	55	50	55	50	55	51	55	51	-0.2	-0.3	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	NE	54	50	54	49	54	50	55	50	0	-0.1	0.4	0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	E	53	48	53	49	53	48	54	49	0.6	0.5	0.9	0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	E	53	48	53	49	53	49	54	49	0.4	0.3	0.8	0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	Ground	E	52	47	53	48	52	48	53	49	0.7	0.5	1	0.9	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA01A	NCA01A.RES.0052	Residential	Ground	E	53	49	53	49	54	49	54	49	-0.1	-0.3	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	N	60	56	60	56	61	56	61	56	-0.1	-0.3	0.3	0	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	W	57	53	58	53	57	53	58	54	0.3	0.1	0.7	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	N	56	51	56	52	56	52	57	52	0.8	0.6	1	0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	58	53	58	53	58	53	58	54	0.3	0.1	0.7	0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	N	61	57	61	56	61	57	61	57	-0.2	-0.4	0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	W	61	56	60	56	61	57	61	57	-0.2	-0.4	0.3	0	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	N	60	56	59	55	60	56	60	55	-1.1	-1.2	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	W	60	56	60	56	61	56	61	56	-0.1	-0.4	0.3	0	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	S	55	51	54	49	55	51	54	50	-1.1	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	53	48	52	47	53	49	53	48	-1	-1.2	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	52	48	51	47	53	48	52	48	-1	-1.2	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	SE	57	52	58	53	57	53	58	54	0.8	0.7	1.2	1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	58	54	58	54	59	54	59	55	0.1	-0.1	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	NE	58	54	58	54	59	54	59	54	0.1	-0.1	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	57	53	58	53	58	53	58	54	0.4	0.3	0.9	0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	58	53	58	53	58	54	58	54	0.3	0.1	0.6	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	57	52	58	53	57	53	58	54	1	0.7	1.3	1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0052	Residential	First	E	58	54	58	54	58	54	59	54	0.1	0	0.6	0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0053	Residential	Ground	NW	62	58	62	58	62	58	63	58	0	-0.2	0.4	0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0053	Residential	Ground	SW	62	58	61	56	62	58	61	57	-1.2	-1.3	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0053	Residential	Ground	NW	62	58	62	58	62	58	63	58	-0.2	-0.4	0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0053	Residential	Ground	SW	61	57	60	56	61	57	61	56	-0.8	-1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0053	Residential	Ground	SE	56	52	55	50	56	52	55	51	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0053	Residential	Ground	NE	57	53	57	52	58	53	57	53	-0.5	-0.6	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0053	Residential	First	NW	63	59	63	59	63	59	64	59	-0.1	-0.3	0.3	0	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0053	Residential	First	SW	63	59	63	59	64	59	64	59	-0.4	-0.6	0	-0.2	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0053	Residential	First	NW	63	59	63	59	63	59	64	59	-0.2	-0.4	0.2	-0.2	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0053	Residential	First	SW	63	59	63	59	63	59	64	59	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0053	Residential	First	SE	63	58	62	58	63	59	63	58	-0.2	-0.3	0.2	-0.1	60	55	NO	NO	NO	NO	YES
NCA01A	NCA01A.RES.0053	Residential	First	NE	62	58	62	57	62	58	62	58	-0.4	-0.5	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	NE	52	47	51	46	52	48	52	47	-0.8	-1	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	SE	52	47	51	46	52	48	51	47	-1	-1.3	-0.7	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	NE	55	50	54	50	55	50	55	50	-0.4	-0.6	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	NW	55	51	55	50	56	51	56	51	-0.4	-0.6	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	SW	55	50	54	50	55	50	55	50	-0.5	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	W	55	50	54	50	55	50	55	50	-0.5	-0.7	0	-0.3	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01A	NCA01A.RES.0054	Residential	Ground	N	54	49	53	49	54	49	54	50	-0.1	-0.2	0.4	0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	W	55	51	54	50	55	51	55	50	-0.7	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	S	53	48	52	47	53	49	52	48	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	E	52	48	51	46	52	48	52	47	-1	-1.2	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	S	50	46	49	45	50	46	50	45	-0.9	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	E	51	47	51	46	52	47	51	47	-0.9	-1.3	-0.7	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	S	51	46	50	45	51	46	50	46	-1	-1.3	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0054	Residential	Ground	E	52	48	51	47	53	48	52	47	-0.9	-1	-0.6	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	W	59	55	59	55	59	55	60	55	0.2	0	0.6	0.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	S	54	50	54	49	55	50	54	50	-0.7	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	W	54	50	54	49	54	50	54	50	-0.7	-0.8	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	S	54	50	53	49	54	50	54	49	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	S	54	49	53	48	54	49	53	49	-0.8	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	S	54	50	53	49	54	50	54	49	-0.9	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	E	51	47	51	46	52	47	52	47	-0.5	-0.6	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	N	58	53	57	52	58	53	57	53	-0.8	-0.9	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	N	58	54	58	54	59	54	59	54	-0.1	-0.3	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0055	Residential	Ground	N	59	54	59	54	59	54	59	55	0.1	-0.1	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0062	Residential	Ground	E	52	48	51	46	52	48	51	47	-1.3	-1.7	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0062	Residential	Ground	N	54	50	53	48	54	50	53	49	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0062	Residential	Ground	W	56	52	55	50	57	52	56	51	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0062	Residential	Ground	S	55	51	54	49	56	51	55	50	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	E	50	46	49	45	51	46	50	45	-1.2	-1.5	-0.8	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	E	51	47	50	45	51	47	51	46	-1.2	-1.5	-0.7	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	N	53	49	52	48	54	49	53	48	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	W	56	51	54	50	56	51	55	50	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	S	55	51	54	49	55	51	54	50	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	W	55	51	54	49	56	51	55	50	-1.4	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	N	54	50	53	48	54	50	54	49	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	W	56	52	55	50	56	52	55	51	-1.4	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	S	55	51	54	49	55	51	54	50	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	E	51	47	50	45	51	47	51	46	-1.3	-1.7	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	S	51	46	49	45	51	47	50	45	-1.4	-1.7	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0063	Residential	Ground	E	51	47	50	45	51	47	50	46	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0064	Residential	Ground	N	55	51	54	49	56	51	55	50	-1.4	-1.7	-0.9	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0064	Residential	Ground	W	58	54	57	52	58	54	57	53	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0064	Residential	Ground	S	57	53	56	51	57	53	56	52	-1.6	-2	-1.1	-1.4	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA01A	NCA01A.RES.0064	Residential	Ground	W	56	52	55	50	56	52	56	51	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0064	Residential	Ground	N	56	52	55	50	56	52	55	51	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0064	Residential	Ground	W	58	54	57	52	58	54	57	53	-1.5	-1.9	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0064	Residential	Ground	S	57	53	56	51	57	53	56	52	-1.6	-1.9	-1	-1.4	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0064	Residential	Ground	E	54	49	52	48	54	50	53	48	-1.4	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	N	52	48	51	47	52	48	52	47	-1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	W	53	49	52	47	53	49	53	48	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	N	53	48	51	47	53	48	52	47	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	W	54	50	53	48	54	50	54	49	-1.4	-1.6	-0.9	-1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	S	54	49	52	48	54	50	53	48	-1.5	-1.8	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	W	54	49	52	48	54	50	53	48	-1.5	-1.7	-1	-1.3	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	S	53	49	52	47	53	49	53	48	-1.4	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	E	51	46	49	45	51	47	50	45	-1.4	-1.7	-0.9	-1.1	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	S	52	48	51	46	53	48	52	47	-1.5	-1.8	-0.9	-1.2	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	E	50	46	49	44	50	46	50	45	-1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	N	51	47	50	45	51	47	51	46	-1	-1.2	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01A	NCA01A.RES.0073	Residential	Ground	E	50	46	49	44	50	46	50	45	-1	-1.2	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0010	Residential	Ground	N	52	47	51	46	52	47	52	47	-0.8	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0010	Residential	Ground	W	54	49	52	48	54	49	53	49	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0010	Residential	Ground	S	52	48	51	47	53	48	52	47	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0010	Residential	Ground	E	50	45	49	44	50	45	49	45	-0.9	-1.1	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0011	Residential	Ground	W	53	49	52	48	53	49	53	48	-0.8	-1.1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0011	Residential	Ground	S	52	48	51	46	52	48	52	47	-1.4	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0011	Residential	Ground	E	50	45	49	44	50	45	49	45	-0.9	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0011	Residential	Ground	N	52	47	51	46	52	48	52	47	-0.6	-0.9	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	W	53	48	52	47	53	49	52	48	-0.9	-1.1	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	N	52	48	51	47	52	48	52	47	-0.8	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	W	54	49	53	48	54	49	53	49	-1	-1.3	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	S	53	48	51	47	53	48	52	47	-1.2	-1.6	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	W	53	49	52	48	54	49	53	48	-1.1	-1.4	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	S	52	48	51	47	53	48	52	47	-1.3	-1.6	-0.9	-1.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	E	50	46	49	45	51	46	50	46	-0.9	-1.1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0012	Residential	Ground	N	52	48	52	47	53	48	52	48	-0.7	-0.9	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0013	Residential	Ground	W	54	49	53	48	54	50	54	49	-0.7	-1	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0013	Residential	Ground	S	52	48	51	46	52	48	52	47	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0013	Residential	Ground	W	53	48	52	48	53	49	53	48	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0013	Residential	Ground	N	52	48	52	47	52	48	52	48	-0.4	-0.6	0	-0.1	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0013	Residential	Ground	W	54	49	53	48	54	50	54	49	-0.6	-1	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0013	Residential	Ground	S	52	48	51	47	53	48	52	47	-1.3	-1.5	-0.8	-1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0013	Residential	Ground	E	51	46	50	45	51	47	51	46	-0.9	-1.2	-0.6	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0013	Residential	Ground	N	52	48	52	47	52	48	52	48	-0.5	-0.6	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0014	Residential	Ground	W	53	49	52	48	53	49	53	48	-0.7	-1	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0014	Residential	Ground	S	51	47	50	45	51	47	50	46	-1.1	-1.3	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0014	Residential	Ground	E	51	46	50	45	51	47	51	46	-1	-1.1	-0.6	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0014	Residential	Ground	N	53	48	52	47	53	49	53	48	-0.7	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	W	53	48	52	48	53	49	53	49	-0.5	-0.6	0	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	S	51	46	49	45	51	46	50	45	-1.3	-1.6	-0.9	-1.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	W	51	47	50	46	51	47	51	46	-1.2	-1.4	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	S	51	46	49	45	51	46	50	45	-1.3	-1.6	-0.8	-1.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	E	48	43	47	42	48	44	48	43	-1.1	-1.2	-0.8	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	S	44	40	44	39	44	40	44	40	-0.7	-0.9	-0.2	-0.4	56	52	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	E	50	45	49	44	50	46	50	45	-0.8	-1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	N	54	49	54	49	54	50	55	50	0.1	0.1	0.6	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	N	54	50	54	49	54	50	55	50	0.1	-0.1	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	N	54	50	54	50	54	50	55	50	0.1	-0.1	0.4	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	W	53	49	53	49	53	49	54	50	0.3	0.1	0.7	0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	Ground	N	53	48	53	48	53	48	54	49	0.5	0.3	0.9	0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	W	55	51	55	50	55	51	56	51	-0.1	-0.3	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	S	52	48	51	46	52	48	52	47	-1.1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	W	53	49	52	48	53	49	53	48	-0.8	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	S	52	48	51	46	52	48	52	47	-1.1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	E	51	46	50	45	51	46	50	46	-0.8	-1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	S	49	45	48	44	49	45	49	44	-0.6	-0.9	-0.2	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	E	52	47	51	46	52	48	52	47	-0.8	-1	-0.5	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	N	55	51	55	51	56	51	56	51	0	-0.1	0.3	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	N	55	51	55	51	56	51	56	51	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	N	55	51	55	51	56	51	56	51	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	W	55	50	55	50	55	50	55	51	0.2	0	0.6	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0025	Residential	First	N	54	50	55	50	55	50	55	51	0.2	0.1	0.6	0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0037	Residential	Ground	NW	50	46	49	44	50	46	50	45	-1	-1.3	-0.7	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0037	Residential	Ground	SW	49	44	48	43	49	45	48	44	-1	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0037	Residential	Ground	SE	49	45	48	43	49	45	49	44	-1	-1.2	-0.6	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0037	Residential	Ground	NE	49	44	48	43	49	44	48	44	-0.8	-0.9	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	NE	52	47	52	47	52	48	52	48	-0.1	-0.3	0.2	0.2	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0038	Residential	Ground	NW	53	49	53	48	53	49	53	49	-0.4	-0.6	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	NW	52	48	52	47	53	48	53	48	-0.3	-0.4	0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	N	53	48	52	48	53	49	53	49	-0.4	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	NW	53	49	53	48	54	49	54	49	-0.4	-0.6	0	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	W	53	49	53	48	53	49	53	49	-0.3	-0.5	0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	NW	52	47	52	47	52	48	53	48	0.1	-0.1	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	NW	52	48	52	48	53	48	53	48	0	-0.2	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	SW	51	47	51	47	51	47	52	47	-0.1	-0.3	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	SE	49	45	48	44	49	45	49	44	-0.9	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	SE	49	44	48	43	49	44	48	44	-0.9	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	S	50	45	49	44	50	45	49	45	-0.9	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	SE	50	46	49	45	51	46	50	46	-0.8	-1.1	-0.5	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	E	49	45	49	44	50	45	49	45	-0.6	-0.9	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	SE	48	43	47	42	48	43	48	43	-0.6	-0.7	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0038	Residential	Ground	SE	48	44	48	43	49	44	48	44	-0.6	-0.8	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	E	52	48	51	47	53	48	52	48	-0.9	-1	-0.6	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	NE	52	48	52	47	53	48	52	48	-0.7	-0.7	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	E	52	47	51	46	52	47	51	47	-1	-1.1	-0.6	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	E	52	47	51	46	52	48	52	47	-0.8	-1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	N	54	50	54	50	55	50	55	50	-0.2	-0.3	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	W	53	49	53	49	54	49	54	50	0.2	-0.1	0.6	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	N	54	49	54	49	54	50	54	50	0.1	-0.1	0.4	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	W	50	46	50	45	50	46	50	46	-0.4	-0.6	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	S	50	46	50	45	51	46	50	46	-0.8	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	E	51	46	50	45	51	47	51	46	-0.8	-1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	E	49	44	48	43	49	45	49	44	-0.8	-0.9	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0039	Residential	Ground	SE	52	47	51	46	52	47	51	47	-1	-1.2	-0.7	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	W	52	48	52	48	53	48	53	48	-0.1	-0.4	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	S	50	45	49	44	50	46	50	45	-0.9	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	W	50	46	49	45	50	46	50	45	-0.7	-1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	S	49	45	48	44	49	45	49	44	-0.8	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	E	50	46	50	45	51	46	50	46	-0.7	-0.8	-0.4	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	N	53	49	53	48	53	49	53	49	-0.4	-0.5	0	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	W	52	48	52	47	52	48	52	48	-0.2	-0.3	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	N	51	47	51	46	52	47	52	47	-0.4	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	E	51	46	50	45	51	46	51	46	-0.7	-0.9	-0.4	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0040	Residential	Ground	N	53	48	53	48	53	49	53	49	-0.3	-0.4	0.1	0	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0041	Residential	Ground	N	54	49	54	49	54	50	54	50	-0.2	-0.2	0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	W	53	49	53	49	54	49	54	49	-0.1	-0.2	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	W	53	48	53	48	53	49	54	49	0.1	-0.1	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	N	54	49	53	49	54	49	54	50	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	W	54	49	54	49	54	50	54	50	-0.3	-0.4	0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	W	53	48	53	48	53	49	53	49	0	-0.2	0.4	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	S	52	48	52	48	53	48	53	48	0	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	W	53	48	53	48	53	49	53	49	0	-0.2	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	S	51	47	50	46	51	47	51	46	-0.9	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0041	Residential	Ground	E	51	47	50	46	52	47	51	47	-0.8	-1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NW	54	49	53	49	54	50	54	49	-0.5	-0.6	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NE	53	48	53	48	53	49	53	49	-0.2	-0.3	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NW	54	49	53	49	54	50	54	49	-0.4	-0.6	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SW	51	47	51	47	52	47	52	48	0.1	-0.1	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NW	52	48	52	47	52	48	53	48	0.1	-0.1	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SW	51	47	51	47	52	47	52	47	0	-0.1	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SE	49	44	48	43	49	44	49	44	-0.5	-0.7	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SW	51	47	51	47	52	47	52	47	0	-0.1	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SE	49	44	48	43	49	44	49	44	-0.5	-0.7	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SW	48	44	48	43	49	44	49	44	-0.4	-0.6	0	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SE	50	46	50	45	51	46	50	46	-0.7	-1	-0.4	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NE	48	44	48	44	48	44	49	44	0.3	0.1	0.7	0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SE	48	44	48	43	48	44	48	44	-0.4	-0.6	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SW	48	44	48	43	49	44	49	44	-0.4	-0.6	0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	SE	51	47	50	46	52	47	51	47	-0.7	-0.9	-0.5	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NE	53	48	52	48	53	48	53	48	-0.5	-0.6	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NE	53	48	52	48	53	49	53	48	-0.4	-0.5	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NE	53	48	53	48	53	49	54	49	-0.1	-0.2	0.2	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NW	53	49	53	48	54	49	54	49	-0.1	-0.3	0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0042	Residential	Ground	NE	53	48	53	48	53	49	53	49	-0.1	-0.2	0.2	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0043	Residential	Ground	W	52	47	52	47	52	48	52	48	0	-0.2	0.4	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0043	Residential	Ground	S	49	45	49	44	50	45	50	45	-0.5	-0.8	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0043	Residential	Ground	E	50	46	49	45	51	46	50	46	-0.9	-1	-0.6	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0043	Residential	Ground	S	48	43	48	43	48	44	48	44	-0.2	-0.3	0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0043	Residential	Ground	E	52	48	52	47	53	48	52	48	-0.7	-0.8	-0.4	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0043	Residential	Ground	N	54	49	53	49	54	50	54	50	-0.4	-0.5	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	E	53	48	52	48	53	48	53	49	-0.4	-0.4	-0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	S	53	49	53	49	54	49	54	49	0	0	0.3	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	54	49	54	49	54	50	54	50	-0.2	-0.3	0.1	0.1	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	54	50	54	49	55	50	55	50	-0.2	-0.3	0	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	E	54	50	54	49	55	50	55	50	-0.3	-0.4	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NE	53	48	52	48	53	49	53	49	-0.4	-0.6	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	E	49	45	49	45	50	45	50	45	-0.2	-0.4	0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	E	49	45	49	44	49	45	50	45	-0.1	-0.3	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NE	50	45	50	45	50	46	51	46	0	-0.1	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	N	50	46	50	45	50	46	50	46	-0.1	-0.2	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	N	49	45	49	45	49	45	50	45	0.2	0	0.6	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NE	49	44	49	44	49	45	49	45	-0.1	-0.2	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NW	50	45	50	45	50	45	50	46	0.1	-0.1	0.5	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NE	50	45	50	45	50	45	50	46	0.1	0	0.5	0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	N	48	44	48	44	49	44	49	45	0	-0.1	0.5	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	N	48	43	47	43	48	43	48	44	-0.3	-0.5	0.2	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NW	48	43	47	43	48	44	48	43	-0.4	-0.6	0	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NW	49	44	49	44	49	45	49	45	0.1	-0.1	0.1	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SW	44	39	47	42	44	40	47	43	2.7	2.6	2.8	2.9	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SW	51	46	50	46	51	47	51	47	-0.2	-0.4	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	W	51	46	51	46	51	47	51	47	-0.2	-0.4	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	W	50	45	50	45	51	46	51	46	0	-0.1	0.1	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SW	49	45	49	45	50	45	50	46	0.3	0.1	0.3	0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SW	48	44	49	44	49	44	49	45	0.2	0.2	0.3	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NW	41	37	41	36	41	37	42	37	-0.2	-0.3	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NW	47	43	48	43	48	43	48	44	0.6	0.5	0.6	0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	W	51	46	51	46	51	47	51	47	-0.1	-0.2	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SW	52	48	52	47	53	48	53	48	-0.5	-0.6	-0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SW	53	48	52	48	53	48	53	48	-0.4	-0.5	-0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	53	48	52	48	53	48	53	49	-0.3	-0.4	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	52	48	52	47	53	48	53	48	-0.3	-0.4	-0.1	0.1	56	52	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	53	48	52	48	53	48	53	49	-0.3	-0.4	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	53	49	53	48	54	49	54	49	-0.3	-0.3	0	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	E	53	49	53	48	54	49	54	49	-0.4	-0.4	-0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	NE	53	48	53	48	53	49	53	49	-0.3	-0.4	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	53	48	52	47	53	48	53	48	-0.4	-0.5	-0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0044	Residential	Ground	SE	53	48	52	48	53	48	53	49	-0.4	-0.4	-0.1	0.1	53	49	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	NW	53	49	53	48	54	49	53	49	-0.6	-0.6	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	NW	51	47	51	47	52	47	52	47	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	NW	53	49	52	48	53	49	53	49	-0.6	-0.6	-0.1	-0.1	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0045	Residential	Ground	SW	51	46	50	46	51	47	51	46	-0.2	-0.4	0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	SE	48	43	47	42	48	43	48	43	-0.6	-0.8	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	SW	48	43	47	42	48	43	48	43	-0.6	-0.7	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	SE	48	43	47	43	48	44	48	43	-0.6	-0.8	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	S	47	43	47	42	48	43	48	43	-0.5	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	SW	47	43	47	42	48	43	48	43	-0.6	-0.8	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	SW	48	43	47	43	48	44	48	43	-0.6	-0.8	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	SE	50	46	50	46	51	46	51	46	-0.1	-0.3	0.1	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	NE	49	45	50	45	50	45	50	46	0.7	0.5	0.9	0.9	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	SE	48	44	49	45	49	44	50	45	1.1	0.9	1.3	1.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0045	Residential	Ground	NE	52	47	52	47	52	47	52	48	-0.2	-0.3	0.3	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0046	Residential	Ground	S	50	46	49	45	50	46	50	45	-0.8	-1.1	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0046	Residential	Ground	E	51	47	50	46	52	47	51	47	-1	-1.1	-0.7	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0046	Residential	Ground	E	48	43	47	43	48	44	48	43	-0.6	-0.7	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0046	Residential	Ground	E	52	47	51	46	52	48	52	47	-1	-1.2	-0.7	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0046	Residential	Ground	N	54	49	53	49	54	50	54	50	-0.5	-0.7	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0046	Residential	Ground	W	53	48	52	48	53	49	53	49	-0.3	-0.5	0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	SE	50	46	50	45	50	46	50	46	-0.5	-0.7	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	NE	52	47	51	47	52	48	52	47	-0.5	-0.6	-0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	NW	53	49	53	48	53	49	53	49	-0.3	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	NE	53	48	52	48	53	48	53	49	-0.1	-0.3	0.2	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	NW	53	48	53	48	53	49	53	49	-0.3	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	SE	48	44	47	43	48	44	48	44	-0.5	-0.7	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	SW	50	46	50	45	50	46	50	46	-0.2	-0.4	0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	SE	51	46	50	46	51	46	51	46	-0.3	-0.5	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	NE	51	46	51	46	51	47	52	47	0.1	0	0.4	0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	SE	49	45	50	45	50	45	50	46	0.4	0.3	0.5	0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	SE	49	44	48	43	49	44	49	44	-0.4	-0.6	-0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047	Residential	Ground	SE	50	45	49	44	50	46	50	45	-0.6	-0.8	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047A	Residential	Ground	NW	52	48	52	47	52	48	53	48	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047A	Residential	Ground	SW	51	46	51	46	51	46	51	47	0.1	0	0.6	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0047A	Residential	Ground	SE	48	44	48	43	48	44	48	44	-0.4	-0.6	0	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	N	53	49	53	48	53	49	53	49	-0.6	-0.7	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	W	51	47	51	46	51	47	52	47	-0.1	-0.2	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	N	53	48	52	48	53	49	53	49	-0.5	-0.6	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	W	52	47	51	47	52	47	52	47	-0.2	-0.4	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	S	48	44	47	42	48	44	48	43	-1.2	-1.5	-0.7	-0.9	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0056	Residential	Ground	W	49	45	48	44	49	45	49	44	-0.9	-1.3	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	S	48	44	47	42	48	44	48	43	-1.2	-1.5	-0.7	-1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	E	43	38	43	38	43	39	43	39	-0.2	-0.4	0.2	0.1	55	51	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	S	46	42	45	41	47	42	46	41	-1.2	-1.5	-0.7	-1	59	54	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	E	50	46	50	45	51	46	50	46	-0.7	-0.8	-0.3	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	N	51	47	50	46	52	47	51	47	-0.7	-0.8	-0.4	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0056	Residential	Ground	E	51	46	50	45	51	46	51	46	-0.8	-0.8	-0.4	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	S	46	42	46	41	46	42	46	42	-0.3	-0.5	0.1	0	58	54	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	S	48	44	49	44	49	44	49	45	0.4	0.1	0.7	0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	E	51	47	51	46	51	47	51	47	-0.3	-0.4	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	N	53	48	52	48	53	49	53	49	-0.5	-0.7	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	W	51	47	51	46	51	47	51	47	-0.2	-0.4	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	S	49	44	48	43	49	44	48	44	-0.8	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	W	49	44	48	43	49	44	48	44	-0.9	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	S	50	45	49	44	50	45	50	45	-0.5	-0.8	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	S	51	46	50	45	51	47	51	46	-0.6	-0.8	-0.3	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0057	Residential	Ground	SE	50	46	50	45	50	46	50	46	-0.4	-0.7	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	N	53	49	53	48	53	49	53	49	-0.3	-0.5	0	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	W	52	47	52	47	52	47	52	48	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	N	52	47	52	47	52	48	52	48	-0.2	-0.3	0.2	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	NW	53	48	52	48	53	48	53	48	-0.2	-0.4	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	N	52	47	52	47	52	48	52	48	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	N	52	48	52	48	53	48	53	48	-0.2	-0.4	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	N	52	48	52	47	52	48	53	48	-0.2	-0.4	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	N	53	48	52	48	53	49	53	49	-0.5	-0.6	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	W	51	46	51	46	51	47	52	47	0.1	0	0.5	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	S	48	44	48	43	49	44	49	44	-0.4	-0.6	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	S	48	44	48	43	48	44	48	44	-0.5	-0.7	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	S	49	44	48	44	49	44	49	44	-0.5	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	E	47	43	47	42	47	43	47	43	-0.2	-0.4	0.2	0	59	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	S	48	44	48	43	49	44	49	44	-0.6	-0.8	-0.1	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	W	49	44	48	44	49	45	49	44	-0.5	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	S	49	45	49	44	49	45	49	45	-0.3	-0.6	0	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	E	51	47	51	46	51	47	51	47	-0.5	-0.7	-0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	E	51	47	51	46	51	47	51	47	-0.5	-0.7	-0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	E	51	47	51	46	52	47	51	47	-0.4	-0.5	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	E	52	47	52	47	52	48	53	48	0.1	0	0.4	0.4	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0058	Residential	Ground	N	52	48	52	48	53	48	53	48	0	-0.1	0.3	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0058	Residential	Ground	E	51	47	51	46	52	47	52	47	-0.4	-0.6	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	NW	54	50	53	49	54	50	54	50	-0.8	-0.8	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SW	51	47	51	47	52	47	52	48	0	-0.2	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	NW	53	48	52	48	53	48	53	48	-0.3	-0.5	0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SW	52	47	51	47	52	47	52	48	-0.1	-0.2	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SW	51	47	51	46	51	47	52	47	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SW	51	47	51	46	51	47	52	47	0	-0.2	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SE	49	44	48	43	49	44	49	44	-0.6	-0.8	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SE	48	44	47	43	48	44	48	43	-0.6	-0.8	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SW	48	44	48	43	49	44	48	44	-0.5	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	SE	51	46	50	46	51	47	51	47	-0.3	-0.5	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	NE	53	49	53	48	54	49	53	49	-0.5	-0.5	-0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	NW	53	49	53	48	54	49	53	49	-0.5	-0.5	-0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0059	Residential	Ground	NE	53	49	53	48	54	49	53	49	-0.5	-0.5	-0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	W	51	47	51	46	51	47	52	47	0	-0.2	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	W	51	47	51	46	51	47	52	47	0	-0.2	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	S	50	45	50	45	50	46	51	46	0	-0.1	0.5	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	W	50	46	50	46	51	46	51	47	0	-0.1	0.4	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	S	49	45	49	44	49	45	49	45	-0.5	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	E	49	44	49	44	49	45	49	45	-0.3	-0.5	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	E	48	43	48	43	48	44	48	44	-0.3	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	E	48	43	48	43	48	44	48	44	-0.2	-0.4	0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	SE	47	43	47	42	47	43	47	43	-0.3	-0.5	0.1	-0.1	59	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	SE	47	43	47	42	48	43	48	43	-0.4	-0.5	0	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	S	48	44	48	43	48	44	48	44	-0.3	-0.6	0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	S	48	44	48	43	49	44	48	44	-0.5	-0.8	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	S	48	44	48	43	49	44	49	44	-0.5	-0.7	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	SW	49	45	49	45	50	45	50	45	0	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	SE	51	47	51	46	52	47	52	47	-0.5	-0.6	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	NE	53	48	53	48	53	49	53	49	-0.4	-0.4	-0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	N	53	49	53	48	54	49	54	49	-0.2	-0.2	0.1	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	NE	53	48	52	48	53	49	53	49	-0.4	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	N	53	49	53	49	54	49	54	49	-0.2	-0.3	0.1	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	NW	54	49	53	49	54	49	54	50	-0.3	-0.4	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	W	53	49	53	48	53	49	53	49	-0.5	-0.6	-0.1	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	NW	53	48	52	48	53	49	53	49	-0.3	-0.4	0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	W	53	48	52	48	53	48	53	48	-0.4	-0.5	0	0	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night			≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night			
NCA01B	NCA01B.RES.0060	Residential	Ground	NW	51	47	51	47	52	47	52	47	-0.1	-0.2	0.3	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	NW	52	48	52	47	52	48	53	48	-0.3	-0.4	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0060	Residential	Ground	W	51	47	51	47	52	47	52	47	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SE	52	47	51	47	52	47	52	47	-0.3	-0.4	-0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SE	53	48	52	48	53	49	53	49	-0.5	-0.6	-0.3	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	E	53	49	53	48	54	49	54	49	-0.4	-0.4	-0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NE	53	49	53	48	54	49	53	49	-0.5	-0.5	-0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	N	53	49	53	48	54	49	54	49	-0.3	-0.3	0	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NW	54	49	53	49	54	50	54	50	-0.4	-0.4	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NE	54	49	54	49	54	50	54	50	-0.4	-0.5	-0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	E	53	48	52	48	53	49	53	49	-0.4	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NE	51	47	51	46	51	47	52	47	-0.2	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	N	51	46	51	46	51	47	51	47	-0.1	-0.2	0.3	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NE	48	44	49	44	49	44	50	45	0.5	0.3	0.8	0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	N	48	43	48	43	48	44	48	44	0	-0.2	0.3	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NW	48	44	48	43	48	44	49	44	-0.1	-0.2	0.4	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	W	52	47	52	47	52	48	52	48	-0.4	-0.5	0	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SW	50	46	50	45	50	46	51	46	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	W	48	44	47	43	48	44	48	43	-0.6	-0.8	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SW	50	45	49	45	50	45	50	45	-0.2	-0.3	0.3	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NW	50	46	50	45	50	46	51	46	-0.2	-0.3	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NE	50	46	50	45	50	46	51	46	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NW	50	45	50	45	50	46	50	46	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SW	48	43	47	42	48	43	48	43	-0.5	-0.8	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SE	49	44	48	44	49	45	49	44	-0.4	-0.7	-0.1	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SW	51	46	50	46	51	46	51	47	-0.2	-0.3	-0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	W	53	48	52	47	53	48	53	48	-0.5	-0.6	-0.3	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SW	53	48	52	47	53	48	53	48	-0.6	-0.7	-0.3	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	S	52	48	52	47	53	48	52	48	-0.5	-0.6	-0.3	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SE	52	47	51	47	52	48	52	48	-0.5	-0.6	-0.3	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SW	53	48	52	48	53	49	53	49	-0.6	-0.6	-0.3	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	SE	53	49	53	48	54	49	53	49	-0.6	-0.7	-0.3	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NE	53	49	53	48	54	49	53	49	-0.5	-0.7	-0.3	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	E	53	48	52	48	53	49	53	48	-0.5	-0.6	-0.3	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0061	Residential	Ground	NE	53	48	52	47	53	48	53	48	-0.6	-0.6	-0.4	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0104	Residential	Ground	SW	50	46	49	45	51	46	50	45	-1	-1.2	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0104	Residential	Ground	SE	50	46	49	44	50	46	50	45	-1.1	-1.4	-0.7	-0.8	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA01B	NCA01B.RES.0104	Residential	Ground	NE	50	46	49	45	50	46	50	46	-0.6	-0.8	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0104	Residential	Ground	NW	51	47	50	46	52	47	51	47	-0.9	-1.2	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0105	Residential	Ground	NE	50	46	49	45	50	46	50	46	-0.7	-0.9	-0.4	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0105	Residential	Ground	NW	51	47	50	46	51	47	51	46	-0.8	-1.1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0105	Residential	Ground	SW	50	46	49	45	50	46	50	45	-1	-1.3	-0.5	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0105	Residential	Ground	SE	50	45	49	44	50	46	50	45	-1	-1.2	-0.7	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	NE	51	46	51	46	51	47	52	47	0	-0.2	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	NE	51	46	51	46	51	47	52	47	-0.1	-0.2	0.3	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	NW	52	48	52	48	53	48	53	48	-0.3	-0.4	0.1	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	SW	52	48	51	47	52	48	52	48	-0.4	-0.7	0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	SE	50	46	49	44	50	46	50	45	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	SW	50	46	49	45	51	46	50	45	-1.1	-1.3	-0.6	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	SE	50	46	49	45	51	46	50	45	-1.1	-1.4	-0.6	-0.9	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	SW	51	47	50	46	52	47	51	47	-0.9	-1.2	-0.4	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	SE	51	47	50	45	51	47	51	46	-1.1	-1.4	-0.7	-0.8	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0106	Residential	Ground	NE	51	47	51	46	51	47	52	47	-0.1	-0.3	0.2	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	NW	53	49	53	48	53	49	53	49	-0.3	-0.4	0.1	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SW	51	46	50	45	51	46	50	46	-0.9	-1	-0.4	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	48	44	47	43	48	44	48	43	-0.7	-0.9	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SW	49	45	49	44	50	45	50	45	-0.6	-0.8	-0.2	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	S	50	45	49	44	50	46	50	45	-0.8	-1.1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	S	50	46	49	45	51	46	50	46	-0.9	-1.1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	50	46	49	45	51	46	50	46	-0.8	-0.9	-0.4	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	E	50	45	49	45	50	46	50	45	-0.6	-0.8	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	NE	49	44	48	44	49	45	49	45	-0.5	-0.6	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	49	44	48	43	49	44	49	44	-0.6	-0.8	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	49	44	48	44	49	45	49	44	-0.7	-0.8	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	50	46	49	45	51	46	50	46	-0.8	-0.9	-0.5	-0.4	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	E	50	46	50	45	51	46	50	46	-0.6	-0.8	-0.3	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	NE	50	46	50	45	50	46	51	46	0	-0.3	0.2	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	NE	48	44	48	43	48	44	49	44	-0.1	-0.3	0.3	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	47	42	46	42	47	43	47	43	-0.4	-0.6	0.1	-0.1	59	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SW	48	44	48	43	48	44	48	44	-0.2	-0.5	0.2	0	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	50	45	49	44	50	45	50	45	-0.7	-0.9	-0.3	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	NE	51	47	51	46	51	47	51	47	-0.5	-0.6	-0.2	-0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	SE	50	46	50	45	51	46	50	46	-0.6	-0.8	-0.2	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	NE	53	48	53	48	53	49	53	49	-0.1	-0.3	0.3	0.2	60	55	NO	NO	NO	NO	NO

NCA	Receiver ID	Receiver Type	Facade		2028 Opening Year				2038 Design Year				Trigger 1 Increase ('With project' - 'Do minimum')				NCG noise criteria		Trigger 2 Do noise levels exceed the cumlative limit with project roads adding ≥ 2dB to the total noise levels?		Trigger 3 Is the contribution from the road project Acute?		Consider additional noise mitigation?
					'Do minimum'		'With project'		'Do minimum'		'With project'		Opening Year		Design Year						Day	Night	
			Floor	Orientation	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night					
					dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	dB(A)	Day	Night	≥ 65dB $L_{Aeq,15h}$	≥ 60dB $L_{Aeq,9h}$	
NCA01B	NCA01B.RES.0107	Residential	Ground	NW	53	48	53	48	53	49	53	49	-0.2	-0.3	0.2	0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0107	Residential	Ground	NE	52	48	52	48	53	48	53	49	0	-0.2	0.3	0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NE	51	47	51	46	52	47	51	47	-0.5	-0.6	-0.2	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NW	51	47	51	46	52	47	52	47	-0.5	-0.7	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NE	51	46	50	46	51	46	51	47	-0.2	-0.4	0.2	0.1	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NW	52	48	52	47	52	48	52	48	-0.5	-0.7	-0.1	-0.2	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	SW	51	46	50	46	51	47	51	46	-0.5	-0.7	0	-0.3	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NW	51	47	51	46	52	47	51	47	-0.8	-1	-0.3	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NW	51	47	50	46	51	47	51	46	-0.8	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NW	51	47	51	46	52	47	51	47	-0.9	-1	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	SW	50	46	49	45	50	46	50	45	-1	-1.3	-0.5	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	SE	49	45	48	44	50	45	49	44	-0.9	-1.2	-0.7	-0.7	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	SW	48	44	47	43	48	44	48	44	-0.8	-1.1	-0.3	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	SE	50	46	49	44	50	46	50	45	-0.9	-1.1	-0.6	-0.6	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	NE	50	45	49	44	50	46	50	45	-0.7	-0.9	-0.4	-0.5	60	55	NO	NO	NO	NO	NO
NCA01B	NCA01B.RES.0108	Residential	Ground	SE	50	45	49	44	50	45	49	45	-0.8	-1	-0.5	-0.5	60	55	NO	NO	NO	NO	NO

C.2 Noise Mitigation Guideline (NMG) barrier analysis for NB.01

RENZO TONIN & ASSOCIATES
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Project Title - M12RT Barrier Assessment

Project:	M12RT
Barrier ID:	NB.01
Chainage/location:	Black Hill - Lenaghans Drive
NCA:	NCA01A, NCA01B
Road:	M1 Motorway

Barrier length (m):	490
Number of benefitting receivers	16

Barrier analysis details

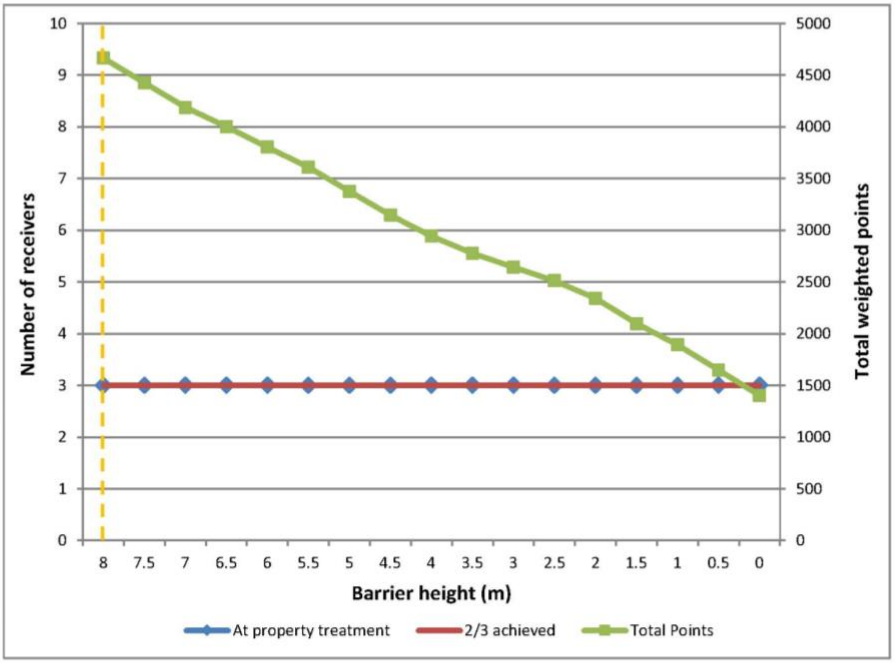
Maximum barrier	- - - -
Height (m)	8.0
Receivers requiring treatment	3
Insertion loss required, dB	10
Insertion loss achieved, dB	7

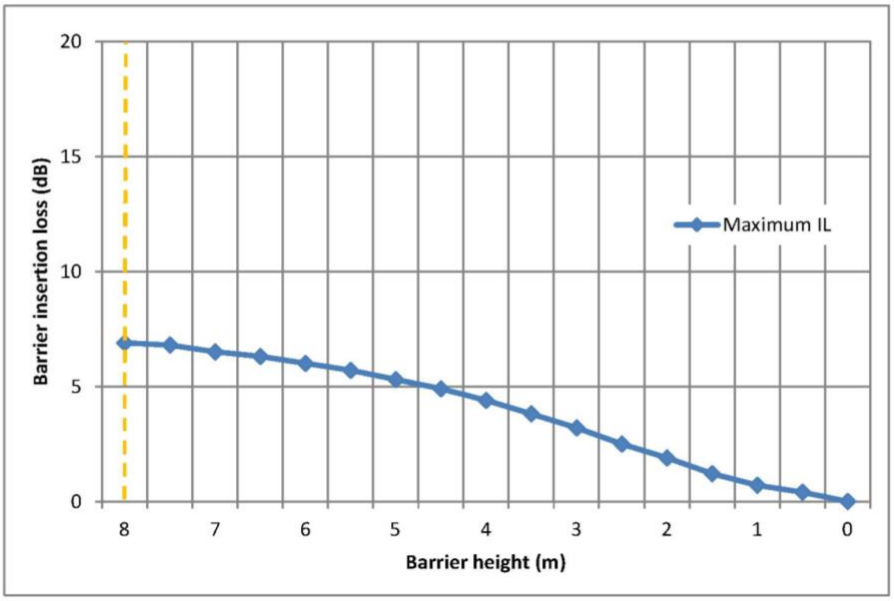
Initial design barrier	- - - -
Height (m)	0
Receivers requiring treatment	3

Design barrier	- - - -
Height (m)	0.0
Receivers requiring treatment	3
Insertion loss required, dB	N/A
Insertion loss achieved, dB	0

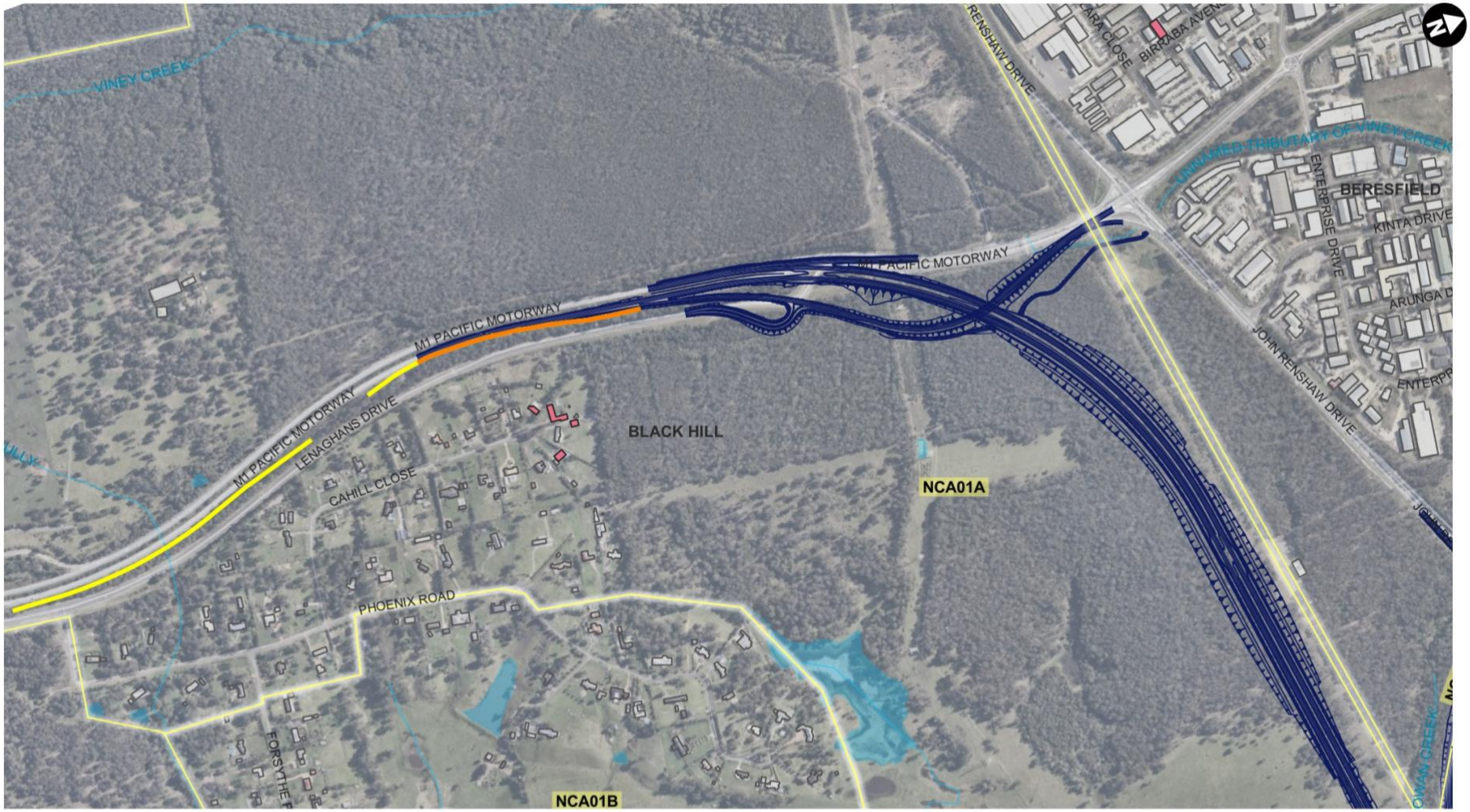
Alternative barrier	- - - -
Height (m)	relocate exisitng

Alternative barrier height based on non-acoustic feasible and reasonable considerations following the outcomes of the review of urban design, visual impact and engineering constraints





C.3 Receiver buildings identified for at property treatment in NCA01A



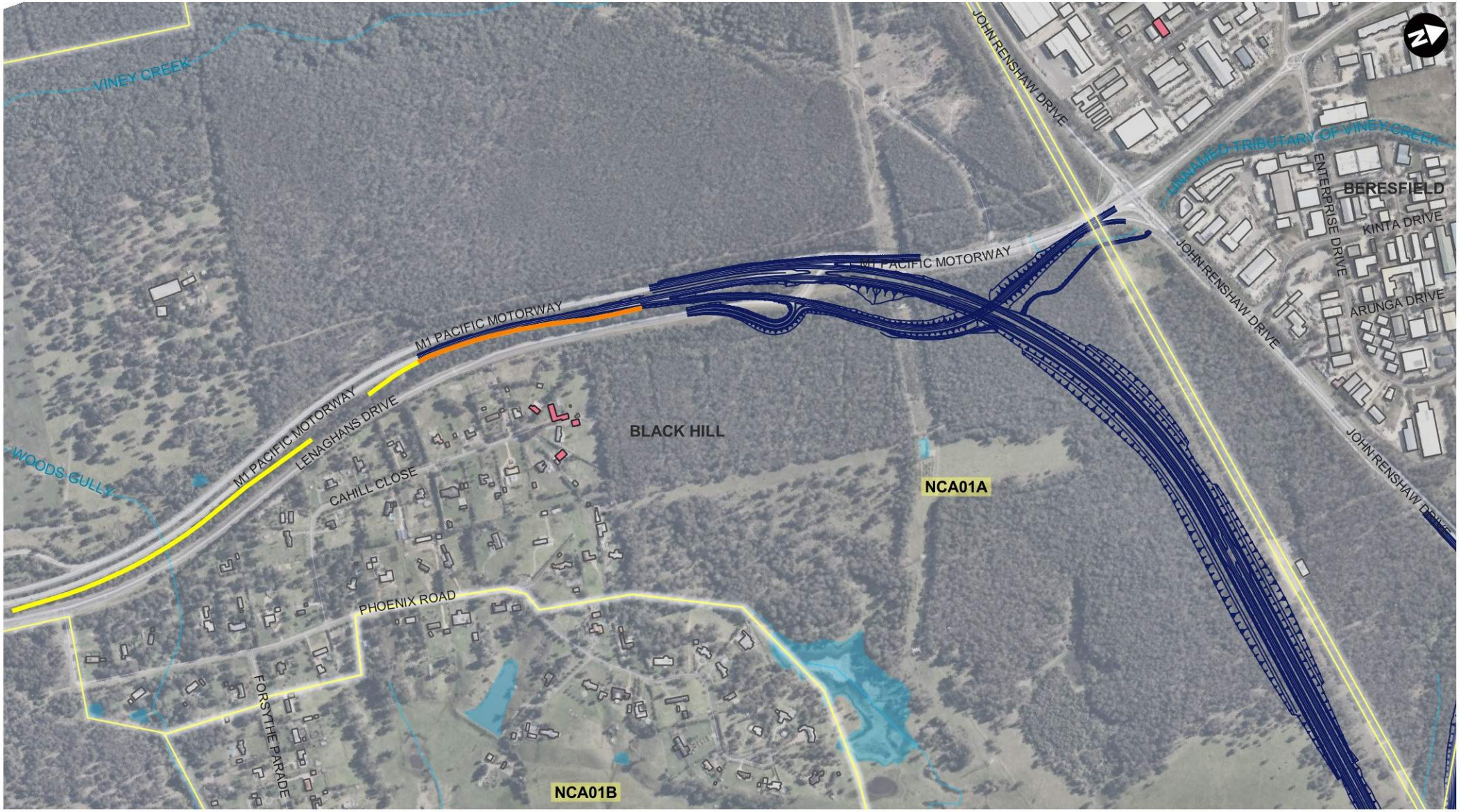
Potentially eligible for treatment

- Receiver building
- NCA
- Design alignment
- Building
- Existing barrier
- Existing barrier to be relocated

150 0 150 300 m

Figure TL081-01.6.2.1.1 Q48 (r7) Receiver buildings potentially eligible for consideration of treatment

C.4 Receiver buildings identified for at property treatment for Entire Project (EIS compared to Revised Project)



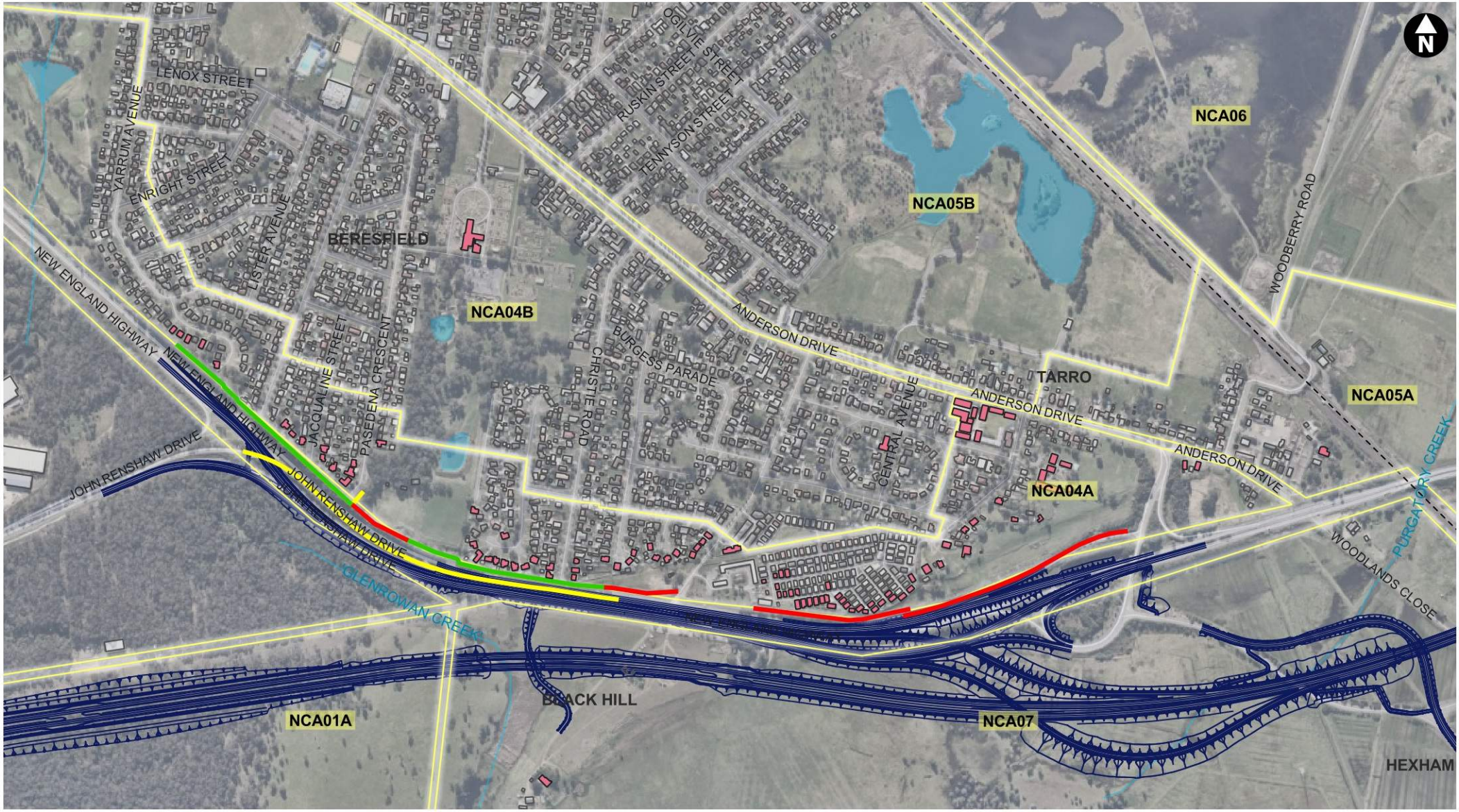
Potentially eligible for treatment

- Receiver building (as identified in EIS)
- Receiver building (additional)
- NCA
- Design alignment
- Building
- Existing barrier
- Existing barrier to be relocated

150 0 150 300 m

Figure TL081-01.6.2.1.1 Q48 (r10) Receiver buildings potentially eligible for consideration of treatment
Mitigated with low noise pavement and alternative barrier heights

Date: 10/01/2022 Project path: R:\AssocSydProjects\TL051-TL100\TL081 mch M1 Motorway to Raymond Terrace\6 Figures & CAD Out\1 . QGIS\TL081-01.6.1 M1 2RT QGIS (r0).qgz



Potentially eligible for treatment

- Receiver building (as identified in EIS)
- Receiver building (additional)
- NCA
- Design alignment
- Building
- Existing barrier
- Existing barrier to be retained / repaired as needed
- New barrier

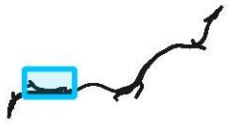


Figure TL081-01.6.2.1.1 Q48 (r10) Receiver buildings potentially eligible for consideration of treatment
Mitigated with low noise pavement and alternative barrier heights

Date: 10/01/2022 Project path: R:\AssocSydProjects\TL051-TL100\TL081 mch M1 Motorway to Raymond Terrace\6 Figures & CAD Out\1 . QGIS\TL081-01.6.1 M12RT QGIS (r0).qgz

Figure TL081-01.6.2.1.1 Q48 (r10) Receiver buildings potentially eligible for consideration of treatment
Mitigated with low noise pavement and alternative barrier heights

Date: 10/01/2022 Project path: R:\AssocSydProjects\TL051-TL100\TL081 mch M1 Motorway to Raymond Terrace\6 Figures & CAD Out\1 . QGIS\TL081-01.6.1 M1 2RT QGIS (r0).qgz

Potentially eligible for treatment

- Receiver building (as identified in EIS)
- Receiver building (additional)
- NCA
- Design alignment
- Building
- Existing barrier

150 0 150 300 m

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Figure TL081-01.6.2.1.1 Q48 (r10) Receiver buildings potentially eligible for consideration of treatment
Mitigated with low noise pavement and alternative barrier heights

Date: 10/01/2022 Project path: R:\AssocSydProjects\TL051-TL100\TL081 mch M1 Motorway to Raymond Terrace\6 Figures & CAD Out\1 . GIS\TL081-01.6.1 M1 2RT GIS (r0).qgz

Potentially eligible for treatment

- Receiver building (as identified in EIS)
- Receiver building (additional)
- NCA
- Design alignment
- Building
- Existing barrier

150 0 150 300 m

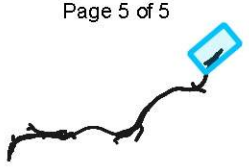

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Figure TL081-01.6.2.1.1 Q48 (r10) Receiver buildings potentially eligible for consideration of treatment Mitigated with low noise pavement and alternative barrier heights

Date: 10/01/2022 Project path: R:\AssocSydProjects\TL051-TL100\TL081 mch M1 Motorway to Raymond Terrace\6 Figures & CAD Out\1 . QGIS\TL081-01.6.1 M12RT QGIS (r0).qgz

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