

AURA DEVELOPMENT – PRECINCT 18 AURA LAKES

Bells Creek Arterial Road, Caloundra South QLD 4551

Road Traffic Noise Assessment

Stockland

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1. INTRODUCTION

Trinity Consultants Australia (Trinity) has been commissioned by Stockland Development Pty Ltd to provide a road traffic noise assessment for part of Precinct 18 of the Aura residential development (Aura Lakes), located within the Caloundra South Priority Development Area (PDA).

It is proposed to develop Aura Precincts 17 to 19 on the southern side of the CAMCOS corridor, between the Bruce Highway and the Bells Creek Arterial. This report focuses on Precinct 18 and identifying measures to noise levels generated by the Bell's Creek Arterial Road, sub-arterial road and trunk connector road.

The report addresses a future scenario which examines the impact of the roads using ultimate traffic projections. The barriers have been designed against these road traffic levels.

The purpose of this report is as follows:

- Outline the relevant project noise criteria.
- Predict and assess the road traffic noise impact onto Precinct 18.
- Describe noise mitigation requirements for Interim and Future scenarios as discussed above.

To aid in the understanding of the terms in this report, a glossary is included in **Appendix A**.

1.1 Information Requests

Trinity completed an original noise assessment report on 14 November 2023 (report 217401.0141.R02V01) as part of a development application for the subject site. SARA reviewed the application documents (including the noise report) and subsequently issued an information request on 22 December 2023. An updated report was issued on 12 April 2024 (report 217401.0141.R02V02) responding to this information request. A further issues letter was issued by SARA on 29 May 2024, which requested further information regarding the road traffic noise assessment.

Table 1.1 and **Table 1.2** presents a copy of the December 2023 and May 2024 information request items, followed by a summary response and reference to relevant report sections.

Table 1.1: SARA Information Request (December 2023) and Summary Response

Information Request Item	Summary Response
Acoustic Assessment	
Item 1 Update noise modelling for the 10-year planning horizon plus including a reasonable time for construction i.e. total 12-15 years.	Refer to Urbis response to further issues on 24 June 2024. The 10-year planning horizon (2034) is beyond the scope of the VISUM, which only models up to 2031, noting that by 2034, this scenario is representative of the ultimate year where all developments are assumed to be fully built out.
Item 2 Provide a table which outlines the specific noise predictions and relevant construction categories for each noise affected allotment for ground and first floors, and if applicable, second floor receivers.	This information has been provided in Appendix D .
Item 3 Provide a separate plan with appropriate chainage and section / details for all required acoustic barriers and heights (to top of wall / RL).	Figure C4 presents the barrier relative height details. The heights are relative to the digital terrain model provided (Appendix F). Further barrier details are provided separately by Stantec.
Item 4	This has been covered by Stockland in a separate document.

Information Request Item	Summary Response
For the Plan of Development, identify all noise affected allotments as identified in an updated Road Traffic Noise Assessment report (i.e. black star annotation).	
Acoustic Assessment - DTMR	
Item 1 Demonstrate compliance with the free field noise criteria applicable to private open space from AO38.1. Compliance with free field noise criteria must be based on free field predictions. The report needs to be updated to provide free field noise contour maps to demonstrate compliance with free field noise criteria from AO38.1 on all areas of all residential Lots.	The approach to estimating free-field noise levels has been updated and additional figures are provided for review.
Item 2 Earthworks - The report shall reference the earthworks plans (Drawing number, revision and date) used in the noise modelling and append a copy of the earthworks plans to the report.	Refer to Appendix F for earthworks drawings.
Item 3 Provide the pad levels for the proposed Lots in the report. Reference to electronic files only is not accepted.	This information has been provided in Appendix D.
Item 4 Provide source, commentary and information to allow the State to establish the alignment Bells Creek Road used in the noise modelling.	The road alignment and heights are as per the Stantec drawings provided in Appendix F.
Item 5 Noise barriers required for compliance with SDAP requirements must comply with TMR technical specification MRTS15. Provide further design information for any proposed barriers.	Detailed barrier design is not available at the current stage of the project. This can be provided at a later stage. The current report addresses the required heights and locations only to meet compliance. The design will be in accordance with the relevant TMR specifications.
Item 6 The QDC MP4.4 shall be applied to identify areas of Noise Category 1 or higher. All noise contour plots shall be extended to clearly show the full extent of Noise Category 1 and higher.	The provided contour plot areas are sufficient to cover all QDC MP4.4 affected areas. It is noted that the QDC MP4.4 noise area is not yet defined on the Queensland Government State Planning Policy Interactive Mapping System. However, based on the current mapping, the QDC MP4.4 extends 250 metres from major roads with similar traffic volumes to Bells Creek Arterial Road. Therefore, it is assumed that QDC MP4.4 requirements will only extend 250 metres from the Bells Creek Arterial Road.
Item 7 Figure C3 shall be annotated to provide the reduced levels (RL) for the top of the noise barrier at the corner of each Lot, at locations of change in noise barrier height and noise barrier ends. Provide zoomed in section and detail of the noise barrier heights and locations. This figure/s shall also confirm the length of the noise barrier which is required to extend beyond the extent of this precinct.	Figure C4 presents the barrier relative height details. The heights are relative to the digital terrain model provided (Appendix F). Further barrier details can be produced during detailed design stages.
Item 8 Childcare and Educational Establishments – Provide noise contours to demonstrate compliance with PO45 (≤ 58 dB(A) L10 (1 hour) façade corrected (maximum hours during normal opening hours).	Section 5.3.3 has been updated to provide further detail on educational establishments.

Table 1.2: SARA Information Request (May 2024) and Summary Response

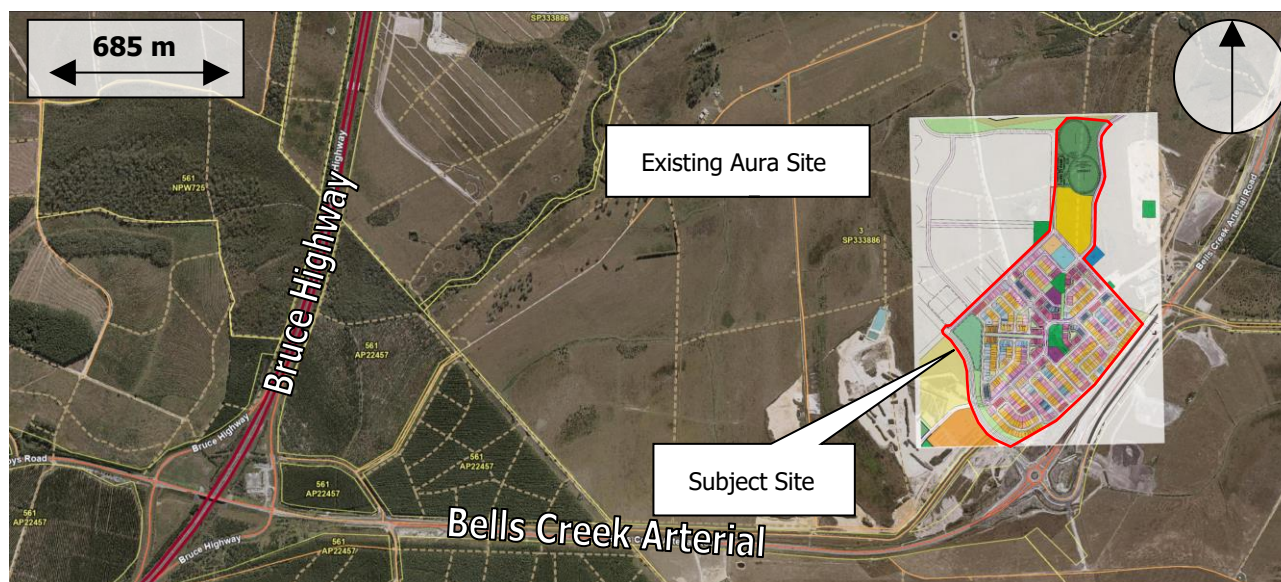
Information Request Item	Summary Response
Acoustic Assessment	
Item 2c Provide a response to DTMR Acoustic Assessment Item 1 – 10-year planning horizon.	Refer to Urbis response to further issues on 24 June 2024. The 10-year planning horizon (2034) is beyond the scope of the VISUM, which only models up to 2031, noting that by 2034, this scenario is representative of the ultimate year where all developments are assumed to be fully built out.
Item 2d In Table 5.1, Segment B2, B3, B5 and B6 has significantly lower traffic volume compared to Segment B1 and B4. Please provide a technical memo from PWC with the traffic volume outputs (AADT) from the VISUM model.	The road traffic volumes have been updated based on the latest traffic reports (Aura Precinct P17-19 Traffic Modelling Refresh, June 2024, and RFI Response, 19 June 2024).
Item 2e Provide a response to DTMR Acoustic Assessment Item 4. Segment A3 and A4 in Figure 5.1 is only the traffic volume of the interchange ramp (based on 2031 traffic model). The ramp infrastructure would be located much closer to the P18 boundary. Remodel the interchange based on a schematic interchange design and include the traffic volume of the interchange itself. Provide spot levels for the schematic interchange design.	In relation to TMR Item 4, the road alignment and heights are as per the Stantec drawings provided in Appendix F.
Item 2f The traffic volume on Trunk Connector is reasonably high and is required to have noise assessment undertaken. Amend the Traffic Noise Assessment, including a technical memo from PWC confirming traffic volume.	The Trunk Connector traffic has been included in the updated noise model. Traffic data is based on the latest traffic reports (Aura Precinct P17-19 Traffic Modelling Refresh, June 2024, and RFI Response, 19 June 2024).
Item 2g As discussed in our meeting with Trinity Consultants and Stockland on 15 April 2024, the noise criteria for the whole Precinct 18 are to be clearly defined (e.g. recommended to be in accordance with QDC MP4.4). This would negate the need for individual dwelling noise assessment in accordance with AS2107 and AS3671. Amend the Traffic Noise Assessment accordingly or provide an alternative solution that removes this burden on individual lot owner/s to undertake a site-specific acoustic assessment.	Refer to Urbis response to further issues on 24 June 2024. Construction costs associated with this approach is being reviewed by Stockland. For the purposes of this application, the methodology has not been amended and will be negotiated at a later date.

In addition to the above, the $L_{A10,1\text{-hour}}$ and $L_{A10,12\text{-hour}}$ predictions at the future school and child care centre lots have been revised based on feedback from TMR.

2. STUDY AREA DESCRIPTION

The development is within the existing Aura estate and will form part of Caloundra South on the Sunshine Coast. The site location of Precinct 18 is shown in **Figure 2.1** (source: Queensland Globe).

Figure 2.1: Site Location



The site is currently vacant, and generally consists of cleared land.

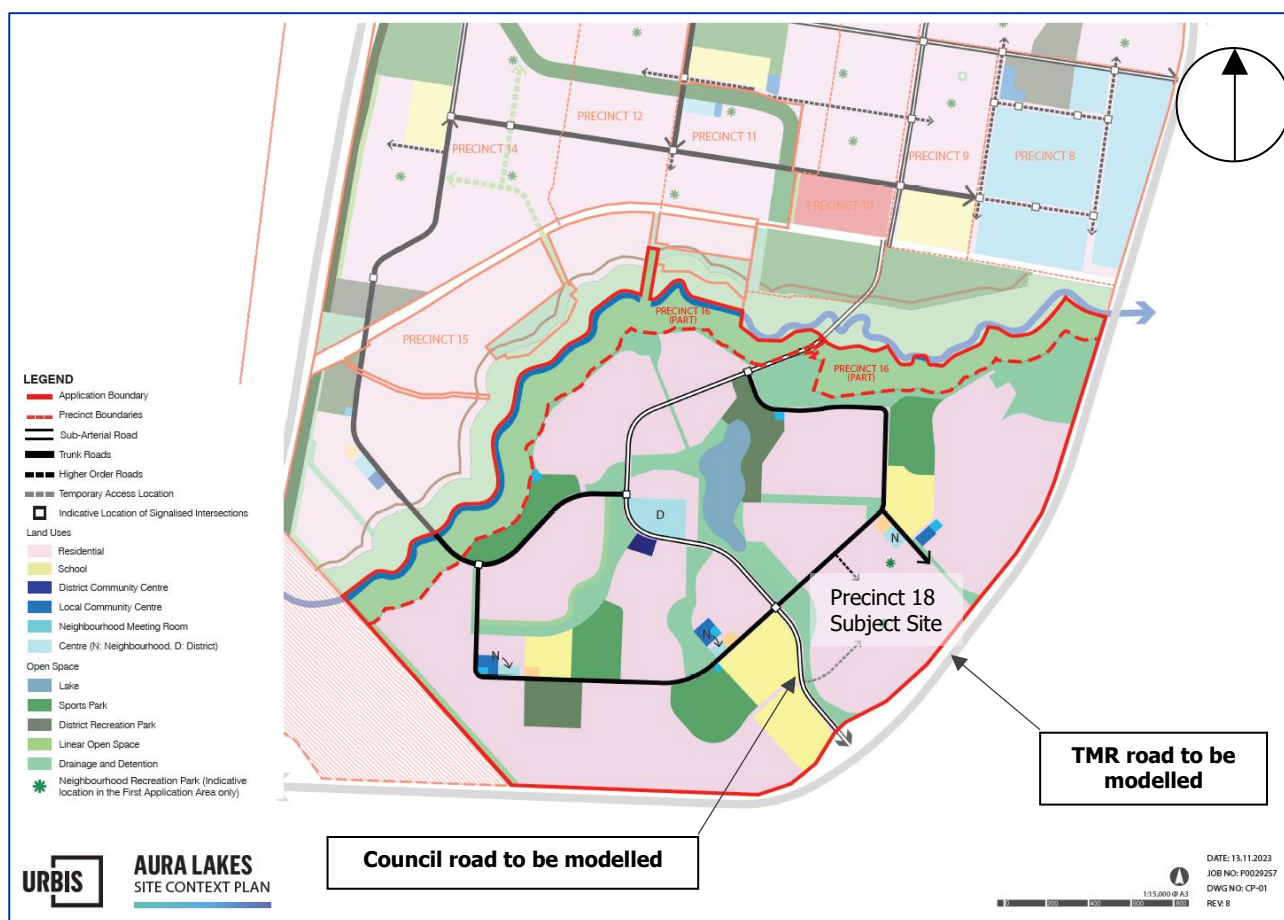
The proposed development is surrounded by the following uses (refer **Figure 2.1**):

- Existing and future development to the west and north.
- Bells Creek Arterial to the east and south.
- Internal major road to the south, between subject Precinct 18 and adjoining future Precinct 19.

The approved site for Precinct 18 is demarcated in solid red in **Figure 2.1** above.

As per the Caloundra South Structure Plan (**Figure 2.2**), Precinct 18 is located east of the other proposed precincts and connects Bells Creek Arterial to the surrounding precincts, i.e. 17 and 19. This assessment will consider the internal sub-arterial road and trunk connector roads (Council controlled), and Bells Creek Arterial (TMR controlled) shown in **Figure 2.2** below.

Figure 2.2: Caloundra South Structure Plan



3. PROPOSED DEVELOPMENT

The proposed Precinct 18 development includes the following components:

- Residential allotments of various sizes;
- Educational lots, including a school and child care;
- Park areas.

A full-size site layout is to be included in **Appendix B**.

4. NOISE CRITERIA

4.1 Overview

Acoustic criteria for the project are required to assess the impact of road traffic noise onto the various lots of the proposed development.

The acoustic assessment will be undertaken in accordance with the following relevant criteria:

- Department of State Development, Manufacturing, Infrastructure and Planning (DSDMIP) State Assessment and Referral Agency (SARA) – State Development Assessment Provisions (SDAP).
- Department of Transport and Main Roads (TMR) – Road Traffic Noise Management: Code of Practice.
- Department of Housing and Public Works (HPW) – Queensland Development Code (QDC) Mandatory Part 4.4 (MP4.4) 'Buildings in transport noise corridors'.
- Department of Environment and Science (DES) – Environmental Protection Policy (Noise) and Environmental Protection Act.
- Sunshine Coast Council Planning Scheme 2014.
- Australian Standard AS/NZS 2107–2016: Acoustics— Recommended design sound levels and reverberation times for building interiors.

4.2 SARA SDAP: Development in a State-Controlled Road Environment

The development is subject to road traffic noise from the Bells Creek Arterial, which is a State-controlled Road. Acoustic criteria for the project will need to address noise intrusion into the development in accordance with 'Module 1: Community Amenity' of SDAP. The current version of the SDAP is v3.0, effective 18 February 2022.

The relevant performance outcomes and acceptable outcomes for developments in a state-controlled road or type 1 multi modal corridor environment are presented in **Table 4.1** and reference tables **Table 4.2**, **4.3** and **4.4**.

Table 4.1: SDAP State Code 1 Performance and Acceptable Outcomes

Performance Outcomes	Acceptable Outcomes
Reconfiguring a lot	
Involving the creation of 5 or fewer new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor	
PO37 Development minimises free field noise intrusion from a state-controlled road.	AO37.1 Development provides a 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.

Performance Outcomes	Acceptable Outcomes
	OR AO37.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound. OR AO37.3 Development provides a solid gap-free fence or other solid gap-free structure along the full extent of the boundary closest to the state-controlled road.
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	
PO39 Development minimises noise intrusion from a state-controlled road in private open space.	AO39.1 Development provides a 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 2.2) for private open space at the ground floor level; 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

Performance Outcomes	Acceptable Outcomes
	b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO39.2 Development achieves the maximum free field acoustic level in reference table 2 (item 2.2) for private open space by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.
PO40 Development (excluding a relevant residential building or relocated building) minimises noise intrusion from a state-controlled road in habitable rooms at the facade.	AO40.1 Development (excluding a relevant residential building or relocated building) provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms; 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 AO40.2 Development (excluding a relevant residential building or relocated building) achieves the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.
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).	No acceptable outcome is provided.
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 purposes to comply with the Building Code of Australia);	No acceptable outcome is provided.

Performance Outcomes	Acceptable Outcomes
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).	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: - provides a noise barrier or earth mound that is designed, sited and constructed: - to achieve the maximum free field acoustic level in reference table 2 (item 2.3) for all outdoor education areas and outdoor play areas; - 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; or - 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: - provides a noise barrier or earth mound that is designed, sited and constructed: - to achieve the maximum building facade acoustic level in reference table 1 (item 1.2); - 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;	No acceptable outcome is provided.

Performance Outcomes	Acceptable Outcomes
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.	
PO46 Development involving: 1. indoor education areas and indoor play areas; or 2. sleeping rooms in a childcare centre; or 3. patient care areas in a hospital achieves the maximum internal acoustic level in reference table 3 (items 3.2-3.4)	No acceptable outcome is provided.
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) 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.

Table 4.2: Reference Table 1 - Maximum Building Façade Acoustic Levels

Applicable use	Acoustic levels
1.1: Accommodation activity	a. ≤ 60 dB(A) L10 (18 hour) façade corrected (measured L90 (8 hour) free field between 10pm and 6am ≤ 40 dB(A)) - OR b. ≤ 63 dB(A) L10 (18 hour) façade corrected (measured L90 (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 4.3: Reference Table 2 - Maximum free field acoustic levels

Applicable use	Acoustic levels
2.1: Private open space for residential lots	a. ≤ 57 dB(A) L10 (18 hour) free field (measured L90 (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) L10 (18 hour) free field (measured L90 (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	≤ 63 dB(A) L10 (12 hour) free field (between 6am and 6pm)

Table 4.4: Reference Table 3 - Maximum internal acoustic levels

Applicable use	Acoustic levels
3.1: Habitable rooms in an accommodation activity (excluding uses addressed in QDC MP4.4)	≤ 35 dB(A) Leq (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	
3.4: Patient care areas in a hospital	

4.3 Queensland Development Code MP4.4

The Queensland Government has a number of mandatory codes that must be complied with at the building application stage for a home. These are referred to as Queensland Development Codes (QDC).

QDC Mandatory Part (MP) 4.4 relates to new buildings in transport noise corridors. This mandatory Code deals with buildings within residential developments close to gazetted roads and railways. MP 4.4 sets mandatory construction standards for new residential development, or additions to existing residential development, within a Transport Noise Corridor.

The noise level categories extend out to 57 dBA $L_{10}(18 \text{ hour})$ for road traffic noise. The road noise categories and corresponding noise levels from Schedule 3, Table 1 of MP4.4 as follows:

- Category 0: ≤ 57 dBA $L_{10}(18 \text{ hour})$
- Category 1: 58 – 62 dBA $L_{10}(18 \text{ hour})$
- Category 2: 63 – 67 dBA $L_{10}(18 \text{ hour})$
- Category 3: 68 – 72 dBA $L_{10}(18 \text{ hour})$
- Category 4: ≥ 73 dBA $L_{10}(18 \text{ hour})$

4.4 Sunshine Coast Council

On 14 April 2014 the Sunshine Coast Council (SCC) adopted the Sunshine Coast Planning Scheme 2014 and the associated planning scheme policies. The planning scheme and the planning scheme policies were gazetted on 2 May 2014 and commenced on 21 May 2014. The Sunshine Coast Planning Scheme 2014 replaces the Caloundra City Plan 2004 and Maroochydore City Plan 2000 planning schemes with one plan for the region.

With regards to the assessment of noise impacts, the relevant sections of the planning scheme are the Nuisance Code (Section 9.4.3) and the Planning Scheme Policy for the Nuisance Code (Section SC6.15). The

Nuisance Code presents Performance Outcomes and Acceptable Outcomes for assessable development for acoustic amenity and noise but does not specifically nominate noise limits or assessment criteria. The Planning Scheme Policy for the Nuisance Code provides guidance for the assessment of road and rail noise, live entertainment, amplified music and voices (patrons). The policy does not specify noise limits but references the following guidelines to achieve the nuisance code outcomes:

- Australian Standard AS/NZS2107–2000: Acoustics— Recommended design sound levels and reverberation times for building interiors. This document is superseded by the 2016 version.
- Department of Housing and Public Works (HPW) – Queensland Development Code (QDC) Mandatory Part 4.4 (MP4.4) 'Buildings in transport noise corridors'.
- Department of Environment and Science (DES) (formerly Department of Environment and Heritage Protection) – Environmental Protection Policy (Noise) and Environmental Protection Act.
- Department of Transport and Main Roads (TMR) – Road Traffic Noise Management: Code of Practice.

On 29th September 2014 Council advised that at the present time, road traffic noise intrusion into buildings should still be assessed against the criteria previously applied by Caloundra City Council and Maroochy Shire Council. Caloundra City Council and Maroochy Shire Council specified an external building facade limit of 63 dBA L₁₀(18 hour) (façade corrected) on residential land. For those instances where this external noise limit was predicted to be exceeded, the internal noise levels within habitable rooms were required to be designed to meet the recommended design sound levels stated in Table 1 of AS/NZS 2107-2016 entitled "Acoustics - Recommended design sound levels and reverberation times for building interiors".

On 10th March 2021 Council provided advice on their recommended approach to assessing allotments or residences affected by transport noise from both State and Council roads. The approach is outlined as follows:

- Where the noise from the State controlled road/s is of a sufficient level to trigger QDC MP4.4 (i.e. 58 dBA L₁₀(18 hour) or higher) at a building façade, then determine the MP4.4 categories for the building facades based on the total noise from all (State and Council) roads;
- Where the noise from the State controlled road/s is not of a sufficient level to trigger QDC MP4.4 (i.e. 57 dBA L₁₀(18 hour) or lower), but the noise from all (State and Council) roads is greater than 63 dBA L₁₀(18 hour) (i.e. the Council traffic noise limit) then determine the building requirements using AS3671 and AS2107 based on the noise from all (State & Council) roads; and
- Where the noise from the State controlled road/s is not of a sufficient level to trigger QDC MP4.4 (i.e. 57 dBA L₁₀(18 hour) or lower), and the noise from all (State and Council) roads is not greater than 63 dBA L₁₀(18 hour) (i.e. the Council traffic noise limit) then no building upgrades are required. Note: If a room has multiple facades and requires AS3671/AS2107 assessment, as per dot point above, then the overall room is assessed per that method.

4.5 Australian Standard AS 2107:2016

For road traffic noise, Council recommends the most applicable assessment methodology would be the application of indoor noise levels specified in AS 2107:2016 "Acoustics - Recommended design sound levels and reverberation times for building interiors" (AS 2107). AS 2107 lists recommended internal noise levels for various building and room types, including residential bedrooms and other areas. For development near major and minor roads, the recommended design levels are as listed in **Table 4.3**.

Table 4.5: Recommended Internal Noise Levels from AS 2107:2106

Road Type	Type of Occupancy / Activity	Design Sound Level L _{eq} dBA
Minor Road	Living areas	30 to 40
	Sleeping areas	30 to 35
	Work areas	35 to 40
Major Road	Living areas	35 to 45

Road Type	Type of Occupancy / Activity	Design Sound Level L_{eq} dBA
	Sleeping areas	35 to 40
	Work areas	35 to 45

4.6 Summary and Noise Limits

Based on the noise criteria prescribed by SDAP and Sunshine Coast Council, the road traffic noise criteria nominated for the development are as follows:

- Road traffic noise – Bells Creek Arterial (State controlled road):
 - Residential lots:
 - At 1m outside buildings 63 dBA L_{10} (18 hour) including façade reflection.
 - For outdoor recreation areas 60 dBA L_{10} (18 hour) excluding façade reflection.
 - Application of MP4.4 to achieve acceptable internal noise levels.
 - Childcare centres and educational establishments:
 - At 1m outside buildings 58 dBA L_{10} (1 hour) including façade reflection for maximum hour during normal opening hours.
 - For outdoor recreation areas 63 dBA L_{10} (12 hour) excluding façade reflection.
 - L_{eq} (1 hour) 35 dBA for maximum hour during normal opening hours in indoor education areas and indoor play areas.
- Road traffic noise – Internal sub-arterial and collector roads (Council controlled roads):
 - Residential lots:
 - External facade noise limit: 63 dBA L_{10} (18 hour) (facade corrected).
 - Internal noise limit (if external limit exceeded): internal design noise levels from AS/NZS 2107:2016, specifically:
 - 35 dBA L_{eq} (1 hour) for bedrooms in residences.
 - 40 dBA L_{eq} (1 hour) for other habitable rooms in residences.
- Road traffic noise from both State and Council controlled roads – follow the process in **Section 4.4**.

5. ROAD TRAFFIC NOISE ASSESSMENT

5.1 Overview

For the purposes of the assessment, predictions were undertaken in accordance with the methodology described in the United Kingdom, Department of Transport (1988) procedure, Calculation of Road Traffic Noise (CoRTN). CoRTN is commonly adopted in Australia for the assessment of road traffic noise impacts and has been subject to scientific studies to determine its performance in Queensland conditions (see Section 4.3.2.1 of the TMR Code of Practice).

The calculation method considers the influence of various elements of the road design including traffic flows, traffic fleet composition, road gradient, acoustic shielding by other buildings and elevations, and road surface type. The method predicts $L_{10}(18\text{hour})$ noise level which is the arithmetic average of the hourly noise levels exceeded 10% of the time between the hours of 6:00 am and midnight.

The SoundPLAN 8.2 computer model has been used to undertake the noise predictions in accordance with the CoRTN methodology. The following sections discuss the modelling inputs, assumptions and results.

5.2 Model Input Data

5.2.1 Traffic Data

Traffic volumes were provided by PricewaterhouseCoopers (PwC) and are based on forecasted volumes using the Aura Visum Model. This model assumes an ultimate road network in 2031 with the Bells Creek Arterial operating as an interchange rather than a roundabout. The data provided in **Table 5.1** relates to the road segments shown in **Figure 5.1** and Figure 5.2. It is noted that the data has only been provided in one segment of Bells Creek Arterial Road, the AADT of this segment has been applied to the entirety of the road.

Table 5.1: PWC Year 2031 Traffic Data

Segment	Road / Section	Year 2031 Traffic Volumes	
		AADT	18 hours (6am to midnight)
A1	Bells Creek (Arterial) Road – northbound, north of roundabout	23,144	21,755
A2	Bells Creek (Arterial) Road – southbound, north of roundabout	29,772	27,985
E1	Bells Creek (Arterial) Road – northbound, south of roundabout	21,687	20,385
E2	Bells Creek (Arterial) Road – southbound, south of roundabout	24,239	22,784
B1	Sub-arterial Road - eastbound	7,662	7,202
B2	Sub-arterial Road - eastbound	8,256	7,760
B3	Sub-arterial Road - eastbound	8,256	7,760
B4	Sub-arterial Road - westbound	11,770	11,064
B5	Sub-arterial Road – westbound	8,140	7,652
B6	Sub-arterial Road – westbound	8,140	7,652
C1	Trunk Connector – eastbound	3,405	3,200
C2	Trunk Connector – westbound	3,394	3,190
D1	Trunk Connector – northbound	2,112	1,985

Segment	Road / Section	Year 2031 Traffic Volumes	
		AADT	18 hours (6am to midnight)
D2	Trunk Connector – southbound	1,788	1,680

Figure 5.1: Modelled Road Sections

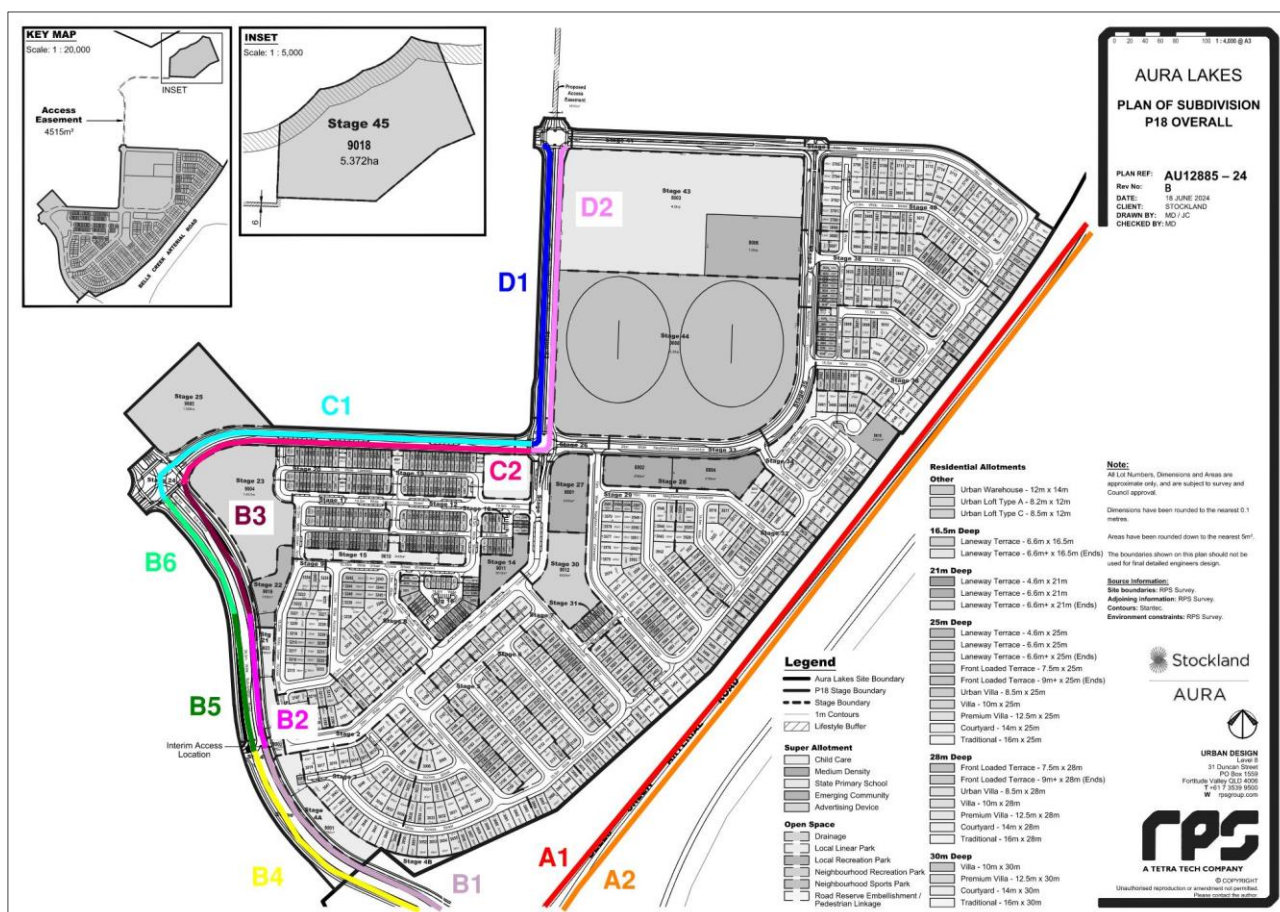
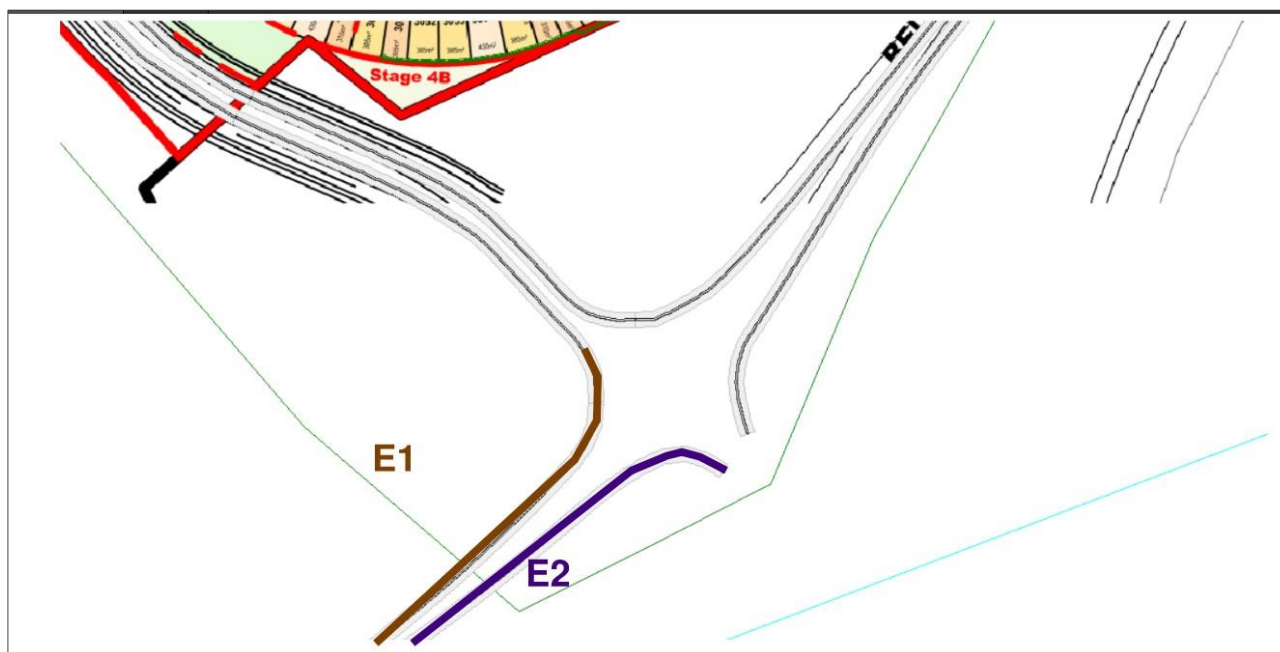


Figure 5.2: Modelled Road Sections (E1 and E2)



The following additional traffic and road assumptions have been applied to the modelling:

- 3% Heavy Vehicle (HV) fleet composition for internal roads and 4% for arterial roads (Note: This is consistent with the assumptions for the earlier Aura development stages).
- 100 km/h along Bells Creek Arterial and 60 km/h along internal (sub-arterial) Road

5.2.2 Other Model Data

In addition to traffic flow data given above, the following assumptions and inputs were considered:

- Noise source height of 0.5m as per CoRTN methodology.
- Road surface corrections:
 - Bells Creek (Arterial) Road: 0 dBA for Dense Graded Asphalt
 - Internal (Sub-arterial) Road: 0 dBA for Dense Graded Asphalt.
- Ground absorption of 0.6, i.e. moderately absorptive, in model except for roads which are fully reflective.
- Ground contours for the site and the surrounding area were obtained from Stantec on 06/11/2023.
- Receiver heights for the proposed lots were 1.8m above ground for ground floors and 4.6 m for the first floors.
- A +2.5 dBA facade reflection allowance is included in the noise level predictions at a facade.
- A - 1.7 dBA façade and – 0.7 dBA free-field calibration factor regarding CoRTN accuracy for Queensland Conditions (as presented in Section 4.3.2.1 of the TMR Code of Practice).

5.3 Future Scenario Predictions (Ultimate)

5.3.1 Without Noise Barriers

Predicted noise level contours are shown in **Appendix C**, as summarised below:

- **Figure C.1** – State-controlled road only (outdoor free-field noise levels)
- **Figure C.2** – State-controlled road only (ground level façade noise levels)
- **Figure C.3** – State-controlled road only (first floor façade noise levels)
- **Figure C.8** – All roads (ground level façade noise levels)
- **Figure C.9** – All roads (first floor façade noise levels).

From these contour results it can be seen that a large number of lots are subject to elevated noise levels, particularly along the eastern boundaries of the site, which are closest to the Bells Creek Arterial road. Based on these results, noise barriers are proposed.

5.3.2 With Noise Barriers

Noise barriers ranging from a relative height of 1.8 m up to 4.2 m are proposed as follows (Refer **Figure C.4**). Predicted noise level contours with are shown in **Appendix C**, as summarised below:

- **Figure C.5** – State-controlled road only (outdoor free-field noise levels)
- **Figure C.6** – State-controlled road only (ground level façade noise levels)
- **Figure C.7** – State-controlled road only (first floor façade noise levels)
- **Figure C.10** – All roads (ground level façade noise levels)
- **Figure C.11** – All roads (first floor façade noise levels).

From these results it can be seen that predicted compliance with the SDAP 60 dBA free-field limit¹ and 63 dBA façade limit is achieved with regards to noise impacts from the Bells Creek Arterial road (State-controlled).

Acoustic-rated construction material requirements are required to meet QDC MP4.4 requirements. These requirements are discussed in **Section 5.5**.

5.3.3 Non-Residential Receivers

Based on the plans, non-residential receivers (such as educational facilities) are located towards the norther-eastern end of the site furthest from the main roads, including:

- Lot 8000 – Child care
- Lot 8003 – State primary school

As per the SDAP Code 1 requirements (see **Section 4.2**), the noise criteria for childcare and educational developments are as follows:

- Façade criteria – $LA_{10,1\text{-hour}}$ 58 dBA
- Free-field criteria for outdoor areas – 63 dBA $LA_{10,12\text{-hour}}$ (6 am to 6 pm)

Table 5.2 presents predicted State-controlled road traffic noise levels at Lots 8000 and 8003.

¹ There are very small/minor areas of exceedance (in the middle of some lots and setback from the boundary), as shown in the outdoor free-field noise plot in Figure C.5. However, it is noted that the modelling does not consider the fact that up to two-storey houses will be located on all lots and covering these small areas. These small areas would not exist with houses in place and it is noted that outdoor areas directly behind (west of) the boundary barrier fully comply.

Table 5.2: Predicted Noise Levels at Childcare and Community Lots

Lot	Predicted $L_{A10,1hr}$ Façade-Corrected Noise Level dBA ^a	Predicted $L_{A10,12hr}$ Free-field Noise Level dBA ^b
8000 – Child care	59	55
8003 – State primary school	61	57
Noise Criteria	58	63

Note a: + 3 dBA correction to $L_{A10,18-hr}$ (based on peak 1-hour movements being conservatively up to 10% of AADT)

Note b: $L_{A10,12hr}$ (free-field) = $1.02 \times L_{A10,18-hr} + 0.3 - 0.7$ (for QLD calibration)²

The results of the modelling show compliance with the outdoor $L_{A10,12-hr}$ limit, but exceedance of the $L_{A10,1-hr}$ façade limit. The modelling is noted to be conservative by locating receptors along the boundary of the lots closest to the Bells Creek Arterial Road and excluding future buildings that would shielded noise from the road.

An exceedance of the façade noise limit is predicted at the boundary by up to 3 dBA and assuming no shielding from future buildings to the east. With potential two-storey buildings providing shielding, at least 5 dBA attenuation would be expected, resulting in compliance. In any case, boundary acoustic barriers could be located along the affected lot boundaries to mitigate noise impacts. The layouts of the child care and school can also be optimised to mitigation noise impacts from the road.

5.4 Barrier Construction Requirements

The barrier adjacent to Bells Creek Arterial will need to comply with TMR barrier requirements detailed in the following documents:

- TMR Specification MRTS15 Noise Fences (March 2019)
- TMR Road Traffic Noise Management Code of Practice Volume 1 (2013)

5.5 Building Construction Requirements

5.5.1 Overview

Acoustic requirements for building construction differ for residences adjacent to the State-controlled Bells Creek Arterial versus the Council-controlled Sub-Arterial. The requirements are summarised as follows:

- QDC MP4.4 requirements apply to the **cyan** area outlined in **Figure C11** of **Appendix C**.
- Design and construction to AS2107 and AS3671 to the **blue** area outlined in **Figure C.10** (ground floor) and **Figure C.11** (first floor) of **Appendix C**. As per Council provisions, this area is outside the QDC MP4.4 zone but noise levels exceed the 63 dBA limit, therefore AS 2107/3671 requirements apply.

Appendix D also identifies the required acoustic requirements for each lot.

5.5.2 QDC MP4.4 Requirements

Lots requiring treatment under MP4.4 lie within the area bounded by the cyan line and road as seen in **Figure C.10** (ground floor) and **C.11** (first floor) in **Appendix C**. This cyan (blue) line reflects the extent of where MP4.4 criteria is assumed to be applicable.

It is noted that the QDC MP4.4 noise area is not yet defined on the Queensland Government State Planning Policy Interactive Mapping System. However, based on the current mapping, the QDC MP4.4 extends 250 metres from major roads with similar traffic volumes to Bells Creek Arterial Road. Therefore, it is assumed that QDC MP4.4 requirements will only extend 250 metres from the Bells Creek Arterial Road.

² Naish, D., Tan, A., & Demirbilek, F., A review of traffic noise indicators and their correlation with the LA10(18hour), Paper Number 6, Proceedings of ACOUSTICS 2011.

From the table in **Appendix D** it can be seen that MP4.4 Categories 0 to 2 will apply to the residences. Further site-specific noise assessments can be conducted for houses in Category 1 to 2 lots with the aim of reducing the requirements taking into account building design and layout.

In accordance with MP4.4, the construction requirements are to be either (i) using construction materials nominated in MP4.4; or (ii) using construction materials and methods that meet the minimum acoustic rating (Rw) requirements in MP4.4, based on the manufacturer's specifications.

Acoustic certification is required to be provided by the window/door supplier. The certification is to be based on acoustic testing of the overall window/door system (i.e. testing of the frame, glass and seals as proposed to be installed).

5.5.3 Council AS2107 Requirements

The residential areas subject to AS2107 criteria requirements by the Sunshine Coast Council are those subject to noise levels in excess of 63 dBA L₁₀(18hour) but outside the QDC MP4.4 area (i.e. **blue** area outlined in **Figures C.10** and **C.11**).

These affected residences are to be designed to AS2107 internal noise levels based on the methods of AS3671.

5.5.4 General

Achieving the target noise reductions across a building façade requires construction details to be of an appropriate acoustic standard and that all exterior openings are to be closed when these habitable rooms are occupied. Therefore, an air-conditioning/mechanical ventilation system that does not degrade the internal acoustic environment or the building envelope's sound isolation and meets the ventilation requirements of the Building Code of Australia may need to be installed.

6. RECOMMENDATIONS AND CONCLUSION

A road noise assessment has been conducted for the Lots within Precinct 18 of the Aura development. The results and recommendations of the assessment are as follows:

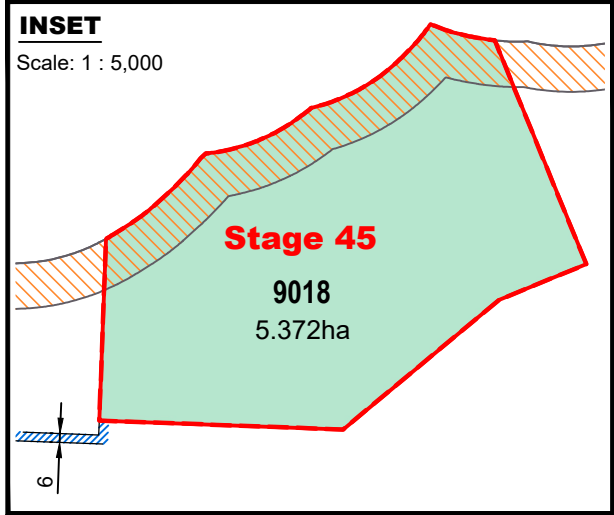
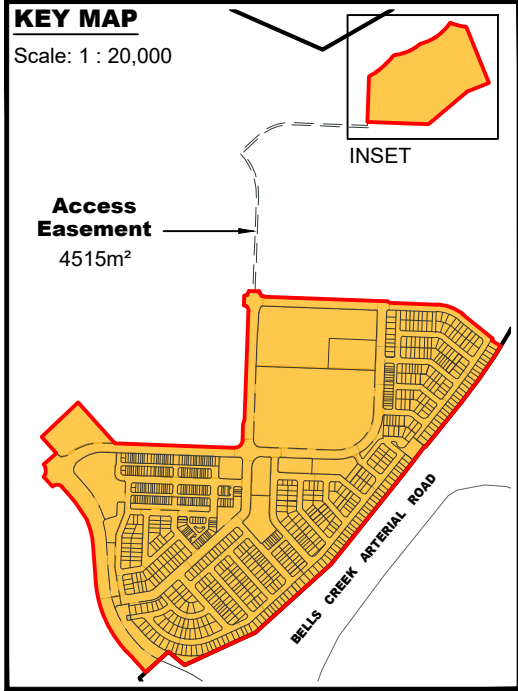
- Road traffic noise from the Bells Creek Arterial and local Council roads have been assessed within this report.
- Road Traffic volumes were provided by PricewaterhouseCoopers (PwC) and are based on forecasted volumes using the Aura Visum Model. **Table 5.1** and
- Figure 5.1 provide details on the segments of the road that have been modelled and the total traffic counts used when modelling the road.
- In order to achieve compliance with the SDAP 60 dBA free-field and 63 dBA façade-corrected noise levels at ground level, the barriers identified in **Figure C.4** are predicted to be required. These barriers range from 1.8 m at the southern end of the site and up to 4.2 metres at the northern end of the site. It is not proposed to build a barrier to protect first floors as the required height would likely be considered aesthetically unacceptable.
- Acoustic requirements for building construction differ for residences adjacent to the State-controlled Bells Creek Arterial versus the Council-controlled Sub-Arterial. The requirements are summarised as follows:
 - QDC MP4.4 construction requirements apply to the cyan area³ outlined in **Figure C10** and **Figure C11** of **Appendix C**.
 - Design and construction to AS2107 and AS3671 to the blue area outlined in **Figure C.10** (ground floor) and **Figure C.11** (first floor) of **Appendix C**. Design according to AS 2107 and AS 3671 will require detailed assessment based on the proposed layout of the house.

³ It is noted that the State Mapping has not been updated to identify the extent of the QDC MP4.4 noise corridor along Bells Creek Arterial. However, based on other major roads with high traffic volumes, the QDC MP4.4 area applies 250 metres from the outside lane. The identified area in cyan is based on a 250 metre setback. This area should be confirmed once the State Mapping has been updated.

APPENDIX A GLOSSARY

Parameter or Term	Description
dB	The decibel (dB) is the unit measure of sound. Most noises occur in a range of 20 dB (quiet rural area at night) to 120 dB (nightclub dance floor or concert).
dBA	Noise levels are most commonly expressed in terms of the 'A' weighted decibel scale, dBA. This scale closely approximates the response of the human ear, thus providing a measure of the subjective loudness of noise and enabling the intensity of noises with different frequency characteristics (e.g. pitch and tone) to be compared.
Day	The period between 7am and 6pm.
Evening	The period between 6pm and 10pm.
Night	The period between 10pm and 7am.
Free-field	The description of a noise receiver or source location which is away from any significantly reflective objects (e.g. buildings, walls).
L ₁	The noise level exceeded for 1% of the measurement period.
L ₁₀	The noise level exceeded for 10% of the measurement period. It is sometimes referred to as the average maximum noise level.
L ₉₀	The noise level exceeded for 90% of the measurement period. This is commonly referred to as the background noise level.
L _{eq}	The equivalent continuous sound level, which is the constant sound level over a given time period, which is equivalent in total sound energy to the time-varying sound level, measured over the same time period.
L _{eq,1hour}	As for L _{eq} except the measurement intervals are defined as 1 hour duration.
L _{max}	Maximum A-weighted sound pressure level.
L _{eq} (24 hour)	The average L _{eq} noise level over the 24-hour period from midnight to midnight.
L ₁₀ (18 hour)	The arithmetic average of the one-hour L ₁₀ values between 6am and midnight. This parameter is used in the assessment of road traffic noise.
R _w	Weighted Sound Reduction Index – is a single number evaluation of the property of a partition to attenuate sounds. For the majority of partitions, the value of R _w will be similar to the value for STC. Partitions with particularly poor performance at 100 Hz may have lower values for R _w than for STC. Conversely, partitions with poor performance at 4000 Hz may have higher R _w than for STC. (As per AS1276.1-1999).
Habitable Rooms	According to the "Building Code of Australia" a Habitable Room is: " a room used for normal domestic activities and Includes a bedroom, living room, lounge room, music room, television room, kitchen, dining room, sewing room, study, playroom, family room, home theatre, and sunroom, but Excludes a bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, photographic darkroom, clothes drying room, and other spaces of a specialised nature occupied neither frequently nor for extended periods."

APPENDIX B DRAWINGS



AURA LAKES
PLAN OF SUBDIVISION
P18 OVERALL

PLAN REF: **AU12885 – 24**
Rev No: **B**
DATE: 18 JUNE 2024
CLIENT: STOCKLAND
DRAWN BY: MD / JC
CHECKED BY: MD

Note:
All Lot Numbers, Dimensions and Areas are approximate only, and are subject to survey and Council approval.
Dimensions have been rounded to the nearest 0.1 metres.
Areas have been rounded down to the nearest 5m².
The boundaries shown on this plan should not be used for final detailed engineers design.

Source Information:
Site boundaries: RPS Survey.
Adjoining information: RPS Survey.
Contours: Stantec.
Environment constraints: RPS Survey.

Residential Allotments

Other

- Urban Warehouse - 12m x 14m
- Urban Loft Type A - 8.2m x 12m
- Urban Loft Type C - 8.5m x 12m

16.5m Deep

- Laneway Terrace - 6.6m x 16.5m
- Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

- Laneway Terrace - 4.6m x 21m
- Laneway Terrace - 6.6m x 21m
- Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

- Laneway Terrace - 4.6m x 25m
- Laneway Terrace - 6.6m x 25m
- Laneway Terrace - 6.6m+ x 25m (Ends)
- Front Loaded Terrace - 7.5m x 25m
- Front Loaded Terrace - 9m+ x 25m (Ends)
- Urban Villa - 8.5m x 25m
- Villa - 10m x 25m
- Premium Villa - 12.5m x 25m
- Courtyard - 14m x 25m
- Traditional - 16m x 25m

28m Deep

- Front Loaded Terrace - 7.5m x 28m
- Front Loaded Terrace - 9m+ x 28m (Ends)
- Urban Villa - 8.5m x 28m
- Villa - 10m x 28m
- Premium Villa - 12.5m x 28m
- Courtyard - 14m x 28m
- Traditional - 16m x 28m

30m Deep

- Villa - 10m x 30m
- Premium Villa - 12.5m x 30m
- Courtyard - 14m x 30m
- Traditional - 16m x 30m

Legend

- Aura Lakes Site Boundary
- P18 Stage Boundary
- Stage Boundary
- 1m Contours
- Lifestyle Buffer

Super Allotment

- Child Care
- Medium Density
- State Primary School
- Emerging Community
- Advertising Device

Open Space

- Drainage
- Local Linear Park
- Local Recreation Park
- Neighbourhood Recreation Park
- Neighbourhood Sports Park
- Road Reserve Embellishment / Pedestrian Linkage

Stockland
AURA

URBAN DESIGN
Level 8
31 Duncan Street
PO Box 1559
Fortitude Valley QLD 4006
T +61 7 3539 9500
W rpsgroup.com

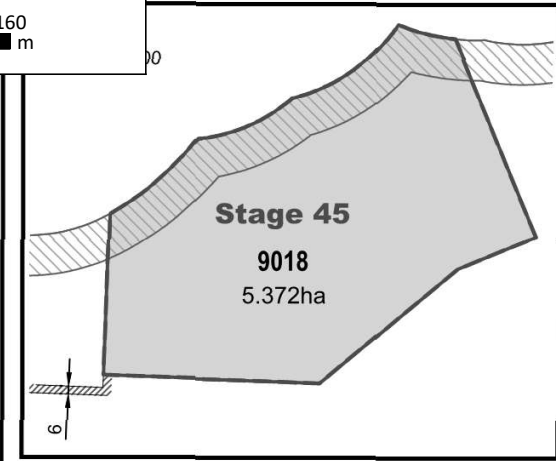
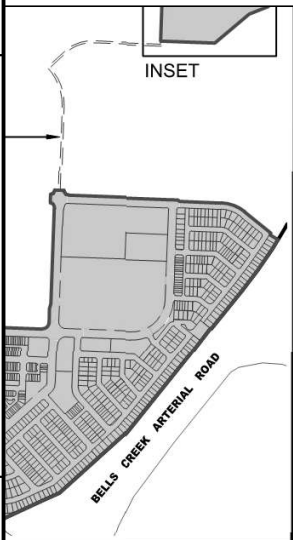
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A TETRA TECH COMPANY

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APPENDIX C NOISE CONTOURS AND BARRIER DESIGN – 2031, ALL ROADS

- **Figure C.1** – State-controlled road only (outdoor free-field noise levels)
- **Figure C.2** – State-controlled road only (ground level façade noise levels)
- **Figure C.3** – State-controlled road only (first floor façade noise levels)
- **Figure C.4 – Modelled Noise Barriers**
- **Figure C.5 – With barriers** - State-controlled road only (outdoor free-field noise levels)
- **Figure C.6 – With barriers** - State-controlled road only (ground level façade noise levels)
- **Figure C.7 – With barriers** - State-controlled road only (first floor façade noise levels)
- **Figure C.8** – All roads (ground level façade noise levels)
- **Figure C.9** – All roads (first floor façade noise levels)
- **Figure C.10 – With barriers** - All roads (ground level façade noise levels)
- **Figure C.11 – With barriers** - All roads (first floor façade noise levels)

Scale 1:4485
0 20 40 80 120 160 m

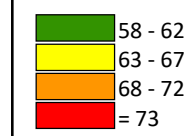


TMR (Bell's Creek Arterial) Road Only
Ultimate Traffic
Free Field
Calculation Height = 1.5 m
No Barrier

Figure
C.1

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Free Field) dB(A)
(-0.7 Free Field Correction)



Signs and symbols

- Road
- Noise Limit
(60 dBA L10 (18 Hour))

Legend

- Aura Lakes Site Boundary
- P18 Stage Boundary
- Stage Boundary
- 1m Contours
- Lifestyle Buffer

Super Allotment

- Child Care
- Medium Density
- State Primary School
- Emerging Community
- Advertising Device

Open Space

- Drainage
- Local Linear Park
- Local Recreation Park
- Neighbourhood Recreation Park
- Neighbourhood Sports Park
- Road Reserve Embellishment / Pedestrian Linkage

Residential Allotments

Other

- Urban Warehouse - 12m x 14m
- Urban Loft Type A - 8.2m x 12m
- Urban Loft Type C - 8.5m x 12m

16.5m Deep

- Laneway Terrace - 6.6m x 16.5m
- Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

- Laneway Terrace - 4.6m x 21m
- Laneway Terrace - 6.6m x 21m
- Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

- Laneway Terrace - 4.6m x 25m
- Laneway Terrace - 6.6m x 25m
- Laneway Terrace - 6.6m+ x 25m (Ends)
- Front Loaded Terrace - 7.5m x 25m
- Front Loaded Terrace - 9m+ x 25m (Ends)
- Urban Villa - 8.5m x 25m
- Villa - 10m x 25m
- Premium Villa - 12.5m x 25m
- Courtyard - 14m x 25m
- Traditional - 16m x 25m

28m Deep

- Front Loaded Terrace - 7.5m x 28m
- Front Loaded Terrace - 9m+ x 28m (Ends)
- Urban Villa - 8.5m x 28m
- Villa - 10m x 28m
- Premium Villa - 12.5m x 28m
- Courtyard - 14m x 28m
- Traditional - 16m x 28m

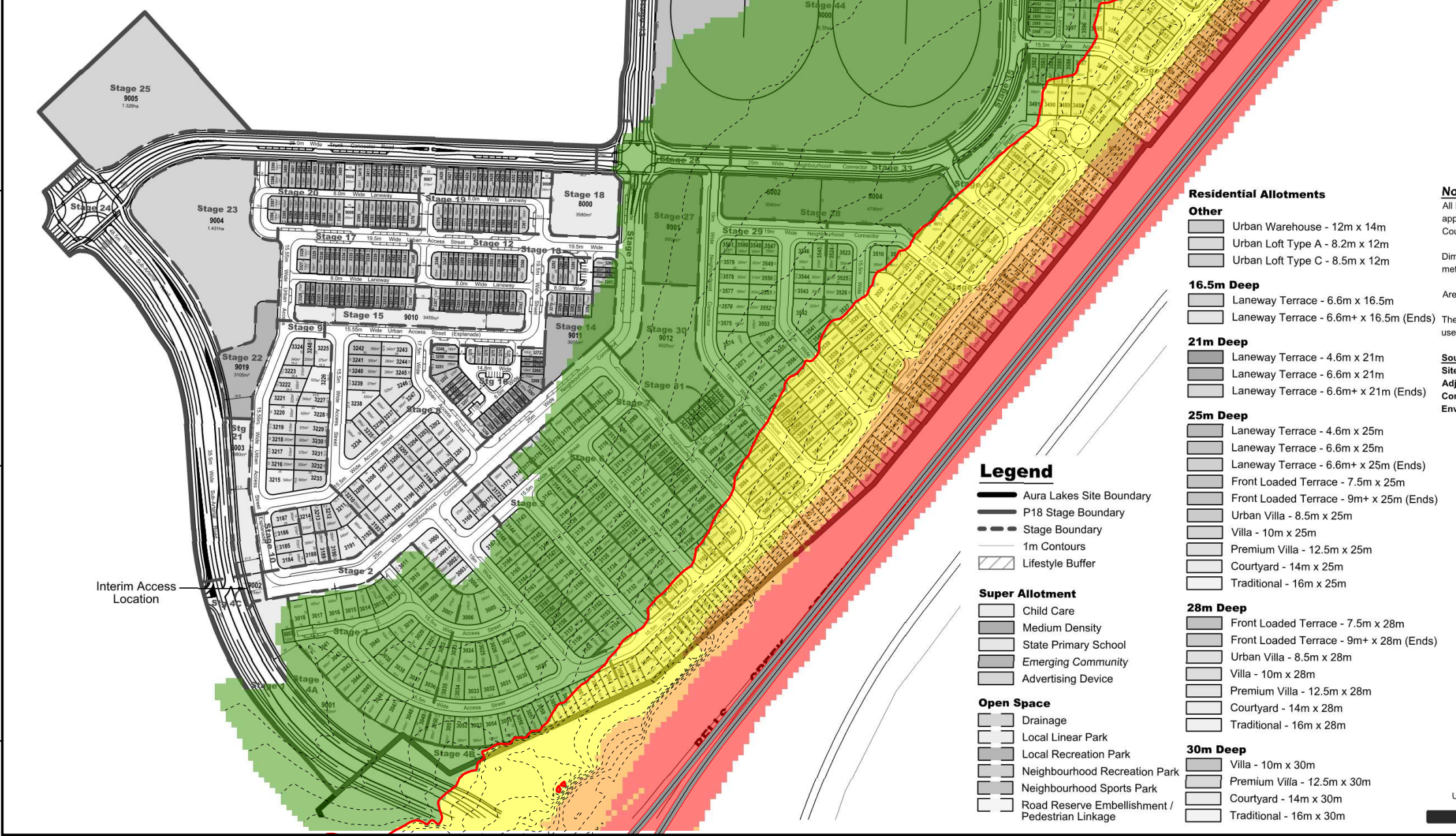
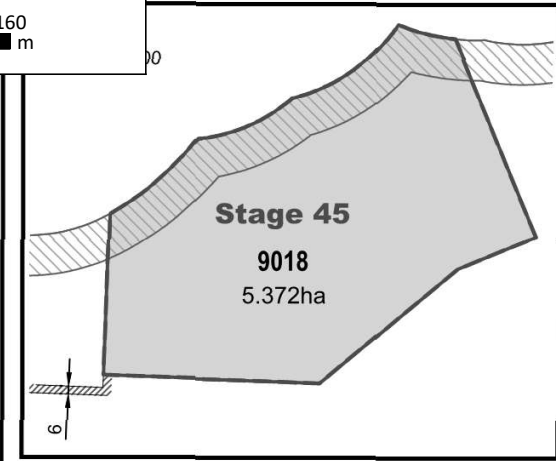
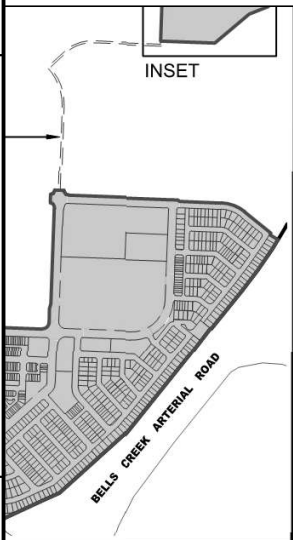
30m Deep

- Villa - 10m x 30m
- Premium Villa - 12.5m x 30m
- Courtyard - 14m x 30m
- Traditional - 16m x 30m

No
All
app
Cou
Dim
met
Are
The
use
Sou
Site
Adj
Con
Env



Scale 1:4485
0 20 40 80 120 160 m



Legend

- Aura Lakes Site Boundary
- P18 Stage Boundary
- - - Stage Boundary
- 1m Contours
- ▨ Lifestyle Buffer

Super Allotment

- ▨ Child Care
- ▨ Medium Density
- ▨ State Primary School
- ▨ Emerging Community
- ▨ Advertising Device

Open Space

- ▨ Drainage
- ▨ Local Linear Park
- ▨ Local Recreation Park
- ▨ Neighbourhood Recreation Park
- ▨ Neighbourhood Sports Park
- ▨ Road Reserve Embellishment / Pedestrian Linkage

Residential Allotments

Other

- ▨ Urban Warehouse - 12m x 14m
- ▨ Urban Loft Type A - 8.2m x 12m
- ▨ Urban Loft Type C - 8.5m x 12m

16.5m Deep

- ▨ Laneway Terrace - 6.6m x 16.5m
- ▨ Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

- ▨ Laneway Terrace - 4.6m x 21m
- ▨ Laneway Terrace - 6.6m x 21m
- ▨ Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

- ▨ Laneway Terrace - 4.6m x 25m
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- ▨ Traditional - 16m x 28m

30m Deep

- ▨ Villa - 10m x 30m
- ▨ Premium Villa - 12.5m x 30m
- ▨ Courtyard - 14m x 30m
- ▨ Traditional - 16m x 30m

TMR (Bell's Creek Arterial) Road Only
Ultimate Traffic
Ground Floor (GF)
Calculation Height = 1.8 m
No Barrier

Figure
C.2

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)

(Facade Corrected) dB(A)
(+2.5 Facade Correction)
(-1.7 TMR Correction)

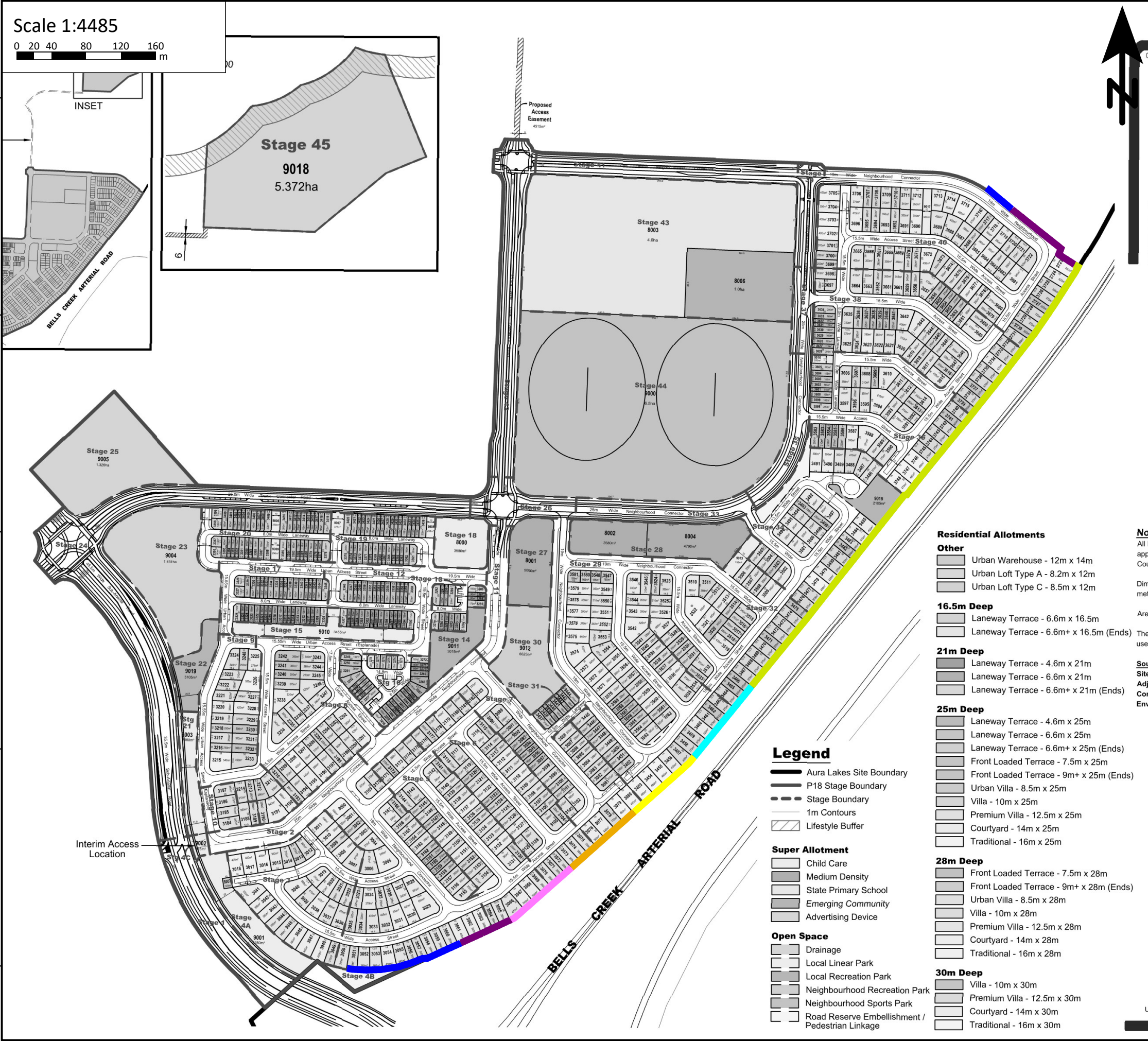
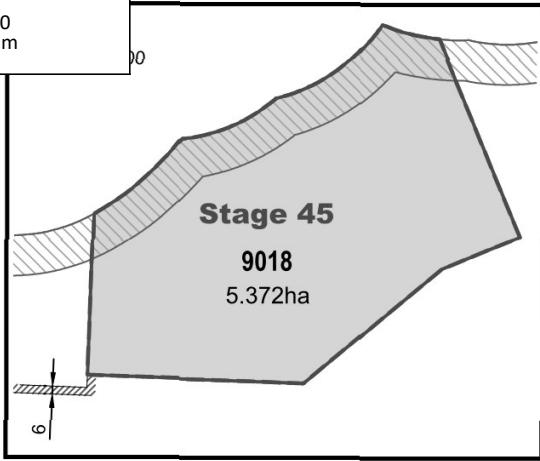
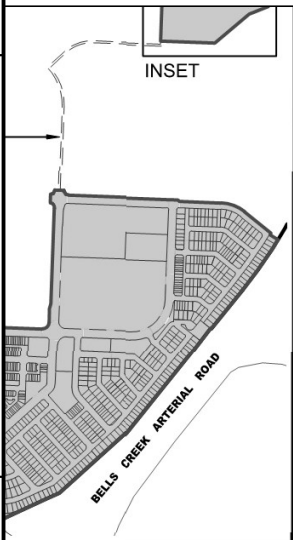
- ▨ 58 - 62 [Cat 1]
- ▨ 63 - 67 [Cat 2]
- ▨ 68 - 72 [Cat 3]
- ▨ = 73 [Cat 4]

Signs and symbols

- ▨ Road
- ▨ Noise Limit
(63 dBA L10 (18 Hour))



Scale 1:4485
0 20 40 80 120 160 m



Noise Barrier Locations

Figure
C.4

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Signs and symbols

- 1.8m Barrier
- 2.5m Barrier
- 3m Barrier
- 3.8m Barrier
- 3.8m Barrier
- 3.5m Barrier
- 4.2m Barrier

Legend

- Aura Lakes Site Boundary
- P18 Stage Boundary
- Stage Boundary
- 1m Contours
- Lifestyle Buffer

Super Allotment

- Child Care
- Medium Density
- State Primary School
- Emerging Community
- Advertising Device

Open Space

- Drainage
- Local Linear Park
- Local Recreation Park
- Neighbourhood Recreation Park
- Neighbourhood Sports Park
- Road Reserve Embellishment / Pedestrian Linkage

Residential Allotments

Other

- Urban Warehouse - 12m x 14m
- Urban Loft Type A - 8.2m x 12m
- Urban Loft Type C - 8.5m x 12m

16.5m Deep

- Laneway Terrace - 6.6m x 16.5m
- Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

- Laneway Terrace - 4.6m x 21m
- Laneway Terrace - 6.6m x 21m
- Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

- Laneway Terrace - 4.6m x 25m
- Laneway Terrace - 6.6m x 25m
- Laneway Terrace - 6.6m+ x 25m (Ends)
- Front Loaded Terrace - 7.5m x 25m
- Front Loaded Terrace - 9m x 25m (Ends)
- Urban Villa - 8.5m x 25m
- Villa - 10m x 25m
- Premium Villa - 12.5m x 25m
- Courtyard - 14m x 25m
- Traditional - 16m x 25m

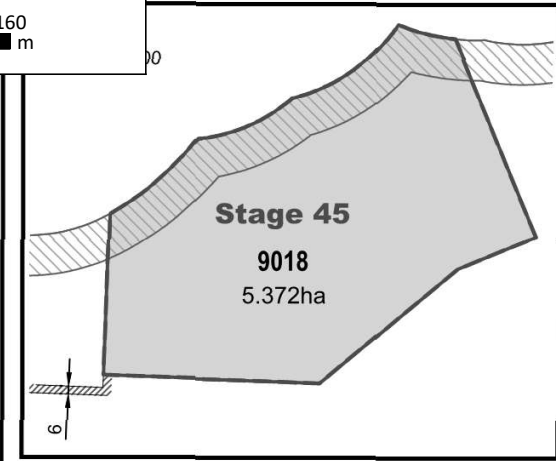
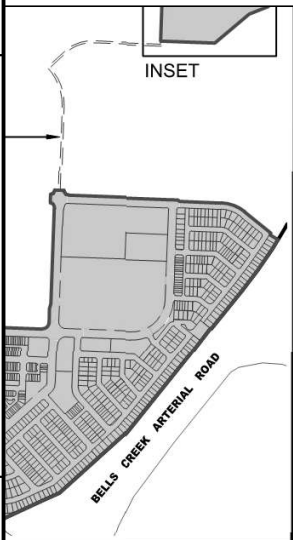
28m Deep

- Front Loaded Terrace - 7.5m x 28m
- Front Loaded Terrace - 9m+ x 28m (Ends)
- Urban Villa - 8.5m x 28m
- Villa - 10m x 28m
- Premium Villa - 12.5m x 28m
- Courtyard - 14m x 28m
- Traditional - 16m x 28m

30m Deep

- Villa - 10m x 30m
- Premium Villa - 12.5m x 30m
- Courtyard - 14m x 30m
- Traditional - 16m x 30m

Scale 1:4485
0 20 40 80 120 160 m

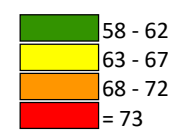


TMR (Bell's Creek Arterial) Road Only
Ultimate Traffic
Free Field
Calculation Height = 1.5 m
With Barrier

Figure
C.5

Project Number: 217401.0141
Date: 25/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Free Field) dB(A)
(-0.7 Free Field Correction)



Signs and symbols

- Road
- Noise Limit (60 dBA L10 (18 Hour))

Legend

- Aura Lakes Site Boundary
- P18 Stage Boundary
- Stage Boundary
- 1m Contours
- Lifestyle Buffer

Super Allotment

- Child Care
- Medium Density
- State Primary School
- Emerging Community
- Advertising Device

Open Space

- Drainage
- Local Linear Park
- Local Recreation Park
- Neighbourhood Recreation Park
- Neighbourhood Sports Park
- Road Reserve Embellishment / Pedestrian Linkage

Residential Allotments

Other

- Urban Warehouse - 12m x 14m
- Urban Loft Type A - 8.2m x 12m
- Urban Loft Type C - 8.5m x 12m

16.5m Deep

- Laneway Terrace - 6.6m x 16.5m
- Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

- Laneway Terrace - 4.6m x 21m
- Laneway Terrace - 6.6m x 21m
- Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

- Laneway Terrace - 4.6m x 25m
- Laneway Terrace - 6.6m x 25m
- Laneway Terrace - 6.6m+ x 25m (Ends)
- Front Loaded Terrace - 7.5m x 25m
- Front Loaded Terrace - 9m+ x 25m (Ends)
- Urban Villa - 8.5m x 25m
- Villa - 10m x 25m
- Premium Villa - 12.5m x 25m
- Courtyard - 14m x 25m
- Traditional - 16m x 25m

28m Deep

- Front Loaded Terrace - 7.5m x 28m
- Front Loaded Terrace - 9m+ x 28m (Ends)
- Urban Villa - 8.5m x 28m
- Villa - 10m x 28m
- Premium Villa - 12.5m x 28m
- Courtyard - 14m x 28m
- Traditional - 16m x 28m

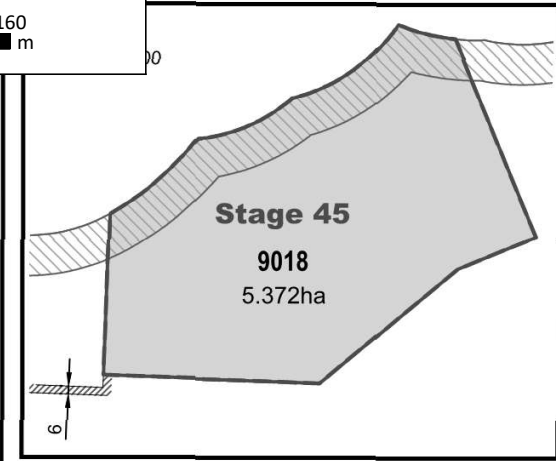
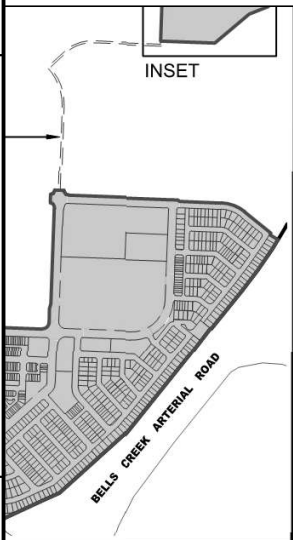
30m Deep

- Villa - 10m x 30m
- Premium Villa - 12.5m x 30m
- Courtyard - 14m x 30m
- Traditional - 16m x 30m

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Scale 1:4485
0 20 40 80 120 160 m



TMR (Bell's Creek Arterial) Road Only
Ultimate Traffic
Ground Floor (GF)
Calculation Height = 1.8 m
With Barrier

Figure
C.6

Project Number: 217401.0141
Date: 25/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Facade Corrected) dB(A)
(+2.5 Facade Correction)
(-1.7 TMR Correction)

58 - 62 [Cat 1]
63 - 67 [Cat 2]
68 - 72 [Cat 3]
= 73 [Cat 4]

Signs and symbols

—	Road
—	Noise Limit (63 dBA L10 (18 Hour))

Residential Allotments

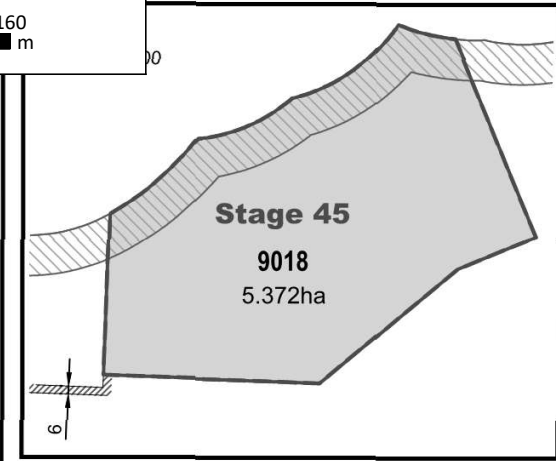
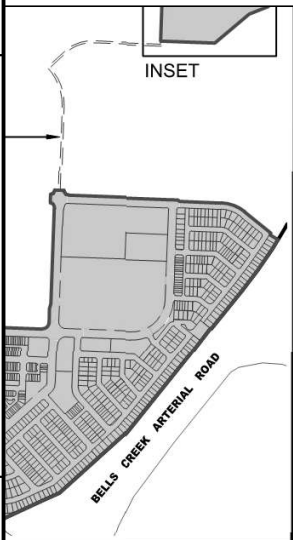
- Other**
- Urban Warehouse - 12m x 14m
 - Urban Loft Type A - 8.2m x 12m
 - Urban Loft Type C - 8.5m x 12m
- 16.5m Deep**
- Laneway Terrace - 6.6m x 16.5m
 - Laneway Terrace - 6.6m+ x 16.5m (Ends)
- 21m Deep**
- Laneway Terrace - 4.6m x 21m
 - Laneway Terrace - 6.6m x 21m
 - Laneway Terrace - 6.6m+ x 21m (Ends)
- 25m Deep**
- Laneway Terrace - 4.6m x 25m
 - Laneway Terrace - 6.6m x 25m
 - Laneway Terrace - 6.6m+ x 25m (Ends)
 - Front Loaded Terrace - 7.5m x 25m
 - Front Loaded Terrace - 9m+ x 25m (Ends)
 - Urban Villa - 8.5m x 25m
 - Villa - 10m x 25m
 - Premium Villa - 12.5m x 25m
 - Courtyard - 14m x 25m
 - Traditional - 16m x 25m
- 28m Deep**
- Front Loaded Terrace - 7.5m x 28m
 - Front Loaded Terrace - 9m+ x 28m (Ends)
 - Urban Villa - 8.5m x 28m
 - Villa - 10m x 28m
 - Premium Villa - 12.5m x 28m
 - Courtyard - 14m x 28m
 - Traditional - 16m x 28m
- 30m Deep**
- Villa - 10m x 30m
 - Premium Villa - 12.5m x 30m
 - Courtyard - 14m x 30m
 - Traditional - 16m x 30m

Legend

- Aura Lakes Site Boundary
 - P18 Stage Boundary
 - Stage Boundary
 - 1m Contours
 - Lifestyle Buffer
- Super Allotment**
- Child Care
 - Medium Density
 - State Primary School
 - Emerging Community
 - Advertising Device
- Open Space**
- Drainage
 - Local Linear Park
 - Local Recreation Park
 - Neighbourhood Recreation Park
 - Neighbourhood Sports Park
 - Road Reserve Embellishment / Pedestrian Linkage



Scale 1:4485
0 20 40 80 120 160 m



TMR (Bell's Creek Arterial) Road Only
Ultimate Traffic
First Floor (F1)
Calculation Height = 4.6 m
With Barrier

Figure
C.7

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Facade Corrected) dB(A)
(+2.5 Facade Correction)
(-1.7 TMR Correction)

58 - 62 [Cat 1]
63 - 67 [Cat 2]
68 - 72 [Cat 3]
= 73 [Cat 4]

Signs and symbols

	Road
	Noise Limit (63 dBA L10 (18 Hour))

Legend

- Aura Lakes Site Boundary
- P18 Stage Boundary
- Stage Boundary
- 1m Contours
- Lifestyle Buffer

Super Allotment

- Child Care
- Medium Density
- State Primary School
- Emerging Community
- Advertising Device

Open Space

- Drainage
- Local Linear Park
- Local Recreation Park
- Neighbourhood Recreation Park
- Neighbourhood Sports Park
- Road Reserve Embellishment / Pedestrian Linkage

Residential Allotments

Other

- Urban Warehouse - 12m x 14m
- Urban Loft Type A - 8.2m x 12m
- Urban Loft Type C - 8.5m x 12m

16.5m Deep

- Laneway Terrace - 6.6m x 16.5m
- Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

- Laneway Terrace - 4.6m x 21m
- Laneway Terrace - 6.6m x 21m
- Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

- Laneway Terrace - 4.6m x 25m
- Laneway Terrace - 6.6m x 25m
- Laneway Terrace - 6.6m+ x 25m (Ends)
- Front Loaded Terrace - 7.5m x 25m
- Front Loaded Terrace - 9m+ x 25m (Ends)
- Urban Villa - 8.5m x 25m
- Villa - 10m x 25m
- Premium Villa - 12.5m x 25m
- Courtyard - 14m x 25m
- Traditional - 16m x 25m

28m Deep

- Front Loaded Terrace - 7.5m x 28m
- Front Loaded Terrace - 9m+ x 28m (Ends)
- Urban Villa - 8.5m x 28m
- Villa - 10m x 28m
- Premium Villa - 12.5m x 28m
- Courtyard - 14m x 28m
- Traditional - 16m x 28m

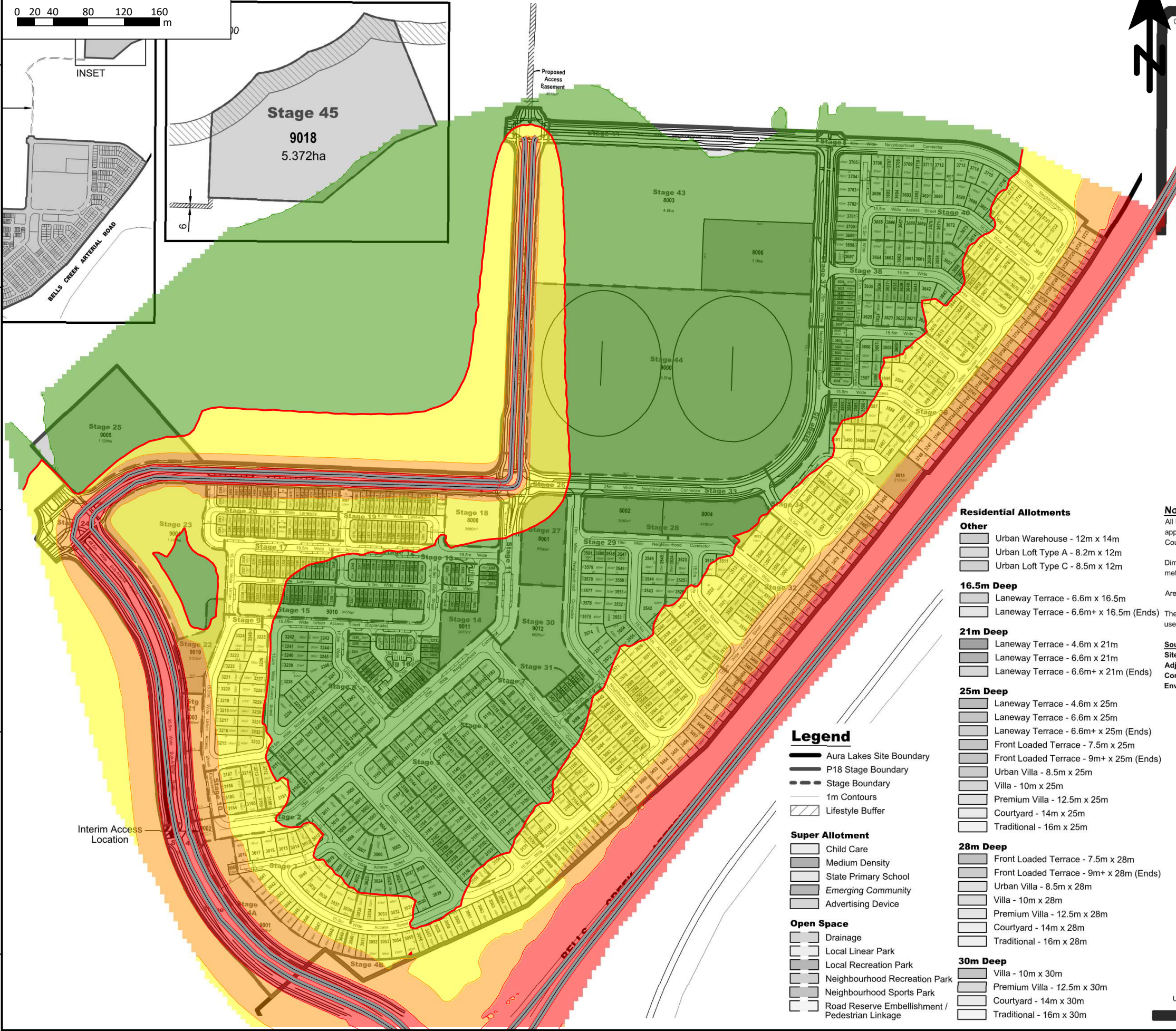
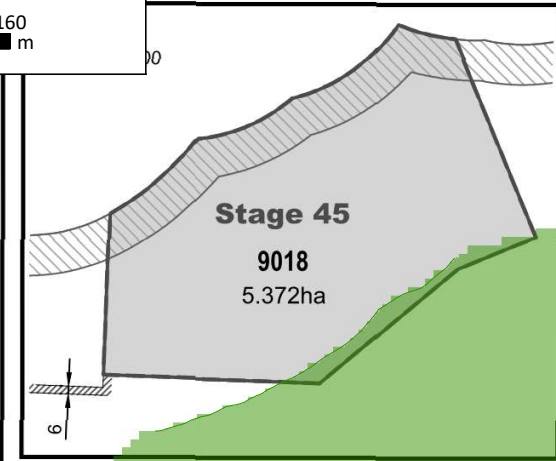
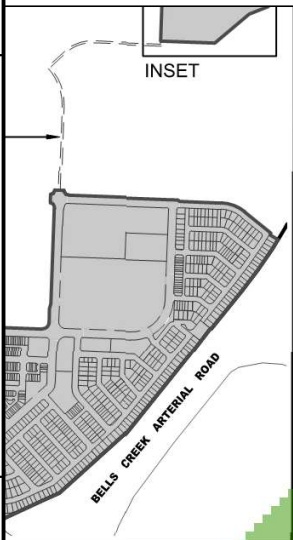
30m Deep

- Villa - 10m x 30m
- Premium Villa - 12.5m x 30m
- Courtyard - 14m x 30m
- Traditional - 16m x 30m

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Scale 1:4485
0 20 40 80 120 160 m



TMR + Council Roads
Ultimate Traffic
Ground Floor (GF) Calculation
Calculation Height = 1.8 m
No Barrier

Figure
C.8

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Facade Corrected) dB(A)
(+2.5 Facade Correction)
(-1.7 TMR Correction)

58 - 62 [Cat 1]
63 - 67 [Cat 2]
68 - 72 [Cat 3]
= 73 [Cat 4]

Signs and symbols

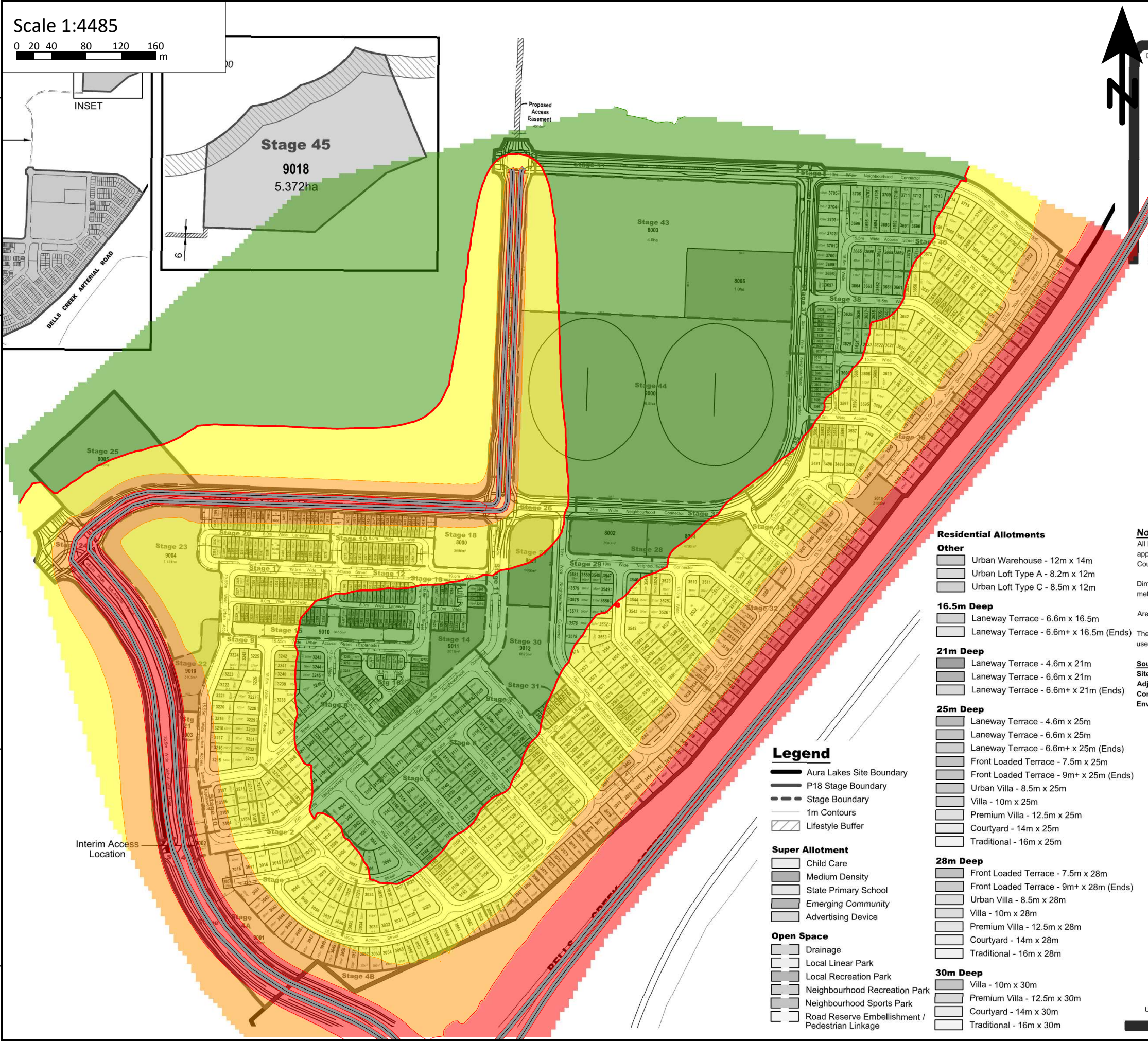
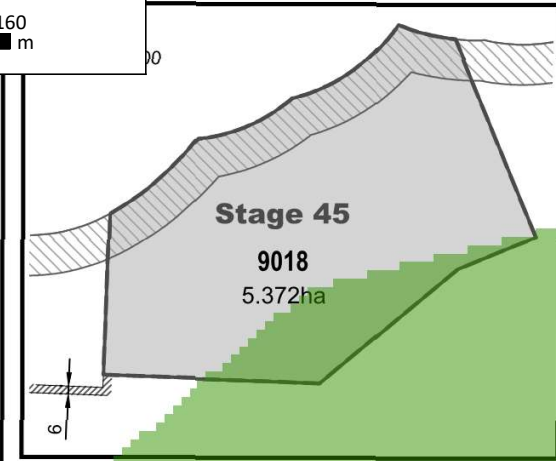
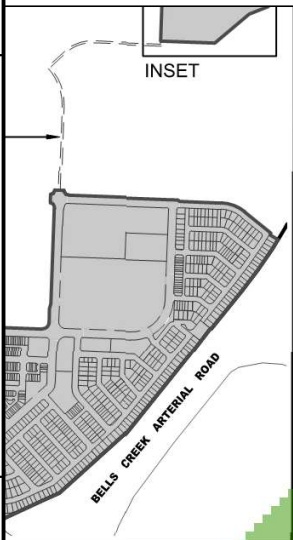
	Road
	External Noise Limit (63 dBA L10 (18 Hour))

- Residential Allotments**
- Other**
- Urban Warehouse - 12m x 14m
 - Urban Loft Type A - 8.2m x 12m
 - Urban Loft Type C - 8.5m x 12m
- 16.5m Deep**
- Laneway Terrace - 6.6m x 16.5m
 - Laneway Terrace - 6.6m+ x 16.5m (Ends)
- 21m Deep**
- Laneway Terrace - 4.6m x 21m
 - Laneway Terrace - 6.6m x 21m
 - Laneway Terrace - 6.6m+ x 21m (Ends)
- 25m Deep**
- Laneway Terrace - 4.6m x 25m
 - Laneway Terrace - 6.6m x 25m
 - Laneway Terrace - 6.6m+ x 25m (Ends)
 - Front Loaded Terrace - 7.5m x 25m
 - Front Loaded Terrace - 9m+ x 25m (Ends)
 - Urban Villa - 8.5m x 25m
 - Villa - 10m x 25m
 - Premium Villa - 12.5m x 25m
 - Courtyard - 14m x 25m
 - Traditional - 16m x 25m
- 28m Deep**
- Front Loaded Terrace - 7.5m x 28m
 - Front Loaded Terrace - 9m+ x 28m (Ends)
 - Urban Villa - 8.5m x 28m
 - Villa - 10m x 28m
 - Premium Villa - 12.5m x 28m
 - Courtyard - 14m x 28m
 - Traditional - 16m x 28m
- 30m Deep**
- Villa - 10m x 30m
 - Premium Villa - 12.5m x 30m
 - Courtyard - 14m x 30m
 - Traditional - 16m x 30m

- Legend**
- Aura Lakes Site Boundary
 - P18 Stage Boundary
 - Stage Boundary
 - 1m Contours
 - Lifestyle Buffer
- Super Allotment**
- Child Care
 - Medium Density
 - State Primary School
 - Emerging Community
 - Advertising Device
- Open Space**
- Drainage
 - Local Linear Park
 - Local Recreation Park
 - Neighbourhood Recreation Park
 - Neighbourhood Sports Park
 - Road Reserve Embellishment / Pedestrian Linkage



Scale 1:4485
0 20 40 80 120 160 m



TMR + Council Roads
Ultimate Traffic
First Floor (F1)
Calculation Height = 4.6 m
No Barrier

Figure
C.9

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Facade Corrected) dB(A)
(+2.5 Facade Correction)
(-1.7 TMR Correction)

58 - 62 [Cat 1]
63 - 67 [Cat 2]
68 - 72 [Cat 3]
= 73 [Cat 4]

Signs and symbols

Road
External Noise Limit (63 dBA L10 (18 Hour))

Residential Allotments

Other

- Urban Warehouse - 12m x 14m
- Urban Loft Type A - 8.2m x 12m
- Urban Loft Type C - 8.5m x 12m

16.5m Deep

- Laneway Terrace - 6.6m x 16.5m
- Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

- Laneway Terrace - 4.6m x 21m
- Laneway Terrace - 6.6m x 21m
- Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

- Laneway Terrace - 4.6m x 25m
- Laneway Terrace - 6.6m x 25m
- Laneway Terrace - 6.6m+ x 25m (Ends)
- Front Loaded Terrace - 7.5m x 25m
- Front Loaded Terrace - 9m+ x 25m (Ends)
- Urban Villa - 8.5m x 25m
- Villa - 10m x 25m
- Premium Villa - 12.5m x 25m
- Courtyard - 14m x 25m
- Traditional - 16m x 25m

28m Deep

- Front Loaded Terrace - 7.5m x 28m
- Front Loaded Terrace - 9m+ x 28m (Ends)
- Urban Villa - 8.5m x 28m
- Villa - 10m x 28m
- Premium Villa - 12.5m x 28m
- Courtyard - 14m x 28m
- Traditional - 16m x 28m

30m Deep

- Villa - 10m x 30m
- Premium Villa - 12.5m x 30m
- Courtyard - 14m x 30m
- Traditional - 16m x 30m

Legend

- Aura Lakes Site Boundary
- P18 Stage Boundary
- Stage Boundary
- 1m Contours
- Lifestyle Buffer

Super Allotment

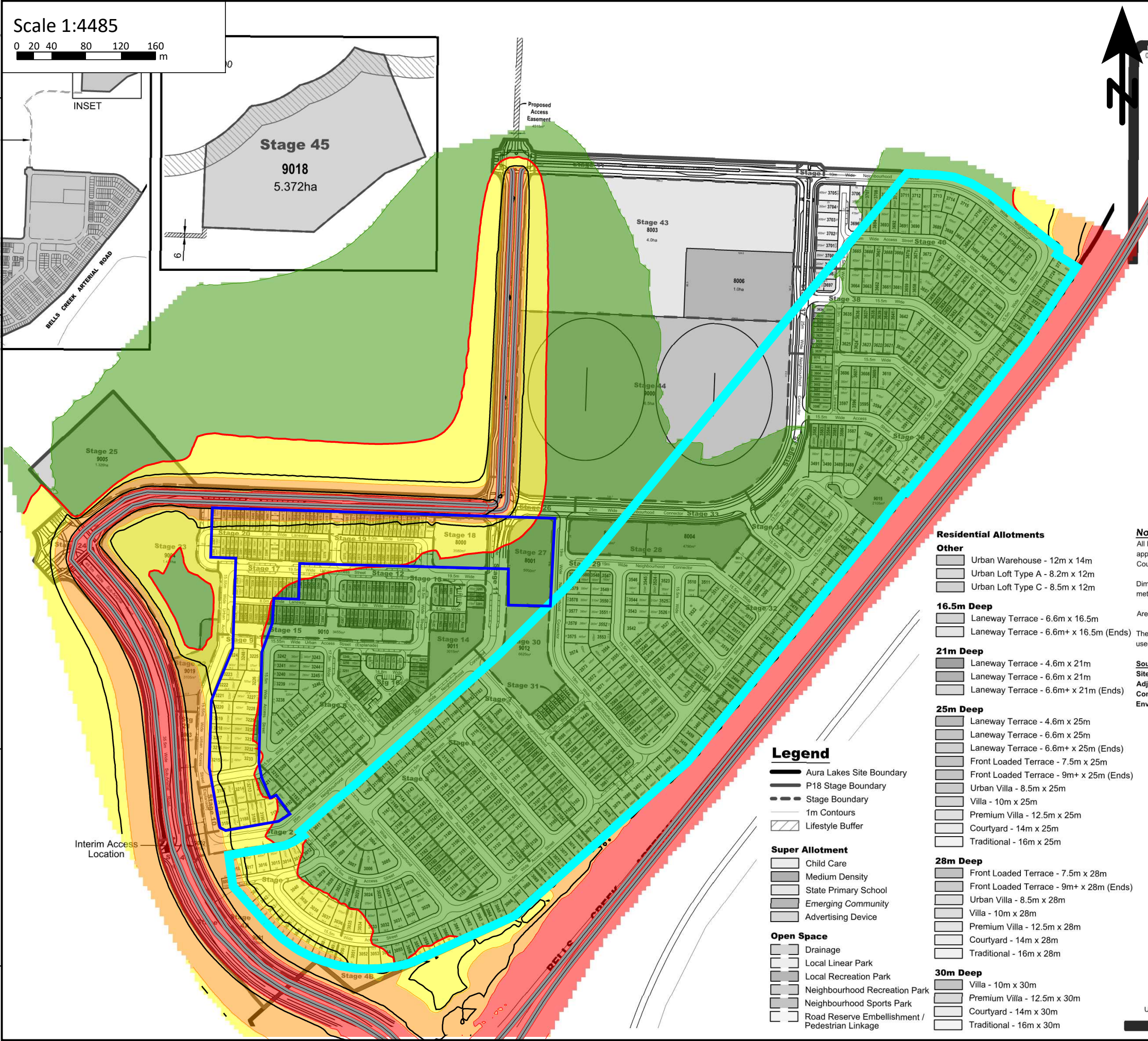
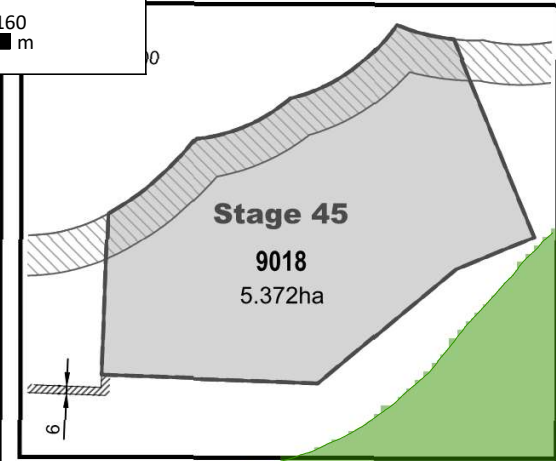
- Child Care
- Medium Density
- State Primary School
- Emerging Community
- Advertising Device

Open Space

- Drainage
- Local Linear Park
- Local Recreation Park
- Neighbourhood Recreation Park
- Neighbourhood Sports Park
- Road Reserve Embellishment / Pedestrian Linkage



Scale 1:4485
0 20 40 80 120 160 m



TMR + Council Roads
Ultimate Traffic
Ground Floor (GF)
Calculation Height = 1.8 m
With Barrier

Figure
C.10

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Facade Corrected) dB(A)
(+2.5 Facade Correction)
(-1.7 TMR Correction)

58 - 62 [Cat 1]
63 - 67 [Cat 2]
68 - 72 [Cat 3]
= 73 [Cat 4]

Signs and symbols

Road
External Noise Limit (63 dBA L10 (18 Hour))
MP4.4 Overlay
Council Road Overlay

Legend

— Aura Lakes Site Boundary
— P18 Stage Boundary
- - - Stage Boundary
— 1m Contours
L Lifestyle Buffer

Super Allotment

Child Care
Medium Density
State Primary School
Emerging Community
Advertising Device

Open Space

Drainage
Local Linear Park
Local Recreation Park
Neighbourhood Recreation Park
Neighbourhood Sports Park
Road Reserve Embellishment / Pedestrian Linkage

Residential Allotments

Other

Urban Warehouse - 12m x 14m
Urban Loft Type A - 8.2m x 12m
Urban Loft Type C - 8.5m x 12m

16.5m Deep

Laneway Terrace - 6.6m x 16.5m
Laneway Terrace - 6.6m+ x 16.5m (Ends)

21m Deep

Laneway Terrace - 4.6m x 21m
Laneway Terrace - 6.6m x 21m
Laneway Terrace - 6.6m+ x 21m (Ends)

25m Deep

Laneway Terrace - 4.6m x 25m
Laneway Terrace - 6.6m x 25m
Laneway Terrace - 6.6m+ x 25m (Ends)
Front Loaded Terrace - 7.5m x 25m
Front Loaded Terrace - 9m+ x 25m (Ends)
Urban Villa - 8.5m x 25m
Villa - 10m x 25m
Premium Villa - 12.5m x 25m
Courtyard - 14m x 25m
Traditional - 16m x 25m

28m Deep

Front Loaded Terrace - 7.5m x 28m
Front Loaded Terrace - 9m+ x 28m (Ends)
Urban Villa - 8.5m x 28m
Villa - 10m x 28m
Premium Villa - 12.5m x 28m
Courtyard - 14m x 28m
Traditional - 16m x 28m

30m Deep

Villa - 10m x 30m
Premium Villa - 12.5m x 30m
Courtyard - 14m x 30m
Traditional - 16m x 30m

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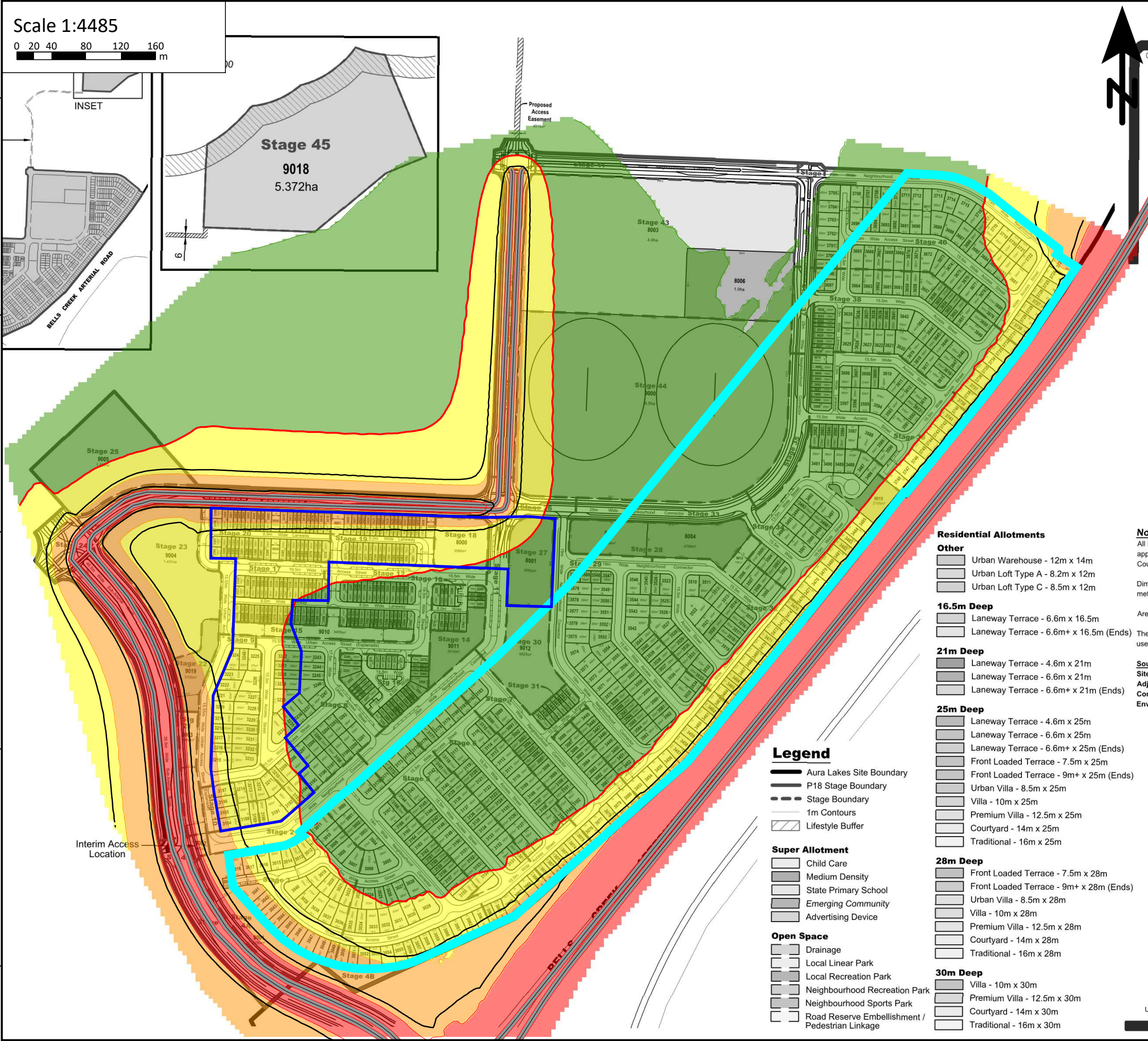
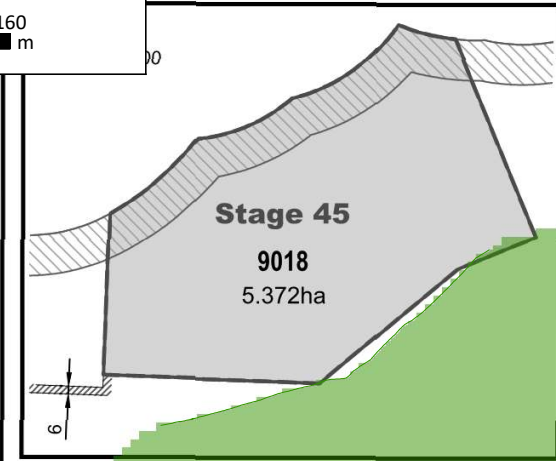
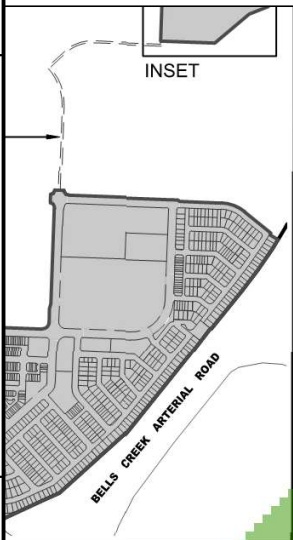
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Scale 1:4485
0 20 40 80 120 160 m



TMR + Council Roads
Ultimate Traffic
Ground Floor (FF)
Calculation Height = 4.6 m
With Barrier

Figure
C.11

Project Number: 217401.0141
Date: 26/06/2024
Drawn By: BAH
Prepared For: Stockland Development

Levels L10 (18 hr)
(Facade Corrected) dB(A)
(+2.5 Facade Correction)
(-1.7 TMR Correction)

58 - 62 [Cat 1]
63 - 67 [Cat 2]
68 - 72 [Cat 3]
= 73 [Cat 4]

Signs and symbols

Road
External Noise Limit (63 dBA L10 (18 Hour))
MP4.4 Overlay
Council Road Overlay

Residential Allotments

- Other**
- Urban Warehouse - 12m x 14m
 - Urban Loft Type A - 8.2m x 12m
 - Urban Loft Type C - 8.5m x 12m
- 16.5m Deep**
- Laneway Terrace - 6.6m x 16.5m
 - Laneway Terrace - 6.6m+ x 16.5m (Ends)
- 21m Deep**
- Laneway Terrace - 4.6m x 21m
 - Laneway Terrace - 6.6m x 21m
 - Laneway Terrace - 6.6m+ x 21m (Ends)
- 25m Deep**
- Laneway Terrace - 4.6m x 25m
 - Laneway Terrace - 6.6m x 25m
 - Laneway Terrace - 6.6m+ x 25m (Ends)
 - Front Loaded Terrace - 7.5m x 25m
 - Front Loaded Terrace - 9m+ x 25m (Ends)
 - Urban Villa - 8.5m x 25m
 - Villa - 10m x 25m
 - Premium Villa - 12.5m x 25m
 - Courtyard - 14m x 25m
 - Traditional - 16m x 25m
- 28m Deep**
- Front Loaded Terrace - 7.5m x 28m
 - Front Loaded Terrace - 9m+ x 28m (Ends)
 - Urban Villa - 8.5m x 28m
 - Villa - 10m x 28m
 - Premium Villa - 12.5m x 28m
 - Courtyard - 14m x 28m
 - Traditional - 16m x 28m
- 30m Deep**
- Villa - 10m x 30m
 - Premium Villa - 12.5m x 30m
 - Courtyard - 14m x 30m
 - Traditional - 16m x 30m

Legend

- Aura Lakes Site Boundary
 - P18 Stage Boundary
 - Stage Boundary
 - 1m Contours
 - Lifestyle Buffer
- Super Allotment**
- Child Care
 - Medium Density
 - State Primary School
 - Emerging Community
 - Advertising Device
- Open Space**
- Drainage
 - Local Linear Park
 - Local Recreation Park
 - Neighbourhood Recreation Park
 - Neighbourhood Sports Park
 - Road Reserve Embellishment / Pedestrian Linkage



APPENDIX D TABULATED RESULTS AND ACOUSTIC REQUIREMENTS

Table D1 Acoustic Construction Requirements

Lot	Pad Level (m)	L _{A10,18-hr} Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
		Ground Floor	First Floor	Ground Floor	First Floor
3000	12.2	61	62	1	1
3001	12.2	61	62	1	1
3002	12.2	61	62	1	1
3003	12.18	61	62	1	1
3004	12.38	61	62	1	1
3005	13.2	61	62	1	1
3006	13.37	62	63	1	2
3007	13.49	62	63	1	2
3008	13.59	62	63	1	2
3009	13.41	62	63	1	2
3010	13.39	62	63	1	2
3011	13.22	63	64	2	2
3012	13.92	63	64	2	2
3013	13.91	64	65	2	2
3014	13.93	64	66	2	2
3015	14.29	65	67	2	2
3016	14.29	66	67	2	2
3017	14.29	67	68	2	3
3018	14.29	69	70	3	3
3019	13.9	63	65	2	2
3020	14.14	63	65	2	2
3021	14.09	63	65	2	2
3022	13.99	63	64	2	2
3023	13.89	62	64	1	2
3024	13.89	62	64	1	2
3025	13.78	62	64	1	2
3026	13.74	62	63	1	2
3027	13.71	61	63	1	2
3028	13.72	61	63	1	2
3029	14.69	62	64	1	2
3030	14.88	62	65	1	2
3031	14.99	63	65	2	2
3032	15.13	63	65	2	2
3033	15.27	63	66	2	2
3034	15.29	64	66	2	2
3035	15.29	64	66	2	2

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3036	15.29	65	67	2	2
3037	15.11	65	67	2	2
3038	14.82	65	67	2	2
3039	14.49	64	67	2	2
3040	13.82	64	66	2	2
3041	14.6	69	70	3	3
3042	14.63	69	70	3	3
3043	14.89	69	70	3	3
3044	14.94	69	70	3	3
3045	15.24	70	70	3	3
3046	15.36	70	70	3	3
3047	15.42	69	70	3	3
3048	15.43	69	70	3	3
3049	15.59	69	70	3	3
3050	15.61	69	70	3	3
3051	15.76	67	70	2	3
3052	15.8	66	69	2	3
3053	15.76	65	69	2	3
3054	15.49	64	68	2	3
3055	15.51	63	68	2	3
3056	15.49	63	67	2	2
3057	15.48	64	67	2	2
3058	15.3	64	67	2	2
3059	15.29	64	67	2	2
3060	15.3	64	68	2	3
3061	15.32	63	68	2	3
3062	15.3	63	68	2	3
3063	15.29	63	68	2	3
3064	15.29	63	68	2	3
3065	15.29	63	68	2	3
3066	15.59	63	69	2	3
3067	15.87	63	69	2	3
3068	15.87	63	69	2	3
3069	15.89	63	69	2	3
3070	15.91	63	69	2	3
3071	15.91	63	69	2	3
3072	16.21	63	70	2	3
3073	16.19	63	68	2	3
3074	16.2	62	68	1	3
3075	16.21	62	68	1	3
3076	16.2	62	68	1	3

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3077	16.29	62	68	1	3
3078	16.31	63	68	2	3
3079	16.3	63	68	2	3
3080	16.3	63	68	2	3
3081	15.99	62	63	1	2
3082	15.8	61	63	1	2
3083	15.69	61	62	1	1
3084	15.39	61	62	1	1
3085	15.39	61	62	1	1
3086	15.09	61	62	1	1
3087	14.89	60	61	1	1
3088	14.69	60	61	1	1
3089	13.02	60	61	1	1
3090	13.03	60	61	1	1
3091	13.49	60	61	1	1
3092	13.99	60	61	1	1
3093	14.19	60	61	1	1
3094	14.39	60	61	1	1
3095	14.39	60	61	1	1
3096	14.79	61	61	1	1
3097	14.79	61	61	1	1
3098	14.99	61	62	1	1
3099	15.19	61	62	1	1
3100	15.49	61	62	1	1
3101	15.49	61	62	1	1
3102	15.78	62	63	1	2
3103	15.8	62	63	1	2
3104	15.78	62	63	1	2
3105	15.68	62	63	1	2
3106	15.14	61	62	1	1
3107	15.13	61	62	1	1
3108	14.76	61	62	1	1
3109	14.56	61	62	1	1
3110	14.24	60	61	1	1
3111	13.95	60	61	1	1
3112	13.74	60	61	1	1
3113	13.44	60	61	1	1
3114	13.25	60	61	1	1
3115	13.03	60	61	1	1
3116	13.02	60	61	1	1
3117	12.63	60	61	1	1

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3118	12.63	60	61	1	1
3119	13.23	60	61	1	1
3120	13.39	60	61	1	1
3121	13.69	60	61	1	1
3122	13.89	60	61	1	1
3123	14.09	61	62	1	1
3124	14.29	61	62	1	1
3125	14.53	61	62	1	1
3126	14.74	61	62	1	1
3127	15.09	61	63	1	2
3128	15.42	62	64	1	2
3129	15.4	62	64	1	2
3130	15.39	62	64	1	2
3131	15.39	62	64	1	2
3132	14.71	61	63	1	2
3133	14.41	61	62	1	1
3134	14.17	61	62	1	1
3135	14.02	61	62	1	1
3136	13.83	61	62	1	1
3137	13.62	61	62	1	1
3138	13.32	60	61	1	1
3139	13.12	60	61	1	1
3140	12.92	60	61	1	1
3141	12.63	60	61	1	1
3142	12.62	60	61	1	1
3143	12.48	60	61	1	1
3144	12.43	60	61	1	1
3145	12.83	60	61	1	1
3146	13.09	61	62	1	1
3147	13.19	61	62	1	1
3148	13.49	61	62	1	1
3149	13.73	61	62	1	1
3150	13.99	61	62	1	1
3151	14.23	61	62	1	1
3152	14.49	61	63	1	2
3153	14.63	61	63	1	2
3154	14.9	62	64	1	2
3155	14.99	62	64	1	2
3156	14.52	62	64	1	2
3157	14.32	61	63	1	2
3158	14.03	61	63	1	2

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3159	14.01	61	63	1	2
3160	13.66	61	62	1	1
3161	13.62	61	62	1	1
3162	13.32	61	62	1	1
3163	13.23	61	62	1	1
3164	12.82	61	62	1	1
3165	12.63	60	62	1	1
3166	12.34	60	62	1	1
3167	12.23	60	62	1	1
3168	12.34	60	61	1	1
3169	12.1	61	62	1	1
3170	12.1	61	62	1	1
3171	12.1	60	62	1	1
3172	12.1	60	61	1	1
3173	12.1	60	61	1	1
3174	12.1	60	61	1	1
3175	12.49	61	61	1	1
3176	12.49	61	61	1	1
3177	12.49	60	61	1	1
3178	12.49	60	61	1	1
3179	12.49	60	61	1	1
3180	12.69	60	61	1	1
3181	12.69	60	61	1	1
3182	12.69	60	61	1	1
3183	12.69	60	61	1	1
3184	12.79	68	69	AS 3671	AS 3671
3185	12.79	68	69	AS 3671	AS 3671
3186	12.53	68	69	AS 3671	AS 3671
3187	12.27	68	69	AS 3671	AS 3671
3188	12.77	66	67	AS 3671	AS 3671
3189	12.73	65	66	AS 3671	AS 3671
3190	12.69	64	66	AS 3671	AS 3671
3191	12.65	64	65	AS 3671	AS 3671
3192	12.49	63	64	-	AS 3671
3193	12.49	63	64	-	AS 3671
3194	12.37	62	64	-	AS 3671
3195	12.3	62	63	-	-
3196	12.2	62	63	-	-
3197	12.2	62	63	-	-
3198	12.1	62	62	-	-
3199	12.1	62	62	-	-

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3200	11.6	61	62	-	-
3201	11.53	61	62	-	-
3202	11.22	61	62	-	-
3203	11.3	61	62	-	-
3204	11.36	62	62	-	-
3205	11.33	62	63	-	-
3206	11.56	62	63	-	-
3207	11.54	62	63	-	-
3208	11.63	62	64	-	AS 3671
3209	11.74	63	64	-	AS 3671
3210	11.89	63	64	-	AS 3671
3211	11.9	63	65	-	AS 3671
3212	11.92	64	65	AS 3671	AS 3671
3213	12.03	64	66	AS 3671	AS 3671
3214	12.1	65	67	AS 3671	AS 3671
3215	12.1	68	69	AS 3671	AS 3671
3216	11.8	68	68	AS 3671	AS 3671
3217	11.63	68	68	AS 3671	AS 3671
3218	11.4	68	68	AS 3671	AS 3671
3219	11.3	67	68	AS 3671	AS 3671
3220	11.1	67	68	AS 3671	AS 3671
3221	10.8	67	67	AS 3671	AS 3671
3222	10.4	66	67	AS 3671	AS 3671
3223	10.4	66	67	AS 3671	AS 3671
3224	10.02	65	66	AS 3671	AS 3671
3225	10.2	64	65	AS 3671	AS 3671
3226	10.4	64	65	AS 3671	AS 3671
3227	10.69	65	66	AS 3671	AS 3671
3228	10.75	65	66	AS 3671	AS 3671
3229	10.85	65	66	AS 3671	AS 3671
3230	10.94	65	66	AS 3671	AS 3671
3231	11.19	65	66	AS 3671	AS 3671
3232	11.6	65	67	AS 3671	AS 3671
3232	12	66	67	AS 3671	AS 3671
3233	12	66	67	AS 3671	AS 3671
3234	11.04	62	64	-	AS 3671
3235	11.3	63	64	-	AS 3671
3236	11.3	62	63	-	-
3237	11.3	62	63	-	-
3238	10.72	63	64	-	AS 3671
3239	10.54	63	64	-	AS 3671

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3240	10.4	63	64	-	AS 3671
3241	10.37	63	64	-	AS 3671
3242	10.4	63	64	-	AS 3671
3243	11	63	63	-	-
3244	11	62	63	-	-
3245	11	62	63	-	-
3246	11.1	62	63	-	-
3247	11.1	62	63	-	-
3248	11.25	62	62	-	-
3249	11.28	62	62	-	-
3250	11.28	62	62	-	-
3251	11.28	62	62	-	-
3252	11.32	61	62	-	-
3253	11.38	61	62	-	-
3254	11.4	61	62	-	-
3255	11.44	61	62	-	-
3256	11.45	61	62	-	-
3257	11.52	61	62	-	-
3258	11.8	61	62	-	-
3259	11.8	61	62	-	-
3260	11.84	61	61	-	-
3260	11.84	61	61	-	-
3261	11.84	61	61	-	-
3262	11.84	61	61	-	-
3263	11.83	61	61	-	-
3264	11.84	61	61	-	-
3265	11.83	61	61	-	-
3266	11.83	61	61	-	-
3267	11.83	60	61	-	-
3268	11.9	61	61	-	-
3269	11.9	61	61	-	-
3270	11.9	61	61	-	-
3271	11.91	61	61	-	-
3272	11.94	61	61	-	-
3273	12	61	62	-	-
3274	11.97	61	62	-	-
3275	11.8	61	62	-	-
3276	11.8	61	62	-	-
3277	11.8	61	62	-	-
3278	11.8	61	62	-	-
3279	11.86	61	62	-	-

		L _{A10,18-hr} Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3280	11.93	61	62	-	-
3281	11.95	61	62	-	-
3282	12.02	61	62	-	-
3283	12.07	61	62	-	-
3284	12.1	61	62	-	-
3285	11.96	61	62	-	-
3286	11.96	61	62	-	-
3287	11.9	61	62	-	-
3288	11.78	62	62	-	-
3289	11.7	62	62	-	-
3290	11.7	62	62	-	-
3291	11.7	62	62	-	-
3292	11.7	62	62	-	-
3293	11.6	61	62	-	-
3294	11.55	62	62	-	-
3295	11.51	62	62	-	-
3296	11.5	62	62	-	-
3297	11.3	62	62	-	-
3298	11.28	62	62	-	-
3299	11.26	62	62	-	-
3300	11.21	62	62	-	-
3301	11.2	62	62	-	-
3302	10.99	62	62	-	-
3303	10.97	62	62	-	-
3304	10.95	62	63	-	-
3305	10.94	62	63	-	-
3306	10.92	62	63	-	-
3307	10.9	62	63	-	-
3308	10.45	62	63	-	-
3309	10.42	63	63	-	-
3310	10.4	63	63	-	-
3311	10.4	63	63	-	-
3312	10.28	63	63	-	-
3313	10.25	63	63	-	-
3314	10.21	63	63	-	-
3315	10.2	63	64	-	AS 3671
3316	10.2	63	64	-	AS 3671
3317	9.98	63	64	-	AS 3671
3318	9.94	63	64	-	AS 3671
3319	9.91	64	64	AS 3671	AS 3671
3320	9.9	64	64	AS 3671	AS 3671

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3321	9.9	64	64	AS 3671	AS 3671
3322	9.66	64	64	AS 3671	AS 3671
3323	9.66	64	65	AS 3671	AS 3671
3324	9.65	64	65	AS 3671	AS 3671
3325	9.64	64	65	AS 3671	AS 3671
3326	9.63	65	65	AS 3671	AS 3671
3327	9.41	65	65	AS 3671	AS 3671
3328	9.42	65	65	AS 3671	AS 3671
3329	9.6	64	65	AS 3671	AS 3671
3330	9.6	64	65	AS 3671	AS 3671
3331	9.6	64	64	AS 3671	AS 3671
3332	9.6	64	64	AS 3671	AS 3671
3333	9.9	64	64	AS 3671	AS 3671
3334	9.9	64	64	AS 3671	AS 3671
3335	9.9	64	64	AS 3671	AS 3671
3336	9.9	64	64	AS 3671	AS 3671
3337	9.9	64	64	AS 3671	AS 3671
3338	10.1	64	64	AS 3671	AS 3671
3339	10.1	64	64	AS 3671	AS 3671
3340	10.1	63	64	-	AS 3671
3341	10.1	63	64	-	AS 3671
3342	10.4	63	64	-	AS 3671
3343	10.4	63	64	-	AS 3671
3344	10.4	63	64	-	AS 3671
3345	10.4	63	64	-	AS 3671
3346	10.9	63	63	-	-
3347	10.9	63	63	-	-
3348	10.9	63	63	-	-
3349	10.9	63	63	-	-
3350	10.9	62	63	-	-
3351	11.2	63	63	-	-
3352	11.2	62	63	-	-
3353	11.2	62	63	-	-
3354	11.2	62	63	-	-
3355	11.2	62	63	-	-
3356	11.5	62	63	-	-
3357	11.5	62	63	-	-
3358	11.5	62	63	-	-
3359	11.5	62	63	-	-
3360	11.5	62	63	-	-
3361	10.88	64	64	AS 3671	AS 3671

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3362	10.87	64	64	AS 3671	AS 3671
3363	10.87	64	64	AS 3671	AS 3671
3364	10.77	64	64	AS 3671	AS 3671
3365	10.77	64	65	AS 3671	AS 3671
3366	10.77	64	65	AS 3671	AS 3671
3367	10.78	64	65	AS 3671	AS 3671
3368	10.78	64	65	AS 3671	AS 3671
3369	10.78	64	65	AS 3671	AS 3671
3370	10.73	64	65	AS 3671	AS 3671
3371	10.37	64	65	AS 3671	AS 3671
3372	10.37	64	65	AS 3671	AS 3671
3373	10.38	64	65	AS 3671	AS 3671
3374	10.38	64	65	AS 3671	AS 3671
3375	10.36	64	65	AS 3671	AS 3671
3376	10.09	64	65	AS 3671	AS 3671
3377	10.09	64	65	AS 3671	AS 3671
3378	10.08	65	65	AS 3671	AS 3671
3379	10.09	65	65	AS 3671	AS 3671
3380	10.08	65	65	AS 3671	AS 3671
3381	10.08	65	65	AS 3671	AS 3671
3382	9.85	65	65	AS 3671	AS 3671
3383	9.83	65	65	AS 3671	AS 3671
3384	9.83	65	65	AS 3671	AS 3671
3385	9.84	65	65	AS 3671	AS 3671
3386	9.58	65	65	AS 3671	AS 3671
3387	9.58	65	66	AS 3671	AS 3671
3388	9.58	65	66	AS 3671	AS 3671
3389	9.58	65	66	AS 3671	AS 3671
3390	9.58	65	66	AS 3671	AS 3671
3391	9.38	65	66	AS 3671	AS 3671
3392	9.37	65	66	AS 3671	AS 3671
3393	9.37	65	66	AS 3671	AS 3671
3394	9.37	66	66	AS 3671	AS 3671
3395	9.37	66	66	AS 3671	AS 3671
3396	9.00	66	66	AS 3671	AS 3671
3397	8.85	66	67	AS 3671	AS 3671
3398	8.92	68	68	AS 3671	AS 3671
3398	9	66	66	AS 3671	AS 3671
3399	8.92	70	71	AS 3671	AS 3671
3400	9.02	68	68	AS 3671	AS 3671
3401	9.02	68	68	AS 3671	AS 3671

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3402	9.02	68	68	AS 3671	AS 3671
3403	9.03	68	68	AS 3671	AS 3671
3404	9.03	68	68	AS 3671	AS 3671
3405	9.23	68	68	AS 3671	AS 3671
3406	9.23	68	68	AS 3671	AS 3671
3407	9.24	68	68	AS 3671	AS 3671
3408	9.23	68	68	AS 3671	AS 3671
3409	9.24	68	68	AS 3671	AS 3671
3410	9.56	67	68	AS 3671	AS 3671
3411	9.57	67	68	AS 3671	AS 3671
3412	9.59	67	68	AS 3671	AS 3671
3413	9.59	67	68	AS 3671	AS 3671
3414	9.6	67	68	AS 3671	AS 3671
3415	9.79	67	68	AS 3671	AS 3671
3416	9.78	67	68	AS 3671	AS 3671
3417	9.79	67	68	AS 3671	AS 3671
3418	9.79	67	68	AS 3671	AS 3671
3419	9.79	67	68	AS 3671	AS 3671
3420	10.07	67	68	AS 3671	AS 3671
3421	10.07	66	68	AS 3671	AS 3671
3422	10.07	66	68	AS 3671	AS 3671
3423	10.08	66	68	AS 3671	AS 3671
3424	10.38	67	68	AS 3671	AS 3671
3425	10.37	66	67	AS 3671	AS 3671
3426	10.37	66	67	AS 3671	AS 3671
3427	10.37	66	67	AS 3671	AS 3671
3428	10.37	66	67	AS 3671	AS 3671
3429	10.37	66	67	AS 3671	AS 3671
3430	10.37	66	67	AS 3671	AS 3671
3431	10.75	66	67	AS 3671	AS 3671
3432	10.76	66	67	AS 3671	AS 3671
3433	10.77	66	67	AS 3671	AS 3671
3434	10.78	66	67	AS 3671	AS 3671
3435	10.78	66	67	AS 3671	AS 3671
3436	10.8	66	67	AS 3671	AS 3671
3437	14.49	60	61	1	1
3438	14.49	60	61	1	1
3439	14.49	60	61	1	1
3440	14.49	60	61	1	1
3441	14.49	60	61	1	1
3442	14.69	60	61	1	1

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3443	14.69	60	61	1	1
3444	14.69	60	61	1	1
3445	14.99	60	61	1	1
3446	15.09	61	61	1	1
3447	15.09	61	62	1	1
3448	15.19	61	62	1	1
3449	15.27	61	62	1	1
3450	15.43	61	62	1	1
3451	15.44	61	63	1	2
3452	15.59	62	63	1	2
3453	15.91	62	67	1	2
3454	15.59	62	67	1	2
3455	15.38	63	67	2	2
3456	15.24	63	68	2	3
3457	15.2	63	69	2	3
3458	15.14	63	68	2	3
3459	15.19	63	68	2	3
3460	15.03	63	67	2	2
3461	14.99	63	68	2	3
3462	14.99	63	68	2	3
3463	14.99	63	68	2	3
3464	14.94	63	68	2	3
3465	14.89	63	68	2	3
3466	14.65	63	68	2	3
3467	14.58	63	68	2	3
3468	14.5	63	68	2	3
3469	14.44	63	68	2	3
3470	14.36	63	67	2	2
3471	14.3	63	67	2	2
3472	14.29	63	67	2	2
3473	14.29	63	68	2	3
3474	14.29	63	67	2	2
3475	14.29	63	68	2	3
3476	14.02	62	67	1	2
3477	14.03	62	67	1	2
3478	14.02	62	67	1	2
3479	14.03	62	67	1	2
3480	14.04	62	67	1	2
3481	13.85	62	67	1	2
3482	13.74	62	68	1	3
3483	13.74	62	67	1	2

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3484	13.74	62	67	1	2
3485	13.75	62	67	1	2
3486	13.09	61	63	1	2
3487	12.99	61	62	1	1
3488	12.63	60	61	1	1
3489	12.59	60	61	1	1
3490	12.3	60	61	1	1
3491	12	60	60	1	1
3492	12.16	60	61	1	1
3493	12.16	60	61	1	1
3494	12.43	60	61	1	1
3495	12.44	60	61	1	1
3496	12.68	60	61	1	1
3497	13.39	61	62	1	1
3498	13.39	61	62	1	1
3499	13.49	61	62	1	1
3500	13.49	61	62	1	1
3501	13.42	61	62	1	1
3502	13.77	61	62	1	1
3503	13.37	61	62	1	1
3504	13.18	60	61	1	1
3505	12.88	60	61	1	1
3506	13.19	60	61	1	1
3507	13.51	60	62	1	1
3508	13.69	61	62	1	1
3509	13.89	61	63	1	2
3510	12.99	59	60	1	1
3511	12.96	60	61	1	1
3512	13.22	60	61	1	1
3513	13.59	60	61	1	1
3514	13.8	61	62	1	1
3515	14.14	61	63	1	2
3516	14.19	61	63	1	2
3517	14.26	61	63	1	2
3518	14.29	61	63	1	2
3519	14.38	61	63	1	2
3520	14.18	61	62	1	1
3521	14.02	60	61	1	1
3522	13.79	60	61	1	1
3523	12.99	59	60	1	1
3524	13.02	59	60	1	1

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3525	13.5	59	61	1	1
3526	13.59	60	61	1	1
3527	13.63	60	61	1	1
3528	14.04	60	61	1	1
3529	14.05	60	61	1	1
3530	14.34	60	62	1	1
3531	14.35	61	62	1	1
3532	14.79	61	63	1	2
3533	14.79	61	63	1	2
3534	14.79	61	63	1	2
3534	14.82	61	63	1	2
3536	14.69	61	62	1	1
3537	14.69	60	62	1	1
3538	14.49	60	61	1	1
3539	14.49	60	61	1	1
3540	14.29	60	61	1	1
3541	14.29	60	61	1	1
3542	14.11	60	61	1	1
3543	13.79	59	61	1	1
3544	13.79	59	61	1	1
3545	13.46	59	60	1	1
3546	13.48	59	60	1	1
3547	13.68	59	61	1	1
3548	13.93	60	61	1	1
3549	13.99	60	61	1	1
3550	14.03	60	61	1	1
3551	14.02	60	61	1	1
3552	14.26	60	61	1	1
3553	14.29	60	61	1	1
3554	14.52	60	61	1	1
3555	14.45	60	61	1	1
3556	14.64	60	61	1	1
3557	14.67	60	61	1	1
3558	14.74	60	61	1	1
3559	14.74	60	62	1	1
3560	14.95	61	62	1	1
3561	14.95	61	62	1	1
3562	15.19	61	63	1	2
3563	15.39	61	63	1	2
3564	15.28	61	62	1	1
3565	15.28	61	62	1	1

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3566	15.29	61	62	1	1
3567	15.29	61	62	1	1
3568	15.09	61	62	1	1
3569	15.09	61	61	1	1
3570	14.99	60	61	1	1
3571	14.99	60	61	1	1
3572	14.89	60	61	1	1
3573	14.89	60	61	1	1
3574	14.7	60	61	1	1
3575	14.49	60	61	1	1
3576	14.49	60	61	1	1
3577	14.39	60	61	1	1
3578	14.39	60	61	1	1
3579	14.39	61	61	1	1
3580	14.18	60	61	1	1
3581	14.17	61	61	1	1
3582	10.71	59	60	1	1
3583	10.69	59	60	1	1
3584	10.89	59	60	1	1
3585	11	59	60	1	1
3586	11.37	60	60	1	1
3587	11.74	59	60	1	1
3588	12.04	60	61	1	1
3589	12.54	61	62	1	1
3590	12.79	61	62	1	1
3591	12.49	61	62	1	1
3592	12.49	61	62	1	1
3593	12.2	60	61	1	1
3594	12.2	60	61	1	1
3595	11.8	60	61	1	1
3596	11.51	60	60	1	1
3597	11	59	60	1	1
3598	10.15	59	60	1	1
3599	10.7	59	60	1	1
3600	10.7	59	60	1	1
3601	10.5	59	60	1	1
3602	10.5	59	60	1	1
3603	10.5	59	60	1	1
3604	10.1	59	60	1	1
3605	10.1	59	60	1	1
3606	10.19	59	60	1	1

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3607	10.49	59	60	1	1
3608	10.49	59	60	1	1
3609	11.01	60	61	1	1
3610	11.01	60	61	1	1
3611	11.32	60	61	1	1
3612	11.34	60	61	1	1
3613	12.39	61	62	1	1
3614	12	61	62	1	1
3615	11.3	61	62	1	1
3616	11.3	61	63	1	2
3617	11	60	62	1	1
3618	11	60	61	1	1
3619	10.7	60	61	1	1
3620	10.7	60	61	1	1
3621	10.5	60	61	1	1
3622	10.5	60	60	1	1
3623	10.1	59	60	1	1
3624	10.1	59	60	1	1
3625	9.8	59	60	1	1
3626	9.65	59	59	1	1
3627	9.6	58	59	1	1
3628	9.6	58	59	1	1
3629	9.6	58	59	1	1
3630	9.2	58	59	1	1
3631	9.2	58	59	1	1
3632	9.2	58	59	1	1
3633	9.02	59	59	1	1
3634	8.68	58	59	1	1
3635	8.89	59	60	1	1
3636	8.93	59	60	1	1
3637	8.95	59	60	1	1
3638	8.96	59	60	1	1
3639	9.2	59	60	1	1
3640	9.24	59	60	1	1
3641	9.25	59	60	1	1
3642	9.22	59	61	1	1
3643	9.58	59	61	1	1
3644	9.6	60	61	1	1
3645	9.89	60	61	1	1
3646	9.88	60	62	1	1
3647	10.82	61	63	1	2

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3648	10.6	61	63	1	2
3649	9.4	61	63	1	2
3650	9.4	61	63	1	2
3651	9.33	60	62	1	1
3652	9.25	60	62	1	1
3653	9.2	60	61	1	1
3654	9.15	60	61	1	1
3655	9.17	60	61	1	1
3656	9.13	60	61	1	1
3657	9.1	60	61	1	1
3658	8.96	60	61	1	1
3659	8.96	60	61	1	1
3660	8.93	59	60	1	1
3661	8.7	59	60	1	1
3662	8.7	59	60	1	1
3663	8.7	59	60	1	1
3664	8.6	59	60	1	1
3665	8.24	59	60	1	1
3666	8.26	59	60	1	1
3667	8.26	59	60	1	1
3668	8.26	59	60	1	1
3669	8.44	60	61	1	1
3670	8.43	60	61	1	1
3671	8.44	60	61	1	1
3672	8.67	60	61	1	1
3673	8.64	60	62	1	1
3674	8.9	60	62	1	1
3675	8.91	60	62	1	1
3676	8.94	60	62	1	1
3677	8.97	61	62	1	1
3678	8.9	61	63	1	2
3679	9.4	61	63	1	2
3680	8.62	61	63	1	2
3681	8.71	62	64	1	2
3682	8.71	61	64	1	2
3683	8.71	61	64	1	2
3684	8.71	61	63	1	2
3685	8.55	61	63	1	2
3686	8.51	61	63	1	2
3687	8.32	61	62	1	1
3688	8.3	61	62	1	1

		LA10,18-hr Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3689	8.3	60	62	1	1
3690	8.1	60	61	1	1
3691	8.1	60	61	1	1
3692	8.1	59	60	1	1
3693	8.1	59	60	1	1
3694	8.1	59	60	1	1
3695	7.7	59	60	1	1
3696	7.7	58	59	-	-
3698	8.2	58	59	1	1
3698	8.25	58	59	1	1
3699	8.2	58	59	-	-
3700	7.9	58	59	-	-
3701	7.9	58	59	-	-
3702	7.67	58	59	-	-
3703	7.4	58	59	-	-
3704	7.4	58	59	-	-
3705	7.05	58	59	-	-
3706	7.11	58	59	-	-
3707	7.1	58	59	-	-
3708	7.39	59	60	-	-
3709	7.42	59	60	1	1
3710	7.42	59	60	1	1
3711	7.44	59	60	1	1
3712	7.45	60	61	1	1
3713	7.89	60	62	1	1
3714	7.88	61	62	1	1
3715	7.8	61	63	1	2
3716	7.86	61	63	1	2
3717	7.94	61	64	1	2
3718	7.96	61	64	1	2
3719	8.1	62	65	1	2
3720	8.14	62	65	1	2
3722	8.13	62	66	1	2
3722	8.38	62	66	1	2
3723	8.62	62	69	1	3
3724	8.9	62	68	1	3
3725	8.94	62	67	1	2
3726	9.22	62	67	1	2
3727	9.24	62	67	1	2
3728	9.55	62	67	1	2
3729	9.55	62	67	1	2

		L _{A10,18-hr} Façade Corrected (dBA)		Acoustic Requirement (MP4.4 Cat or AS 3671)	
3730	9.84	63	67	2	2
3731	9.84	63	67	2	2
3732	9.86	62	67	1	2
3733	10.36	63	67	2	2
3734	10.51	63	67	2	2
3735	10.85	63	67	2	2
3736	11.14	63	67	2	2
3737	11.44	62	67	1	2
3738	11.64	62	67	1	2
3739	11.94	62	67	1	2
3740	12.25	62	67	1	2
3741	12.46	62	67	1	2
3742	12.77	62	67	1	2
3743	12.76	62	67	1	2
3744	13.06	62	67	1	2
3745	13.06	62	67	1	2
3746	13.29	62	67	1	2
3747	13.45	62	67	1	2
3748	16.36	62	67	1	2
8001	13.14	61	61	AS 3671	AS 3671
8002	16.39	60	61	1	1
8004	15.34	59	60	1	1
8006	8.02	58	59	-	-

APPENDIX E QDC MP4.4 CONSTRUCTION REQUIREMENTS

Component of Buildings External Envelope	Minimum Acoustic Rating (R_w)	Acceptable Forms of Construction
Noise Category 4		
Glazing	43	Double glazing consisting of two panes of minimum 5mm thick glass with at least 100mm air gap and full perimeter acoustically rated seals.
External walls	52	Two leaves of clay brick masonry, at least 270mm in total, with subfloor vents fitted with noise attenuators.
Roof	45	Concrete or terracotta tile or sheet metal roof with sarking, acoustically rated plasterboard ceiling at least 13mm thick fixed to ceiling joists, cellulose fibre insulation at least 100mm thick with a density of at least 45kg/m ³ in the cavity. OR Concrete or terracotta tile or sheet metal roof with sarking, 2 layers of acoustically rated plasterboard at least 16mm 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.
Floors	51	Concrete slab at least 150mm thick.
Entry doors	35	Solid core timber not less than 45mm thick, fixed so as to overlap the frame or rebate of the frame by not less than 10mm, with full perimeter acoustically rated seals.
Noise Category 3		
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.

Component of Buildings External Envelope	Minimum Acoustic Rating (R_w)	Acceptable Forms of Construction
External walls	47	Two leaves of clay brick masonry at least 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) 50mm thick mineral insulation or 50mm thick glass wool insulation with a density of 11kg/m^3 or 50mm thick polyester insulation with a density of 20kg/m^3 in the cavity. OR Two leaves of clay brick masonry at last 110mm thick with: (i) cavity not less than 50mm between leaves; and (ii) at least 13mm thick cement render on each face OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) Mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m^3 positioned between studs; and (iii) One layer of plasterboard at least 13mm thick fixed to outside face of studs. OR Single leaf of minimum 150mm thick masonry of hollow, dense concrete blocks, with mortar joints laid to prevent moisture bridging.
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 doors	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 blockboard not less than 45mm thick; and/or (ii) acoustically laminated glass not less than 10.38mm thick.

Noise Category 2		
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	Two leaves of clay brick masonry at least 110mm thick with cavity not less than 50mm between leaves OR Single leaf of clay brick masonry at least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/m³ positioned between studs; and (iii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Single leaf of brick masonry at least 110mm thick with at least 13mm thick render on each face OR Concrete brickwork at least 110mm thick OR In-situ concrete at least 100mm thick OR Precast concrete at least 100mm thick and without joints.
Roof	38	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity, mineral insulation or glass wool insulation at least 50mm thick with a density of at least 11 kg/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/m³ 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/m³ 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.

Noise Category 2		
Entry doors	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 blockboard not less than 45mm thick; and/or (ii) acoustically laminated glass not less than 10.38mm thick.
Noise Category 1		
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 least 110mm thick with: (i) a row of at least 70mm x 35mm timber studs or 64mm steel studs at 600mm centres, spaced at least 20mm from the masonry wall; and (ii) One layer of plasterboard at least 10mm thick fixed to outside face of studs OR Minimum 6mm thick fibre cement sheeting or weatherboards or plank cladding externally, minimum 90mm deep timber stud or 92mm metal stud, standard plasterboard at least 13mm thick internally.
Roof	35	Concrete or terracotta tile or metal sheet roof with sarking, plasterboard ceiling at least 10mm thick fixed to ceiling cavity.
Entry doors	28	Fixed so as to overlap the frame or rebate of the frame, constructed of - (i) Wood, particleboard or blockboard not less than 33mm thick; or (ii) Compressed fibre reinforced sheeting not less than 9mm thick; or (iii) Other suitable material with a mass per unit area not less than 24.4kg/m ² ; or (iv) Solid core timber door not less than 35mm thick fitted with full perimeter acoustically rated seals.
Noise Category 0		
No additional acoustic treatment required – standard building assessment provisions apply.		