Aura South Early Release Area

Acoustic Report

Development Application



4 November 2026 **Ref: 301051305**

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Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer
C01	25/08/2026	DA Draft Acoustic Report	PL	MT
C02	28/08/2026	DA Acoustic Report	PL	MT
C03	29/10/2026	DA Acoustic Report	MT	ML
C04	04/11/2026	DA Acoustic Report	MT	ML

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Executive Summary

Aura South Early Release Area is proposed on land adjacent to Bells Creek Arterial Road, a State-controlled road within a designated transport noise corridor. Stantec Australia Pty Ltd was engaged by Stockland Development Pty Ltd to undertake a traffic noise impact assessment to support the Development Application (DA).

Road traffic noise modelling was undertaken for future traffic conditions on Bells Creek Arterial Road and the proposed internal road network to assess compliance with applicable Queensland State and Sunshine Coast Council acoustic requirements. The assessment considered both outdoor living areas and future residential building facades.

The assessment identified that traffic noise from Bells Creek Arterial Road would exceed applicable outdoor noise criteria for lots located along the northern boundary of the development if mitigation measures were not provided.

To achieve compliance with State Development Assessment Provisions (SDAP) requirements, acoustic barriers ranging from approximately 2.0 m to 2.8 m in height are recommended along sections of the Bells Creek Arterial Road frontage. The modelling predicts that implementation of these barriers will achieve the required outdoor noise criteria for affected residential lots.

Following implementation of the recommended barriers, a number of lots remain subject to façade noise levels that trigger building envelope requirements under Queensland Development Code MP4.4 and/or AS3671. Future dwellings on these lots will require construction measures such as upgraded glazing, acoustic seals and enhanced building envelope construction to achieve the relevant internal noise criteria. Most affected lots require Category 1 or Category 2 treatments, with a limited number of lots adjacent to internal roads requiring higher-category treatments.

Subject to implementation of the recommended acoustic barriers and adoption of the nominated building construction requirements for affected lots, the proposed development is capable of achieving the applicable State and local government road traffic noise objectives and is considered acoustically suitable for residential development.

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1. Introduction

Stantec Australia Pty Ltd (Stantec) have been engaged by Stockland Development Pty Ltd to undertake a noise impact assessment for the development application stage (DA) of the proposed Early Release Area (ERA) of Aura South located on Lot 1 on SP332399 and Lot 2 on SP3577480. The Aura South development is within the Caloundra South Priority Development Area (CS PDA).

This acoustic assessment report:

- Discusses the acoustic condition of the existing site as well as the acoustic quality standards for the Project.
- Establishes criteria pertinent to external noise intrusion from road traffic noise; and
- Provides in-principal design recommendations and discussion for the abovementioned parameters based on the findings and applicable design guidelines.

A glossary of acoustic terms used in this report is included in **Appendix A**.

The recommendations made in this report are specific to the project design at the date of issue of this report. The project design may be subject to change during the following stages. Where this occurs, the assumptions made to inform the recommendations in the report may no longer be valid; therefore, further advice should be sought to ensure that the acoustic outcomes presented in this report are achieved.

The performance of products referred to in this report are made to meet the acoustic requirements only. It does not consider other aspects, including but not limited to thermal, wind, impact, structural, mechanical, national construction code, security and fire requirements. Relevant discipline reports, drawings and specifications should be referred to for conformance.

This report relates to this specific project and must not be applied to any other project without prior consultation with Stantec. Designs and conditions can vary between projects causing significant variations in acoustic performance and relevant subsequent advice to one project may not apply to another.

This report shall not be relied upon as providing any warranties or guarantees of construction quality regarding acoustics.

2. Referenced Documentation

2.1 Regulations, Policies, Standards and Guidelines

The following documents detailed in **Table 1** are relevant to the project and are referred to throughout this report.

Table 1: Applicable Regulations, Policies, Standards and Guidelines referenced in this report

Title	Abbreviation
STATE LEGISLATION AND LOCAL COUNCIL POLICIES	
State Development Assessment Provisions Version 3.6 (effective 12th December 2025 from the Department of State Development, Infrastructure and Planning)	SDAP
Queensland Development Code (QDC) Mandatory Part 4.4 (MP4.4) – Building in a transport noise corridor	QDC MP4.4
Sunshine Coast Planning Scheme 2014	SCPS
Halls Creek PDA Development Scheme	CS PDA
AUSTRALIAN AND INTERNATIONAL STANDARDS	
AS 1055:2018 *Acoustics – Description and measurement of environmental noise*	AS 1055
Australian / New Zealand Standard AS/NZS 2107:2016 – *Acoustics – Recommended design sound levels and reverberation times for building interiors*	AS 2107
Australian / New Zealand Standard AS/NZS 3671:1989 – *Acoustics – Road traffic noise intrusion – Building siting and construction*	AS3671
TECHNICAL GUIDELINES AND OTHER	
Department of Transport and Main Roads (TMR) – Transport Noise Management Code of Practice 2013 Volume 1 – Road Traffic Noise	CoP 2013
UK Department of Transport Welsh Office *Calculation of Road Traffic Noise* 1988	CoRTN

2.2 Study Inputs

Acoustic assessment and the preparation of this report have been conducted based on the following received documentation detail in **Table 2**.

Table 2: Received documentation

Date Received	Detail	Revision / Date Prepared	Prepared By	Format
14/10/2026	Aura South Concept Lot Layout • *240553-91C Early Release Area ROL - Subdivision Plan (with Lot Numbers)*	14/10/2026	Place Design Group	pdf
22/10/2026	*Traffic volumes* • *Noise Modelling Traffic Volumes*	05/08/2026	Jalahawi	doc
03/03/2026	Digital terrain model: • *KN Supertin – Interim RAB Option – 2026-08-17 (MGA2020).Zip*	13/08/2026	KN Group (RPS conversion to GDA 2020)	dwg

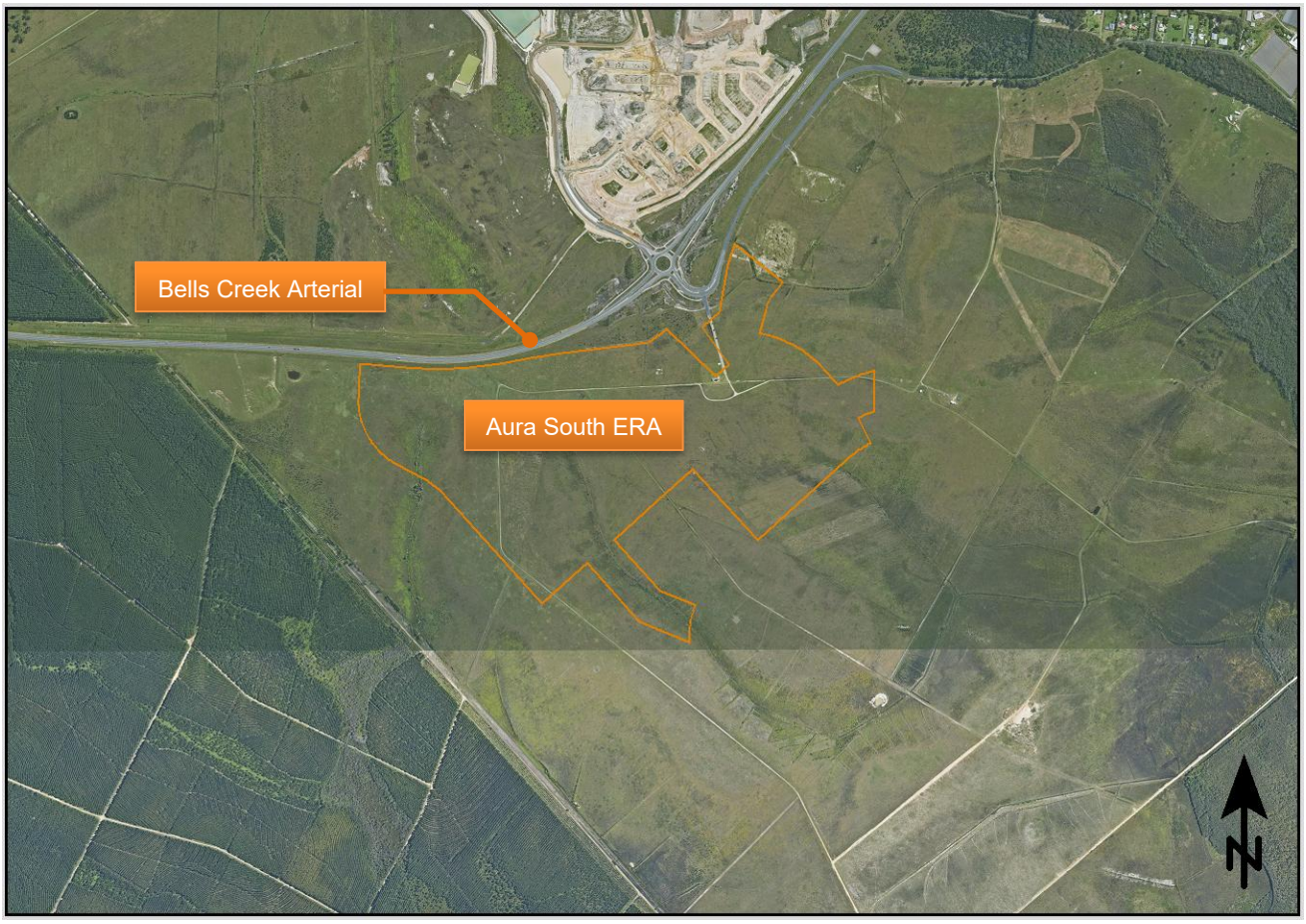
3. Project Details

3.1 Site Description

3.1.1 Project Location

The project site is located on Lot 1 on SP332399 and Lot 2 on SP3577480 and is within the Sunshine Coast Council local government area. The project site and surrounding areas are detailed in **Figure 1**.

Figure 1: Project site and surrounding land uses



Source: Google Satellite (image accessed 28/10/2024) | Site Overlay: Aura South Structure Plan.pdf (dated 30/01/25) | Annotations by Stantec

3.1.2 Surrounding Land Uses

The following surrounding land uses were identified:

- Bells Creek Arterial Road bounds the north of the site;
- Future development is proposed to the south and east;
- A tree plantation is located to the west and separates the site from the Bruce Highway (>2.3km distance from the nearest proposed lot to the highway).

3.2 Proposed Development

This report has been prepared on behalf of Stockland Development Pty Limited (the Applicant) in support of a Priority Development Area (PDA) development application over land located at Bells Creek Road, Coochin Creek, comprising Lot 1 on SP332399 and Lot 2 on SP357748 (the site). The application seeks approval for the Early Release Area (ERA) of Stockland's Aura South project, within the Halls Creek PDA.

The development application seeks a PDA Development Permit for:

1. Reconfiguring a Lot (962 residential lots, 2 medium density lots, parks and balance land) in accordance with a Plan of Development;

2. Operational Works in accordance with a Plan of Development; and

3. Material Change of Use in accordance with a Plan of Development.

Declaration of the Halls Creek PDA established the planning framework required to accelerate the delivery of Aura South. As the first neighbourhood within the PDA, the ERA will bring forward 1,051 new homes, including three multiple dwelling sites accommodating about 80 apartments. This crucial housing supply will be supported by local services and infrastructure, five enterprise and employment lots, a neighbourhood centre, district sports and local parks, high-quality open space areas and active transport connections, establishing strong foundations for the new Aura South community.

Together, these elements will create a highly liveable, walkable and connected community which will contribute significantly to the delivery of housing, employment and community infrastructure in the southern growth corridor of the Sunshine Coast.

A full site layout is provided in **Appendix B**.

3.3 Acoustic Design Issues and Considerations

Based on the review of the design documentation the following acoustic design issues have been identified:

- Noise from Bells Creek Arterial Road and internal roads will require acoustic treatment to comply with State and Council noise criteria.

4. Acoustic Criteria

4.1 QLD State Development Assessment Provisions – State Code 1

The proposed development will be located within 25m of Bells Creek Arterial Road, which is a transport noise corridor. Therefore, the provisions of the QLD SDAP State Code 1: *Development in a state-controlled road environment* (SDAP) are applicable to the site.

The applicable performance outcomes and acceptable outcomes are defined in Table 1.5 of SDAP SC1 and are reproduced in **Table 3** below.

Table 3: SDAP SC1 Applicable Performance and Acceptable Outcomes

Performance Outcomes	Acceptable Outcomes
Reconfiguring a lot	
Involving the creation of 6 or more new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor	
PO38 Reconfiguring a lot minimises free field noise intrusion from a **state-controlled road.**	**AO38.1** Development provides noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR **AO38.2** Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.
Material change of use (accommodation activity)	
Ground floor level requirements adjacent to a state-controlled road or type 1 multi-modal corridor	
PO41 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in reference Table 3 (item 3.1 (see **Table 6** below)).	No acceptable outcome is provided.
Material change of use (accommodation activity)	
Above ground floor level requirements (accommodation activity) adjacent to a state-controlled road or type 1 multi-modal corridor	
PO42 Balconies, podiums, and roof decks include: 1. a continuous **solid gap-free structure** or balustrade (excluding gaps required for drainage	No acceptable outcome is provided.

Performance Outcomes	Acceptable Outcomes
purposes to comply with the Building Code of Australia); 2. highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums, and roof decks.	
PO43 Habitable rooms (excluding a **relevant residential building** or **relocated building**) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1 (see **Table** 6 below)).	No acceptable outcome is provided.
Material change of use (other uses)	
Ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor	
PO44 Development: 1. provides a noise barrier or earth mound that is designed, sited and constructed: a. to achieve the maximum free field acoustic level in reference table 2 (item 2.3) for all **outdoor education areas** and **outdoor play areas**; b. in accordance with: i. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; ii. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; iii. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020;or 2. achieves the maximum free field acoustic level in reference table 2 (item 2.3) for all **outdoor education areas** and **outdoor play areas** by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.	No acceptable outcome is provided.
PO45 Development involving a **childcare centre** or **educational establishment**: 1. provides a noise barrier or earth mound that is designed, sited and constructed: 2. to achieve the maximum building façade acoustic level in reference table 1 (item 1.2); 3. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic	No acceptable outcome is provided.

Performance Outcomes	Acceptable Outcomes
Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 4. achieves the maximum building facade acoustic level in reference table 1 (item 1.2) by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.	
Above ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor	
PO47 Development involving a childcare centre or educational establishment which have balconies, podiums or elevated outdoor play areas predicted to exceed the maximum free field acoustic level in reference table 2 (item 2.3 (see **Table 5** below)) due to noise from a state-controlled road are provided with: 1. a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); 2. highly acoustically absorbent material treatment for the total area of the soffit above balconies or elevated outdoor play areas.	No acceptable outcome is provided.
PO48 Development including: 1. indoor education areas and indoor play areas in a childcare centre or educational establishment; or 2. sleeping rooms in a childcare centre; or 3. patient care areas in a hospital located above ground level, is designed and constructed to achieve the maximum internal acoustic level in reference table 3 (items 3.2 - 3.4 (see Table 6 below)).	No acceptable outcome is provided.

Table 4: Maximum building facade acoustic levels (Table 1 – SDAP SC1)

Applicable use	Acoustic levels
1.1: Accommodation activity	a. ≤ 60 dB(A) L_{10} (18 hour) façade corrected (measured L_{90} (8 hour) free field between 10pm and 6am ≤40 dB(A)) OR b. ≤ 63 dB(A) L_{10} (18 hour) façade corrected (measured L_{90} (8 hour) free field between 10pm and 6am > 40 dB(A))
1.2: Childcare centre or educational establishment	≤58 dB(A) L10 (1 hour) façade corrected (maximum hour during normal opening hours)

Table 5: Maximum free field acoustic levels (Table 2 – SDAP SC1)

Applicable use	Acoustic levels
2.2: Private open space for residential lots	a. ≤ 57 dB(A) L_{10} (18 hour) free field (measured L_{90} (18 hour) free field between 6am and 12 midnight ≤45 dB(A))
2.2: Private open space for an accommodation activity (including lots created for a future accommodation activity)	OR b. ≤ 60 dB(A) L_{10} (18 hour) free field (measured L_{90} (18 hour) free field between 6am and 12 midnight >45 dB(A))
2.3: Outdoor education areas and outdoor play areas in a childcare centre or educational establishment	c. ≤ 63 dB(A) L10 (12 hour) free field (between 6am and 6pm)

Table 6: Maximum internal acoustic levels (Table 3 – SDAP SC1)

Applicable use	Acoustic levels
3.1: Habitable rooms in **an accommodation activity** (excluding uses addressed in QDC MP4.4)	≤ 35 dB(A) L_{eq} (1 hour) (maximum hour over 24 hours)
3.2: Indoor education areas and **indoor play areas** in a childcare centre or education establishment	
3.3: Sleeping rooms in a childcare centre	

4.2 Queensland Development Code Mandatory Part 4.4

Queensland Development Code Mandatory Part 4.4 (QDC MP4.4) was introduced 31st August 2010 and updated 17th August 2015 in conjunction with planning policy requirements which define planning overlay areas affected by transportation noise as “Transport Noise Corridors”.

The purpose of the Code is to ensure habitable rooms of Class 1-4 buildings located in transport noise corridors are designed and constructed to reduce the extent to which transport noise intrudes into those rooms. The Code applies to any building work on certain residential buildings which are subject to a building approval.

The Code applies to residential buildings if it:

(i) is class 1, 2, 3 or 4 building; and
(ii) is located in a transport noise corridor; and
(iii) is not a relocated building; and
(iv) building application is made after release of the Code

The Code requires that each external facade of a habitable room be assigned a noise category:

(i) which is dependent upon the future noise exposure at the façade presented in mapping of Transport Noise Corridor; or
(ii) as defined by a detailed transportation noise assessment (undertaken in accordance with the requirements of Schedule 3 of the Code). The objective of the noise assessment is to clearly demonstrate the noise category that is applicable to a particular part of a building, or site.

The applicable criteria for determining the relevant noise category are reproduced from the Code and provided in **Table 7**.

Table 7: MP 4.4 Noise Category levels

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

NOTES:

1) measured at 1 m from the façade of the proposed building.

4.3 Sunshine Coast Planning Scheme 2014

At this stage the Sunshine Coast Planning Scheme 2014 (SCPS) does not provide criteria for road traffic noise intrusion. SC 6.15 Planning scheme policy for the nuisance code provides guidance on preventing and minimising noise intrusion associated with road traffic but does not include criteria to be achieved.

Section SC6.15.11 of the planning scheme policy refers to multiple codes and guidelines with the following considered relevant for the assessment of road traffic noise:

- AS2107:2000 - Acoustics – Recommended design sound levels and reverberation times for buildings interiors (Standards Australia) 2000;
- AS3671:1989 - Acoustics – Road traffic noise intrusion – Building siting and construction (Standards Australia) 1989;
- Queensland Development Code: Mandatory Part 4.4 - Buildings in a transport noise corridor; and
- Road Traffic Noise Management: Code of Practice (Department of Main Roads) 2008.

For other precincts within Aura, Sunshine Coast Council has allowed the application of the superseded Caloundra City Council and Maroochy Shire Council façade limit of 63 dB(A) $L_{10,18hr}$ for residential land uses. If the façade noise limit is exceeded the building envelope is to be designed using AS3671:1989 to achieve the applicable internal noise levels provided in AS2107:2016.

Further advice from Sunshine Coast Council included information on how to assess a lot when impacted by a State-controlled Road, Council Road or a combination of both. Based on this information an assessment matrix has been developed as shown in **Table 8**.

Table 8: Matrix for road traffic noise intrusion assessment requirements

	State-controlled Road noise $L_{10,18hr}$ ≥ 58 dB(A) (façade corrected)	**State-controlled Road noise $L_{10,18hr}$ < 58 dB(A) (façade corrected)**
Council Road noise $L_{10,18hr}$ ≥ 63 dB(A) (façade corrected)	QDC MP4.4	AS3671 / AS2107
Council Road noise $L_{10,18hr}$ ≤ 63 dB(A) (façade corrected)	QDC MP4.4	No assessment required

4.4 AS2107:2016 Internal Noise Levels

AS 2107 provides recommendations for suitable internal noise levels (defined as the equivalent continuous A-weighted sound pressure level — $L_{Aeq,t}$) which aim to optimise the acoustic amenity in various occupied spaces. The applicable recommended design values for residential building habitable spaces are reproduced from AS 2107 in **Table 9**.

Table 9: Indoor design sound level criteria

Type of occupancy / activity	Design sound level ($L_{Aeq,T}$) range, in dB(A)
Houses or apartments near major roads	
Living areas	35 to 45
Sleeping areas (night time)	35 to 40
Work areas	35 to 45

5. Traffic Noise Assessment

5.1 Assessment Overview

As the project site is located within 25 m of a State transport corridor and includes internal roads assessable by Sunshine Coast Council, a traffic noise impact assessment is required in order to address the acoustic requirements applicable to each lot within the development.

5.2 Road Traffic Noise Modelling

To predict noise impacts, calculations were made using the recognised CoRTN algorithm assisted by a three-dimensional computer model of the site created within SoundPLAN 9.1 acoustic software. The computer model was created as a representation of the future site and incorporates the following inputs:

- Calculation algorithms – SoundPLAN implementation of accepted noise prediction standards;
- Terrain elevation – A 3D representation of the terrain at completion of construction;
- Ground surface corrections – Areas of soft (absorptive) and hard (reflective) ground;
- Roads sources – The placement of each road source as a source line and the input of traffic flow parameter;
- Buildings – Detailed implementation of the proposed building from drawings (i.e. layout, height, floors), and
- Sensitive receptors – Locations where the noise limits are to be assessed. As the exact building footprints within the lots have not been finalised at this stage of the assessment, the receivers are generally positioned at the centre of each proposed lot to provide an overview of the potential traffic noise impacts.

Road traffic noise calculations were conducted by applying the SoundPLAN implementation of the UK Department of Transport Welsh Office Calculation of Road Traffic Noise 1988 (CoRTN) algorithms. CoRTN is widely accepted in Australia for the calculation of road traffic noise and, in addition with SoundPLAN, is recommended in the Department of Transport and Main Roads document Transport Noise Management Code of Practice Volume 1 – Road Traffic Noise, dated November 2013 (CoP 2013).

For full details on modelling inputs refer to **Appendix C**.

5.3 Predicted Road Traffic Noise Levels to Private Open Space

Residential lots and outdoor education areas affected by road traffic noise from a State-controlled road are required to comply with the noise limits provided in **Table 5**. Based on the traffic volumes modelled along Bells Creek Arterial, it is assumed that the $L_{90,18hr}$ will be > 45 dB(A) therefore the applicable noise limits are as follows:

- ≤ 60 dB(A) $L_{10,18hr}$ (measured 6am – 12am midnight) free field in private open spaces of residential lots and / or accommodation activities; and

To estimate the $L_{A10,12hr}$ parameter a +1.4 dB(A) adjustment is applied to the calculated $L_{A10,18hr}$ value[1]. Because the $L_{A10,12hr}$ noise limit is 3 dB(A) higher than the $L_{A10,18hr}$, and the adjustment to calculate the $L_{A10,12hr}$ is less than this, compliance for all outdoor areas can be demonstrated by meeting the ≤ 60 dB(A) $L_{A10,18hr}$ noise limit.

The predicted free-field noise levels at the project site are presented in **Figure 2** and **Figure 3**.

[1] Brown, R. and Brown, H. (2016) 'A re-examination of the relationship between the L10(18hour) noise level parameter and other road traffic noise level parameters' *Proceedings of Acoustics 2016*, DOI: ACOUSTICS2016-130-Review Paper.

Figure 2: BCA - free-field noise levels without acoustic barrier

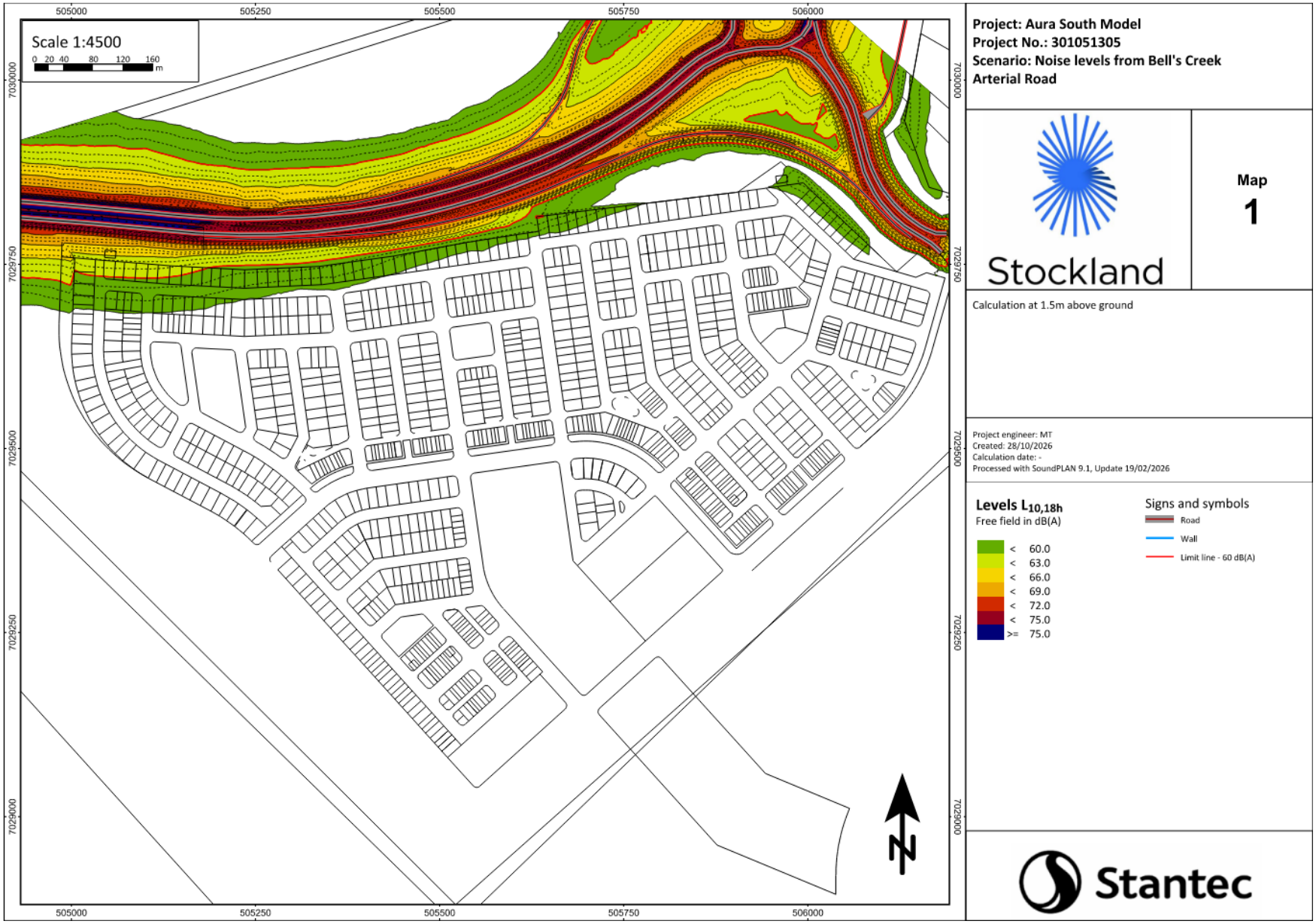
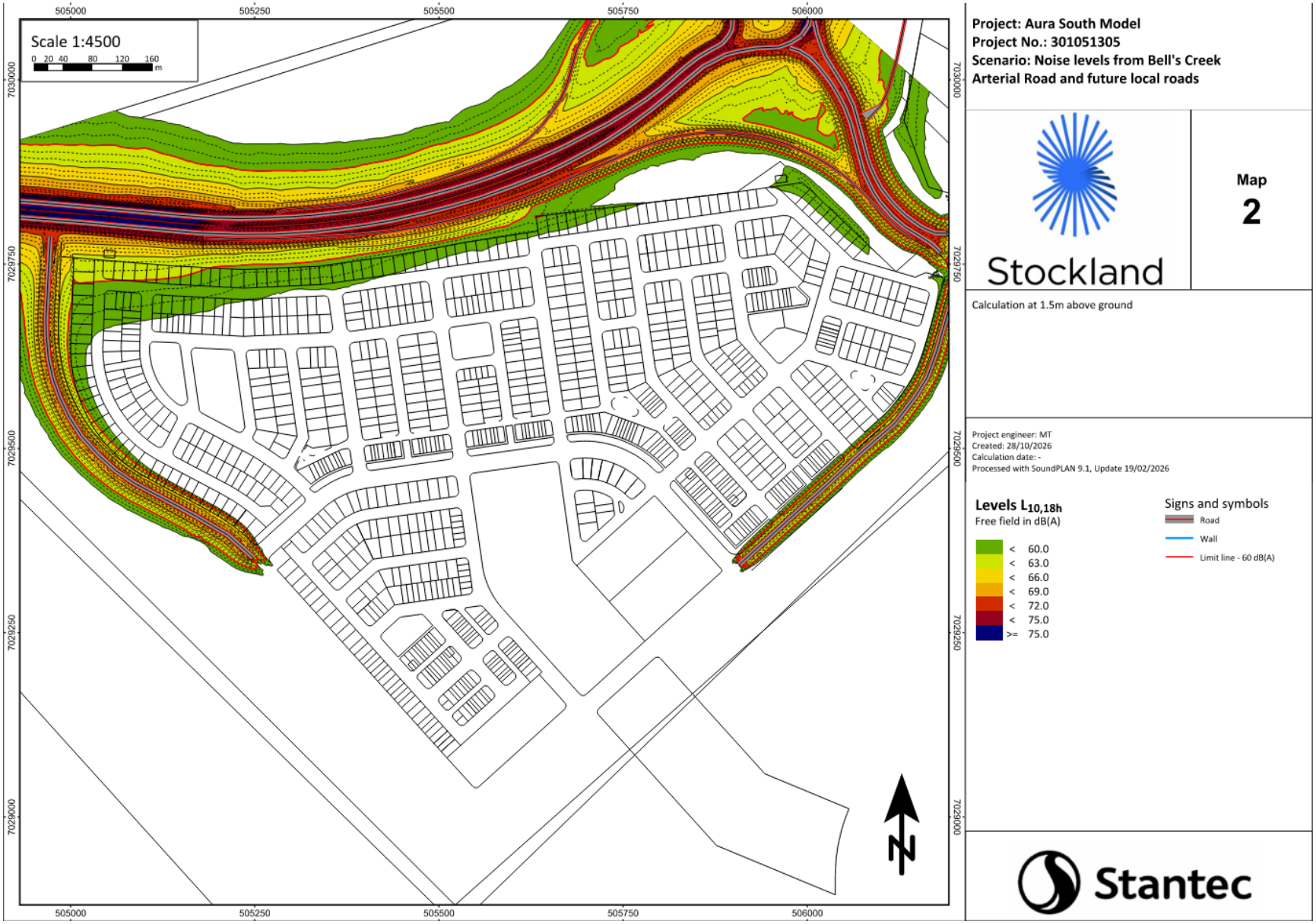


Figure 3: All Roads - free-field noise levels without acoustic barrier



5.4 Recommended Acoustic Barriers

To comply with the SDAP free-field noise limits it is recommended to provide acoustic barriers along the Bells Creek Arterial Road frontage. The proposed acoustic barrier locations and heights are presented in **Figure 4**.

Figure 4: Proposed Bells Creek Arterial Road acoustic barrier



The resulting noise predictions with the proposed barriers are presented in **Figure 5** and **Figure 6**.

Figure 5: BCA - free-field noise levels with proposed acoustic barrier

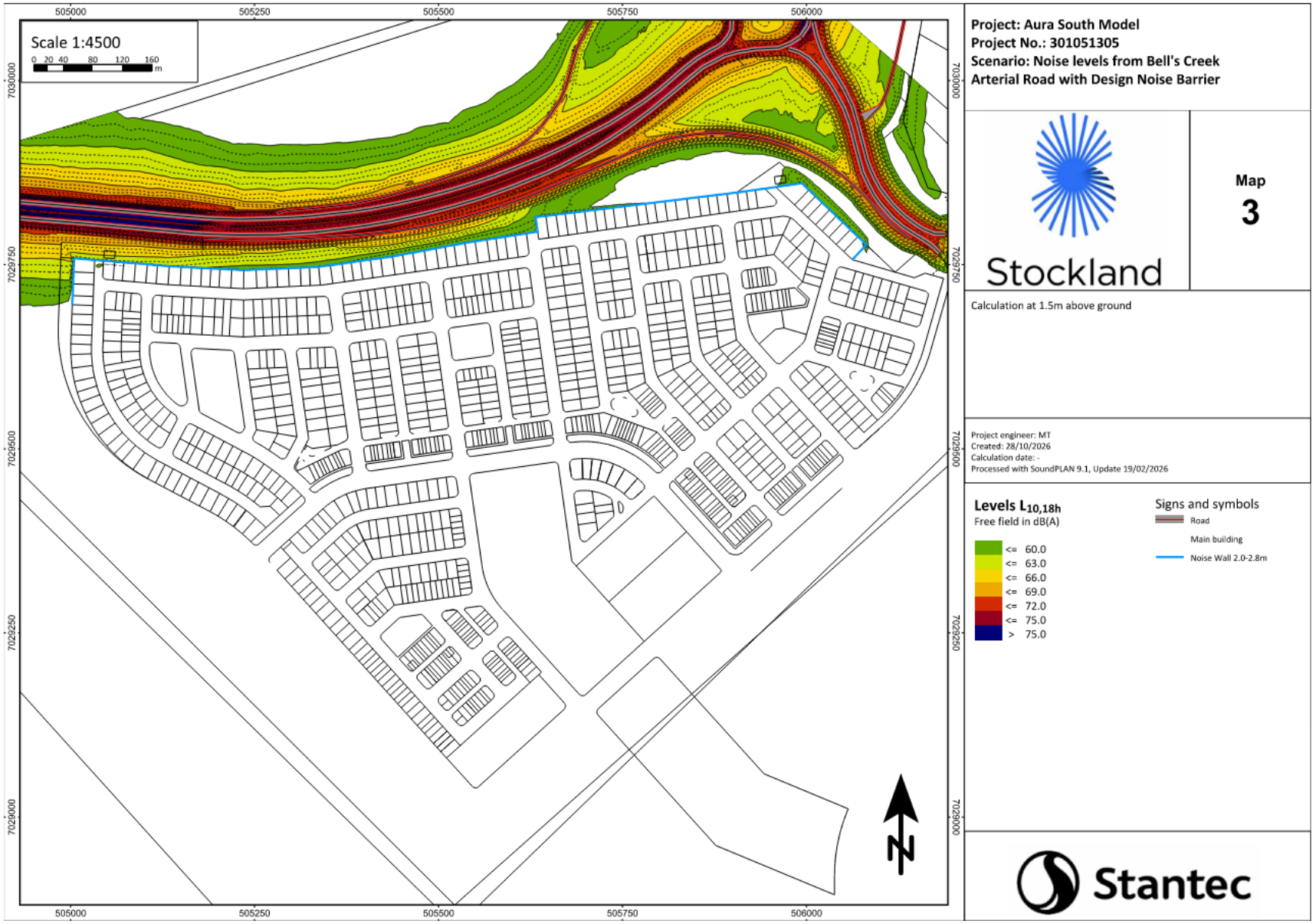
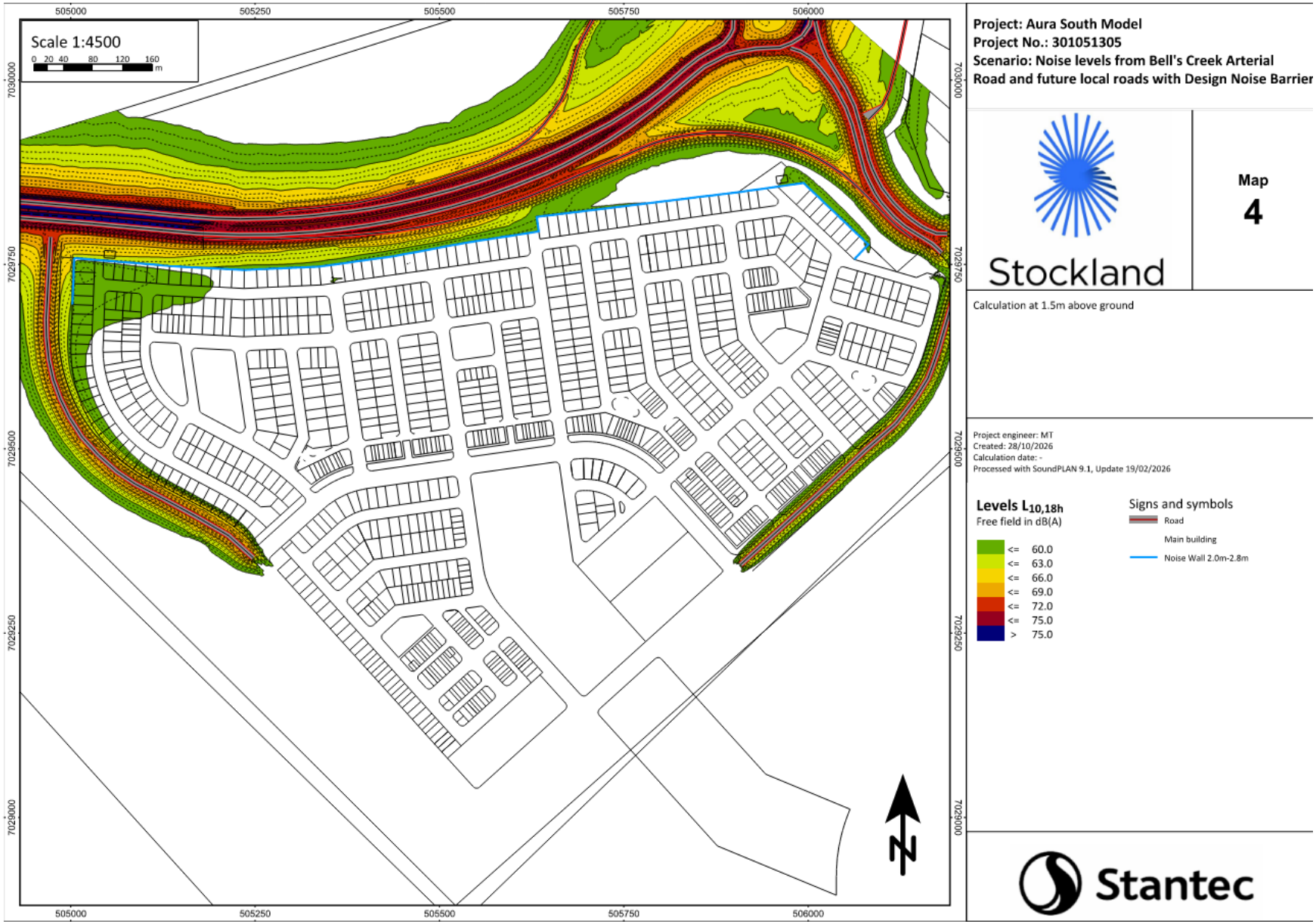


Figure 6: All Roads - free-field noise levels with proposed acoustic barrier



Compliance with SDAP outdoor free field noise levels from state controlled roads is predicted on the basis that the acoustic barriers recommended in **Section 5.4** are implemented.

5.5 Road Traffic Noise Levels at Future Residential Lots

The acoustic model was used to calculate the façade corrected $L_{10(18hr)}$ noise levels at ground (1.8m), first floor levels (4.6m) and second floor levels (7.4m) from State-controlled Roads and the local road network. As per the assessment matrix provided in **Table 8** any lot affected by ≥ 58 dB(A) façade corrected noise levels from a State-controlled Road shall be assessed in accordance with QDC MP4.4. Shielding provided by the recommended acoustic barriers in **Section 5.4** has been accounted for in these modelling scenarios.

The results of the calculations are provided in Figure 7, Figure 8 and Figure 9 with individual lot noise levels included in Appendix D.

Figure 7: Road traffic façade corrected noise levels with proposed noise barriers at ground floor

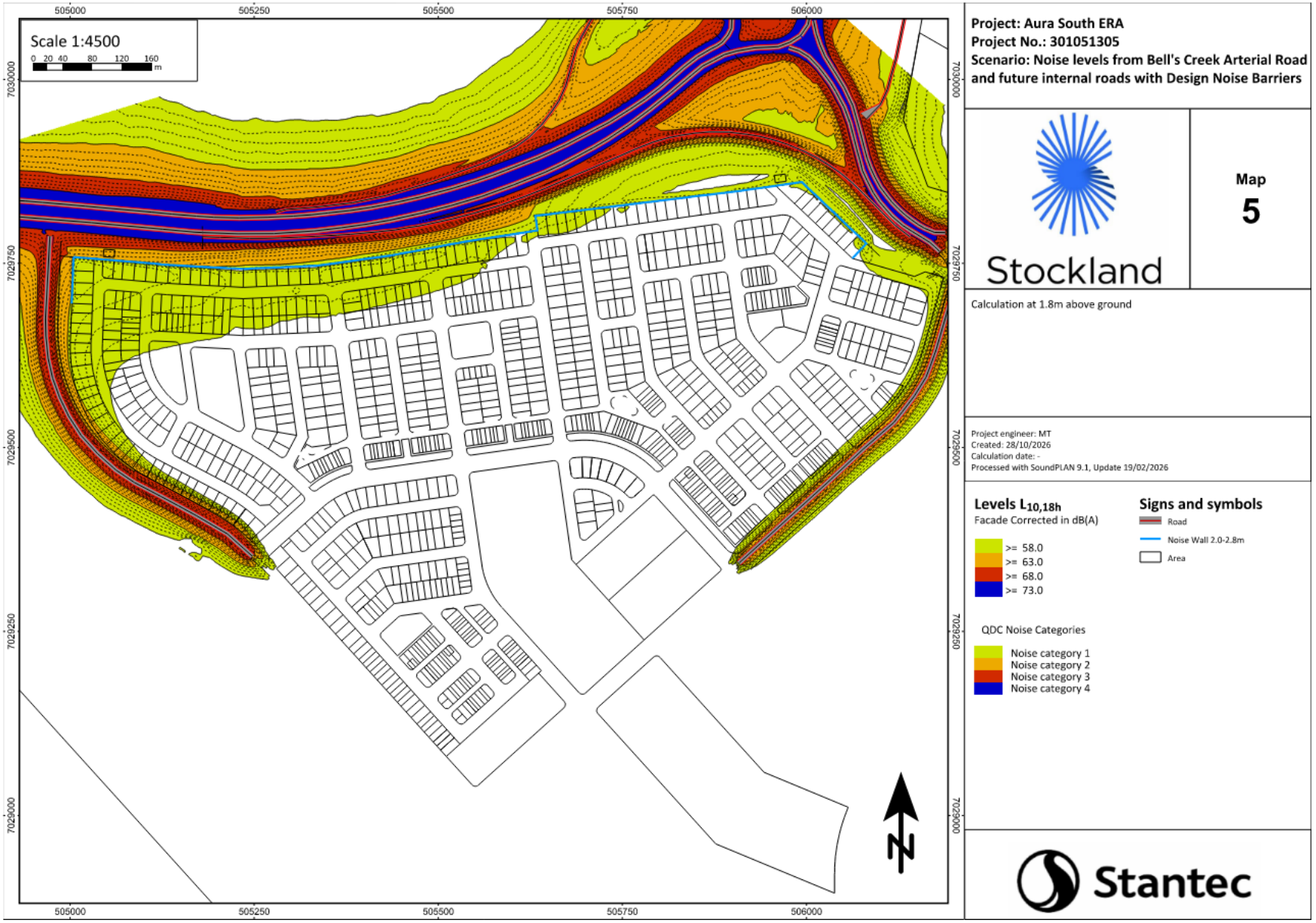


Figure 8: Road façade corrected noise levels with proposed noise barriers at first floor

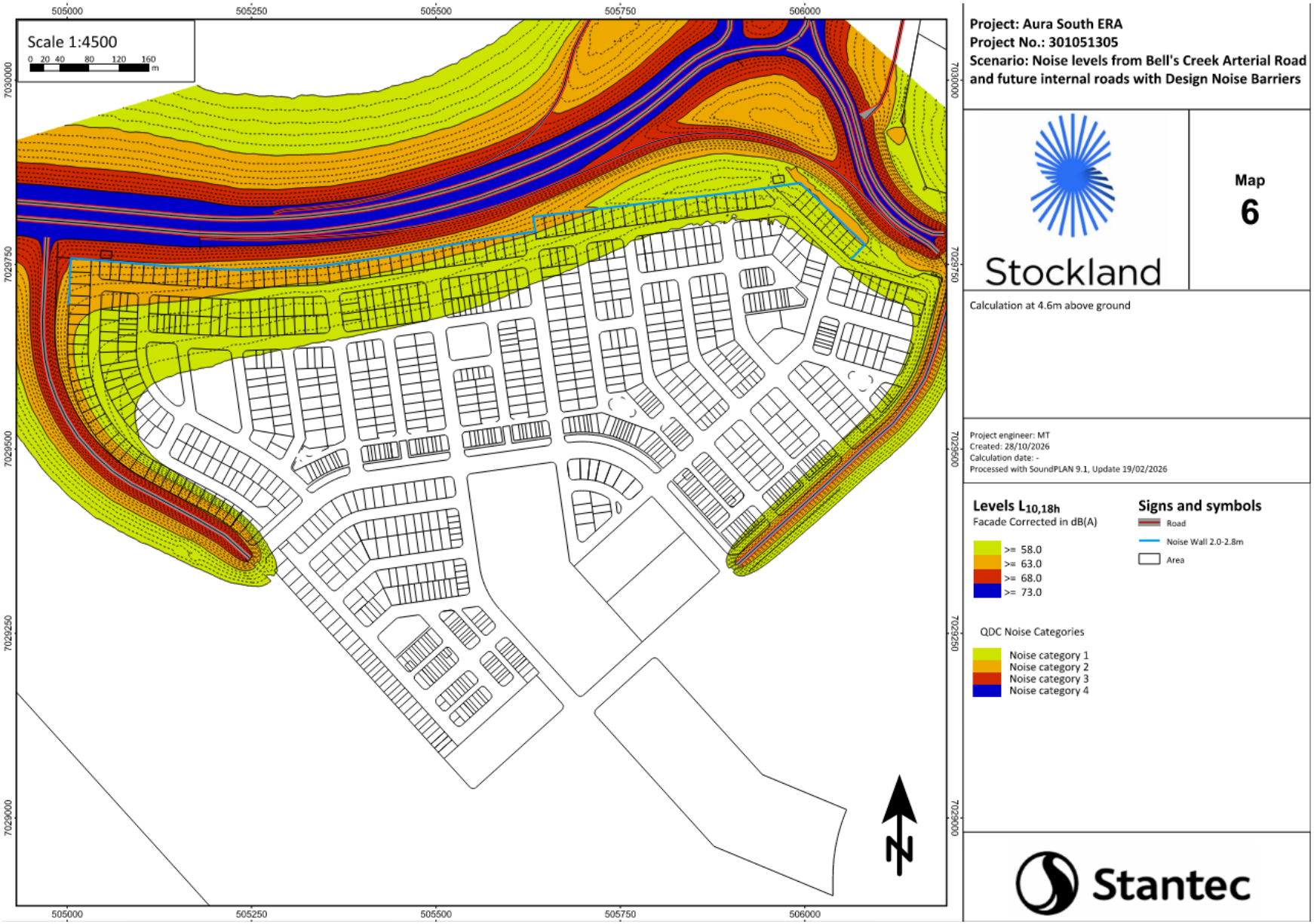
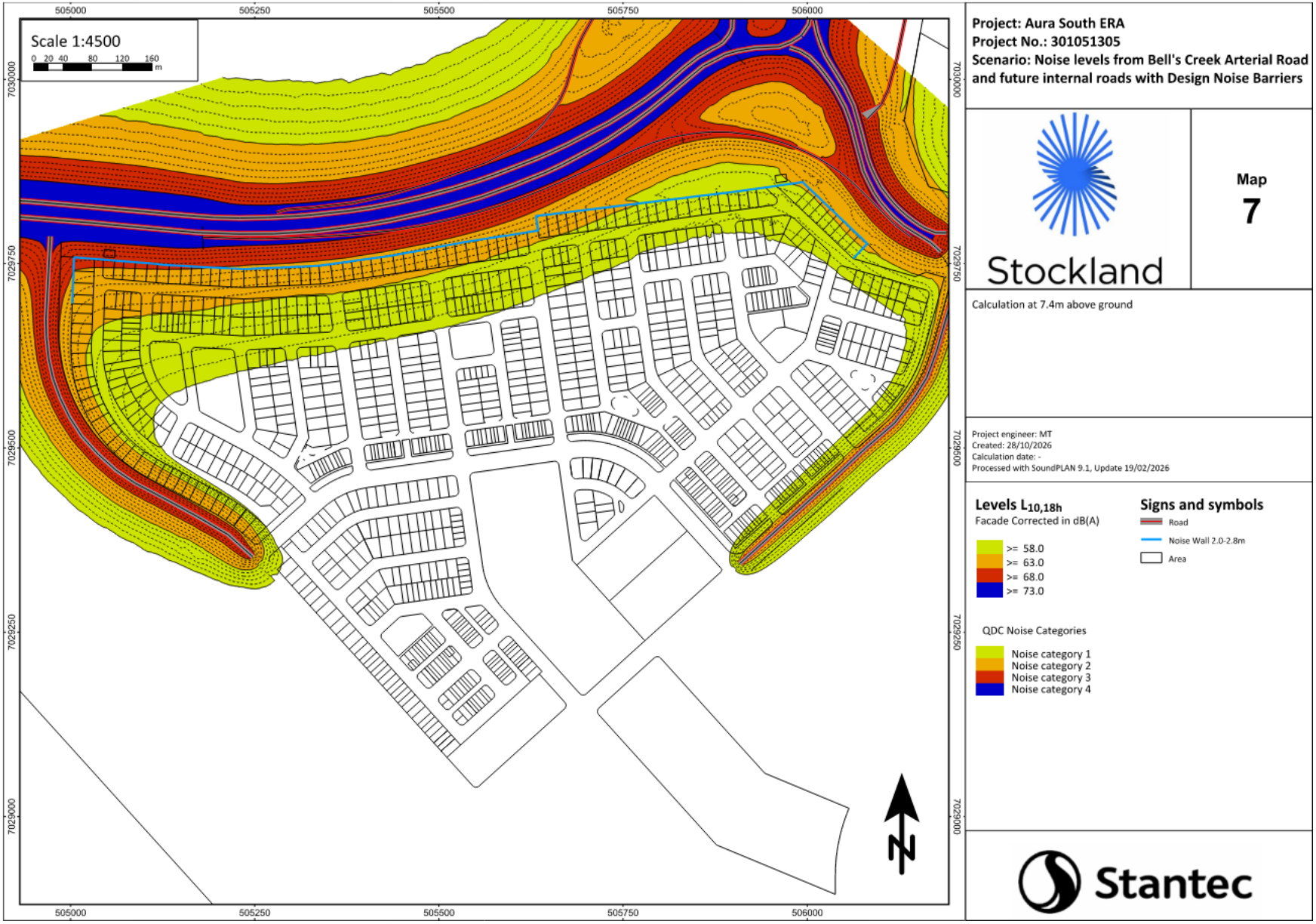


Figure 9: Road façade corrected noise levels with proposed noise barriers at second floor



6. Recommendations

6.1 Barrier Construction Requirements

Acoustic barriers or earth mounds required to address noise from State Controlled Roads (refer to **Section 5.4**) must be constructed in accordance with:

- Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013;
- Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019;
- Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020.

6.2 Building Envelope Construction Requirements

6.2.1 State Controlled Roads – QDC MP4.4 Assessment

QDC MP4.4 has been applied to all residential lots where the predicted noise impacts from State controlled roads (without Council roads) was ≥58dB(A) façade corrected. Final QDC MP4.4 noise categories were determined with the contribution of both State controlled and Council roads. The predicted noise impacts and required treatments for noise affected lots are detailed in **Appendix D**.

6.2.2 Council Roads – AS2107 / AS3671 Assessment

Residential lots which exceed the Council criteria (63 dB(A) $L_{10,18hr}$ façade corrected) are to be assessed in accordance with AS3671 to achieve the AS2107 internal noise criteria provided in **Section 4.4**. The predicted noise impacts and required treatments for noise affected lots are detailed in **Appendix D**. Future dwellings on lots affected by local roads will need to be designed and constructed to Category 1-3 requirements which are detailed as follows:

Category 1. Standard construction; openings, including open windows and doors may comprise up to 10% of the exposed facade. TNR of approximately 10 dB(A) is expected.

Category 2. Standard construction, except for lightweight elements, such as fibrous cement, or metal cladding, or all glass facades. Windows, doors and other openings must be closed. TNR of approximately 25 dB(A) is expected.

Category 3. Special construction, chosen in accordance with Clause 3.4. Windows, doors and other openings must be closed. TNR between 25 and 35 is expected.

Note for the purposes of this assessment, Category 2 has been further divided into Categories 2a and 2b to reflect construction requirements. Refer to Appendix F for further clarification of these categories, and of the acoustic treatment and review process required for each Lot.

It should be noted that external windows and doors will need to be closed for predicted internal noise levels to comply with the design benchmarks for Category 2-3, therefore alternative ventilation may be required.

For the purposes of this assessment, the broad AS 3671 construction categories have been further resolved into project-specific construction requirements, as detailed in Appendix F. Categories A, B and C in Appendix F correspond to progressively increasing traffic noise reduction requirements and provide defined minimum acoustic performance requirements for the principal building-envelope elements. This additional breakdown allows the required construction treatment to be more closely matched to the predicted façade noise exposure, rather than applying the most onerous construction requirements across the full range of an AS 3671 category. The Appendix F categories therefore provide a consistent and proportionate means of implementing the AS 3671 assessment and achieving the applicable AS/NZS 2107 internal noise criteria required under the Council assessment pathway.

7. Conclusion

Stantec Australia Pty Ltd (Stantec) have been engaged by Stockland Development Pty Ltd to undertake a noise impact assessment for the development application stage (DA) of the proposed Aura South Early Release Area.

This acoustic report has:

- outlined the acoustic services scope of works for the project;
- established relevant acoustic criteria in accordance with current Legislation, Regulations, Council Policies, Australian Standards and Design Guidelines;
- provided recommendations for acoustic barriers to comply with State or Council requirements; and
- identified key acoustic issues that are to be addressed by the project during subsequent design stages.

We trust that this report to be sufficient for your current requirements; however, should you have any queries, please do not hesitate to contact the undersigned on (07) 3029 5000.

Regards,





Matt Terlich (Author)
Acoustics Project Technical Lead for **Stantec**

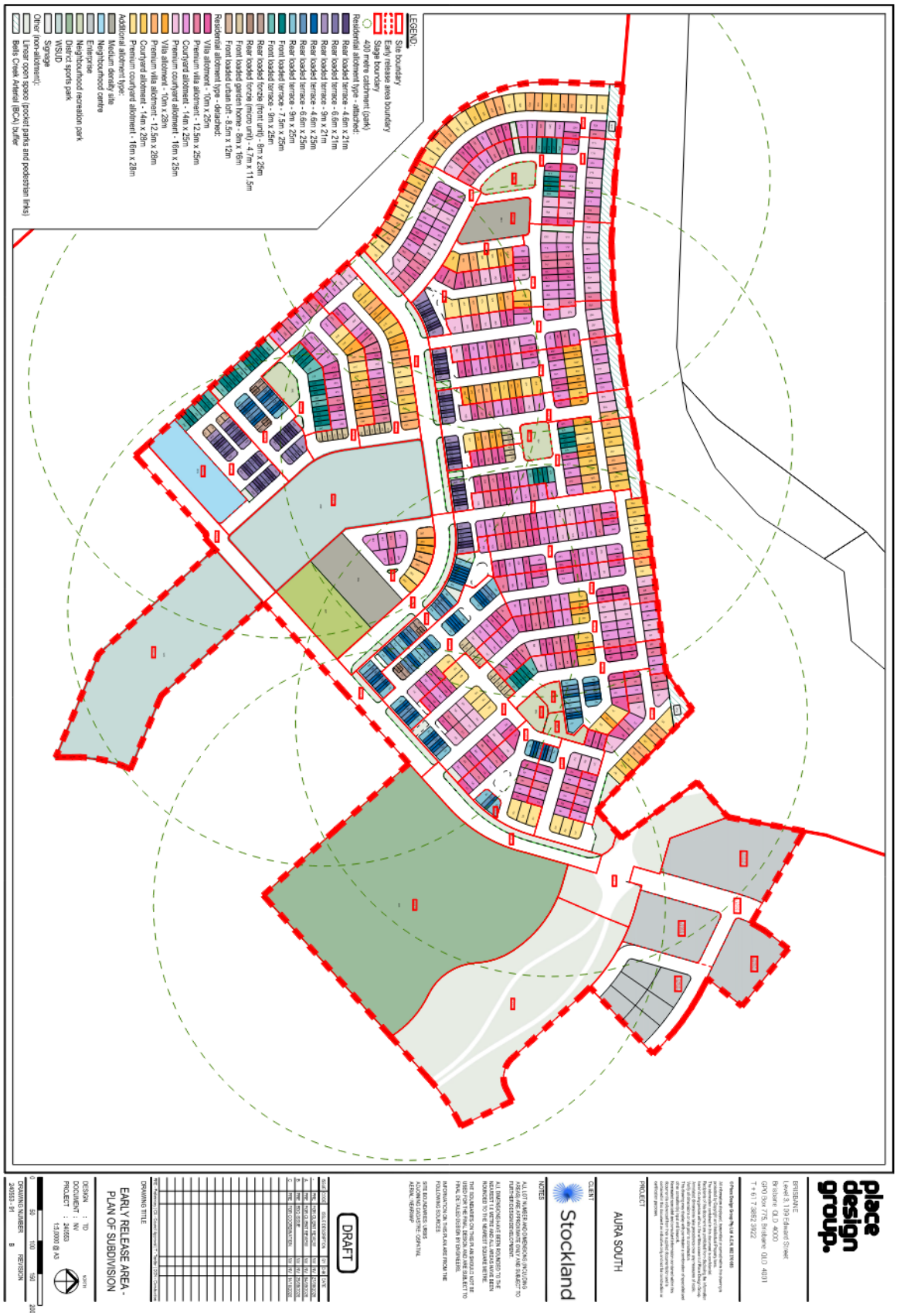
Michael Lanchester (Reviewer)
Principal, Acoustics Project Technical Lead,
Team Leader for **Stantec**

Appendices

Appendix A Glossary of Acoustic Terms

TERM	DEFINITION
Attenuation	A reduction in the magnitude of sound.
A-weighting	A frequency dependent filter applied to an instrument-measured noise. In its simplest form, the filter is designed to replicate the relative sensitivity to loudness perceived by the human ear.
Barrier	Solid walls or partitions, solid fences, earth mounds, earth berms, buildings, etc. used to reduce noise.
dB	The abbreviation for decibel.
dB(A)	A-weighted sound level in decibels.
Free Field	An environment in which there are no acoustic reflective surfaces. Free field noise measurements are carried out outdoors at least 3.5 m from any acoustic reflecting structures other than the ground.
LA1	The A-weighted sound pressure level exceeded for 1 % of the measurement time period.
LA10	The A-weighted sound pressure level exceeded for 10 % of the measurement time period.
LAeq	The equivalent continuous sound pressure level in dB(A). It is often accompanied by an additional suffix “T”, which is indicative of the measurement time period. (e.g. LAeq,15min, symbolising the measurement is evaluated over 15-minutes).
LAmax	The maximum A-weighted sound pressure level recorded over the measurement period.
Reverberation	The persistence of a sound within a space, which will naturally decay over time. Most apparent once the source signal has ceased emitting. Reverberation may have effects on speech intelligibility if not adequately controlled. Reverberation time, represented in seconds, can vary depending on the volume and surface finishes of the space.
Rw	Weighted sound reduction index. A single number value which represents the airborne sound insulation performance of a partition or building element that has been determined under laboratory testing conditions.
Sound Power Level	The total sound energy radiated by a source, expressed in Watts. The sound power level is ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Sound Pressure Level	The measured acoustic wave strength in a given environment and at a particular point of interest where the total sound level expressed is relative to a reference pressure, i.e. the threshold of human hearing. Sound pressure level is typically measured using a standard sound level meter with a microphone, expressed in decibels (dB).

Appendix B Site Layout



Appendix C Noise Modelling Details

A three-dimensional computer model of the study area was created within SoundPLAN 9.1 software. The following inputs were utilised:

- **Lot receptor locations** – As the exact building footprints within the lots have not been finalised at this stage of the assessment, the receivers were positioned approximately at the centre of the proposed lot to provide an overview of the potential impact to the lot.
- **Lot receptor heights** – Receptor heights were set to 1.5m for recreation areas, 1.8m for ground floor and 4.6m for first floor in accordance with TMR CoP 2013. An additional receptor height of 7.4m for the second floor was also included with the 2.8m floor separation described in TMR CoP 2013.
- **Source heights** – Road noise assumed source height of 0.5m.
- **Noise map calculations** – Noise contour maps were calculated as free-field noise levels, 1.5 m, 1.8m, 4.6m and 7.4m above ground level with 5m resolution. TMR corrections were applied to all maps with 1.8m, 4.6m and 7.4m maps also including façade correction.
- **Calculation algorithms** – Road traffic noise was calculated using SoundPLAN implementation of the UK Department of Transport Welsh Office *Calculation of Road Traffic Noise* 1988 (CoRTN), which is accepted by TMR CoP 2013.
- **Ground surface corrections** – Road surfaces are calculated as hard ground (no absorption) with 60% ground absorption applied to represent a mix of hard and soft surfaces throughout the development.
- **Façade correction** - +2.5dB(A) façade correction applied for non-free field calculations.
- **TMR corrections** - -1.7 dB(A) façade and -0.7dB(A) free-field CoRTN calibration factors for all Queensland roads (other than the Pacific Motorway from Logan Motorway to Nerang) in accordance with Table 4.3.2.1 of TMR CoP 2013.
- **Terrain:** The civil design ground contours for the site were provided by KN Group (refer to **Table 2**) and used to calculate the final ground levels of the site.
- **Road alignments:** Roads were digitised following the alignment shown on georeferenced photography imported into SoundPLAN and / or the proposed lot layout plan provided by KN Group (refer to **Table 2**).
- **Road surface corrections:** All roads within the model have been modelled as dense graded asphalt with 0 dB(A) correction applied in accordance with Table 4.3.4.1 of TMR CoP 2013.
- **Conversion factors applied for different road noise parameters:** $L_{A10,12hr} \approx L_{A10,18hr}$ + 1.4 dB(A) [2].
- **Road traffic parameters:** Road traffic volumes were obtained from Jalahawi Consulting for internal roads and Bells Creek Arterial as presented in **Figure 10** and **Figure 11**. It is understood that these traffic volumes represent the ultimate development scenario, notionally corresponding to approximately the year 2048, when the full development is realised.

[2] Brown, R. and Brown, H. (2016) 'A re-examination of the relationship between the L10(18hour) noise level parameter and other road traffic noise level parameters' *Proceedings of Acoustics 2016*, DOI: ACOUSTICS2016-130-Review Paper.

Figure 10: Future traffic volumes (source: Jalahawi August 2026)

JALAHAWI CONSULTING
TRAFFIC + TRANSPORT SPECIALISTS

Figure 2 – Daily Traffic Volumes (Aura South ERA)

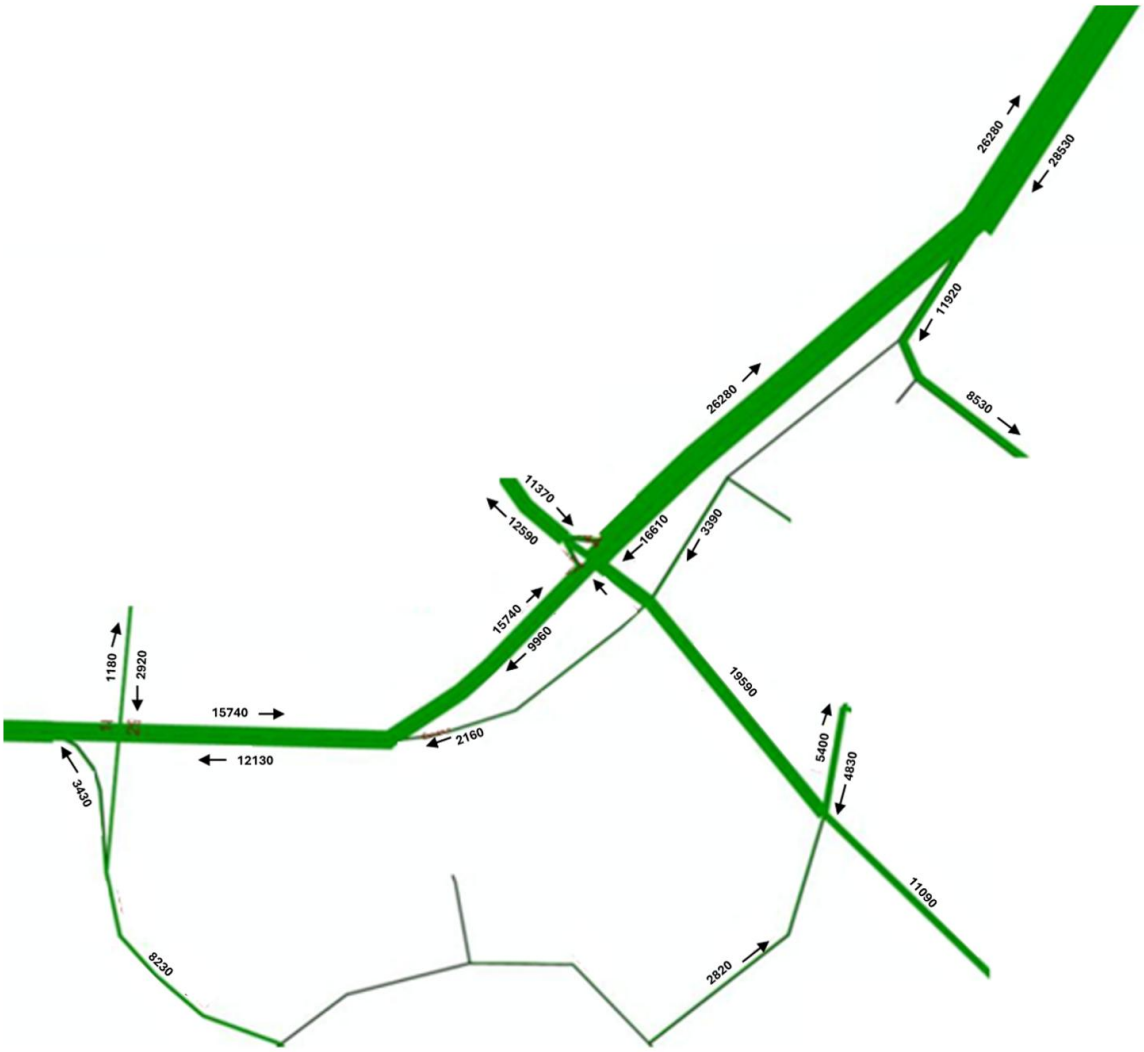
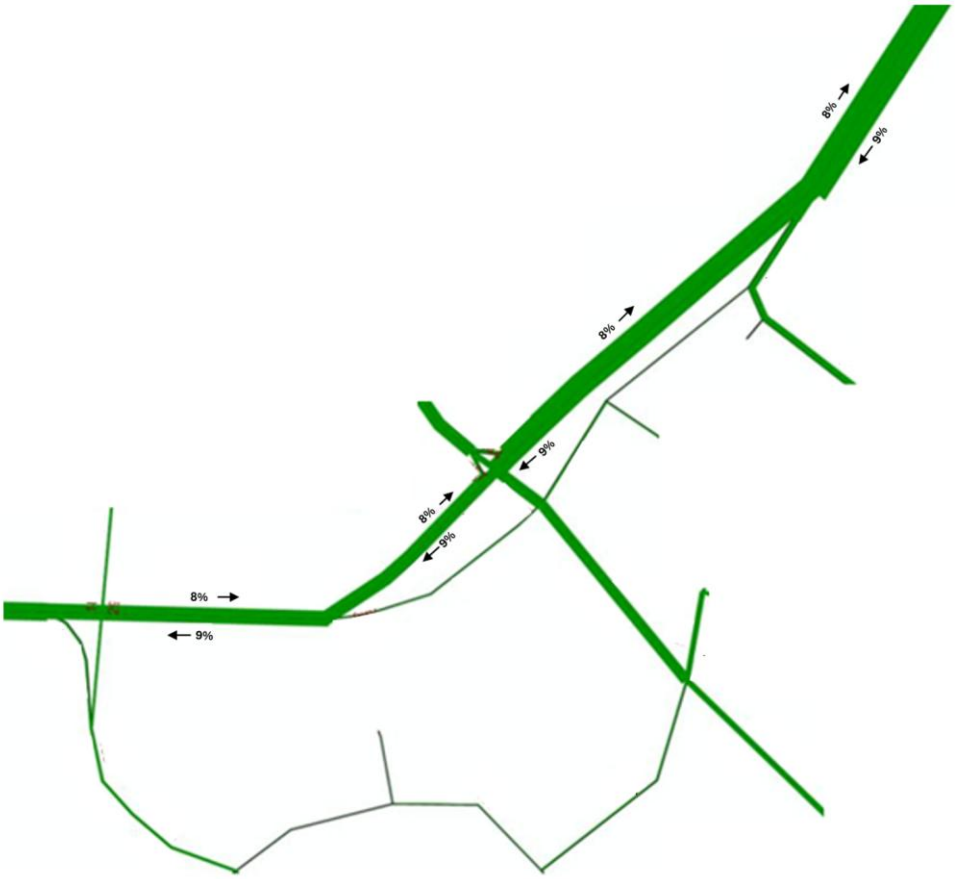


Figure 11: Future heavy vehicle percentages (source: Jalahawi August 2026)

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Figure 3 – Heavy Vehicle Percentages (Aura South ERA)



Heavy vehicle volumes from BCA count data

Note that a minimum 5% heavy vehicles has been applied to roads within Aura South

Appendix D Residential Lot Predicted Noise Levels

Table 10 provides the noise levels for all lots which require assessment under QDC MP4.4 or AS3671. Lots which did not trigger QDC MP4.4 or AS3671 assessment have been excluded. Lots which are not able to be built to include the 3rd floor ('Second') have also been excluded – this excludes all lots except Lots 8001 and 8003, which are medium density sites, of which only Lot 8001 requires assessment under QDC MP4.4 or AS3671.

Table 10: Future Road Noise Traffic Predictions

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
101	57	59	-	0	1	-	-
102	57	59	-	0	1	-	-
103	57	59	-	0	1	-	-
120	57	58	-	0	1	-	-
121	59	61	-	1	1	-	-
122	59	61	-	1	1	-	-
123	59	61	-	1	1	-	-
124	59	61	-	1	1	-	-
125	59	61	-	1	1	-	-
201	59	61	-	1	1	-	-
202	58	60	-	1	1	-	-
203	58	60	-	1	1	-	-
204	57	59	-	0	1	-	-
205	57	59	-	0	1	-	-
206	57	59	-	0	1	-	-
207	57	59	-	0	1	-	-
208	56	58	-	0	1	-	-
209	56	58	-	0	1	-	-
210	56	57	-	0	1	-	-
211	55	57	-	0	1	-	-
219	56	58	-	0	1	-	-
220	57	59	-	0	1	-	-
221	58	60	-	1	1	-	-
222	56	59	-	0	1	-	-
223	57	59	-	0	1	-	-
224	57	59	-	0	1	-	-

[3] AS3671 Construction Categories are described further in Table F-1 in Appendix F.
'-' indicates that a separate AS 3671 construction category has not been assigned at that building level because the applicable State-controlled-road assessment is addressed through QDC MP 4.4, or because the Council-road assessment trigger is not exceeded (no assessment is required in this case). AS 3671 columns are based on the Council-road contribution only, rather than the combined level.

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
301	59	61	-	1	1	-	-
302	59	61	-	1	1	-	-
303	59	61	-	1	1	-	-
304	59	61	-	1	1	-	-
305	59	61	-	1	1	-	-
306	58	61	-	1	1	-	-
307	58	60	-	1	1	-	-
308	58	60	-	1	1	-	-
309	58	60	-	1	1	-	-
310	58	61	-	1	1	-	-
311	58	61	-	1	1	-	-
312	57	61	-	1	1	-	-
313	57	61	-	1	1	-	-
314	57	61	-	0	1	-	-
315	57	61	-	0	1	-	-
316	61	64	-	1	2	-	-
317	60	64	-	1	2	-	-
318	60	64	-	1	2	-	-
319	60	64	-	1	2	-	-
320	60	64	-	1	2	-	-
321	60	64	-	1	2	-	-
322	60	64	-	1	2	-	-
323	60	64	-	1	2	-	-
324	60	64	-	1	2	-	-
325	59	63	-	1	2	-	-
326	59	63	-	1	2	-	-
327	59	63	-	1	2	-	-
416	55	57	-	0	1	-	-
417	55	57	-	0	1	-	-
418	55	57	-	0	1	-	-
419	55	57	-	0	1	-	-
420	55	57	-	0	1	-	-
421	55	58	-	0	1	-	-
422	56	58	-	0	1	-	-
423	56	58	-	0	1	-	-
424	56	58	-	0	1	-	-
425	56	58	-	0	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
426	56	58	-	0	1	-	-
427	56	58	-	0	1	-	-
428	55	58	-	0	1	-	-
429	57	59	-	0	1	-	-
430	57	60	-	0	1	-	-
431	57	60	-	0	1	-	-
432	57	60	-	0	1	-	-
433	57	60	-	0	1	-	-
434	56	60	-	0	1	-	-
435	56	59	-	0	1	-	-
436	55	58	-	0	1	-	-
437	55	58	-	0	1	-	-
438	56	59	-	0	1	-	-
439	56	60	-	0	1	-	-
440	57	61	-	0	1	-	-
441	57	61	-	0	1	-	-
442	59	63	-	1	2	-	-
443	58	63	-	1	2	-	-
444	58	63	-	1	2	-	-
445	58	63	-	1	2	-	-
501	56	58	-	0	1	-	-
514	59	61	-	1	1	-	-
515	58	60	-	1	1	-	-
516	58	60	-	1	1	-	-
517	58	60	-	1	1	-	-
518	58	60	-	1	1	-	-
519	58	60	-	1	1	-	-
520	58	60	-	1	1	-	-
521	58	60	-	1	1	-	-
624	55	58	-	0	1	-	-
625	55	58	-	0	1	-	-
626	55	58	-	0	1	-	-
627	55	58	-	0	1	-	-
628	56	60	-	0	1	-	-
629	56	60	-	0	1	-	-
630	56	60	-	0	1	-	-
631	56	60	-	0	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
632	56	60	-	0	1	-	-
633	57	61	-	0	1	-	-
634	57	61	-	0	1	-	-
635	57	61	-	0	1	-	-
636	57	61	-	0	1	-	-
637	57	61	-	0	1	-	-
638	58	63	-	1	2	-	-
639	58	63	-	1	2	-	-
640	58	63	-	1	2	-	-
641	59	63	-	1	2	-	-
701	58	60	-	1	1	-	-
702	58	60	-	1	1	-	-
703	58	60	-	1	1	-	-
704	58	60	-	1	1	-	-
705	58	60	-	1	1	-	-
706	58	60	-	1	1	-	-
707	58	60	-	1	1	-	-
708	58	60	-	1	1	-	-
801	58	60	-	1	1	-	-
802	58	59	-	1	1	-	-
803	58	59	-	1	1	-	-
804	58	59	-	1	1	-	-
805	58	59	-	1	1	-	-
806	57	59	-	1	1	-	-
807	57	59	-	1	1	-	-
808	57	59	-	0	1	-	-
809	57	59	-	0	1	-	-
914	55	58	-	0	1	-	-
915	55	58	-	0	1	-	-
916	55	58	-	0	1	-	-
917	55	58	-	0	1	-	-
918	56	58	-	0	1	-	-
919	56	59	-	0	1	-	-
920	56	59	-	0	1	-	-
921	57	60	-	0	1	-	-
922	56	60	-	0	1	-	-
923	56	60	-	0	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
924	57	61	-	0	1	-	-
925	57	61	-	0	1	-	-
926	57	61	-	1	1	-	-
927	58	62	-	1	1	-	-
928	59	64	-	1	2	-	-
929	59	64	-	1	2	-	-
930	59	64	-	1	2	-	-
931	60	64	-	1	2	-	-
932	59	64	-	1	2	-	-
1016	55	57	-	0	1	-	-
1017	56	58	-	0	1	-	-
1018	56	58	-	0	1	-	-
1019	56	59	-	0	1	-	-
1020	57	60	-	0	1	-	-
1021	57	61	-	1	1	-	-
1022	55	58	-	0	1	-	-
1023	55	58	-	0	1	-	-
1024	56	58	-	0	1	-	-
1025	56	59	-	0	1	-	-
1026	56	60	-	0	1	-	-
1027	57	60	-	0	1	-	-
1028	58	62	-	1	1	-	-
1029	58	62	-	1	1	-	-
1030	58	62	-	1	1	-	-
1031	58	62	-	1	1	-	-
1032	60	64	-	1	2	-	-
1033	60	65	-	1	2	-	-
1034	60	65	-	1	2	-	-
1035	60	65	-	1	2	-	-
1036	61	65	-	1	2	-	-
1037	61	65	-	1	2	-	-
1038	61	66	-	1	2	-	-
1117	55	57	-	0	1	-	-
1118	56	58	-	0	1	-	-
1119	56	59	-	0	1	-	-
1120	57	59	-	0	1	-	-
1121	57	60	-	0	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
1122	57	61	-	1	1	-	-
1123	58	62	-	1	1	-	-
1124	58	62	-	1	1	-	-
1133	55	57	-	0	1	-	-
1216	55	57	-	0	1	-	-
1217	56	58	-	0	1	-	-
1218	56	58	-	0	1	-	-
1219	56	58	-	0	1	-	-
1220	56	58	-	0	1	-	-
1229	56	58	-	0	1	-	-
1230	57	60	-	1	1	-	-
1231	57	60	-	1	1	-	-
1232	58	60	-	1	1	-	-
1233	58	60	-	1	1	-	-
1234	58	60	-	1	1	-	-
1235	58	60	-	1	1	-	-
1236	58	60	-	1	1	-	-
1237	58	60	-	1	1	-	-
1238	58	60	-	1	1	-	-
1239	58	60	-	1	1	-	-
1240	58	60	-	1	1	-	-
1241	59	62	-	1	1	-	-
1242	59	62	-	1	1	-	-
1243	59	62	-	1	1	-	-
1244	59	61	-	1	1	-	-
1245	59	61	-	1	1	-	-
1246	58	61	-	1	1	-	-
1247	58	61	-	1	1	-	-
1248	58	61	-	1	1	-	-
1249	58	61	-	1	1	-	-
1250	59	64	-	1	2	-	-
1251	59	64	-	1	2	-	-
1252	59	64	-	1	2	-	-
1253	60	64	-	1	2	-	-
1254	60	65	-	1	2	-	-
1255	60	64	-	1	2	-	-
1256	60	65	-	1	2	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
1257	60	65	-	1	2	-	-
1324	55	57	-	0	1	-	-
1330	56	57	-	0	1	-	-
1331	56	58	-	0	1	-	-
1332	56	58	-	0	1	-	-
1333	57	58	-	0	1	-	-
1334	57	59	-	0	1	-	-
1335	58	61	-	1	1	-	-
1336	59	62	-	1	1	-	-
1337	60	65	-	1	2	-	-
1338	60	65	-	1	2	-	-
1339	60	65	-	1	2	-	-
1414	56	57	-	0	1	-	-
1415	56	58	-	0	1	-	-
1416	56	58	-	0	1	-	-
1417	57	58	-	0	1	-	-
1418	57	59	-	1	1	-	-
1423	56	57	-	0	1	-	-
1424	56	58	-	0	1	-	-
1425	56	58	-	0	1	-	-
1426	57	58	-	0	1	-	-
1427	57	59	-	1	1	-	-
1428	57	59	-	1	1	-	-
1429	59	61	-	1	1	-	-
1430	59	61	-	1	1	-	-
1431	59	61	-	1	1	-	-
1432	59	61	-	1	1	-	-
1433	59	61	-	1	1	-	-
1434	59	61	-	1	1	-	-
1435	59	61	-	1	1	-	-
1436	59	62	-	1	1	-	-
1437	60	62	-	1	1	-	-
1438	60	62	-	1	1	-	-
1439	60	62	-	1	1	-	-
1440	60	62	-	1	1	-	-
1441	60	62	-	1	1	-	-
1442	60	62	-	1	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
1443	60	65	-	1	2	-	-
1444	60	65	-	1	2	-	-
1445	59	65	-	1	2	-	-
1446	59	65	-	1	2	-	-
1447	60	65	-	1	2	-	-
1448	60	65	-	1	2	-	-
1505	56	57	-	0	1	-	-
1506	56	58	-	0	1	-	-
1507	56	58	-	0	1	-	-
1508	57	58	-	0	1	-	-
1509	58	59	-	1	1	-	-
1510	58	59	-	1	1	-	-
1514	56	57	-	0	1	-	-
1515	56	58	-	0	1	-	-
1516	57	58	-	0	1	-	-
1517	57	58	-	0	1	-	-
1518	58	59	-	1	1	-	-
1519	58	59	-	1	1	-	-
1520	58	60	-	1	1	-	-
1521	59	61	-	1	1	-	-
1522	59	61	-	1	1	-	-
1523	60	62	-	1	1	-	-
1524	59	61	-	1	1	-	-
1525	60	62	-	1	1	-	-
1526	60	65	-	1	2	-	-
1527	60	66	-	1	2	-	-
1528	60	66	-	1	2	-	-
1529	59	66	-	1	2	-	-
1614	56	57	-	0	1	-	-
1615	56	58	-	0	1	-	-
1616	57	58	-	0	1	-	-
1617	57	58	-	0	1	-	-
1622	56	57	-	0	1	-	-
1623	56	58	-	0	1	-	-
1624	56	58	-	0	1	-	-
1625	57	58	-	0	1	-	-
1626	57	59	-	0	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
1701	58	59	-	1	1	-	-
1702	58	59	-	1	1	-	-
1703	58	60	-	1	1	-	-
1704	58	60	-	1	1	-	-
1705	58	60	-	1	1	-	-
1706	58	60	-	1	1	-	-
1707	59	61	-	1	1	-	-
1708	59	61	-	1	1	-	-
1709	59	61	-	1	1	-	-
1710	59	61	-	1	1	-	-
1711	59	61	-	1	1	-	-
1712	59	61	-	1	1	-	-
1713	59	61	-	1	1	-	-
1714	59	61	-	1	1	-	-
1715	59	61	-	1	1	-	-
1716	60	62	-	1	1	-	-
1717	60	62	-	1	1	-	-
1718	60	63	-	1	2	-	-
1719	60	63	-	1	2	-	-
1720	60	62	-	1	1	-	-
1721	60	62	-	1	1	-	-
1722	60	62	-	1	1	-	-
1723	60	62	-	1	1	-	-
1724	60	62	-	1	1	-	-
1725	59	65	-	1	2	-	-
1726	59	66	-	1	2	-	-
1727	59	66	-	1	2	-	-
1728	59	66	-	1	2	-	-
1729	60	66	-	1	2	-	-
1730	60	66	-	1	2	-	-
1731	59	66	-	1	2	-	-
1732	59	66	-	1	2	-	-
1803	56	57	-	0	1	-	-
1804	56	58	-	0	1	-	-
1805	56	58	-	0	1	-	-
1806	57	58	-	0	1	-	-
1807	57	59	-	0	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
1910	56	57	-	0	1	-	-
1911	56	58	-	0	1	-	-
1912	56	58	-	0	1	-	-
1913	56	58	-	0	1	-	-
1914	57	58	-	0	1	-	-
1915	56	58	-	0	1	-	-
1916	56	58	-	0	1	-	-
1917	56	58	-	0	1	-	-
1918	56	57	-	0	1	-	-
1919	56	57	-	0	1	-	-
1926	63	65	-	2	2	A	B
1927	66	67	-	2	2	B	B
1928	66	66	-	2	2	B	B
1929	66	67	-	2	2	B	B
1930	66	66	-	2	2	B	B
1931	66	67	-	2	2	B	B
1932	66	67	-	2	2	B	B
1933	66	67	-	2	2	B	B
1934	66	67	-	2	2	B	B
1935	66	67	-	2	2	B	B
1936	66	67	-	2	2	B	B
1937	66	67	-	2	2	B	B
2001	57	58	-	0	1	-	-
2002	57	59	-	1	1	-	-
2003	57	59	-	1	1	-	-
2004	58	59	-	1	1	-	-
2005	58	60	-	1	1	-	-
2006	58	60	-	1	1	-	-
2007	59	60	-	1	1	-	-
2008	59	61	-	1	1	-	-
2009	60	61	-	1	1	-	-
2010	60	62	-	1	1	-	-
2011	60	62	-	1	1	-	-
2012	60	62	-	1	1	-	-
2013	61	63	-	1	2	-	-
2014	61	63	-	1	2	-	-
2015	61	63	-	1	2	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
2016	60	63	-	1	2	-	-
2017	60	63	-	1	2	-	-
2018	60	62	-	1	1	-	-
2019	60	62	-	1	1	-	-
2020	60	62	-	1	1	-	-
2021	60	62	-	1	1	-	-
2022	60	62	-	1	1	-	-
2023	60	62	-	1	1	-	-
2101	60	63	-	1	2	-	-
2102	61	63	-	1	2	-	-
2103	61	63	-	1	2	-	-
2104	61	63	-	1	2	-	-
2105	61	63	-	1	2	-	-
2106	61	64	-	1	2	-	-
2107	61	64	-	1	2	-	-
2109	61	64	-	1	2	-	-
2110	61	64	-	1	2	-	-
2111	59	66	-	1	2	-	-
2112	60	67	-	1	2	-	-
2113	60	67	-	1	2	-	-
2114	60	67	-	1	2	-	-
2115	60	67	-	1	2	-	-
2116	61	67	-	1	2	-	-
2117	61	67	-	1	2	-	-
2118	61	68	-	1	3	-	-
2119	61	68	-	1	3	-	-
2201	57	59	-	1	1	-	-
2202	58	60	-	1	1	-	-
2203	58	60	-	1	1	-	-
2204	58	60	-	1	1	-	-
2205	58	60	-	1	1	-	-
2206	59	60	-	1	1	-	-
2207	59	61	-	1	1	-	-
2208	59	61	-	1	1	-	-
2209	59	61	-	1	1	-	-
2210	60	61	-	1	1	-	-
2211	60	62	-	1	1	-	-

Lot	Predicted Traffic Noise Level, $L_{10,18h}$			QDC MP 4.4 Noise		AS3671 Construction Category[3]	
	Ground	First	Second	Ground	First	Ground	First
2212	60	62	-	1	1	-	-
2213	61	63	-	1	2	-	-
2214	61	63	-	1	2	-	-
2215	62	64	-	1	2	-	-
2216	62	64	-	1	2	-	-
2217	65	67	-	2	2	A	B
2218	65	67	-	2	2	B	B
2219	65	67	-	2	2	B	B
2220	65	67	-	2	2	B	B
2221	64	66	-	2	2	A	B
2222	64	66	-	2	2	A	B
2223	64	65	-	2	2	A	B
2224	63	65	-	2	2	A	B
2225	63	65	-	2	2	-	A
2226	62	65	-	1	2	-	-
2227	62	64	-	1	2	-	-
2228	62	64	-	1	2	-	-
2229	62	64	-	1	2	-	-
2230	62	64	-	1	2	-	-
2231	62	64	-	1	2	-	-
2232	62	64	-	1	2	-	-
2233	62	64	-	1	2	-	-
2234	62	65	-	1	2	-	-
2235	62	65	-	1	2	-	-
2236	62	66	-	1	2	-	-
2237	62	67	-	1	2	-	-
2238	61	68	-	1	3	-	-
2239	61	68	-	1	3	-	-
2341	56	58	-	0	1	-	-
2342	55	57	-	0	1	-	-
8001	59	60	61	1	1 (1 Second Floor	-	-

Appendix E QDC MP4.4 Construction Requirements

Schedule 1 of QDC MP4.4 for the minimum required R_w of building components is reproduced in **Table 11**. Recommendations for the performance and construction of façade elements has been provided in

Table 12. NOTE: Other forms of construction may be applied, provided these meet the R_w values required.

Where a R_w rating applies to a window, this applies to the glass, frame and window seal system. An acoustic test certificate will be required from the window supplier for Category 2 glazing and higher. It is noted that in order to achieve the internal design sound levels, windows must remain closed.

Table 11: Minimum Rw required for the building component (reproduced from QDC MP4.4)

Noise Category	Minimum transport noise reduction required for habitable rooms, dB(A)	Component of building's external envelope	Minimum R_w required for each component
3	35	Glazing	38 (total area of glazing for a *habitable* room is greater than 1.8m^2)
			35 (total area of glazing for a *habitable* room is less than or equal to 1.8 m^2)
		External walls	47
		Roof	41
		Floors	45
		Entry doors	33
2	30	Glazing	35 (total area of glazing for a *habitable* room is greater than 1.8m2)
			32 (total area of glazing for a *habitable* room is less than or equal to 1.8 m^2)
		External walls	41
		Roof	38
		Floors	45
		Entry doors	33
1	25	Glazing	27 (total area of glazing for a *habitable* room is greater than 1.8 m^2)
			24 (total area of glazing for a *habitable* room is less than or equal to 1.8 m^2)
		External walls	35
		Roof	35
		Entry doors	28
0	No additional acoustic treatment required – standard building assessment provisions apply.		

Table 12: Construction recommendations (reproduced from QDC MP4.4)

Component of building's external envelope	Minimum R_w	Component of building's external envelope
Glazing	38	Minimum 14.38 mm thick laminated glass, with full perimeter *acoustically rated seals*; OR

Component of building's external envelope	Minimum R_w	Component of building's external envelope
		Double glazing consisting of one pane of minimum 5 mm thick glass and one pane of minimum 6 mm thick glass with at least 44 mm air gap, and full perimeter *acoustically rated seals*
	35	Minimum 10.38 mm thick laminated glass, with full perimeter *acoustically rated seals*.
	32	Minimum 6.38 mm thick laminated glass with full perimeter *acoustically rated seals*.
	27	Minimum 4 mm thick glass with full perimeter *acoustically rated seals*
	24	Minimum 4 mm thick glass with standard weather seals
External Walls	47	Two leaves of clay brick masonry at least 110 mm thick with: (i) cavity not less than 50 mm between leaves; and (ii) 50 mm thick mineral insulation or 50 mm thick glass wool insulation with a density of 11kg/m^3 or 50 mm thick polyester insulation with a density of 20kg/m^3 in the cavity. OR Two leaves of clay brick masonry at last 110 mm thick with: (i) cavity not less than 50 mm between leaves; and (ii) at least 13 mm thick cement render on each face OR Single leaf of clay brick masonry at least 110 mm thick with: (i) a row of at least 70 mm x 35 mm timber studs or 64 mm steel studs at 600 mm centres, spaced at least 20 mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50 mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of plasterboard at least 13 mm thick fixed to outside face of studs. OR Single leaf of minimum 150 mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging.
External Walls (cont.)	41	Two leaves of clay brick masonry at least 110 mm thick with cavity not less than 50 mm between leaves OR Single leaf of clay brick masonry at last 110 mm thick with: (i) a row of at least 70 mm x 35 mm timber studs or 64 mm steel studs at 600 mm centres, spaced at least 20 mm from the masonry wall; and (ii) mineral insulation or glass wool insulation at least 50 mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of plasterboard at least 10 mm thick fixed to outside face of studs OR Single leaf of brick masonry at least 110 mm thick with at least 13 mm thick render on each face OR Concrete brickwork at least 110 mm thick OR In-situ concrete at least 100 mm thick OR Precast concrete at least 100 mm thick and without joints.
	35	Single leaf of clay brick masonry at least 110 mm thick with:

Component of building's external envelope	Minimum R_w	Component of building's external envelope
		(i) a row of at least 70 mm x 35 mm timber studs or 64 mm steel studs at 600 mm centres, spaced at least 20 mm from the masonry wall; and (ii) One layer of plasterboard at least 10 mm thick fixed to outside face of studs OR Minimum 6 mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90 mm deep timber stud or 92 mm metal stud, standard plasterboard at least 13 mm thick internally.
Roof	41	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10 mm thick fixed to ceiling joists, glass wool insulation at least 50 mm thick with a density of at least 11 kg/m^3 or polyester insulation at least 50 mm thick with a density of at least 20 kg/m^3 in the cavity. OR Concrete suspended slab at least 100 mm thick.
	38	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10 mm thick fixed to ceiling cavity, mineral insulation or glass wool insulation at least 50 mm thick with a density of at least 11 kg/m^3.
	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10 mm thick fixed to ceiling cavity.
Floors	45	Concrete slab at least 100 mm thick OR Tongued and grooved boards at least 19 mm thick with: (i) timber joists not less than 175 mm x 50 mm; and (ii) mineral insulation or glass wool insulation at least 75 mm thick with a density of at least 11 kg/m^3 positioned between joists and laid on plasterboard at least 10 mm thick fixed to underside of joists; and (iii) mineral insulation or glass wool insulation at least 25 mm thick with a density of at least 11 kg/m^3 laid over entire floor, including tops of joists before flooring is laid; and (iv) secured to battens at least 75 mm x 50 mm; and (v) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.
Entry Doors	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10 mm, fitted with full perimeter acoustically rated seals and constructed of - (i) solid core, wood, particleboard or blockboard not less than 45 mm thick; and/or (ii) acoustically laminated glass not less than 10.38 mm thick.
	28	Fixed so as to overlap the frame or rebate of the frame, constructed of - (i) Wood, particleboard or blockboard not less than 33 mm thick; or (ii) Compressed fibre reinforced sheeting not less than 9 mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4 kg/m^2; or (iv) Solid core timber door not less than 35 mm thick fitted with full perimeter *acoustically rated seals*.

Appendix F AS3671 Construction Requirements

This appendix provides supplementary information to this report with respect to the required building construction category for the proposed residential buildings within this Stage.

This assessment specifies building envelope requirements in terms of categories in accordance with Australian Standard AS 3671:1989 – *"Acoustics – Road Traffic Noise Intrusion, Building & Siting".* This has been adopted as the construction is required to control road traffic noise levels potentially intruding into the dwellings.

This standard does not provide the specific constructions required to achieve these categories, or minimum Weighted Sound Reduction Index (Rw ratings) of specific building elements.

Because AS3671 does not specify actual construction, adoption of this category system means that a specific acoustic report for each dwelling may be required where the required Category is 3 or more, and there is often some confusion as to the definition of "standard construction".

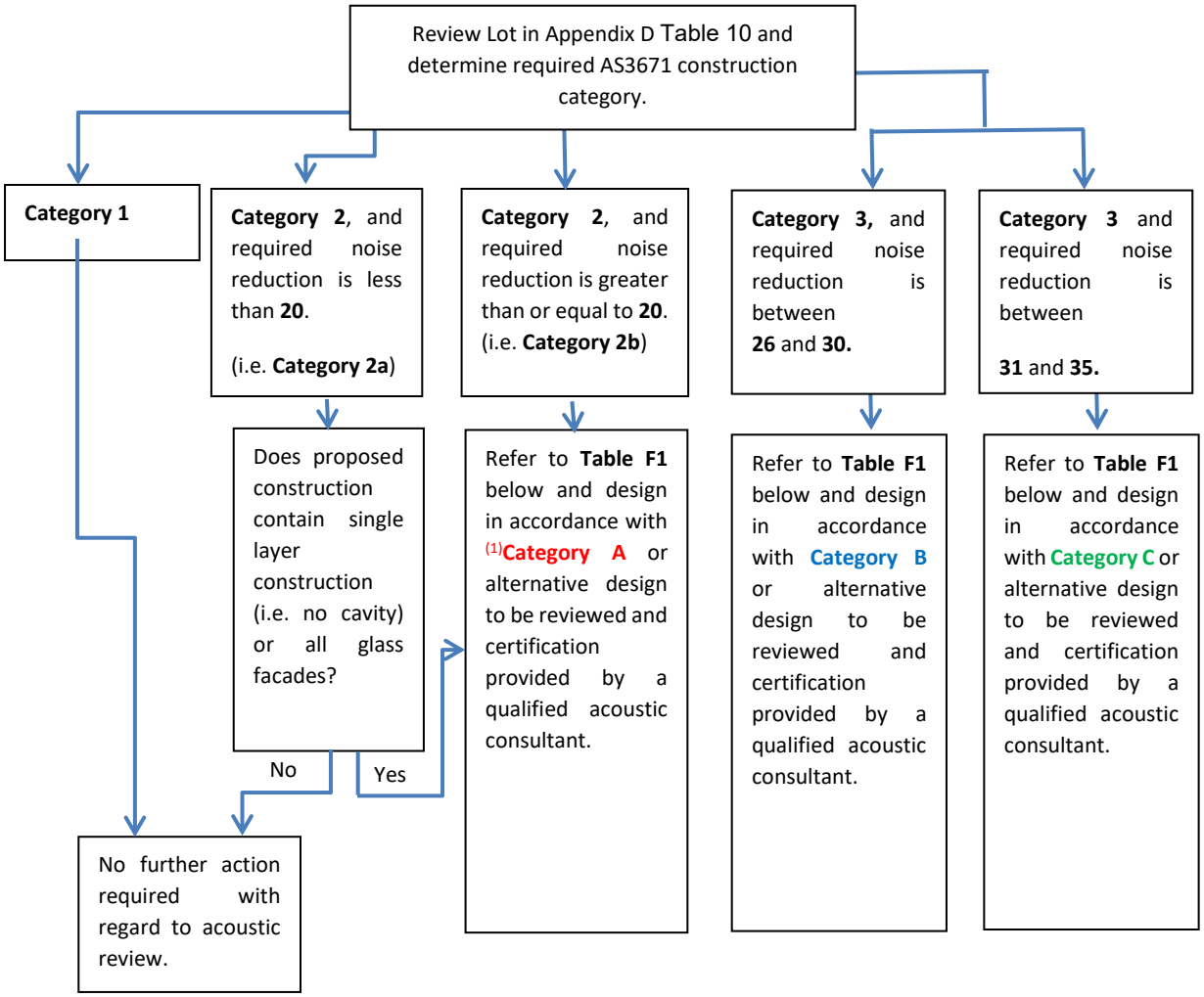
The following information has been prepared to provide alternative to obtaining a specific acoustic report for each dwelling. It should be noted that because this advice has been generalised to suit the entire site, the following recommendations may be conservative, and some savings to the building costs may be made if an individual acoustic report is obtained for a specific dwelling.

This appendix intends to provide a typical indication of required building materials depending on the noise reduction required and should be read in accordance with the information contained in this acoustic report. Please note that the information in this appendix applies to this development only and is not general advice suitable for use for other developments.

The following process should be adopted to identify the recommended minimum construction for the dwelling:

1. Determine the Lot number for the dwelling in question.
2. Based on the Lot number, obtain the required construction category from Table 10: Future Road Noise Traffic Predictions in Appendix D of this report.
3. Follow the flowchart detailed in Figure F-1.

Figure F-1: Procedure to Select the Required Dwelling Construction Based on AS3671 Construction Category



Notes:

(1) Category A as referred to above, can generally be achieved with standard construction unless the dwelling is constructed from single layer construction (i.e. no wall cavity) or all glass facades. Refer below for typical constructions required to achieve the nominated categories. An acoustic review / design certification would generally be required if the dwelling construction is a significant departure from standard construction or that detailed below.

Table F-1 below specifies the minimum required Weighted Sound Reduction Index (Rw rating) for each element (e.g. windows, walls, etc.) of the dwelling building envelope, depending on the required noise reduction and category as selected above from Figure F-1. Alternative construction to that listed in the table is acceptable on condition it meets the minimum Rw rating for the component.

Table F-1: Typical Required Building Construction Acoustic Rating Compared to Required Noise Reduction

Equivalent AS 3671 Category	Minimum traffic noise reduction (dB(A)) required for habitable rooms	Component of Buildings external envelope	Minimum Rw required for each component	Indicative Construction Required to achieve this Rw Rating
Category A	21-25	Glazing	27 (where total area of glazing for a habitable room is greater than 1.8m^2)	Minimum 4mm thick glass with full perimeter acoustically rated seals
			24 (where total area of glazing for a habitable room is less than or equal to 1.8m^2)	Minimum 4mm thick glass with standard weather seals
		External Walls	35	Single leaf of clay brick masonry at last 110mm thick with: (i) a row of 70mm x 35mm timber studs or 64mm steel studs at 600mm centres; and (ii) mineral insulation or glass wool insulation at least 50mm thick with a density of min. 11 kg/m^3 positioned between studs; and (iii) One layer of 10mm thick plasterboard fixed to outside face of studs OR Outer layer FC Sheet or equivalent lightweight external cladding (minimum mass 12.5kg/m^2) with; (i) a row of 70mm x 35mm timber studs or 64mm steel studs at 600mm centres; and (ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of 10mm thick plasterboard fixed to outside face of studs
		Roof	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.

		Entry Door	28	Fixed so as to overlap the frame or rebate of the frame, constructed of (i) 35mm thick wood, particleboard or block board; or (ii) 9mm Compressed fibre reinforced sheeting not less than 9mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4kg/m^2; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter acoustically rated seals.
Category B	26-30	Glazing	35 (where total area of glazing for a habitable room is greater than 1.8m^2)	Minimum 10.38mm thick laminated glass, with full perimeter acoustically rated seals
			32 (where total area of glazing for a habitable room is less than or equal to 1.8m^2)	Minimum 6.38mm thick laminated glass with full perimeter acoustically rated seals.
		External Walls	41	Single leaf of clay brick masonry at last 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of plasterboard at least 10mm thick fixed to outside face of studs
		Roof	38	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to the ceiling cavity, mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3.
		Floors	45	Concrete slab at least 100mm thick OR Tongued and grooved boards at least 19mm thick with: (i) timber joists not less than 175mm x 50mm; and (ii) mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/m^3 positioned between joists and laid on plasterboard

				at least 10mm thick fixed to underside of joists; and (iii) mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/m^3 laid over entire floor, including tops of joists before flooring is laid; and (iv) secured to battens at least 75mm x 50mm; and (v) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.
		Entry Door	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with perimeter acoustic seals and constructed from - (i) solid core, wood, particleboard or block board 45mm thick; and/or (ii) acoustically laminated glass 10.38mm thick.
Category C	31-35	Glazing	38 (where total area of glazing for a habitable room is greater than 1.8m^2)	Minimum 14.38mm thick laminated glass, with full perimeter acoustically rated seals; OR Double glazing consisting of one pane of minimum 5mm thick glass and one pane of minimum 6mm thick glass with at least 44mm air gap, and full perimeter acoustically rated seals
			35 (where total area of glazing for a habitable room is less than or equal to 1.8m^2)	Minimum 10.38mm thick laminated glass, with full perimeter acoustically rated seals
		External Walls	47	Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs.
		Roof	41	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling joists, glass wool insulation at least 50mm thick with a density of at least 11kg/m^3 or polyester insulation at

			least 50mm thick with a density of at least 20kg/m^3 in the cavity. OR Concrete suspended slab at least 100mm thick
	Floors	45	Concrete slab at least 100mm thick OR Tongued and grooved boards at least 19mm thick with: (i) timber joists not less than 175mm x 50mm; and (ii) mineral insulation or glass wool insulation at least 75mm thick with a density of at least 11kg/m^3 positioned between joists and laid on plasterboard at least 10mm thick fixed to underside of joists; and (iii) mineral insulation or glass wool insulation at least 25mm thick with a density of at least 11kg/m^3 laid over entire floor, including tops of joists before flooring is laid; and (iv) secured to battens at least 75mm x 50mm; and (v) the assembled flooring laid over the joists, but not fixed to them, with battens lying between the joists.
	Entry Door	33	Fixed so as to overlap the frame or rebate of the frame by not less than 10mm, fitted with full perimeter acoustically rated seals and constructed of - (i) solid core, wood, particleboard or block board not less than 45mm thick; and/or (ii) acoustically laminated glass not less than 10.38mm thick.

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