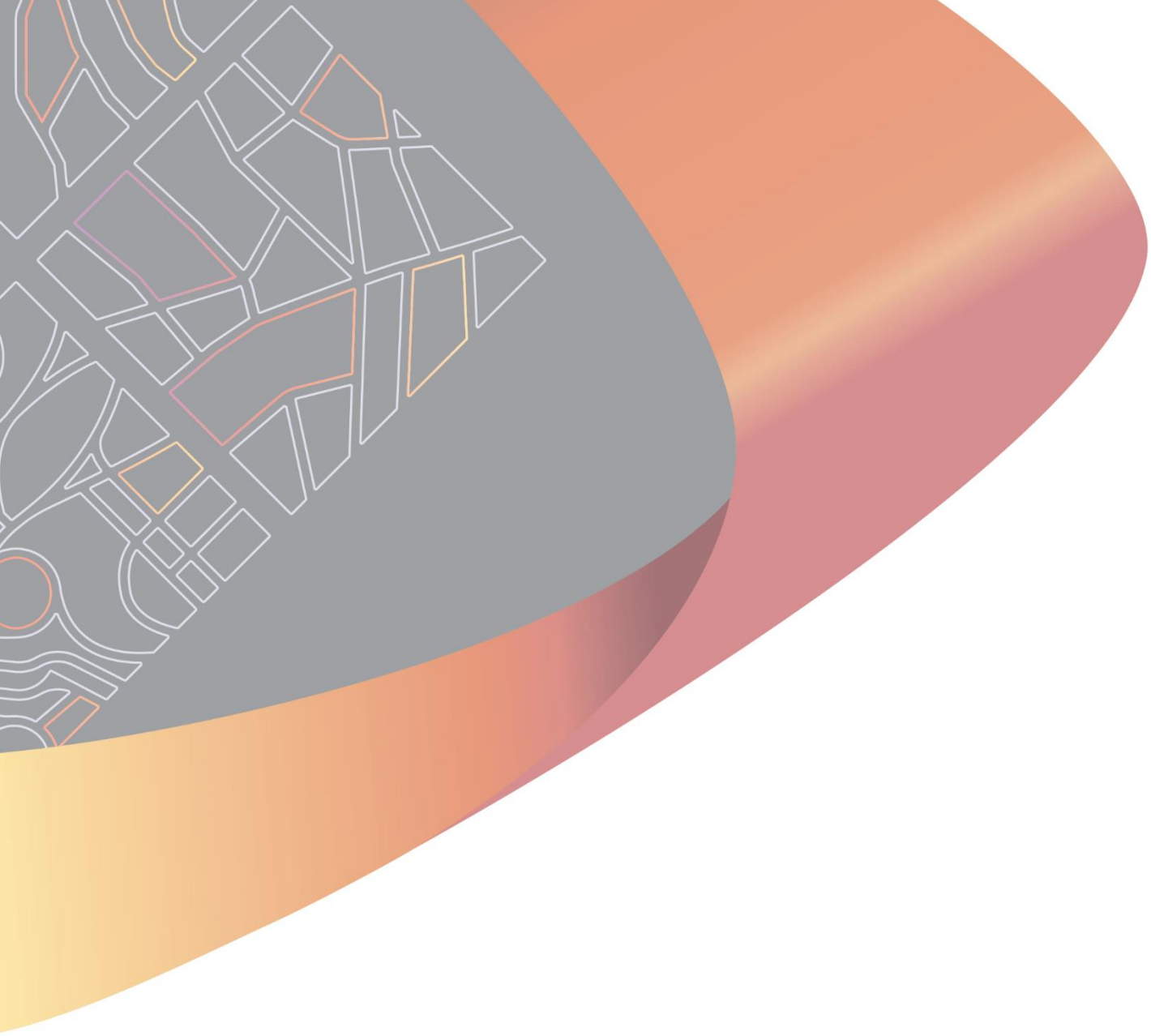

Premise

APPENDIX G

Acoustic Report prepared by Stantec

brazier motti

Parkside Greater Ascot – Stage 1

Acoustic Report

Noise Impact Assessment

7 November 2024

Ref: 301050931

PREPARED FOR:

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Revision Schedule

Revision No.	Date	Description	Prepared by	Quality Reviewer
P01	22/10/2024	Draft – for review and comment	CE	MLL
C01	07/11/2024	Final – for submission	CE	MLL

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1. Introduction

Stantec Australia Pty Ltd (Stantec) have been engaged by Parkside Group Pty Ltd to undertake acoustic assessment in support of the development application submission for the Parkside Greater Ascot – Stage 1 project. The project site is located at 182 Shaw Road, Shaw QLD 4818 and is within the Townsville City Council (TCC).

The following has been proposed for Stage 1 of Parkside Greater Ascot project:

- Childcare Centre (3248 m^2 site);
- Pad Site 5 – Food and Beverage (1997 m^2 site);
- Pad Site 6 – Food and Beverage (1848 m^2 site);
- Pad Site 7 – Automotive Workshop (1389 m^2 site); and
- Pad Site 8 – Petrol Station, Food and Beverage and Automatic Carwash (4296 m^2 site).

The purpose of this report is to;

- Define understanding of the existing sites and proposed uses of the buildings;
- Establish noise criteria applicable to noise emissions from the sites;
- Assess onsite environmental noise emissions to nearby sensitive receivers and external noise impacts onto sensitive uses; and
- Provide design recommendations for all sites to comply with the relevant criteria.

Each of the acoustical aspects identified have been addressed in this report and recommendations are made to provide a consistent acoustical outcome for the project.

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

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

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

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

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

2. Referenced Documentation

2.1 Regulations, Policies, Standards and Guidelines

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

Table 1: Applicable regulations, policies, standards and guidelines referenced in this report

Title	Abbreviation
STATE LEGISLATION AND LOCAL COUNCIL POLICIES	
Queensland Environmental Protection Act 1994	EPA 1994
Queensland Environmental Protection (Noise) Policy 2019	EPP 2019
Townsville City Council – Townsville City Plan (v2022/02)	TCC City Plan
Department of Transport and Main Roads – Transport Noise Management Code of Practice Volume 1 – Road Traffic Noise	TMR CoP
The State of Queensland (Department of Housing, Local Government, Planning and Public Works) – State code 1: Development in a state-controlled road environment	SDAP SC1
AUSTRALIAN AND INTERNATIONAL STANDARDS	
Australian Standard AS 1055.1-1997 *Acoustics – Description and measurement of environmental noise*	AS 1055
International Standards Organization 9613-2:1996 *Attenuation of sound during propagation outdoors – Part 2: General method of calculation*	ISO 9613
Australian / New Zealand Standard AS/NZS 2107:2016 – *Acoustics – Recommended design sound levels and reverberation times for building interiors*	AS 2107
TECHNICAL GUIDELINES	
Association of Australian Acoustical Consultants *Guideline for Child Care Centre Acoustic Assessment* (v3.0)	AAAC Guideline

2.2 Study Inputs

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

Table 2: Received documentation

Date Received	Detail	Revision / Date Prepared	Prepared By	Format
23/08/2024	Architectural drawings package: • *GREATER ASCOT - CHILDCARE- 240820_LR*	15/07/2024	Cottee Parker	pdf
08/10/2024	Architectural drawings package: • *1002 STAGE 1 SITE PLAN REV_07* • *2m fence detail*	27/09/2024	Cottee Parker	pdf
08/10/2024	Traffic impact assessment (TIA) report: • *P001406/R01*	Rev A 29/08/2024	Premise	pdf

3. Project Details

3.1 Site Description

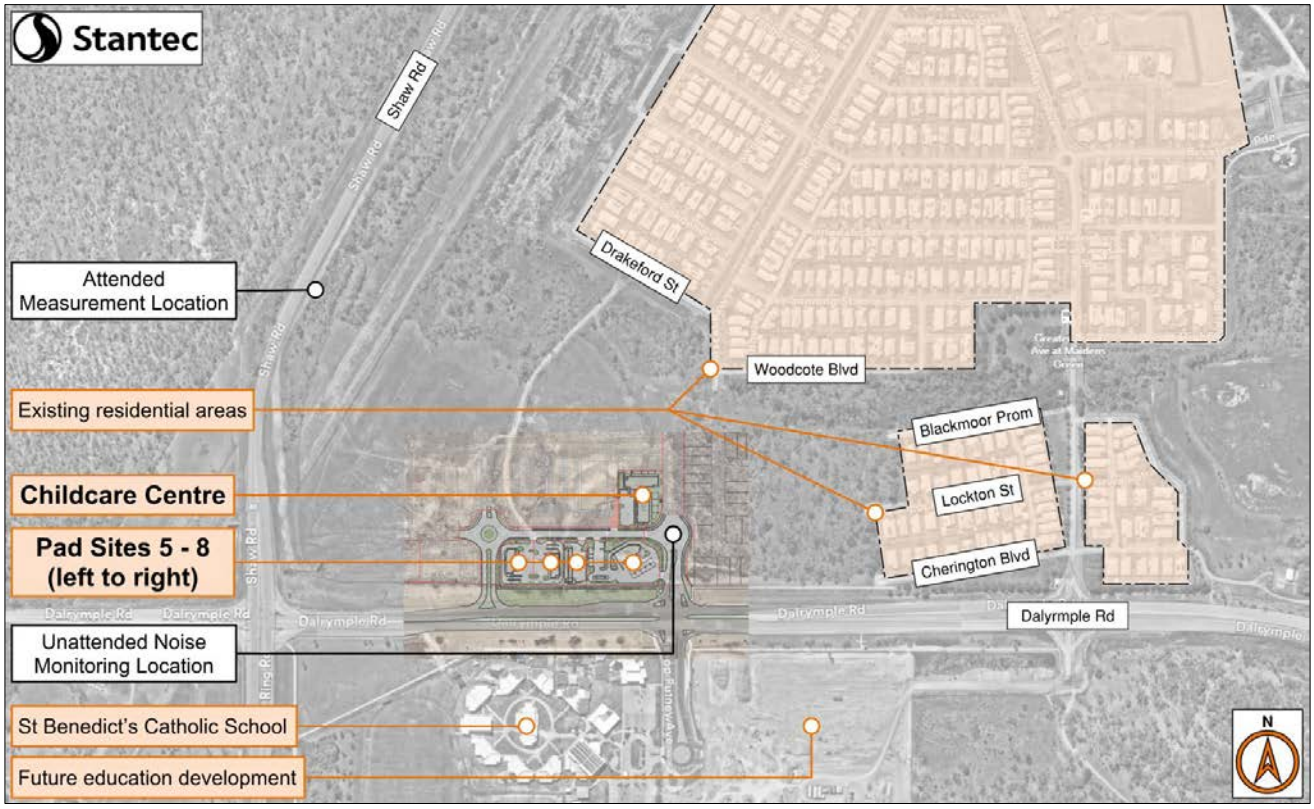
3.1.1 Project Location

The project site is located at 182 Shaw Road, Shaw QLD 4818 (5001 / SP340651). The Stage 1 project area is bound by:

- NORTH: Drakeford St, existing residential developments, future retail developments (subsequent project staging);
- EAST: Future (5000 / SP334260) and existing residential developments, Blackmore Prom, Lockton St and Cherington Blvd;
- SOUTH: Dalyrmple Rd, St Benedict's Catholic School and future educational development; and
- WEST: Shaw Rd (state-controlled road) and future retail developments (subsequent project staging).

The project site, surrounding areas and noise measurement locations (refer to **Section 3.3**) are detailed in **Figure 1**.

Figure 1: Project site, surrounding land uses and measurement locations



Source: Nearmap (image dated 14/07/2024 – link) | Annotations by Stantec

3.1.2 Surrounding Land Uses / Zoning

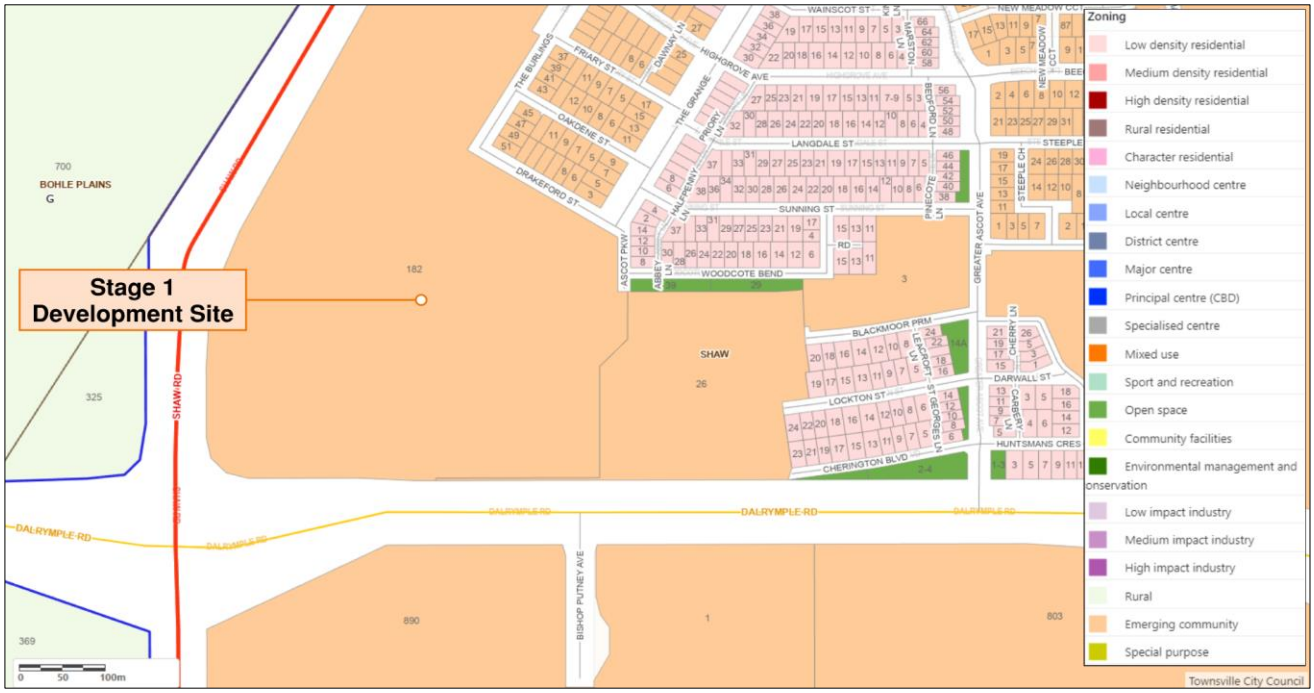
The TownsvilleMAPS – Townsville City Plan interactive mapping tool (link) was reviewed to determine existing and proposed land-uses of the areas surrounding the site (see **Figure 2**). The following was identified:

- The entire project site (i.e., 5001 / SP340651) is currently zoned Emerging Community;
- Existing lots surrounding the project site generally consist of the following land uses;
    - Emerging Community;

- Low Density Residential; and
- Rural.

- The nearest existing noise sensitive receivers to the project site are located at;
  - 23 Cherington Boulevard SHAW QLD 4818;
  - 19 and 24 Lockton Street SHAW QLD 4818;
  - 20 Blackmoor Promenade SHAW QLD 4818;
  - 6 to 30 Woodcote Bend SHAW QLD 4818;
  - 8 to 14 Ascot Parkway SHAW QLD 4818;
  - 3 The Grange SHAW QLD 4818;
  - 6 to 16 Drakeford Street SHAW QLD 4818
  - 51 The Burlings SHAW QLD 4818; and
  - 890 Dalrymple Road SHAW QLD 4818.
- It is understood that future noise sensitive uses are proposed for;
  - 1 Bishop Putney Avenue SHAW QLD 4818 (future educational);
  - 26 Lockton Street SHAW QLD 4818 (future residential);
- The proposed development lot (5001 / SP340651) is not located within;
  - Aircraft Noise Exposure Forecast (ANEF) contours;
  - Transport Noise Corridors – Rail contours; or
  - Transport Noise Corridors – State-controlled Roads (voluntary) contours.
- The proposed development lot (5001 / SP340651) is located within;
  - 25 m of a State transport corridor (State-controlled Roads, see **Figure 3**); and
  - Transport Noise Corridors – State-controlled Roads up to Category 1: 58 dB(A) =< Noise Level < 63 dB(A) (see **Figure 4**). It is noted that all proposed Stage 1 developments, in particular the Childcare Centre site, are situated outside of all noise contours (including Category 0: Noise Level < 58 dB(A)).

Figure 2: Land use / zoning surrounding the project site

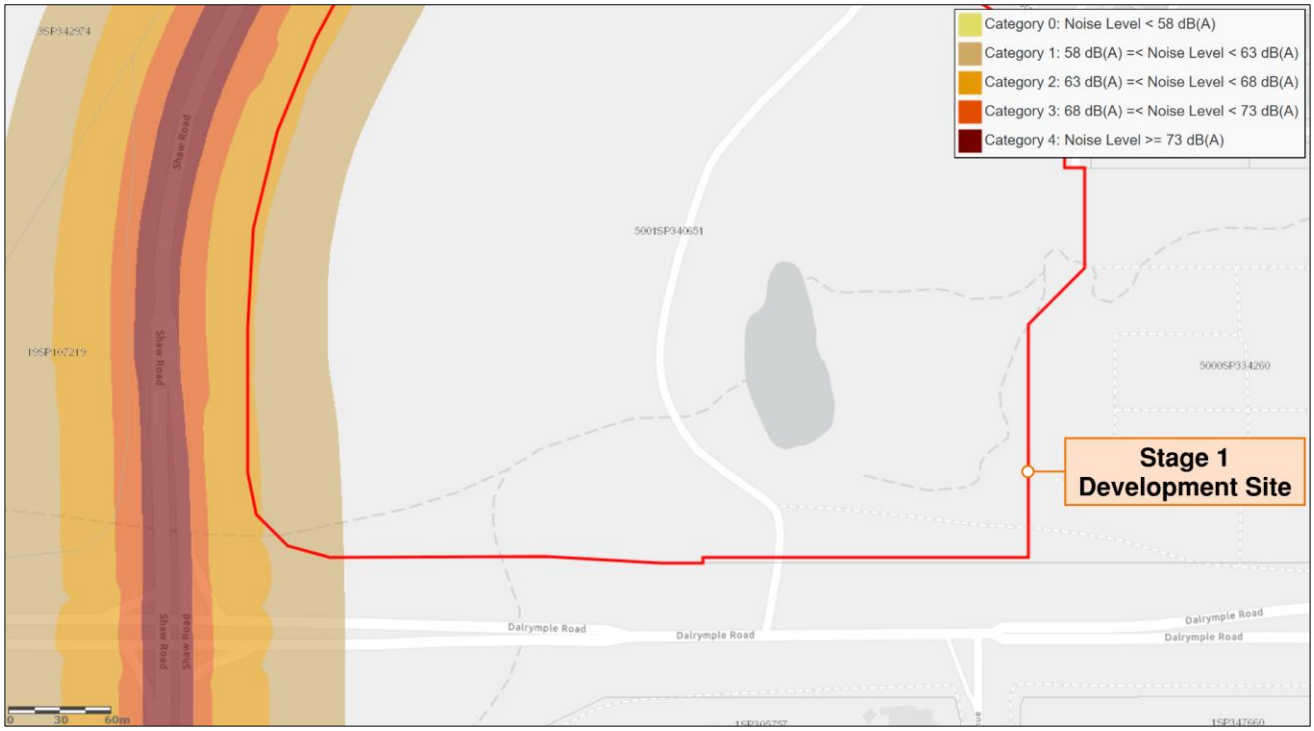


Source: TownsvilleMAPS – Townsville City Plan interactive mapping tool (link)| Annotations by Stantec

Figure 3: Project location shown in context within proximity to State-controlled road

Source: QLD Government Development Assessment Mapping System | Annotations by Stantec

Figure 4: Project location shown in context with Transport noise corridors – State-controlled road (mandatory)



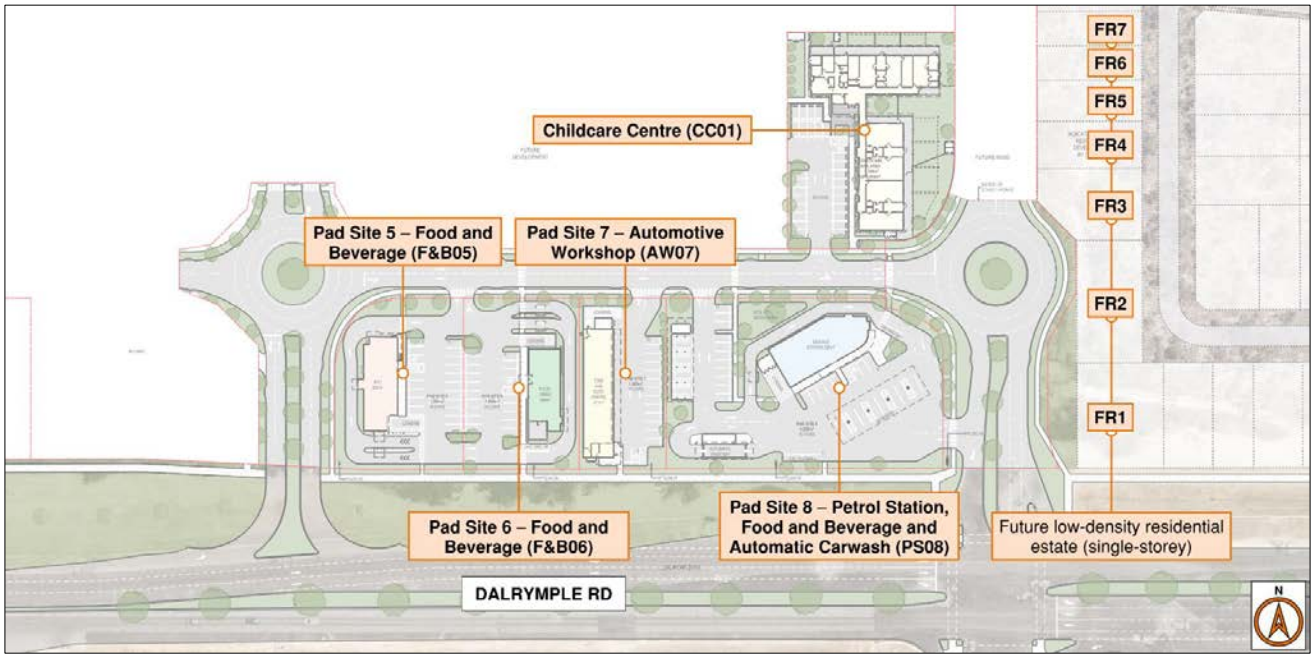
Source: QLD Government State Planning Policy Interactive Mapping System | Annotations by Stantec

3.2 General Description of Stage 1 Proposed Developments

3.2.1 General Layout

The general layout of the developments proposed for Parkside Greater Ascot – Stage 1 project, as well as indicative locations of potential future residential receptors have been provided in **Figure 5**. Further descriptions are provided below.

Figure 5: General layout of development sites proposed for the Parkside Greater Ascot – Stage 1 project



Source: 'Stage 1 Site Plan – SD1002[07]' – Cottee Parker Architects 20/08/2024 | Annotations by Stantec

3.2.2 Childcare Centre (CC01)

The current proposal for CC01 includes:

- Development Site Area: 3248 m^2
- Gross Floor Area: 954 m^2
- Outdoor Play Area: 904 m^2
- Population: 120 children (0 months to 5 years) / 21 educators – 141 total
- Site Vehicles: 19 visitors (1 car / 6 children) / 9 staff (1 car / fulltime staff) – 28 parking bays
- Proposed Operating Hours: Mon – Fri 6 AM to 6 PM (no outdoor activities before 7 AM)

3.2.3 Pad Site 5 – Food and Beverage (F&B05)

The current proposal for F&B05 includes:

- Development Site Area: 1964 m^2
- Gross Floor Area: 293 m^2
- Site Vehicles: 19 parking bays, 1 loading bay, 2 drive through lanes with 1 waiting bay
- Proposed Trading Hours: 24 hours offered to tenant

3.2.4 Pad Site 6 – Food and Beverage (F&B06)

The current proposal for F&B06 includes:

- Development Site Area: 1848 m^2
- Gross Floor Area: 240 m^2
- Site Vehicles: 19 parking bays, 1 loading bay, 2 drive through lanes with 1 waiting bay
- Proposed Trading Hours: 24 hours offered to tenant

3.2.5 Pad Site 7 – Automotive Workshop (AW07)

The current proposal for F&B06 includes:

- Development Site Area: 1389 m^2
- Gross Floor Area: 371 m^2
- Site Vehicles: 15 parking bays, 1 loading bay and 4 workshop bays (internal)
- Proposed Trading Hours: 24 hours offered to tenant (typical trading around Townsville region is 7 AM – 5 PM (link) and will be assumed for the proposed development)

3.2.6 Pad Site 8 – Service Station, Food and Beverage and Automatic Carwash (PS08)

The current proposal for PS08 includes:

- Development Site Area: 4296 m^2
- Gross Floor Area: 385 m^2 (service station only)
- Site Vehicles: 19 parking bays, 8 petrol bowser bays, 4 carwash / vacuum bays, 1 automatic carwash bay, 1 loading bay, 1 drive through lane.
- Proposed Trading Hours: 24 hours offered to tenant

3.2.7 Future Residential Receptors

As indicated in **Figure 5**, a land lot subdivision of 26 Lockton Street SHAW QLD 4818 (5000 / SP334260) for a new low-density residential estate is planned for location towards the east of the project site. Stantec have been advised that the following is considered typical for the future developments:

- Development Heights: Single storey (average façade height of 3.5 m)
- Minimum Boundary Setbacks: 3 m

In addition to the above parameters, it is expected that the western boundary of the lots indicated will include fencing / screening for visual amenity, security and acoustic purposes given proposed access is indicated to the east. For assessment purposes, Stantec have considered a standard acoustic fence to a maximum height of 2.4 m (RL 13.25 m) for lots FR1 – FR7 indicated in **Figure 5**.

3.3 Existing Acoustic Environment

3.3.1 Unattended Noise Monitoring (Noise Logging)

To quantify the existing noise environment on site and specify noise limits, unattended noise monitoring (noise logging) was conducted 19th September 2024 to 26th September 2024 (inclusive).

The location of the noise monitoring location has been shown in **Figure 1**.

Noise measurements were conducted following guidance from Australian Standard AS 1055:2018 – *Acoustics – Description and measurement of environmental noise* (AS 1055), and the instruments were configured as follows:

- A-weighting frequency response;
- FAST time response; and
- 15-minute intervals.

The sound level meter was calibrated before and after the measurement period. The instrument showed a drift less than ±1 dB during the course of monitoring; therefore, measurements are considered valid according to AS 1055.

A summary of the average unattended noise levels recorded are presented in **Table 3**. For further details and full measured results, refer to **Appendix B**.

Table 3: Summary of relevant noise descriptors used to determine noise limits and inform acoustic assessment

Monitoring Location	Rating Background Noise Level, $L_{90,T}$ dB(A)			Background Noise Level, $L_{90,T}$ dB(A)			Equivalent Continuous Noise Level, L_{eq} dB(A)			Road Traffic Noise Levels, $L_{10,18hr}$ dB(A)
	Day [1)]	Evening [1)]	Night [1)]	Day	Evening	Night	Day	Evening	Night	
See Figure 1	41	38	27	41	39	34	50	49	47	50

NOTES:

1) Day – 7 AM-6 PM | Evening – 6 PM-10 PM | Night – 10 PM-7 AM I 18hr – 6 AM-12 PM

3.3.2 Attended Measurements – Road Traffic Noise

Attended measurements of road traffic noise were conducted near Shaw Road on 1st October 2024 (see location in **Figure 1**). Measurements were conducted between 2:30 PM – 4:30 PM with the primary intent being to quantify road traffic noise levels during peak periods. Attended measurements were conducted due to the excessive distance between transport noise corridor, noise monitoring location and location of the proposed childcare centre.

The attended measurements were conducted in accordance with the Shortened Measurement Procedure outlined in Section III of the UK Department of Transport Welsh Office Calculation of Road Traffic Noise 1988 (CoRTN). CoRTN is widely accepted in Australia as a method for assessing and measuring noise associated with traffic.

A summary of noise levels and road traffic counts obtained has been presented in **Table 4**.

Table 4: Measured road traffic noise levels and traffic counts

ID	Road	Time Period	Vehicle Counts Recorded (both directions)			Measured $L_{10,1hr}$ dB(A)
			Cars	Trucks	% HV	
001	Shaw Rd (between Dalrymple Rd and Woolcock St)	2:50 PM – 3:00 PM	197	14	6.6	71.4
002		3:15 PM – 3:25 PM	262	14	5.1	71.6
003		3:55 PM – 4:05 PM	221	22	9.1	72.3
					Calculated $L_{10,3hr}$	71.8
					Calculated $L_{10,18hr}$	70.8

4. Acoustic Criteria

4.1 Environmental Noise Emissions

4.1.1 Queensland Government – Environmental Protection Act 1994

The objective of the Queensland Government Environmental Protection Act 1994 (EPA 1994) is "*to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.*"

To uphold this intent, and of relevance to acoustic assessment for the project, the EPA 1994 defines a series of noise-related standards in *Chapter 8, Part 3B Offences relating to noise standards*. The following sections are considered applicable to the project:

Section 440R Building work

(1) A person must not carry out building work in a way that makes an audible noise—

(a) on a business day or Saturday, before 6.30a.m. or after 6.30p.m; or

(b) on any other day, at any time.

(2) The reference in subsection (1) to a person carrying out building work—

(a) includes a person carrying out building work under an owner-builder permit; and

(b) otherwise does not include a person carrying out building work at premises used by the person only for residential purposes.

Section 440T Pumps

(1) This section applies to premises at or for which there is a pump.

(2) An occupier of the premises must not use, or permit the use of, the pump on any day—

(a) before 7a.m, if it makes an audible noise; or

(b) from 7a.m. to 7p.m, if it makes a noise of more than 5dB(A) above the background level [1]; or

(c) from 7p.m. to 10p.m, if it makes a noise of more than 3dB(A) above the background level; or

(d) after 10p.m, if it makes an audible noise.

(3) Subsection (2) (a), (c) and (d) do not apply to a noise made at an educational institution, that is not more than 5dB(A) above the background level.

(4) In this section—

***pump** —*

(a) means an electrical, mechanical or pneumatic pump; and

Examples — liquid pump, air pump, heat pump

(b) includes a swimming pool pump and a spa blower.

[1] *NOTE: According to the EPA 1994:*
- *Background level means the background A-weighted sound pressure level under the prescribed standard measured as $L_{A90,T}$.*
- *$L_{A90,T}$ means the A-weighted sound pressure level obtained using time weighting 'F' that is exceeded for 90% of the measuring period (T).*

Section 440U Air-conditioning equipment

(1) This section applies to premises at or for which there is air-conditioning equipment.

(2) An occupier of the premises must not use, or permit the use of, the equipment on any day:

(a) before 7am, if it makes a noise of more than 3dB(A) above the background level; or

(b) from 7am to 10pm, if it makes a noise of more than 5dB(A) above the background level; or

(c) after 10pm, if it makes a noise of more than 3dB(A) above the background level.

4.1.2 Queensland Government – Environmental Protection (Noise) Policy 2019

The Queensland Government Environmental Protection (Noise) Policy 2019 (EPP 2019) identifies environmental values to be enhanced or protected, states acoustic quality objectives, and provides a framework for making decisions about the acoustic environment.

Schedule 1 Acoustic Quality Objectives

The acoustic quality objectives are stated in Schedule 1 of the *Queensland Environmental Protection (Noise) Policy 2019*. In accordance with EPP 2019, the acoustic quality objectives are stated for a defined type of noise sensitive use and specified period of the day (reproduced in **Table 5**). The environmental values which EPP 2019 aims to enhance or protect are also stated. It is intended that the acoustic quality objectives be progressively achieved as part of achieving the purpose of EPP 2019 over the long term.

Table 5: Acoustic quality objectives as defined in Schedule 1 of the EPP 2019

Sensitive Receptor	Time of Day	Acoustic Quality Objectives [1] (measured at the receptor) dB(A)			Environmental Value
		$L_{Aeq,adj,1hr}$	$L_{A10,adj,1hr}$	$L_{A1,adj,1hr}$	
residence (for outdoors)	daytime and evening	50	55	65	health and wellbeing
residence (for indoors)	daytime and evening	35	40	45	health and wellbeing
	night-time	30	35	40	health and wellbeing, in relation to the ability to sleep
school or playground (for outdoors)	when the children usually play outside	55	—	—	health and wellbeing, and community amenity

NOTES:

1) *The $L_{Aeq,Adj,T}$ noise limits apply to all noise sources, whilst the $L_{A10,Adj,1hr}$ and $L_{A1,Adj,1hr}$ only apply to intermittent noise sources (i.e., excludes air conditioning).*

4.1.3 Local Council – Townsville City Council

The TCC City Plan was reviewed to determine acoustic requirements applicable to the project. Since the project site is zoned Emerging Community, all proposed developments are required to comply with any relevant acoustic requirements applicable under the emerging community zone code. This type of zone is intended to support the transition of land to urban uses. Developments must consider the impact on surrounding residential areas and ensure compatibility with existing and future land uses.

Since no specific noise limits are provided by the code, we refer to the project noise trigger levels referenced by the TCC City Plan planning scheme policy SC6.4.19 Noise and Vibration (TCC Noise Policy).

The TCC Noise Policy defines the following regarding project noise trigger levels:

The project noise trigger level provides a benchmark or objective for assessing a proposal or site. It is not intended for use as a mandatory requirement. The project noise trigger level is a level that, if exceeded, would indicate a potential noise impact on the community, and so 'trigger' a management response; for example, further investigation of mitigation measures. The Project noise trigger level is the lower (i.e., the more stringent) value of the intrusive noise level and amenity noise level.

4.1.3.1 Amenity Noise Levels

Similar to EPP 2019, Table SC6.4.19.1 of the TCC Noise Policy outlines the following maximum noise level objectives for individual receiver types (see **Table 6**. NOTE: irrelevant receiver types to this assessment have been omitted).

Table 6: Maximum recommended amenity of noise levels for all sources (Table SC6.4.19.1)

Receiver	Noise Amenity Area	Time of Day	Maximum Recommended Amenity Noise Level for All Sources $L_{Aeq\ 15\ minutes}$, dB(A)
Residence	**Suburban** - an area that has local traffic with characteristically intermittent traffic flows or with some limited commerce or industry. This area often has the following characteristic: evening ambient noise levels defined by the natural environment and human activity.	Day	55
		Evening	45
		Night	40
School classroom – internal	All	Noisiest 1-hour period when in use	35 (internal)
Active recreation area (e.g. school playground)	All	When in use	55

4.1.3.2 Intrusive Noise Levels

Intrusive noise levels determined in accordance with TCC Noise Policy are presented in **Table 7** and have been based on the rating background levels determined by Stantec (see **Table 3**).

Table 7: Intrusive noise limits determined in accordance with TCC Noise Policy

Receiver	Measured Rating Background Noise Level, $L_{90,T}$ dB(A)			Intrusive Noise Level Limits, L_{eq} dB(A)		
	Day [1)]	Evening [1)]	Night [1)]	Day [1)]	Evening [1)]	Night [1)]
All sensitive uses	41	38	27	46	43	32

4.1.3.3 Project Noise Trigger Levels

Based on the above, the following project noise trigger levels presented in **Table 8** have been determined in accordance with the TCC Noise Policy.

Table 8: Project noise trigger levels

Receiver	Time of Day	Project Noise Trigger Levels $L_{eq\ 15\ minutes}$, dB(A)
Residence	Day	46
	Evening	43
	Night	32
School classroom – internal	Noisiest 1-hour period when in use	35 (internal)

Receiver	Time of Day	Project Noise Trigger Levels $L_{eq\ 15\ minutes}$, dB(A)
Active recreation area (e.g. school playground, golf course)	When in use	55

4.2 Road Traffic Noise

4.2.1 State Development Assessment Provisions v3.0

As indicated by the QLD Government Development Assessment Mapping System, the project site is situated within 25 m of a state-controlled road (i.e., Shaw Rd); hence, the project, in particular, the proposed childcare centre is required to comply with the relevant acoustic requirements appliable under the State Development Assessment Provisions v3.0 - State Code 1: Development in a state-controlled road environment (SDAP SC1).

The purpose of this code is to protect state-controlled roads, future state-controlled roads and other infrastructure in state-controlled roads from adverse impacts of development. Specifically, this code seeks to ensure that the community is protected from significant adverse impacts resulting from environmental emissions generated by vehicles using state-controlled roads.

Whilst Stantec note that the proposed childcare centre use is situated well outside projected noise contours associated with Shaw Rd (see **Figure 4**), the applicable Performance Outcomes (PO) and Acceptable Outcomes (AO) for uses near a State-controlled road are reproduced in **Table 9.**

Table 9: Environmental emissions (SDAP SC1 – Table 1.5)

Performance Outcomes	Acceptable Outcomes
Material change of use (other uses)	
Ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor	
PO44 Development: 1. provides a noise barrier or earth mound that is designed, sited and constructed: a. to achieve the maximum free field acoustic level in reference table 2 (item 2.3) for all outdoor education areas and outdoor play areas; b. in accordance with: i. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; ii. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; iii. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 2. achieves the maximum free field acoustic level in reference table 2 (item 2.3) for all outdoor education areas and outdoor play areas by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	No acceptable outcome is provided.
PO45 Development involving a childcare centre or educational establishment: 1. provides a noise barrier or earth mound that is designed, sited and constructed: 2. to achieve the maximum building facade acoustic level in reference table 1 (item 1.2); 3. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 4. achieves the maximum building facade acoustic level in reference table 1 (item 1.2) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	No acceptable outcome is provided.

Performance Outcomes	Acceptable Outcomes
PO46 Development involving: 2. sleeping rooms in a childcare centre; achieves the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is provided.

Table 10: Maximum building façade acoustic level (SDAP SC1 – Reference Table 1)

Applicable use	Acoustic levels
1.2: Childcare centre or educational establishment	≤ 58 dB(A) L_{10} (1 hour) façade corrected (maximum hour during normal opening hours)

Table 11: Maximum free field acoustic level (SDAP SC1 – Reference Table 2)

Applicable use	Acoustic Level
2.3: Outdoor education areas and outdoor play areas in a childcare centre or educational establishment	≤ 63 dB(A) L_{10} (12 hour) free field (between 6am and 6pm)

Table 12: Maximum internal acoustic levels (SDAP SC1 – Reference Table 3)

Applicable use	Acoustic Levels
3.2: Indoor education areas and indoor play areas in a childcare centre or education establishment	≤ 35 dB(A) L_{eq} (1 hour) (maximum hour over 24 hours)
3.3: Sleeping rooms in a childcare centre	

5. Environmental Noise Impact Assessment

5.1 Assessment Methodology

5.1.1 Carparking, Drive-through and Petrol Station

Noise emissions from vehicle movements all proposed carparks, vehicle drive-through and petrol station areas have the potential to influence the general acoustic amenity of surrounding noise sensitive uses. Noise emissions from such sources are required to comply with all relevant environmental noise limits at the nearest noise sensitive receivers outlined in **Section 3.1.2** of this report.

The complexity of associated noise events can be difficult to accurately simulate as individual noise sources (i.e., vehicle parking bay turnover rates, location of noise event such as motion (acceleration, deceleration), idling, ignition, door slams etc.). Therefore, acoustic assessment has been based on the technical research paper *"Prediction of parking area noise in Australian conditions"* from the Australian Acoustical Society Conference (Nicol and Johnson, 2011) and parking lot study *"Recommendations for the Calculation of Sound Emissions of Parking Areas, Motorcar Centers and Bus Stations as well as of Multi-Storey Car Parks and Underground Car Parks"* (Bavarian Landesamt für Umwelt, 2007, 6th edn, BayLfU).

Correction factors described by Nicol and Johnson (in section *"Application of BAYLFU to Australian Conditions"*) were applied carpark noise emissions in the acoustic simulation model.

Refer to **Appendices C.3 to C.5** for additional assessment input parameters.

5.1.2 Loading Dock, Waste Collection and Petrol Tankers

Noise emissions from loading dock activities can contribute to the general acoustic environment at surrounding noise sensitive receptors and is required to be assessed against environmental noise limits established in this report.

Noise emissions from heavy vehicle types and loading dock-related activities are typically formed by a combination of successive, often transient, noise events. Events include engine noise (ignition, idle, acceleration, deceleration), reversing alarms (beepers), brake squeals, compression / venting brake release.

Calculations were conducting using the SoundPLAN implementation of ISO 9613. Refer to **Appendix C.6** for additional assessment input parameters.

5.1.3 Carwash Facilities

Noise emissions from carwash facilities are known to cause disturbance in residential areas, particularly when dry blowers are implemented. Careful consideration should be given to location and operations.

Calculations were conducting using the SoundPLAN implementation of ISO 9613. Refer to **Appendix C.7** for additional assessment input parameters.

5.1.4 Automotive Workshop

Like carpark areas, an automotive workshop can, at times, consist of a complex array of noise sources, including use of pneumatic tools, mechanical lifts and other machinery.

Calculations were conducting using the SoundPLAN implementation of ISO 9613. Source noise levels were established based on a measured data presented in a variety of relevant technical research papers. Refer to **Appendix C.8** for additional assessment input parameters.

5.1.5 Childcare Centre Activities

Noise emissions from the proposed childcare centre have the potential to impact on the acoustic environment of surrounding residential areas (existing and future). Two outdoor play areas are proposed for the north and east of the proposed childcare centre

Calculations were conducting using the SoundPLAN implementation of ISO 9613. Source noise levels were established based on Association of Australasian Acoustical Consultants *Guideline for Child Care Centre Acoustic Assessment* (AAAC Guideline). Refer to **Appendix C.9** for additional assessment input parameters.

5.2 Assessment Inputs and Assumptions

5.2.1 Light Vehicle Movements and Carwash Facilities

All sites were incorporated into the acoustic model based on the architectural drawings package (refer **Table 2**). The architectural drawings package indicates the following parking bay allocations for light vehicles (refer **Table 13**). Worst-case peak traffic volumes for each site were provided by the traffic consultant.

Table 13: Parking bay allocations a peak traffic volumes for light vehicles

Site	Number of Car Parking Bays	Peak Traffic Volumes
Childcare Centre (CC01)	28	90 vph
Pad Site 5 – Food and Beverage (F&B05)	19	82 vph
Pad Site 6 – Food and Beverage (F&B06)	20	82 vph
Pad Site 7 – Automotive Workshop (AW07)	15	13 vph
Pad Site 8 – Service Station, Food and Beverage and Automatic Carwash (PS08)	33 (incl. bowsers and manual car maintenance bays)	276 vph

Site specific traffic movements include in the acoustic model were determined based on the following assumptions:

- Peak period in the project area referred to in the assessment occurs during Thursday evening – 4:30 PM to 5:30 PM.
- 24-hour operation has been considered for F&B05, F&B06 and PS08. CC01 will be open from 6 AM – 6 PM; however, activity between 6 AM and 7 AM is assumed negligible and noise emissions are unlikely to be of significance during this period. It is expected AW07 will generally operate during the daytime period (i.e., 7 AM – 6 PM).
- For 24-hour operations (i.e., F&B05, F&B06 and PS08), it is assumed that the worst case one-hour peak traffic volumes during;
    - evening (6 PM – 10 PM) will be equivalent day-time peak volumes; and
    - night (10 PM – 7 AM) will be equivalent to 25 % of day-time peak volumes.
- Based on similar assessments conducted by Stantec, a distribution of walk-in and drive through traffic of 1/3 (33%) and 2/3 (67%), respectively, has been assumed for F&B05, F&B06 and PS08 (food and beverage drive through).
- Whilst some cross-utilisation is expected, the following is assumed for all total vehicle movements at PS08;
    - 80% utilises petrol bowsers;
    - 17.5% utilises food and beverage drive through and convenience store facilities;
    - 1.25% utilises the automatic carwash facility; and
    - 1.25% utilises the manual carwash / vacuum facilities.

Based on the above, Stantec have considered the following onsite vehicle movements to occur at all assessed sites during the worst-case peak periods to be conservative for the purpose of acoustic assessment:

Table 14: 1-hr peak onsite vehicle movements assumptions

Tenancy	Period	Peak Vehicle Movements per hour	Total Parking Bay Turnover Rate per hour
CC01	Day (7 AM – 6 PM)	90	3.2
F&B05 and F&B06	Day (7 AM – 6 PM)	82	1.4
	Evening (6 PM – 10 PM)	82	1.4
	Night (10 PM – 7 AM)	21	0.4
AW07	Day (7 AM – 6 PM)	13	0.9
PS08 – Petrol Station Bowsers	Day (7 AM – 6 PM)	235	27.9
	Evening (6 PM – 10 PM)	235	27.9
	Night (10 PM – 7 AM)	59	7.0
PS08 – F&B / Convenience Store / Other Parking	Day (7 AM – 6 PM)	23	0.62
	Evening (6 PM – 10 PM)	23	0.62
	Night (10 PM – 7 AM)	6	0.15
PS08 – Automatic Carwash	Day (7 AM – 6 PM)	2.8	-
	Evening (6 PM – 10 PM)	2.8	-
	Night (10 PM – 7 AM)	0.7	-
PS08 – Manual Carwash / Vacuum Facilities	Day (7 AM – 6 PM)	2.8	0.7
	Evening (6 PM – 10 PM)	2.8	0.7
	Night (10 PM – 7 AM)	0.7	0.2

Detailed modelling inputs pertinent to onsite vehicle movements and carwash facilities, in addition to drive-through speaker noise for F&B05, F&B06 and PS-08 has been provided **Appendix C**.

5.2.2 Loading Docks, Waste Collection and Petrol Tankers

The following assumptions have been made in relation to loading dock operations:

- Deliveries and waste collection will occur during day hours only (i.e., 7 AM – 6 PM);
- Medium rigid vehicles (MRV) ≤ 12.5 m and smaller refuse collection vehicles for deliveries and waste collection. Given the proposed use of the development, it is expected that trucks with refrigeration units will access each loading dock;
- Manual unloading of vehicles will occur;
- Delivery vehicles will arrive to site and have the refrigeration units operating for 10-minutes total whilst unloading occurs;
- One (1) delivery and unloading activity is expected at each loading dock during a 1-hour period.
- Pumping of fuel at PS08 will occur for a full hour during a 1-hour period.

Typical noise levels associated with loading dock related activities has been provided **Appendix C**.

5.2.3 Automotive Workshop

Due to the complexity and intermittent nature of various noise sources within automotive workshops, source noise levels (provided in **Appendix C.8**) have been determined based on various research papers. The reverberant sound pressure level determined (i.e., $L_{p,rev}$ 95 dB(A)) was incorporated into the acoustic model as an industrial noise source apparent for 50% of the worst-case 1 hour period, with consideration also given to expected building envelope construction types.

As per typical trading hours for Automotive Workshops around the Townsville region (link), it is expected that the proposed development will operate from 7 AM to 5 PM.

5.2.4 Childcare Centre Outdoor Play Areas

Two outdoor areas are generally proposed along north and east aspects of the proposed childcare centre. The Association of Australian Acoustical Consultants *Guideline for Child Care Centre Acoustic Assessment* v3.0 (AAAC Guideline) provides guidance of typical sound power levels associated with continuous children activity / play, summarised in

Table 15: Effective sound power level for groups of 10 children (Table 1, AAAC Guideline)

Age Group	Effective Sound Power Level, L_w dB(A)
10 Children – 0 to 2 years	78
10 Children – 2 to 3 years	85
10 Children – 3 to 5 years	87

The assessment of noise emissions from outdoor play areas has been conducted based on the following assumptions;

- The childcare centre will accommodate up to a maximum of 120 children and will generally be of the following age distribution (based on numbers documented on the architectural drawings);
    - 0 – 2 years of age: 36 children
    - 2 – 3 years of age: 40 children
    - 3 – 5 years of age: 44 children
- The source sound power level associated with each age group has been calculated based on the AAAC Guidelines input levels and children numbers (refer to **Appendix C.9**). To address the worst-case scenario, the calculated source noise levels from each age group have been distributed across the outdoor play areas in the acoustic model as an area source.
- The childcare centre will open from 6:00 AM. During 6:00 AM – 7:00 AM, Stantec have been advised that external play areas are not expected to be used during this period.
- During the worst case one hour period, all outdoor play areas will be utilised concurrently and at full capacity for the full hour.
- Based on the architectural drawings, a solid blockwork wall to 1000 mm AFFL will be provided to the south-east corner of the outdoor play area and has been incorporated into the acoustic model. Fencing indicated by the drawings has not been simulated.

5.3 Predicted Noise Levels

A noise emissions assessment was conducted based on the assessment parameters, inputs and assumptions detailed in **Section 5.2** and **Appendix C**.

A summary of predicted noise levels at each receptor has been presented in **Table 16** (NOTE: all receptors along each nearest street have been considered, with the worst-case levels presented). Detailed results, including contribution from source groups have been presented in **Appendix D**.

Table 16: Summary of highest predicted noise levels

Receiver location (nearest affected premises)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A)		
	Day	Evening	Night	Day	Evening	Night
Existing Noise Sensitive Receptors [1]						
3 The Grange, Shaw	**46**	**43**	**32**	40	33	27
6 Drakeford Street, Shaw				40	33	27
8 Ascot Parkway, Shaw				42	35	29
20 Blackmoor Promenade, Shaw				40	33	27
23 Cherington Boulevard, Shaw				41	34	28
24 Lockton Street, Shaw				41	35	29
30 Woodcote Bend, Shaw				41	34	28
51 The Burlings, Shaw				39	32	26
St Benedict's Catholic School (indoor)	**35**	—	—	45 (10) [2]	—	—
St Benedict's Catholic School – Outdoor Play	**55**	—	—	51	—	—
Future Noise Sensitive Receptors (see Figure 5) [1]						
Future Receptor 1 (FR1)	**46**	**43**	**32**	45	40	34 (2)
Future Receptor 2 (FR2)				45	40	34 (2)
Future Receptor 3 (FR3)				46	38	32
Future Receptor 4 (FR4)				46	38	32
Future Receptor 5 (FR5)				46	37	31
Future Receptor 6 (FR6)				45	36	30
Future Receptor 7 (FR7)				44	36	30

NOTES:

1) *Existing receptors have been assessed in the absence of noise barrier (described in **Section 3.2.7**, i.e., 2.4 m (h) at RL 13.25 m). The barrier described has been simulated to all future receptors.*

2) *Standard outdoor-to-indoor correction of -5 dB applied based on findings in Ryan, M, Lanchester, M & Pugh, S 2011, 'Noise Reduction through Facades with Open Windows', Paper Number 37, Proceedings of ACOUSTICS 2011, 2-4 November 2011, Gold Coast, Australia.*

5.4 Discussion and Recommendations

5.4.1 Existing Residential Receptors

Based on the noise impact assessment described above, compliance with environmental noise limits is predicted at all existing residential noise sensitive receptors based on the combined operations of all proposed sites.

5.4.2 Future Residential Receptors

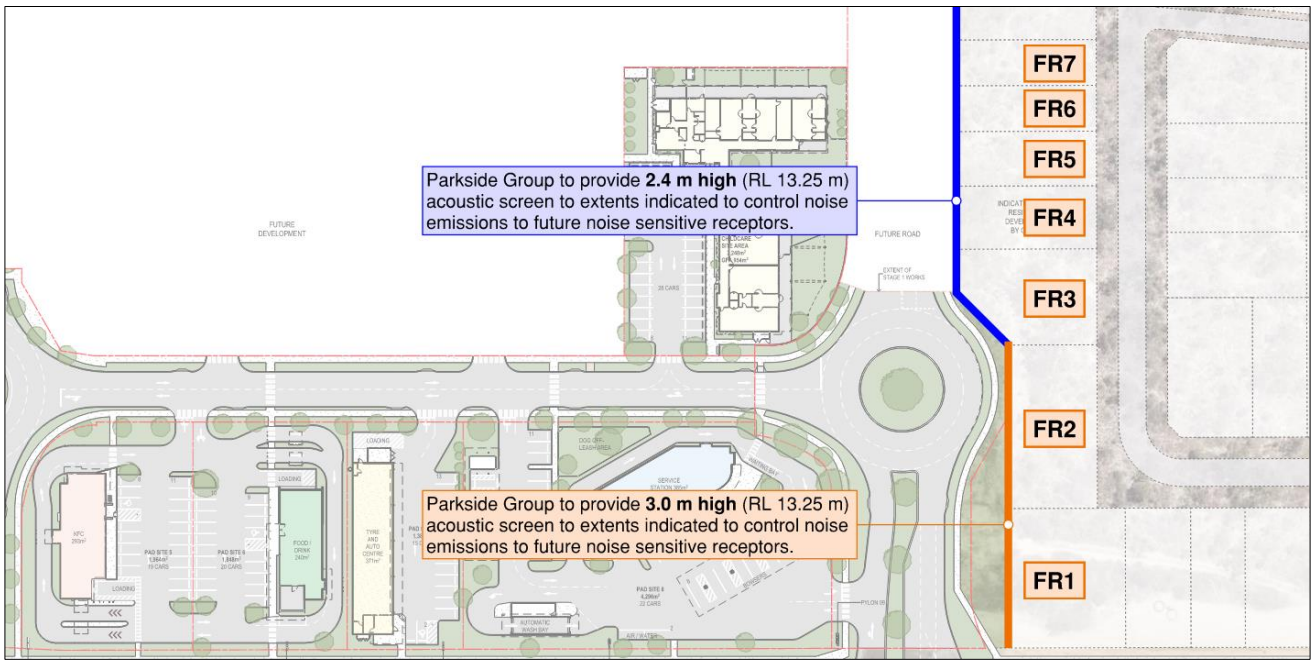
Compliance to the applied noise limits is estimated at future noise sensitive uses to the east of the Stage 1 project during day and evening periods.

Marginal non-compliance of ≤ 2 dB(A) to the applied noise limits is estimated at future noise sensitive uses (FR1 and FR2) to the east of the Stage 1 project, which has considered a 2.4 m acoustic noise barrier to the western aspect of each development lot. With reference to the detailed analysis provided in **Appendix D**, exceedances are mostly attributable petrol station vehicle movements.

Whilst the exceedance is deemed to be minor, compliance with the applied limits during the night-time period is project where the barrier to FR1 and FR2 is increased to 3.0 m (RL 13.25 m).

Where compliance with all applicable noise limits is targeted for future developments at the indicative locations proposed, it is recommended Parkside Group provide acoustic screening to the locations and extents indicated in **Figure 6**.

Figure 6: Recommended extent of acoustic screening for control of noise emissions at future receptors



General construction recommendations for the recommended acoustic screening are provided below:

- Continuous and without gaps (incl. base) to the minimum height above relative ground level (AHD 13.25 considered) indicated in **Figure 6**.
- Constructed of a material with a min. surface mass of 10 kg/m^2. Approved products include:
    - Glass;
    - lapped kiln-dried softwood timber palings (min. 19 mm thick and overlapped by at least 15 mm);
    - 9 mm fibre cement sheet;

- concrete blockwork or brick;
- an approved modular wall system (e.g., Wallmark, Poly-Tek, Modular Walls); or
- combination of the above.

5.4.3 Existing Educational Uses

Whilst compliance without outdoor noise limits is projected at St Benedict's Catholic School, a 10 dB(A) exceedance to internal noise level targets (inclusive of standard outdoor-to-indoor correction of -5 dB) is projected. With reference to the detailed analysis provided in **Appendix D**, exceedances are mostly attributed to the simulated noise emissions associated with the workshop activity at AW07, and petrol tanker activities and vehicle movements.

In reviewing online imagery, it appears as though the Kindergarten at St Benedict's Catholic School (most affected receptor at this site) appears to have minimal windows to the northern façade, and generally appear fixed (i.e., unopenable). Hence, the outdoor-to-indoor correction is likely ≥ 15 dB(A), meaning compliance with indoor noise targets is generally expected for this building.

Further, noise monitoring measurements conducted at a greater setback distance from Dalrymple Road indicated an average $L_{eq,day}$ 50 dB(A), which generally align with noise modelling predictions. Therefore, noise impacts from this road are already expected to exceed internal noise targets with windows open.

Based on the above, additional treatments to control noise emissions from the Stage 1 project are not deemed necessary.

5.4.4 General Recommendations

In addition to the above, the following recommendations are generally made:

5.4.4.1 Automotive Workshop

Whilst noise emissions from the Automotive Workshop are generally not expected to result in adverse comment, noise emissions from the Automotive Workshop could be further reduced by:

- Keeping roller doors closed when not required to be open.
- Conducting all noisy works in indoor areas of the workshop and train employees on noise reduction techniques.
- Selecting the quietest equipment available (fit noise suppressors as required) and ensuring regular maintenance practices for equipment.

5.4.4.2 Loading Dock, Waste Collection and Petrol Tankers

- Conduct operations during daytime periods only (i.e., 7 AM – 7 PM). Activities outside these times is not advised.

5.4.4.3 Carwash Facilities

Due to the variability of noise from such facilities, the following is advised as best practice:

- Equipment / facility noise levels shall not exceed the assessed equipment sound power levels presented in **Table 28**.
- Whilst general compliance is expected during all periods of the day, it is generally recommended to limit use of all carwash facilities to daytime and evening periods only. As an alternative for the automatic carwash, closeable entrance and exit doors are recommended when in use during nighttime periods.

5.4.5 Mechanical Plant Noise Limits

Mechanical services plant has not been proposed (common at the development application stage of most projects). Therefore, detailed calculations of proposed selections cannot be conducted. In lieu of this information, additional

calculations were conducted based on first principle formulation to estimate the maximum sound power level (L_w) for combined plant expected to comply with the applicable noise limits at the closest sensitive receptors.

The following inputs and assumptions were considered, which is considered highly conservative and result in overestimated sound power limits:

- Compliance with the prescribed project noise trigger levels applicable under TCC City Plan, with consideration of predicted noise levels at all existing and future noise sensitive receptors from additional site activities (**Section 5.3).**
- Given exhaust fans, outdoor condensers or the like are inclined to operate on a 24-hour basis (for F&B05, F&B06, & PS08), noise emissions have been assessed against night-time (i.e., 10 PM – 7 AM) noise limits. As it is expected that AW07 and CC01 will operate during daytime hours; these have been excluded from assessment during evening and night-time periods.
- Noise attenuation factors such as sound source directivity, building shielding effects, noise barriers and other noise controls are not applied (this is conservative).
- Standard directivity influences caused by building reflections (a Q-factor of 2 applied, hemispherical propagation).
- Assumed location of plant at the midpoint on the roof of each proposed building (for PS08, this is taken to be above the main service station / convenience store building).

Based on the above, mechanical plant or air intake / discharge points which are without additional screening, attenuation or other noise mitigation measures would be required to not exceed the following sound power levels (combined for each site):

- Childcare Centre (CC01): L_w 78 dB(A) (daytime operation assumed only);
- Pad Site 5 – Food and Beverage (F&B05): L_w 76 dB(A);
- Pad Site 6 – Food and Beverage (F&B06): L_w 72 dB(A);
- Pad Site 7 – Automotive Workshop (AW07): L_w 86 dB(A) (daytime operation assumed only);
- Pad Site 8 – Petrol Station, Food and Beverage and Automatic Carwash (PS08): L_w 67 dB(A).

Given plant for such establishments (particularly kitchen exhaust fans for fast food restaurants) typically exhibit noise levels in the order of L_w 90 dB(A), it is likely that unattenuated plant would exceed the above and, consequently, the prescribed noise limits.

Therefore, it is recommended that the Contractor or Tenant undertakes and submits to Council an acoustic assessment of building services plant prior to occupancy demonstrating compliance with the environmental noise limits established in this acoustic report (inclusive of penalties for tonality, impulsiveness and / or other nuisance characteristics). The assessment shall be conducted by a suitably qualified person (i.e., acoustic engineer) and consider contribution to noise emissions from adjoining tenancies.

To mitigate noise emissions from all plant areas, it is generally recommended to provide solid, continuous screening or acoustic louvres to all dedicated plant locations to a height sufficient to at least break the “direct line of sight” between plant and noise sensitive receptors. Generally, this applies to the east aspect of all plant spaces. Further to the above, mechanical services intake / discharge paths shall not be directed towards the nearest noise sensitive receptor locations.

For costing purposes, provisions shall be made for the following:

- Noise barriers or acoustic louvres (particularly on north and east aspects of the plant deck);
- Acoustic attenuators (for kitchen exhausts, Mylar lining or similar will likely be required);
- In-duct linings; and / or
- Quiet equipment selections of selections with custom silencer / attenuation options.

6. External Noise Impact Assessment

6.1 Road Traffic Noise

6.1.1 Assessment Overview

As the project site is located within 25 m of a State controlled road (Shaw Rd), a road traffic noise impact assessment is required in order to address the acoustic requirements applicable under SDAP SC1 (see **Section 4.2.1**). Specifically, the requirements and subsequent assessment described herein apply to the proposed childcare centre (CC01).

6.1.2 Road Traffic Noise Modelling

To predict noise impacts, calculations were made using a three-dimensional computer model of the site created within SoundPLAN 8.2 acoustic software. The computer model was created as a representation of the existing and future site, which incorporates the following inputs:

- Calculation algorithms – SoundPLAN implementation of accepted noise prediction standards;
- Terrain elevation – A 3D representation of the existing terrain and at completion of construction;
- Ground surface corrections – Areas of soft (absorptive) and hard (reflective) ground;
- Roads sources – The placement of each road source as a source line and the input of traffic flow parameter;
- Buildings – Detailed implementation of the proposed building from drawings (i.e., layout, height, floors), and
- Sensitive receptors – Locations where the noise limits are to be assessed.

For details of the inputs applied to the acoustic model, refer to **Appendix C**.

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

6.1.3 Verification of Road Traffic Noise Model

According to CoP 2013, a road traffic noise model is deemed to be verified if the average difference between the measured and calculated values of the relevant noise descriptors is no more than ± 2 dB. Further, this document states that:

> *"If the average difference between existing measured and calculated noise descriptors values is positive (i.e. average measured values exceed the calculated values), then the calculated values shall be adjusted upwards by this average difference before determining the predicted values."*

> *"If the average difference between existing measured and calculated noise descriptors values is negative (i.e. average calculated values exceed the measured values), then no adjustment shall be made to the calculated values before determining the predicted values."*

Results of the road traffic model predictions at the attended measurement location (see **Figure 1**) care presented in **Table 17**. The predicted $L_{A10,18hr}$ was +0.1 dB greater than the measured value; therefore, within the acceptable TMR CoP 2013 tolerance. Thus, the road traffic noise model is considered validated and suitable for predicting noise levels using 2034 traffic volumes.

Table 17: Road traffic noise model verification

Predicted $L_{10,18hr}$ dB(A)	Measured $L_{10,18hr}$ dB(A)	Difference
70.9	70.8	+0.1 dB(A)

6.2 Predicted Road Traffic Noise Impacts

Results of road traffic noise predictions from state-transport noise corridors at CC01 are presented in **Table 18**. It is noted that the assessment has excluded any screening (e.g., blockwork wall to 1000 mm and fence above to 1800 mm) to north and east aspects of the proposed development.

Table 18: Ultimate (Y2034) road traffic noise level predictions

Receptor (relative site location)	Noise Limit	Predicted Road Traffic Noise Levels [1)]	Comments
CC01 – Most exposed façade (west)	$L_{10(1hr)}$ ≤ 58 dB(A)	$L_{10(1hr)}$ 57 dB(A)	Complies with requirements
CC01 – Outdoor play area (north)	$L_{10(12hr)}$ ≤ 63 dB(A)	$L_{10(12hr)}$ 51 dB(A)	Complies with requirements
CC01 – Outdoor play area (east)	$L_{10(12hr)}$ ≤ 63 dB(A)	$L_{10(12hr)}$ 44 dB(A)	Complies with requirements
CC01 – Indoor sensitive areas (north)	$L_{eq(1hr)}$ ≤ 35 dB(A)	$L_{eq(1hr)}$ 52 dB(A)	Building envelope to provide minimum noise reduction of 18 dB(A) and is achievable using standard building envelope construction. NOTE: openable elements to be closed to north, south and west aspects to achieve target noise levels (mechanical ventilation required).
CC01 – Indoor sensitive areas (east)	$L_{eq(1hr)}$ ≤ 35 dB(A)	$L_{eq(1hr)}$ 39 dB(A)	
CC01 – Indoor sensitive areas (south)	$L_{eq(1hr)}$ ≤ 35 dB(A)	$L_{eq(1hr)}$ 50 dB(A)	
CC01 – Indoor sensitive areas (west)	$L_{eq(1hr)}$ ≤ 35 dB(A)	$L_{eq(1hr)}$ 53 dB(A)	

NOTES:

1) *All predictions include $L_{10(18hr)}$ conversion factors described in **Table 22**, as well as + 2.5 dB(A) façade correction (where applicable).*

Based on the above, future (Y2034) road traffic noise projections are expected to comply with the acoustic requirements applicable under SDAP SC1 without the need for any significant noise control devices.

Whilst a minimum noise reduction level has been assigned to the building envelope, standard construction is expected to result in compliance with internal noise level targets in sensitive uses. Openable elements to north, south and west aspects are required to be closed to achieve target noise levels; hence, mechanical services strategy may be required. In addition, the minimum performances nominated are expected to sufficiently control external noise ingress from proposed new developments assessed in this report.

7. Conclusion

Stantec have been engaged by Parkside Group Pty Ltd to undertake acoustic assessment in support of the development application submission for the Parkside Greater Ascot – Stage 1 project proposed for 182 Shaw Road, Shaw QLD 4818.

As described in this report, a noise impact assessment was undertaken using noise modelling software (SoundPLAN) to accurately assess potential environmental noise impacts from the proposal to surrounding existing and future developments based on all planned activities, as well as road traffic noise impacts from state-transportation corridors onto sensitive uses. Regarding environmental noise impacts from the proposal, noise levels were estimated at each existing and future noise sensitive use.

Noise monitoring was undertaken to establish ambient acoustic conditions affecting the site and to serve as a basis for establishing environmental noise limits in accordance with state and local planning policies. Attended noise measurements were also undertaken for the purpose of quantifying road transport noise levels.

Acoustic treatments and operational measures have been nominated where applicable to satisfy the respective criteria outlined in this report.

We trust that this report to be sufficient for your current requirements; however, should you have any queries, please do not hesitate to contact the undersigned on (07) 3811 4500.

Regards,

Carl Edser (Author)
Acoustics Project Technical Lead for **Stantec**

Appendices

Appendix A Glossary of Acoustic Terms

TERM	DEFINITION
Adverse Weather	Weather conditions that affect noise (wind and temperature inversions) that occur at a particular site for a significant period of time. The previous conditions are for wind occurring more than 30% of the time in any assessment period in any season and/or for temperature inversions occurring more than 30% of the nights in winter).
Ambient Noise	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment Location	The position at which noise measurements are undertaken or estimated.
Assessment Period	The period in a day over which assessments are made.
Attenuation	A reduction in the magnitude of sound.
A-weighting	A frequency dependent filter applied to an instrument-measured noise. In its simplest form, the filter is designed to replicate the relative sensitivity to loudness perceived by the human ear.
Background Noise	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the LA90 noise level.
Barrier	Solid walls or partitions, solid fences, earth mounds, earth berms, buildings, etc. used to reduce noise.
Ctr	A standard weighting curve which replicates low frequency noise, such as that from traffic. Often added to DnT,w or Rw to characterise airborne sound insulation performance.
dB	The abbreviation for decibel.
dB(A)	A-weighted sound level in decibels.
Extraneous Noise	Noise resulting from activities that are not typical of the area. Atypical activities include construction, and traffic generated by holidays period and by special events such as concert or sporting events. Normal daily traffic is not considered to be extraneous.
Free Field	An environment in which there are no acoustic reflective surfaces. Free field noise measurements are carried out outdoors at least 3.5 m from any acoustic reflecting structures other than the ground.
Frequency	Frequency is synonymous to pitch. Frequency or pitch can be measured on a scale in units of Hertz (Hz). Most noise sources typically comprise of a vast, and often complex, range of frequencies.
Frequency Response	This is a characteristic of a system which has a measured response resulting from a known applied input. In a mechanical structure, the frequency response function (FRF) is the spectrum of the vibration of a structure divided by the spectrum of the input force to the system. To measure the frequency response of a mechanical system, one must measure the spectra of both the input force to the system and the vibration response.
Hertz	The frequency of vibration and sound is measured in hertz (Hz) and is representative of the number of cycles occurring per second.
Impulsive Noise	Noise having a high peak of short duration or a sequence of such peaks. A sequence of impulses in rapid succession is termed repetitive impulsive noise.
Intermittent Noise	Level that drops to the background noise level several times during the period of observation.
LA1	The A-weighted sound pressure level exceeded for 1 % of the measurement time period.
LA10	The A-weighted sound pressure level exceeded for 10 % of the measurement time period.
LA90	The A-weighted sound pressure level exceeded for 90 % of the measurement time period. Typically represents the background noise level of an environment.
LAeq	The equivalent continuous sound pressure level in dB(A). It is often accompanied by an additional suffix “T”, which is indicative of the measurement time period. (e.g. LAeq,15min, symbolising the measurement is evaluated over 15-minutes).
Noise Logger	A sound level meter situated at a particular point of interest. The instrument is typically for an extended period in order to ascertain typical noise patterns associated with the measurement position.

TERM	DEFINITION
Reverberation	The persistence of a sound within a space, which will naturally decay over time. Most apparent once the source signal has ceased emitting. Reverberation may have effects on speech intelligibility if not adequately controlled. Reverberation time, represented in seconds, can vary depending on the volume and surface finishes of the space.
Rw	Weighted sound reduction index. A single number value which represents the airborne sound insulation performance of a partition or building element that has been determined under laboratory testing conditions.
Sound Level Meter	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound Power Level	The total sound energy radiated by a source, expressed in Watts. The sound power level is ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Sound Pressure Level	The measured acoustic wave strength in a given environment and at a particular point of interest where the total sound level expressed is relative to a reference pressure, i.e. the threshold of human hearing. Sound pressure level is typically measured using a standard sound level meter with a microphone, expressed in decibels (dB).
Spectrum	The spectrum is the result of transforming a time domain signal to the frequency domain. Spectrum analysis is the procedure of doing the transformation, and it is most commonly done with an FFT analyser.

Appendix B Noise Monitoring Details

B.1 Measurement Method

Unattended noise logging was conducted 19th September 2024 to 26th September 2024 (inclusive) at the locations shown in **Figure 1** (coordinates in **Table 19**). This location was considered representative of the noise environment at and around the project site.

Table 19: Noise monitoring coordinates

Latitude	Longitude
-19°17'17"	146°42'2"

The following instrumentation was used:

- NTi XL2 Class 1 sound level meter (S/N A2A-12892-E0), and Pulsar 105 Class 1 acoustic calibrator (S/N 72913). The instrument had a current calibration certificate by a certified National Association of Testing Authorities (NATA) acoustics laboratory at the time of measurements.

Noise measurements were conducted in accordance with Australian Standard AS 1055.1-1997 – *Acoustics – Description and measurement of environmental noise*, and the instruments were configured as follows:

- A-weighting frequency response;
- FAST time response;
- 15-minute intervals;

The sound level meter was calibrated before and checked at the end of the measurement period. The instrument showed a drift less than ±1 dB during the course of monitoring; therefore, measurements are considered valid according to AS1055.1-1997.

B.2 Summary of Measured Noise Levels

The raw sound level meter files were post-processed to determine relevant long-term noise descriptors, some of which were used to determine the applicable noise limits.

Results and time trace plots of relevant noise descriptors are provided below (see **Table 20** and **Figure 7**). Where data was not measured for a full period (i.e., at the start and end of measurement), the cells are shown dashed in the table. In addition, the noise descriptor averages are presented.

A summary of weather observations by the Bureau of Meteorology (BoM) during the monitoring period is presented in **Table 21**. Where adverse weather (e.g., rain, excessive wind) occurred within the monitoring period, the measured data has been excluded. The data has also been modified to account for nearfield extraneous noise from insects captured during the measurement period (see **Section B.3**).

Table 20: Summary of measured noise levels (rounded) at -19°17'17"; 146°42'2"

Noise descriptor	Average	19/09/24	20/09/24	21/09/24	22/09/24	23/09/24	24/09/24	25/09/24	26/09/24
$L_{A10,18hr\ (6am-\ 12am)}$	50	—	49	51	48	51	52	51	—
$L_{Aeq,7am-6pm}$	50	—	50	49	47	51	52	50	—
$L_{Aeq,6pm-10pm}$	49	49	46	50	48	51	50	47	—
$L_{Aeq,10pm-7am}$	47	46	46	48	48	49	47	48	—
$L_{A90,7am-6pm}$	41	—	39	40	38	42	43	44	—
$L_{A90,6pm-10pm}$	39	39	38	42	36	39	39	38	—
$L_{A90,10pm-7am}$	34	35	32	34	33	35	35	33	—

Noise descriptor	Average	19/09/24	20/09/24	21/09/24	22/09/24	23/09/24	24/09/24	25/09/24	26/09/24
$RBL_{6pm-10pm}$	41	—	37	36	35	39	41	42	—
$RBL_{6pm-10pm}$	38	34	36	40	31	37	35	35	—
$RBL_{10pm-7am}$	27	27	24	27	25	26	27	25	—

Figure 7: Time trace of relevant noise descriptors

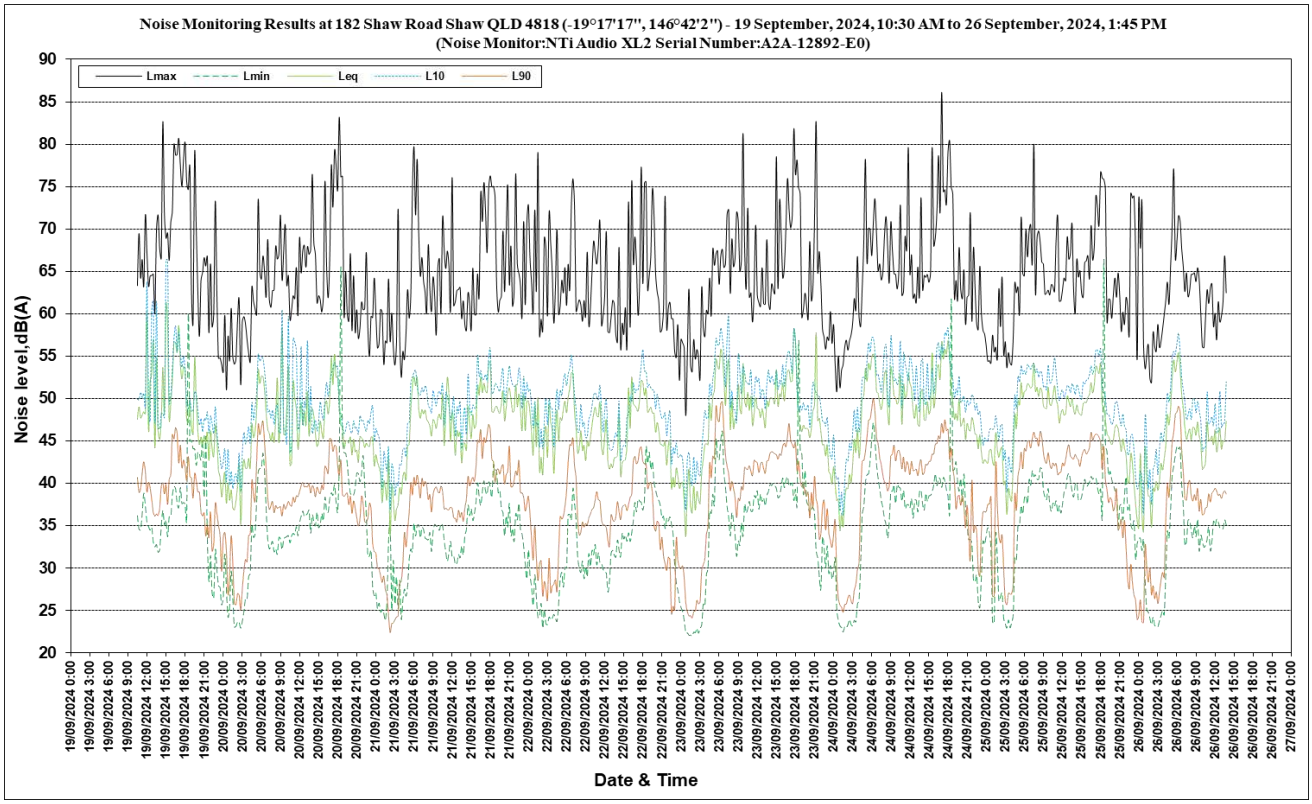


Table 21: Summary of BoM weather observations during unattended monitoring

Townsville, Queensland
September 2024 Daily Weather Observations

Australian Government
Bureau of Meteorology

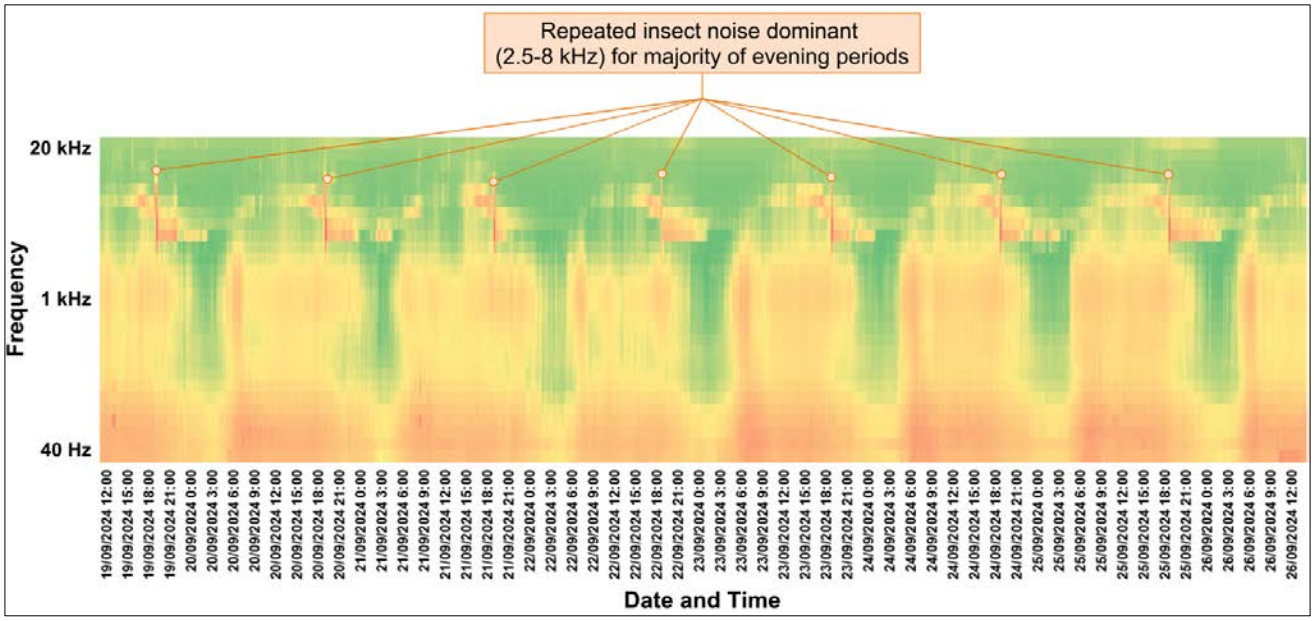
Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9am						3pm					
		Min	Max				Dirn	Spd	Time	Temp	RH	Cld	Dirn	Spd	MSLP	Temp	RH	Cld	Dirn	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	eighths		km/h	hPa	°C	%	eighths		km/h	hPa
1	Su	16.6	28.3	0			ENE	33	16:44	25.6	72	7	NE	13	1018.9	26.9	68		ENE	26	1015.7
2	Mo	16.8	28.2	0			NE	28	13:57	25.5	63		ENE	6	1019.6	27.5	58		NE	20	1016.7
3	Tu	17.8	29.0	0			ENE	52	14:43	24.2	76	1	ESE	17	1020.5	27.8	49		ENE	31	1017.7
4	We	19.7	26.7	0			ESE	54	12:26	24.7	56	8	SE	28	1021.4	25.9	55	7	ESE	28	1018.4
5	Th	19.8	27.6	0			ENE	57	11:57	23.9	57	8	ESE	31	1022.5	26.3	52	8	E	35	1019.4
6	Fr	16.5	27.7	0			E	52	09:48	23.5	67	8	SE	15	1024.9	26.5	55	1	E	31	1021.7
7	Sa	19.8	28.2	0			ENE	46	12:50	24.0	58	8	SSE	11	1024.5	26.1	48	8	SE	20	1021.1
8	Su	17.6	28.5	0			ENE	37	12:28	23.0	69	8	SE	24	1021.1	26.3	52	7	ENE	24	1017.5
9	Mo	17.4	28.5	0			ENE	41	13:27	24.3	60	7	ESE	13	1018.2	26.1	67		NE	26	1015.2
10	Tu	19.4	28.4	0			ENE	39	13:29	26.1	66	1	ESE	20	1018.8	26.6	67		ENE	30	1016.0
11	We	19.7	29.3	0			ENE	48	12:47	25.9	62	7	SE	24	1021.0	26.9	52		ENE	31	1018.0
12	Th	17.6	28.5	0			NE	37	12:41	25.2	61	1	ESE	17	1019.6	27.0	62		NE	28	1015.7
13	Fr	16.6	28.4	0			NE	37	14:33	24.4	61	1	SSE	13	1017.3	26.6	59		NE	30	1014.1
14	Sa	19.9	28.8	0			ENE	52	12:30	26.1	53	2	ESE	26	1017.6	27.3	56		ENE	39	1014.3
15	Su	18.2	28.1	0			NE	41	12:23	24.7	55	3	SE	17	1017.2	25.2	60	8	NE	28	1014.5
16	Mo	20.9	27.7	0			E	54	15:47	23.6	61	7	SE	17	1019.1	26.4	46	8	E	30	1016.2
17	Tu	20.6	26.0	0			E	56	14:14	23.2	61	8	ESE	30	1019.1	25.1	52	5	E	35	1017.4
18	We	19.4	27.4	0			ESE	43	11:17	22.5	65	8	SE	19	1019.0	24.9	63	8	E	30	1016.8
19	Th	19.0	27.7	0			NE	35	11:05	24.1	71	8	SE	11	1017.9	26.5	62	6	NE	19	1013.7
20	Fr	19.5	29.6	0			NW	28	11:02	25.8	73	5	NNW	11	1015.0	27.6	63	3	N	17	1010.7
21	Sa	20.8	33.5	0			NW	35	16:31	28.8	40	8	SE	7	1015.6	32.6	20		NE	15	1010.5
22	Su	14.5	32.8	0			NE	31	15:01	27.7	18	7	W	6	1016.8	30.9	16		NE	26	1012.6
23	Mo	16.7	28.9	0			ENE	39	13:52	26.0	52		SE	13	1018.2	26.7	63		ENE	31	1016.1
24	Tu	17.0	29.4	0			E	39	09:18	25.5	68	8	ESE	22	1019.1	26.7	63		ENE	31	1015.8
25	We	21.9	28.7	0			ENE	43	13:49	25.9	66	1	E	26	1017.8	26.9	67		ENE	30	1014.8
26	Th	20.4	29.2	0			ENE	33	13:31	26.6	66	7	NE	17	1017.0	28.0	55	1	NNE	17	1013.0
27	Fr	21.4	30.2	0			ENE	26	11:11	27.0	72		NW	2	1015.6	28.8	63		NE	13	1011.8
28	Sa	20.1	30.7	0			NE	31	13:37	27.8	63	8	E	9	1016.7	29.5	54		NNE	20	1012.6
29	Su	21.7	29.8	0			NE	35	12:20	27.0	70	7	ENE	17	1017.1	28.8	60	1	NE	24	1012.6
30	Mo	21.7	30.5	0			NE	31	13:28	27.6	61	1	NE	13	1016.7	29.3	53		NE	19	1012.7
Statistics for September 2024																					
	Mean	19.0	28.9							25.3	61	5		16	1018.8	27.3	55	5		26	1015.4
	Lowest	14.5	26.0							22.5	18	1	NW	2	1015.0	24.9	16	1	NE	13	1010.5
	Highest	21.9	33.5	0			ENE	57		28.8	76	8	ESE	31	1024.9	32.6	68	8	ENE	39	1021.7
	Total			0.0																	

B.3 Modifications Measurement Data due to Extraneous Noise

Nearfield extraneous noise from insects was evident in audio recordings and analysis of 1/3rd octave band background noise data (L_{90}). A simple spectrogram was generated to demonstrate where these occur and has been presented in **Figure 8**.

Due to the proximity to the sound level meter, insect noise (in particular) significantly influenced overall results at the noise sensitive receptor. Whilst common to the existing environment, it is likely that insect noise does not occur all year round and may unfavourably influence assessment conclusions made. Further, insect noise is likely to reduce with additional developments. Hence, extraneous data has been removed from all analysis described in this report.

Figure 8: Spectrogram indicating extraneous noise excluded from measurement data (L_{90} – 1/3rd octave band)



Appendix C Noise Modelling Details

C.1 Base Model Parameters

A summary of the modelling conditions is presented in **Table 22**.

Table 22: Noise modelling parameters

<table>
<tr><th>Item</th><th>Inputs and Assumptions</th></tr>
<tr><td colspan="2">Road Traffic Noise</td></tr>
<tr><td>Calculation Method</td><td>CoRTN (1988) with variations as described in this report. Low traffic correction not used.</td></tr>
<tr><td>Road Surface Corrections</td><td>Pavement surfaces are considered Stone Mastic Asphalt (SMA) / Dense Grade Asphalt (DGA
A 0.0 dB correction was applied.</td></tr>
<tr><td>Traffic data</td><td>Historic AADT data obtained from 2013 -2023 traffic census data (SITE ID: 92235)
Projected growth rates based 2023 data. Based on the census data, Shaw Rd indicates negative growth to preceding years (i.e., 2019 and 2022). To account for potential increases in traffic noise once the Parkside Greater Ascot project is complete, a 2.3% projected growth rate has been assumed based on information provided in the referenced traffic impact assessment (general growth of Townsville region per annum).
Table 23: Projected traffic data (2034)
<table>
<tr><th>Road ID</th><th>Description</th><th>Direction</th><th>Posted Speed</th><th>AADT (2023)</th><th>Projected AADT (2034)</th><th>Heavy Vehicle (%)</th></tr>
<tr><td rowspan="3">92235</td><td rowspan="3">Shaw Rd 800m Nth of Dalrymple Rd</td><td>North</td><td>80 km/h</td><td>4600</td><td>7554</td><td>9.3</td></tr>
<tr><td>South</td><td>80 km/h</td><td>5882</td><td>5907</td><td>15.2</td></tr>
<tr><td>Both</td><td>80 km/h</td><td>10482</td><td>13461</td><td>11.9</td></tr>
</table></td></tr>
<tr><td>Road Gradient</td><td>0 %</td></tr>
<tr><td>Source Heights</td><td>Model assumes average source height of 0.5 m</td></tr>
<tr><td>Correction for Australian condition</td><td>As per the TMR guidance, -0.7 dB is applied to free-field condition</td></tr>
<tr><td>Conversion Factors</td><td>$L_{A10,12hr} \approx L_{A10,18hr}$ + 1.8 dB(A) [2]
$L_{A10,1hr} \approx L_{A10,18hr}$ + 4 dB(A) [3]
$L_{Aeq,1hr}$ day $\approx L_{A10,18hr}$ + 0.4 dB, based on onsite noise measurement data and a study by R. Brown[4]</td></tr>
<tr><td colspan="2">General Assessment Input Parameters</td></tr>
<tr><td>Calculation Algorithms</td><td>Calculations were conducting using the SoundPLAN implementation of ISO 9613-2:1996 - Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation. The following atmospheric parameters were used:
• Temperature: 10°C
• Relative humidity: 70 %
• Atmospheric pressure: 1013.3 mbar
For carpark assessments, noise emissions were calculated using the SoundPLAN implementation of the “Recommendations for the Calculation of Sound Emissions of Parking Areas, Motorcar Centers and Bus</td></tr>
</table>

[2] $L_{10,12hr} = L_{10,18hr} + 10\log_{10}(\frac{18}{12})$

[3] Based on the measured difference between max $L_{Aeq,1hr}$ and $L_{10(18hour)}$ at noise logger location.

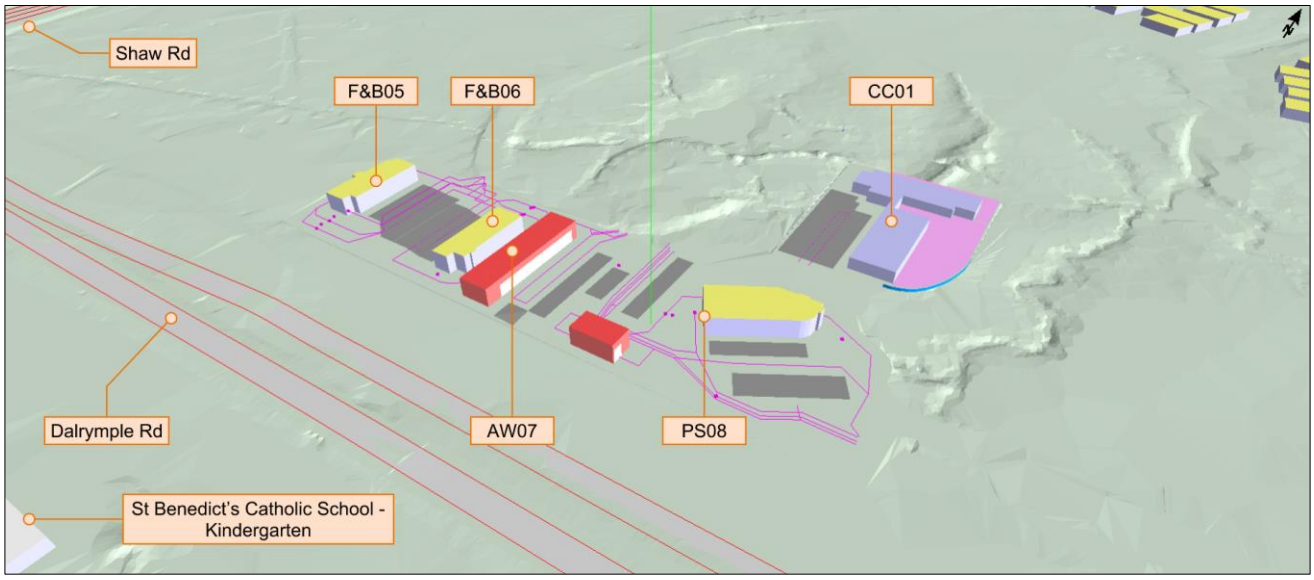
[4] The difference of $L_{Aeq,1hr\ day}$ and $L_{10(18hour)}$ was found to be closely corelated (0.4 dB average difference). (R. Brown, “*An assessment of the relationship between the $L_{10(18hour)}$ noise level parameter and other road traffic noise level parameters*”, Proceedings of Acoustics, 3-5 November 2004, Gold Coast)

Item	Inputs and Assumptions
	Stations as well as of Multi-Storey Car Parks and Underground Car Parks" (Bavarian Landesamt für Umwelt, 2007, 6th edn).
Ground Topography	A 1 metre Digital Elevation Model (DEM) derived from LiDAR obtained from an Australian Government website and was used to calculate 3D contours at 0.25 m elevation intervals. With the exception of carpark grade level, the data was used 'as is', and it is considered of sufficient resolution for assessment purposes.
Ground Absorption	TMR Policy advises generally advises 50%
Receptor Locations	Assessed at 1 m from the façade at heights of 1.5 m above relative floor level.

C.2 Noise Model Layout

The general layout of the noise model generated in SoundPlan has been presented in **Figure 9**.

Figure 9: Noise model layout



C.3 Carpark Noise Modelling Inputs

Additional carpark modelling parameters implemented are provided in **Table 24**.

Table 24: Acoustic simulation model carpark assumptions and inputs

Parameter	Model Input
Parking lot type (K_{PA})	Fast food restaurants (+4 dB) (F&B05, F&B06) Visitors and staff (+0 dB) (CC01, AW07, PS08)
Base unit (B0)	1 parking bay
Base B (total parking bays)	28 (CC01) 19 (F&B05) 20 (F&B06) 15 (AW07) 33 (PS08)
Road surface (K_{Stro})	Asphaltic driving lanes (+0 dB)
Passaging traffic	Separated (all)
Impulsive surcharge (K_I)	4 dB (all)

Parameter	Model Input
L_{max} – Door slam / Closing tail gate / boot lid	L_w 91 dB(A)
Single vehicle noise level	Ref. L_w 64 dB(A)
Vehicle spectrum	Typical
Source height	RL 0.5 m

NOTES:

1) CC01 – Childcare Centre | F&B05 – Pad Site 5 | F&B06 – Pad Site 6 | AW07 – Automotive Workshop | PS08 – Pad Site 8

C.4 Drive-through Vehicle Modelling Inputs

Drive-through parameters implemented are provided in **Table 25**.

Table 25: Input parameters for drive-through vehicles

Parameter	Model Input
Single vehicle noise level	Driving – L_w 48 dB/m, m^2 (based on L_w 85 dB(A) @ 5 km/h) Idling – L_w 85 dB(A)
Vehicle spectrum	Associated with vehicle under low load (sites are generally flat)
Source height	RL 0.5 m

C.5 Drive-through Speaker Modelling Inputs

Source noise levels associated with drive through speaker boxes are provided in **Table 26**.

Table 26: Drive through speaker box source noise levels

Source	Octave Band Sound Power Level (L_W, dB)							Total Sound Power Level – L_W dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	
Drive through speaker box	62	64	66	77	80	73	57	82

C.6 Loading Dock and Petrol Tanker Modelling Inputs

Truck movement parameters implemented for all loading docks are provided in **Table 27**.

Table 27: Input parameters for loading dock and petrol tanker vehicles

Parameter	Model Input
Single vehicle noise level	Refrigerated Truck Driving – L_w 61 dB/m, m^2 (L_w 98 dB(A) @ 5 km/h) Petrol Tanker Driving – L_w 73 dB/m, m^2 (L_w 110 dB(A) @ 5 km/h) Refrigerated Truck Idling – L_w 98 dB(A) Reverse beeper – L_w 66 dB/m, m^2 (L_w 103 dB(A) @ 5 km/h) Petrol Tanker Refuelling – L_w 92 dB(A)
Vehicle spectrum	Associated with vehicle under low load (sites are generally flat)
Source height	Refrigerated Truck – RL 3.0 m Petrol Tanker – RL 1.5 m

C.7 Carwash Facilities Modelling Inputs

Services parameters implemented for all carwash associated facilities are provided in **Table 28**.

Table 28: Input parameters for carwash facilities

Parameter	Model Input
Activity Noise Level	Automatic Carwash entrance / exit with roller doors open – L_w 92 dB(A) Vacuum Cleaner – L_w 83 dB(A)
Building Envelope Construction	Walls / Ceiling – 150 mm tilt panel concrete (R_w 54) Roller doors (open – R_w 0)

C.8 Automotive Workshop Modelling Inputs

Automotive workshop parameters simulated are provided in **Table 29**.

Table 29: Input parameters for automotive workshop

Parameter	Model Input
Activity Noise Levels	$L_{p,rev}$ 95 dB(A)
Building Envelope Construction	Walls – 150 mm tilt panel concrete (R_w 54) Ceiling – 0.48 mm sheet metal (no insulation – R_w 17) Roller doors (open – R_w 0)

C.9 Childcare Centre Modelling Inputs

The Association of Australian Acoustical Consultants Guideline for Child Care Centre (AAAC Guideline) provides guidance of typical sound power level ranges associated with continuous children activity / play in outdoor areas. Source sound power levels have been determined in accordance with the method described by the AAAC Guideline, as presented in **Table 30**.

Table 30: Input noise levels for childcare centre outdoor play areas

Location	Parameter	Input	Octave Band Sound Power Level, L_w dB								Total Sound Power Level, L_w dB(A)
			63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
NORTH ZONE	Noise Level (10 children)	0-2 yrs	54	60	66	72	74	71	67	64	78
	n	36									
	Correction	6									
	Noise Level Input		**60**	**66**	**72**	**78**	**80**	**77**	**73**	**70**	**83**
EAST ZONE	Noise Level (10 children)	2-3 yrs	61	67	73	79	81	78	74	70	85
	Noise Level (10 children)	3-5 yrs	64	70	75	81	83	80	76	72	87
	Average Noise Level	2-5 yrs	63	69	74	80	82	79	75	71	86
	n	84									
	Correction (for n)	9									
	Noise Level Input		**72**	**78**	**83**	**89**	**91**	**88**	**84**	**80**	**95**

Appendix D Predicted Noise Levels – Contribution from Source Groups

A summary of predicted noise levels and contribution from each noise source group at each receptor has been presented in **Table 31** (NOTE: all receptors along each nearest street have been considered, with the worst-case levels presented).

Table 31: Summary of highest predicted noise levels and contribution from noise source groups

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
Existing Noise Sensitive Receptors										
3 The Grange, Shaw	46	43	32	40	33	27	AW07 - Loading Dock Activities	13		
							AW07 - Vehicle Movements	18		
							AW07 - Workshop Activity	37		
							CC01 - Play Activities	33		
							CC01 - Vehicle Movements	22		
							F&B05 - Loading Dock Activities	22		
							F&B05 - Vehicle Movements	27	27	21
							F&B06 - Loading Dock Activities	22		
							F&B06 - Vehicle Movements	26	26	20
							PS08 - Automatic Carwash	17	17	11
							PS08 - Carwash and Vacuum	14	14	8
							PS08 - Loading Dock Activities	25		
							PS08 - Petrol Tanker Activities	25		
							PS08 - Vehicle Movements	30	30	24
6 Drakeford Street, Shaw	46	43	32	40	33	27	AW07 - Loading Dock Activities	15		
							AW07 - Vehicle Movements	17		
							AW07 - Workshop Activity	36		
							CC01 - Play Activities	32		
							CC01 - Vehicle Movements	23		
							F&B05 - Loading Dock Activities	21		

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							F&B05 - Vehicle Movements	27	27	21
							F&B06 - Loading Dock Activities	21		
							F&B06 - Vehicle Movements	26	26	20
							PS08 - Automatic Carwash	23	23	17
							PS08 - Carwash and Vacuum	13	13	7
							PS08 - Loading Dock Activities	27		
							PS08 - Petrol Tanker Activities	25		
							PS08 - Vehicle Movements	29	29	23
8 Ascot Parkway, Shaw	46	43	32	39	33	26	AW07 - Loading Dock Activities	12		
							AW07 - Vehicle Movements	17		
							AW07 - Workshop Activity	34		
							CC01 - Play Activities	35		
							CC01 - Vehicle Movements	21		
							F&B05 - Loading Dock Activities	22		
							F&B05 - Vehicle Movements	26	26	20
							F&B06 - Loading Dock Activities	21		
							F&B06 - Vehicle Movements	25	25	18
							PS08 - Automatic Carwash	21	21	15
							PS08 - Carwash and Vacuum	12	12	6
							PS08 - Loading Dock Activities	24		
							PS08 - Petrol Tanker Activities	29		
							PS08 - Vehicle Movements	30	30	24
20 Blackmoor Promenade, Shaw	46	43	32	36	30	24	AW07 - Loading Dock Activities	8		
							AW07 - Vehicle Movements	13		
							AW07 - Workshop Activity	30		
							CC01 - Play Activities	31		
							CC01 - Vehicle Movements	17		

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							F&B05 - Loading Dock Activities	14		
							F&B05 - Vehicle Movements	19	19	13
							F&B06 - Loading Dock Activities	12		
							F&B06 - Vehicle Movements	19	19	13
							PS08 - Automatic Carwash	21	21	15
							PS08 - Carwash and Vacuum	10	10	4
							PS08 - Loading Dock Activities	20		
							PS08 - Petrol Tanker Activities	27		
							PS08 - Vehicle Movements	28	28	22
23 Cherington Boulevard, Shaw	46	43	32	37	31	25	AW07 - Loading Dock Activities	4		
							AW07 - Vehicle Movements	14		
							AW07 - Workshop Activity	31		
							CC01 - Play Activities	32		
							CC01 - Vehicle Movements	19		
							F&B05 - Loading Dock Activities	13		
							F&B05 - Vehicle Movements	17	17	11
							F&B06 - Loading Dock Activities	12		
							F&B06 - Vehicle Movements	17	17	11
							PS08 - Automatic Carwash	23	23	17
							PS08 - Carwash and Vacuum	4	4	-2
							PS08 - Loading Dock Activities	20		
							PS08 - Petrol Tanker Activities	30		
							PS08 - Vehicle Movements	29	29	23
24 Lockton Street, Shaw	46	43	32	37	31	25	AW07 - Loading Dock Activities	9		
							AW07 - Vehicle Movements	13		
							AW07 - Workshop Activity	30		
							CC01 - Play Activities	32		

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							CC01 - Vehicle Movements	19		
							F&B05 - Loading Dock Activities	14		
							F&B05 - Vehicle Movements	19	19	13
							F&B06 - Loading Dock Activities	11		
							F&B06 - Vehicle Movements	19	19	13
							PS08 - Automatic Carwash	25	25	19
							PS08 - Carwash and Vacuum	5	5	-1
							PS08 - Loading Dock Activities	22		
							PS08 - Petrol Tanker Activities	29		
							PS08 - Vehicle Movements	29	29	23
30 Woodcote Bend, Shaw	46	43	32	39	32	26	AW07 - Loading Dock Activities	11		
							AW07 - Vehicle Movements	16		
							AW07 - Workshop Activity	33		
							CC01 - Play Activities	34		
							CC01 - Vehicle Movements	20		
							F&B05 - Loading Dock Activities	21		
							F&B05 - Vehicle Movements	25	25	19
							F&B06 - Loading Dock Activities	19		
							F&B06 - Vehicle Movements	23	23	17
							PS08 - Automatic Carwash	20	20	14
							PS08 - Carwash and Vacuum	11	11	5
							PS08 - Loading Dock Activities	23		
							PS08 - Petrol Tanker Activities	28		
							PS08 - Vehicle Movements	29	29	23
51 The Burlings, Shaw	46	43	32	39	32	26	AW07 - Loading Dock Activities	15		
							AW07 - Vehicle Movements	17		
							AW07 - Workshop Activity	36		

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							CC01 - Play Activities	27		
							CC01 - Vehicle Movements	26		
							F&B05 - Loading Dock Activities	21		
							F&B05 - Vehicle Movements	26	26	20
							F&B06 - Loading Dock Activities	21		
							F&B06 - Vehicle Movements	27	27	21
							PS08 - Automatic Carwash	22	22	16
							PS08 - Carwash and Vacuum	12	12	6
							PS08 - Loading Dock Activities	26		
							PS08 - Petrol Tanker Activities	24		
							PS08 - Vehicle Movements	26	26	20
St Benedict's Catholic School (indoor)	35			45 (10)			AW07 - Loading Dock Activities	16		
							AW07 - Vehicle Movements	24		
							AW07 - Workshop Activity	42		
							CC01 - Play Activities	33		
							CC01 - Vehicle Movements	22		
							PS08 - Automatic Carwash	23		
							F&B05 - Loading Dock Activities	29		
							F&B05 - Vehicle Movements	14		
							F&B06 - Loading Dock Activities	28		
							F&B06 - Vehicle Movements	33		
							PS08 - Carwash and Vacuum	15		
							PS08 - Loading Dock Activities	31		
							PS08 - Petrol Tanker Activities	38		
							PS08 - Vehicle Movements	38		
St Benedict's Catholic School - Outdoor Play	55			51			AW07 - Loading Dock Activities	24		
							AW07 - Vehicle Movements	30		

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							AW07 - Workshop Activity	48		
							CC01 - Play Activities	36		
							CC01 - Vehicle Movements	25		
							PS08 - Automatic Carwash	30		
							F&B05 - Loading Dock Activities	36		
							F&B05 - Vehicle Movements	19		
							F&B06 - Loading Dock Activities	35		
							F&B06 - Vehicle Movements	37		
							PS08 - Carwash and Vacuum	23		
							PS08 - Loading Dock Activities	38		
							PS08 - Petrol Tanker Activities	42		
							PS08 - Vehicle Movements	42		
Future Noise Sensitive Receptors (see Figure 5)										
Future Receptor 1 (FR1)	46	43	32	45	40	34	AW07 - Loading Dock Activities	6		
							AW07 - Vehicle Movements	20		
							AW07 - Workshop Activity	36		
							CC01 - Play Activities	40		
							CC01 - Vehicle Movements	28		
							F&B05 - Loading Dock Activities	13		
							F&B05 - Vehicle Movements	19	19	13
							F&B06 - Loading Dock Activities	12		
							F&B06 - Vehicle Movements	18	18	12
							PS08 - Automatic Carwash	30	30	24
							PS08 - Carwash and Vacuum	8	8	2
							PS08 - Loading Dock Activities	29		
							PS08 - Petrol Tanker Activities	38		
							PS08 - Vehicle Movements	40	40	34

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
Future Receptor 2 (FR2)	46	43	32	45	40	34	AW07 - Loading Dock Activities	16		
							AW07 - Vehicle Movements	18		
							AW07 - Workshop Activity	32		
							CC01 - Play Activities	41		
							CC01 - Vehicle Movements	28		
							F&B05 - Loading Dock Activities	15		
							F&B05 - Vehicle Movements	21	21	15
							F&B06 - Loading Dock Activities	15		
							F&B06 - Vehicle Movements	22	22	16
							PS08 - Automatic Carwash	31	31	25
							PS08 - Carwash and Vacuum	8	8	2
							PS08 - Loading Dock Activities	29		
							PS08 - Petrol Tanker Activities	36		
							PS08 - Vehicle Movements	39	39	33
Future Receptor 3 (FR3)	46	43	32	46	38	32	AW07 - Loading Dock Activities	15		
							AW07 - Vehicle Movements	21		
							AW07 - Workshop Activity	37		
							CC01 - Play Activities	44		
							CC01 - Vehicle Movements	27		
							F&B05 - Loading Dock Activities	17		
							F&B05 - Vehicle Movements	24	24	18
							F&B06 - Loading Dock Activities	18		
							F&B06 - Vehicle Movements	25	25	19
							PS08 - Automatic Carwash	29	29	23
							PS08 - Carwash and Vacuum	17	17	11
							PS08 - Loading Dock Activities	28		
							PS08 - Petrol Tanker Activities	35		

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							PS08 - Vehicle Movements	37	37	31
Future Receptor 4 (FR4)	46	43	32	46	38	32	AW07 - Loading Dock Activities	10		
							AW07 - Vehicle Movements	20		
							AW07 - Workshop Activity	36		
							CC01 - Play Activities	45		
							CC01 - Vehicle Movements	27		
							F&B05 - Loading Dock Activities	16		
							F&B05 - Vehicle Movements	22	22	16
							F&B06 - Loading Dock Activities	15		
							F&B06 - Vehicle Movements	22	22	16
							PS08 - Automatic Carwash	25	25	19
							PS08 - Carwash and Vacuum	11	11	5
							PS08 - Loading Dock Activities	25		
							PS08 - Petrol Tanker Activities	35		
							PS08 - Vehicle Movements	37	37	31
Future Receptor 5 (FR5)	46	43	32	46	37	31	AW07 - Loading Dock Activities	10		
							AW07 - Vehicle Movements	18		
							AW07 - Workshop Activity	34		
							CC01 - Play Activities	44		
							CC01 - Vehicle Movements	26		
							F&B05 - Loading Dock Activities	17		
							F&B05 - Vehicle Movements	23	23	16
							F&B06 - Loading Dock Activities	17		
							F&B06 - Vehicle Movements	22	22	16
							PS08 - Automatic Carwash	21	21	15
							PS08 - Carwash and Vacuum	10	10	4
							PS08 - Loading Dock Activities	25		

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							PS08 - Petrol Tanker Activities	34		
							PS08 - Vehicle Movements	36	36	30
Future Receptor 6 (FR6)	46	43	32	45	36	30	AW07 - Loading Dock Activities	10		
							AW07 - Vehicle Movements	17		
							AW07 - Workshop Activity	34		
							CC01 - Play Activities	44		
							CC01 - Vehicle Movements	26		
							F&B05 - Loading Dock Activities	17		
							F&B05 - Vehicle Movements	22	22	16
							F&B06 - Loading Dock Activities	17		
							F&B06 - Vehicle Movements	22	22	16
							PS08 - Automatic Carwash	20	20	14
							PS08 - Carwash and Vacuum	11	11	5
							PS08 - Loading Dock Activities	24		
							PS08 - Petrol Tanker Activities	33		
							PS08 - Vehicle Movements	36	36	30
Future Receptor 7 (FR7)	46	43	32	44	36	30	AW07 - Loading Dock Activities	10		
							AW07 - Vehicle Movements	17		
							AW07 - Workshop Activity	34		
							CC01 - Play Activities	43		
							CC01 - Vehicle Movements	25		
							F&B05 - Loading Dock Activities	17		
							F&B05 - Vehicle Movements	23	23	17
							F&B06 - Loading Dock Activities	17		
							F&B06 - Vehicle Movements	22	22	16
							PS08 - Automatic Carwash	20	20	14
							PS08 - Carwash and Vacuum	11	11	5

Receiver location (lot plan)	Prescribed noise limits, L_{eq} dB(A)			Highest predicted noise levels, L_{eq} dB(A) (rounded)			Group Source Contribution, L_{eq} dB(A) (rounded)			
	Day	Evening	Night	Day	Evening	Night	Source	Day	Evening	Night
							PS08 - Loading Dock Activities	24		
							PS08 - Petrol Tanker Activities	33		
							PS08 - Vehicle Movements	35	35	29

NOTES:

1) *Standard outdoor-to-indoor correction of -5 dB applied based on findings in Ryan, M, Lanchester, M & Pugh, S 2011, 'Noise Reduction through Facades with Open Windows', Paper Number 37, Proceedings of ACOUSTICS 2011, 2-4 November 2011, Gold Coast, Australia.*

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APPENDIX H

SARA Pre-Lodgement Advice – 2404-40129 SPL

Queensland Government

SARA reference: 2404-40129 SPL
Applicant reference: 26700-003-07

29 May 2024

Parkside Development Pty Ltd
C/- Brazier Motti
595 Flinders Street
TOWNSVILLE QLD 4810
Emma.Staines@braziermotti.com.au

Attention: Ms Emma Staines

Dear Ms Staines

SARA Pre-lodgement advice - 182 Shaw Road, Shaw

I refer to the pre-lodgement meeting held on 17 May 2024 in which you sought advice from the State Assessment and Referral Agency (SARA) regarding the proposed development at the above address. This notice provides advice on aspects of the proposal that are of relevance to SARA.

SARA's understanding of the project

In October 2013, Townsville City Council issued a Development Permit for a Material Change of Use for a Neighbourhood Centre (MI11/0064), including a Concurrence Agency Response with Conditions (SPD-0417-035739). The approval comprised a Supermarket, Shops and a Food Precinct and is due to lapse on 3 October 2025.

As the applicant has developed concepts over time, the site plan now requires amendment to reflect a new concept master plan that has been prepared over the whole 12ha site. To allow future applications to be made in accordance with this concept master plan, a Minor Change application is proposed in relation to the existing approval to relocate the development footprint.

Stage 1 of the conceptual master plan includes a service station, car wash, shop, food and drink outlet, childcare centre and swim school. To authorise development of these land uses, a new development application will be required to be made to Townsville City Council for a Material Change of Use. As the site is included in the Townsville City Plan's Emerging community zone, the application will be impact assessable.

North and North West regional office
Level 4, 445 Flinders Street, Townsville
PO Box 5666, Townsville QLD 4810

The subject site is located on a state-controlled road (Shaw Road) and is within 100m of a state-controlled road intersection (Shaw Road/Dalrymple Road). The proposed works (diversion of the waterway) associated with Stage 1 of the conceptual master plan impact a green mapped waterway according to the Queensland waterways for waterway barrier works mapping. The proposed development therefore triggers state referral. SARA would be a referral agency for the proposed application.

Supporting information
The advice in this letter is based on the following documentation that was submitted with the pre-lodgement request or tabled at the pre-lodgement meeting.

Drawing/report title	Prepared by	Date
Site Plan Stage 01, reference 6570 – SK01	Cottee Parker	29 April 2024
Greater Ascot Stage 1 sketch	Cottee Parker	17 May 2024

Pre-lodgement meeting record

Meeting date	17 May 2024
Meeting location	MS Teams
Meeting chair	Bronwyn Bignoux
Meeting attendees	Refer to **Attachment 1**
Meeting minutes	Refer to **Attachment 2**

Pre-lodgement advice

The following advice outlines the aspects of the proposal that are of relevance to SARA.

SARA's jurisdiction and fees	
1.	The application will require referral to SARA under the following provisions of the Planning Regulation 2017: • Schedule 10, Part 9, Division 4, Subdivision 2, Table 4, Item 1 – Material change of use of premises near a state transport corridor. This will require a fee of $3,636 (3,430 fee units) to be paid in accordance with Schedule 10, Part 9, Division 4, Subdivision 2, Table 4, Item 8 (d)(ii). • Schedule 10, Part 6, Division 4, Subdivision 3, Table 1, Item 1 – Operational work that is constructing or raising waterway barrier works. This will require a fee of $3,636 (3,430 fee units) for each waterway barrier works that is the subject of the application, to be paid in accordance with Schedule 10, Part 6, Division 4, Subdivision 2, Table 1, Item 5 (a)(ii). SARA would be a referral agency for the proposed application. *Note: From 1 July 2023, the fee a unit value will be $ 1.060 to reflect the 2023-2024 Government Indexation Rate (GIR). The value of the fee unit is prescribed in the Acts Interpretation (Fee Unit) Amendment Regulation 2022, which will be updated annually to reflect the GIR.*

Key matters and action items	
2.	The key issues identified in relation to the proposed development relate to site access arrangements and the proposed waterway barrier works: • **Access arrangements:** The subject site is located within 25m of a state-controlled road (Shaw Road) and is within 100m of the state-controlled Shaw Road/Dalrymple Road intersection. In order to ensure compliance with State code 1: Development in a state-controlled road environment, detailed information will be required in relation to traffic generation and the safety and operational performance impacts associated with the proposed development. This includes the provision of detailed, scaled and dimensioned proposal plans, a Traffic Impact Assessment and a Stormwater Management Plan (including a Flood Impact Assessment). Specific requirements in this regard are detailed in points 3, 4 and 5 below. It is noted that although Shaw Road is currently classified as a state-controlled road, it is in the process of being handed over to Townsville City Council (council) and will eventually no longer be gazetted as a state-controlled road. Whilst SARA is currently a referral agency in relation to Shaw Road, the applicant is encouraged to undertake close consultation with council to ensure that council is supportive of the proposed access arrangements to Shaw Road. • **Waterway barrier works:** The proposed works are located on a green mapped waterway according to the Queensland waterways for waterway barrier works mapping. It is understood that the waterway is proposed to be diverted to facilitate the construction of the neighbourhood centre. In order to ensure compliance with State code 18: Constructing or raising waterway barrier works in fish habitats, detailed information will be required in relation to the proposed waterway barrier works. This includes relevant scaled, referenced and dated plans with supporting information, as well as details in relation to fish passage. Specific requirements this regard are detailed in points 6, 7, 8 and 9 below. It is noted that if the assessable waterway barrier works are considered to be essential for the success of the development as a whole, they should be applied for concurrently with the proposed Material Change of Use development application in an integrated development application.
Access arrangements	
3.	**Details of development** It is recommended that the applicant provide detailed, scaled and dimensioned proposal plans that identify, at a minimum, the following: a) Detailed site plan(s), showing: i) All aspects of the proposed development and the location of all proposed buildings, structures and works located within the subject site. ii) Vehicle access locations, dimensions and types. iii) The location of existing and proposed utilities and infrastructure connections required to service the proposed development (i.e. stormwater drainage, etc.).

4.	**Traffic Impact Assessment** Due to the nature of the use being a commercial development that has the potential to attract through traffic from Shaw Road, it should be demonstrated that the proposed development does not result in increase safety and operation performance impacts on the state-controlled road. Potential upgrades along the local road were identified at the pre-lodgement meeting. The applicant is required to demonstrate that any future upgrades of the local road will not impact on the safety and operating performance of the Shaw Road/Dalrymple Road intersection. A Traffic Impact Assessment (TIA) is required to be submitted as part of the development application, demonstrating that all vehicles associated with the proposed development will not adversely impact upon the safety or operating performance of the broader state transport network. The TIA is required to be prepared in accordance with TMR's *Guide to Traffic Impact Assessment – December 2018* (GTIA) (available at https://www.tmr.qld.gov.au/business-industry/Technicalstandards-publications/Guide-to-Traffic-Impact-Assessment). The TIA must be prepared and certified by a suitably qualified RPEQ and must include, but not be limited to, the following: a) Identify the impact assessment area by impact type in accordance with section 6.4 of GTIA. b) Identify the extent of impacts generated by development traffic per impact type and impact assessment area. For example, demonstrate the spatial extent where development traffic exceeds 5% of the base traffic. c) Identify all vehicle types to be used by the development (including during construction). d) Identify the impact the development may have on the safety, efficiency and condition of the state-controlled road. e) Identify hours of operation. f) Identify the number of employees associated with the development. g) Identify the expected traffic that will be generated by the development. h) Identify peak hour trips. i) Identify the expected traffic distribution on the road network as a result of the development, including destinations. j) Demonstrate that there will be no disruption to the state-controlled road network during construction. k) Recommend mitigation measures to ensure the development does not have an adverse impact on the safety and operating condition of the state-controlled road network, and how the measures comply with relevant TMR Design requirements and with the Department of Transport and Main Roads' Road Planning and Design Manual (2nd Edition). l) Functional layout plans showing any proposed upgrades to the state or local network.
Stormwater management	
5.	When lodging the development application, the applicant is required to provide a Stormwater Management Plan, including a Flood Impact Assessment, to demonstrate compliance with PO8-PO14 of State code 1: Development in a state-controlled road environment. The Stormwater Management Plan, including Flood Impact Assessment, must demonstrate that the management of stormwater and flooding post construction of the intersection can achieve a no worsening impact (on the pre-development condition) for all flood and

	stormwater events that exist prior to development and up to a 1% Annual Exceedance Probability (AEP). This must include at least the following flood and stormwater events: 63.2%, 50%, 20%, 10%, 5%, 2% and 1% AEP. Stormwater management for the proposed development must ensure no worsening or actionable nuisance to the state-controlled road caused by peak discharges, flow velocities, water quality, sedimentation and scour effects. In particular, the following should be addressed: a) Verify the pre-development condition. Verify the existing drainage characteristics of the site in relation to the road corridor. All relevant legal points of discharge for the development site should be identified. b) Catchment Analysis. Provide pre-development and post-development catchment plans that clearly identify all internal catchments on the site, external catchments draining into the site, the flow paths (direction of flow) within each catchment, the size of each catchment and the legal point of discharge for each catchment. c) Flood impact assessment. Provide a hydraulic and hydrological analysis demonstrating the design flood peak discharges for the site and surrounding area which exist in the pre and post development scenarios for all flood and stormwater events up to a 1% Annual Exceedance Probability. This should include at least the following flood and stormwater events: 63.2%, 50%, 20%, 10%, 5%, 2% and 1% AEP. Mapping (afflux, water level/depth and velocity impact maps) should be provided to clearly illustrate the pre-development scenario, and the post development impacts for all relevant design events. The report should also demonstrate that flood storage capacity is maintained on the site with the development. Overland flow paths/ hydraulic conveyance should be maintained on the site as part of the proposed development. d) Maintain the pre-development condition. The pre-development flow scenario will need to be replicated in the post development condition. The proposed development should not impede or interfere with any drainage, stormwater or floodwater flows, including sheet flows, from the road corridor or vice versa. Retaining structures, filling/excavation, and structures or any other works to the land should be designed to include provision for drainage so as not to adversely impact on the state-controlled road corridor. The development design will need to address any concentration of flows, potential for back-up/ponding and scour/erosion which may undermine the road. e) Water quantity assessment. The peak discharge analysis should provide adequate details of the pre and post development impervious area of the site and give adequate consideration to the detention basin requirements of the QUDM, Fourth Edition. f) Conceptual drainage layout. Provide a conceptual stormwater drainage layout plan showing the proposed drainage network on the site, including the ring tanks, and demonstrating how all water flows will be collected and conveyed to the legal point of discharge. g) Mitigation measures. Include details of the mitigation measures proposed to address any potential stormwater and flooding impacts of the proposed development. The design flood peak discharges should be shown for the mitigated case to demonstrate there is no worsening impact on the state-controlled road.
Waterway barrier works	
6.	**Proposed Material Change of Use application/s** The SDAP Guideline for State Code 18 will assist in the preparation of a development application and responding to the relevant Performance Outcomes (POs) for assessable development impacting waterways. Under the Planning Regulation 2017, constructing or raising waterway barrier works is an

	operational works development trigger. Impacts to waterways providing for fish passage, a matter of State environmental significance under the Environmental Offsets Regulation 2014, should be identified and avoided where possible, in early stages of planning. Approval of an MCU development application is not an indication that a subsequent separate operational works development application for a development trigger that has not been assessed, will be successful. To avoid significant project management risks associated with missed triggers, a development application for an MCU should not include elements that are constructing or raising waterway barrier works unless that development trigger is also applied for. If any assessable waterway barrier works are considered to be essential for the success of the development as a whole, they should be applied for concurrent with the MCU development trigger(s) in an integrated development application. Examples of inherent waterway barrier works that may be associated with this proposal for an MCU include filling areas of waterways; diverting or blocking waterways/ road/pedestrian access across waterways (refer to Fisheries Queensland's website, *Waterway barrier works*). The Queensland waterway for waterway barrier works mapping displays a waterway on the subject lot(s). Avoiding waterways altogether would remove the risk of impact on these waterways that provide for fish passage. This would remove the need for an operational works approval associated with this development trigger. In order to avoid impacts to waterways in freshwater areas, Fisheries Queensland recommends a minimum 50-metre setback (incorporating natural vegetation and other buffer elements) from aquatic habitats. These generic buffer widths are considered a 'starting point' from which site-specific requirements can be negotiated. If waterway barrier works are required but have not been identified, it is recommended further pre-lodgement advice is sought prior to submitting a development application.
7.	**Constructing or raising waterway barrier works within fish habitats** a) The *Queensland waterways for waterway barrier works* mapping provides guidance on the likely location of waterways as defined in the *Fisheries Act 1994*. Please note that all waterways that are present on-ground may be displayed on the mapping. The mapping should be used in conjunction with the user guide. This document contains information about known mapping anomalies and what to do if you find one. b) Refer to the Department of Agriculture and Fisheries' website for more information on waterway barrier works including examples of waterway barrier works and works not considered waterway barrier works. c) Under the Planning Regulation 2017, works involving constructing or raising waterway barrier works must be undertaken in accordance with the relevant accepted development requirements or under a development approval (assessable development). d) The proposed works do not comply with the accepted development requirements (ADR) as the proposal to divert a mapped waterway to construct a neighbourhood centre cannot meet any of the prescribed work types. Works are therefore considered assessable development and will require development approval application. e) In an application for a development approval for operational works involving

constructing or raising waterway barrier works, the following will need to be provided:

i. Completed copy of DA Form 1 including Template 4 – Waterway barrier works;

ii. The SDAP Guideline for State Code 18 will assist in the preparation of a development application and responding to the relevant Performance Outcomes (POs) for assessable development impacting waterways. Particular attention should be paid to the following POs:

- All development – Impacts on waterways - PO1 to PO3.
- All development in general – PO4 to PO22.
- Temporary waterway barrier works - PO34 to PO38.

iv. Relevant scaled, referenced and dated plans as per SARA's DA Forms guide: Relevant plans, including:

- a longitudinal section of the waterway from upstream to downstream showing the existing bed level of the waterway in relation to the proposed waterway barrier works;
- a cross-section of the waterway from bank to bank showing the existing bed and bank levels of the waterway in relation to the proposed waterway barrier works;
- the location of waterways and any tidal land within, and adjacent to the site including natural bed level, high banks, main channel, low-flow channel and the following where relevant – levels of highest astronomical tide, mean high water spring tide, and low water spring tide;
- registered property boundaries; and
- contours of the bed and banks of the waterway at the site and to at least 100 m upstream and downstream of the site.

Note – all plans should be able to be read to scale at A3 size

v. Written documentation discussing the following:

- Brief overview of the proposed works (e.g. waterway diversion, single/multi-span bridge for pedestrian access, bed level crossing for vehicular access, culvert crossing for pedestrian/vehicular access, etc.).
- A description of the waterway proposed to be impacted (e.g. condition, size, connectivity, general hydrology) and nature of the impact.
- A description of the work method (e.g. timing, equipment to be used).
- A detailed description of how the development has been planned to avoid or minimise impacts to waterways through considerations such as design, location, setbacks/buffer distances, construction, maintenance.
- Details of on-site mitigation actions, during and after the development.
- The extent of any future maintenance works required for the continued safe operation of the proposed structure or facility.

8.	**All development - Impacts on waterway** a) PO1 of State code 18: Provide evidence that demonstrates the proposed works will not have an adverse impact on the waterway: Demonstrate how the design, construction and maintenance of the development has been planned to not result in adverse impacts to waterways and fish habitats. This includes at relevant planning stages and consideration of the design, location, construction and operation of the waterway barrier works. b) PO2 of State code 18: Demonstrate the development is designed, constructed and maintained to avoid and minimise impacts on matters of state environmental significance: An application must demonstrate how impacts to waterways are avoided in the first instance. Where avoidance is not reasonably possible, it must be demonstrated how impacts to waterways have been managed and minimised. Include plans and drawings of the development site, identifying all waterways and fish habitats within and adjoining the development site with an overlay of the proposed development. c) PO3 of State code 18: Demonstrate that where development impacts on matters of state environmental significance, development mitigates impacts and provides an offset for any acceptable significant residual impact on matters of state environmental significance: Waterways providing for fish passage are a Matter of State Environmental Significance (MSES) under the *Environment Offsets Act 2014.* An application must demonstrate how impacts to waterways have been mitigated. Despite mitigation measures, the works may still result in a Significant Residual Impact (SRI), in which case an environmental offset may be required. Any rehabilitation of waterways providing for fish passage on site may help to reduce the scale of the SRI. Options to mitigate the SRI to waterways providing for fish passage must be pursued before an offset can be considered. The Significant Residual Impact Guideline is useful in determining the likelihood of the proposed development resulting in a SRI.
9.	**All development in general** a) In order to meet PO4 of State code 18, demonstrate that aspects of development are only proposed within a waterway where there is a functional requirement and the development cannot be feasibly located elsewhere. The applicant is required to provide supporting information, including plans and drawings, that identify all development components (including construction requirements) within a waterway. b) In order to meet PO5 of State code 18, demonstrate that for the life of the barrier, adequate fish passage must be provided and maintained at all waterway barrier works through: i. fish way(s) that adequately provide for the movement of fish; or ii. the movement of fish is adequately provided for in another way. Submit plans and drawings of the waterway barrier works and any associated structures or works areas. Include details of all design aspects that will provide fish passage. c) In order to meet PO6 of State code 18, demonstrate that waterway barrier works are designed, constructed, operated and maintained to provide lateral and longitudinal fish passage for all members of the fish community. Ensure that the new channel is designed to provide lateral and longitudinal passage to fish, retaining the value of the waterway in terms of connectivity between migratory routes for fish. d) In relation to PO7 of State code 18, demonstrate that the development is designed and

	operated so that all components of waterway barrier works and pathways of potential fish movement provide for safe fish passage. Stepped spillways are not acceptable. Discuss risks to safe fish passage and how these risks will be alleviated. e) In regard to PO8 of State code 18, demonstrate that the drownout characteristics of the waterway barrier works are designed and constructed to not result in adverse impacts to fish passage. Relating to any proposed culverts, detail and discuss the frequency, duration and timing of drownout of the waterway barrier works in relation to the identified fish passage requirements of the system, taking into consideration adequate fish passage for the fish community and biomass. f) In order to address PO9 of State code 18, demonstrate that the development does not result in adverse impacts to fisheries resources. Discuss any potential impacts to fisheries resources that may result from the proposed development. Provide details on how the proposed development has been designed, constructed and/or will be managed to protect fisheries resources from identified potential impacts. g) In relation to PO10 of State code 18, demonstrate that the design, construction and maintenance of the development does not result in non-essential hardening or unnatural modification of the main channel of the waterway. In particular, demonstrate that impacts to fish habitats and fish passage have been avoided and natural fish habitats and waterway features have been retained. If any hardening of the waterway is proposed, demonstrate why it is essential for the development, taking into consideration designs that would not require hardening or modifying fish habitats. For example, culverts should be sized appropriately to minimise any scour protection within the waterway. h) In regard to PO11 of State code 18, demonstrate that the development retains natural fish habitat and features such as shade, pools, riffles, rock outcrops and boulders, wherever possible. Submit supporting material, including plans and discussion, to demonstrate how the development retains natural fish habitats and habitat complexity. i) With reference to PO13 of State code 18, demonstrate, where channels are to be significantly modified, the design and construction of the development replicates natural waterways and habitat features. If it has been demonstrated that significant modification to the waterway cannot be avoided and there is a functional requirement for the development to be located within the waterway, discuss the natural habitat features that are incorporated into the development. This could include pools, riffles, shaded and open sections, deep and shallow sections, and different types of substrata. Provide plans showing the elements of the design that include natural waterway features. For example, plan-view, longitudinal and cross-sections of the waterway showing waterway profiles with any proposed pools, vegetation, riffles, etc.
Lodgement material	
10.	It is recommended that the following information is submitted when referring the application to SARA: • DA form 1. • Template 4: Waterway barrier works. • A full response to the relevant sections of SDAP Code 1: Development in a state-controlled road environment. • A full response to the relevant sections of SDAP Code 18: Constructing or raising

	waterway barrier works in fish habitats. • Landowner's consent. • Relevant plans as per the DA Forms guide, including plans detailed in points 3 to 9 above.

This advice outlines aspects of the proposed development that are relevant to SARA's jurisdiction. This advice is provided in good faith and is:

- based on the material and information provided to SARA
- current at the time of issue
- not applicable if the proposal is changed from that which formed the basis of this advice.

The advice in this letter does not constitute an approval or an endorsement that SARA supports the development proposal. Additional information may be required to allow SARA to properly assess the development proposal after a formal application has been lodged.

For further information please contact Bronwyn Bignoux, Principal Planning Officer, on 4747 3907 or via email NQSARA@dsdilgp.qld.gov.au who will be pleased to assist.

Yours sincerely

Graeme Kenna
Manager (Planning)

enc Attachment 1 – Pre-lodgement meeting attendance record
Attachment 2 – Pre-lodgement meeting minutes

Development details	
Proposal:	Minor Change Application - Development Permit for Material Change of Use for the Neighbourhood Centre – Amendment of site plan for Stage 1
Street address:	182 Shaw Road, Shaw
Real property description:	Lot 5001 on SP340651
SARA role:	Referral agency
Assessment Manager:	Townsville City Council
Assessment criteria:	State Development Assessment Provisions (SDAP): • State code 1: Development in a state-controlled road environment • State code 18: Constructing or raising waterway barrier works in fish habitats
Existing use:	Subject site is vacant

Development details	
Relevant site history:	Development Permit for Material Change of Use for the Neighbourhood Centre (MI11/0064) including a Concurrence Agency Response with Conditions (SPD-0417-035739)

Attachment 1 — Pre-lodgement meeting attendance record

Meeting attendees:

Name	Position	Organisation
Emma Staines	Town Planner	Brazier Motti
Stephen Motti	Director	Brazier Motti
Michael Tapiolas	Development Manager	Parkside Development
Bradley Jones	Principal Traffic Engineer	Premise
Adam Pease	Townsville General Manager	Premise
Rob Klug	Traffic Engineer	Premise
Zac Strogusz	Traffic Engineer	Premise
Sean Georgeson	Fisheries Biologist	Department of Agriculture and Fisheries
Denise Hinneberg	Principal Advisor	Department of Transport and Main Roads
Aidan Colahan	Town Planner	Department of Transport and Main Roads
Graeme Kenna	Planning Manager	Department of Housing, Local Government, Planning and Public Works
Bronwyn Bignoux	Principal Planning Officer	Department of Housing, Local Government, Planning and Public Works

Apologies: Peter Tapiolas – Parkside Development

Attachment 2 — Pre-lodgement meeting minutes

1.	**Meeting opening** - Bronwyn Bignoux of SARA opened the meeting and welcomed all. She noted that the purpose of the meeting was to discuss a proposed material change of use application to Townsville City Council. - Apologies: Peter Tapiolas, Parkside Developments. - There was a round of introductions.
2.	**Stephen Motti – Brazier Motti** - Stephen provided an overview of the existing development approval and development to date. He said that there was a longstanding approval for Greater Ascot, for 2,500 residential lots. There had been development over time, which included the existing stage. Stage 1 provided for commercial activity and had approval conditions which remained current. Given the emergence of a community at Greater Ascot, Parkside Development was looking to contribute to the initial stage. - The proposed change to the application included changes to the position of buildings and additional elements (e.g. fuel stop and childcare centre) - which would be independent applications. There were emerging opportunities currently. - The proposed change to Stage 1 involved a change of elements. Brazier Motti had met with Townsville City Council, who advised they were satisfied with the proposed mix of uses and understood the process intended to be followed to secure approval for the changes. - The intent of the meeting was to discuss the structure of Stage 1 and access arrangements, especially access options (e.g. off Dalrymple Road). - Brazier Motti were aware that an application was required and would require revised Technical Agency assessment (as a referral agency).
3.	**Department of Agriculture and Fisheries (DAF) – Sean Georgeson** - Sean said that DAFs main concern related to the waterway. Was it proposed to fill the waterway in the vicinity of the centre? If so, this would constitute waterway barrier works. Fish passage would have to be provided for. - Stephen said they would be mindful of these types of development in the operational work stage. - Sean said there was a defined bed and banks in relation to the green waterway. Fish could use the waterway for movement. DAF considered the waterway a defined green waterway based on desktop analysis. If evidence could be provided that it was not a defined waterway, then the proposed operational work would not constitute waterway barrier works based on evidence. - Sean said the operational work, as currently proposed, would not meet the accepted development requirements (ADF). An application would need to show that fish diversion and passage had been catered for. There would then be no concerns in the assessment process. In summary, suitable evidence needed to be provided, as well as demonstration of how impacts had been minimised impacts and fish passage catered for.

4.	**Department of Transport and Main Roads (DTMR) – Denise Hinneberg and Aidan Colahan** - Brad shared his screen showing the road network in relation to the subject site and explained that, until recently, there had been a right turn into Dalrymple Road which then merged into one lane. The existing approval provided for access from Dalrymple Road. He noted that current work was underway which was duplicating this particular section of Dalrymple Road. There was therefore no longer a merge in relation to the access area. - Aidan asked whether the proposed access was still 200m from the intersection. - Emma confirmed that it was and referred to the proposal plan circulated ahead of the meeting. - Aidan asked whether there had been any consideration of public transport (PT) in Stage 1. - Denise said that while it was acknowledged that one was not looking at all uses, so not all of the detail was required, DTMR could not say Stage 1 was in order. DTMR needed to also look at PT, etc. in relation to the wider area. She noted there were good active transport linkages in relation to the site. - Stephen noted that council had also discussed the broader transport strategy (hierarchy, set down places, etc.). - Denise advised that the applicant consider laydown areas. She asked about the timing of the application. Denise noted that a path was needed to get to the pedestrian linkages outside of the site. - Stephen said that, in the original residential stage, boulevards and landscaping had been an important feature of the road hierarchy in Greater Ascot. Stage 1 would be established in a similar form. - Michael agreed, stating that Parkside Development had a footpath masterplan. It was noted that there was a 2,5m shared pathway along Dalrymple Road (linking into Shaw Road pathway). - Aidan said he assumed that a new TIA would be lodged with application. - Bronwyn said that providing a broader context to the proposed Stage 1 application would be useful. - Denise said that, in regard to pathway design, it was important to make pedestrian linkages wide enough. The plan provided indicated narrow pathways. - Denise said that, in relation to the TIA, Dalrymple Road was a different road now due to its duplication. She asked whether weaving at the site entrance (from the outside lane to the entrance) had been considered. - Bradley shared an aerial photograph of the area in question and the matter was discussed. - Aidan asked whether there would be an additional lane into the site. He said that it was assumed that turn warrant assessments would be undertaken in terms of TMR's GTA. - Rob said that it was likely that the 10 year design life would require a turn/deceleration lane (likely a 100m from the state-controlled road network). - Denise mentioned an example of this type of lane at Castletown and noted that one lane was mainly used. She also flagged an issue which had been experienced at the Fairfield centre. - Denise said that, if Stage 1 was going to include a service station, the applicant should be mindful in the TIA of fuel tankers and service vehicles getting into the location (and have a standing distance of 1 at the bowser and 2 behind so that there was no queuing into the access). She noted this was not a TMR issue but was flagging the matter for consideration. - Michael queried the relationship between council and DTMR in relation to the proposed application given the planned handover of Shaw Road to council. Denise said this would depend on the circumstances – the application may be handed over the council in

	due course. She said that, in relation to a contribution to wider network, council had a different threshold. It was agreed that Parkside Development would meet with DTMR and Brazier Motti to discuss further this matter further.
5.	**Discussion of proposed development** - Bronwyn queried the clearing of native vegetation. Emma advised that clearing was exempt clearing work. - Sean reiterated that some POs in State code 18 were key in relation to the proposed application. They were PO5, PO10 (avoid hardening and provide a cross section of the waterway), PO11 (retain natural vegetation) and PO13 (replicate the natural waterway as much as possible). PO 34-38 were important if any temporary waterway barrier works were proposed.
6	**Closing** - Bronwyn thanked all for their attendance. - She said that written SARA pre-lodgement meeting advice would now be prepared and closed the meeting.

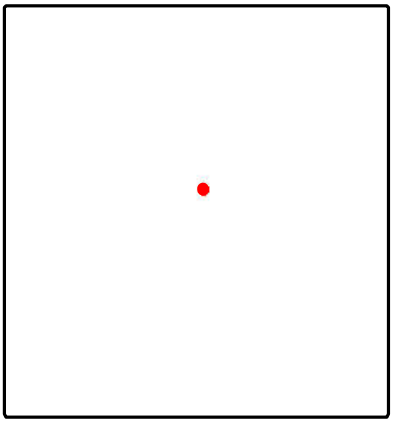
APPENDIX I

SARA Mapping

State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government



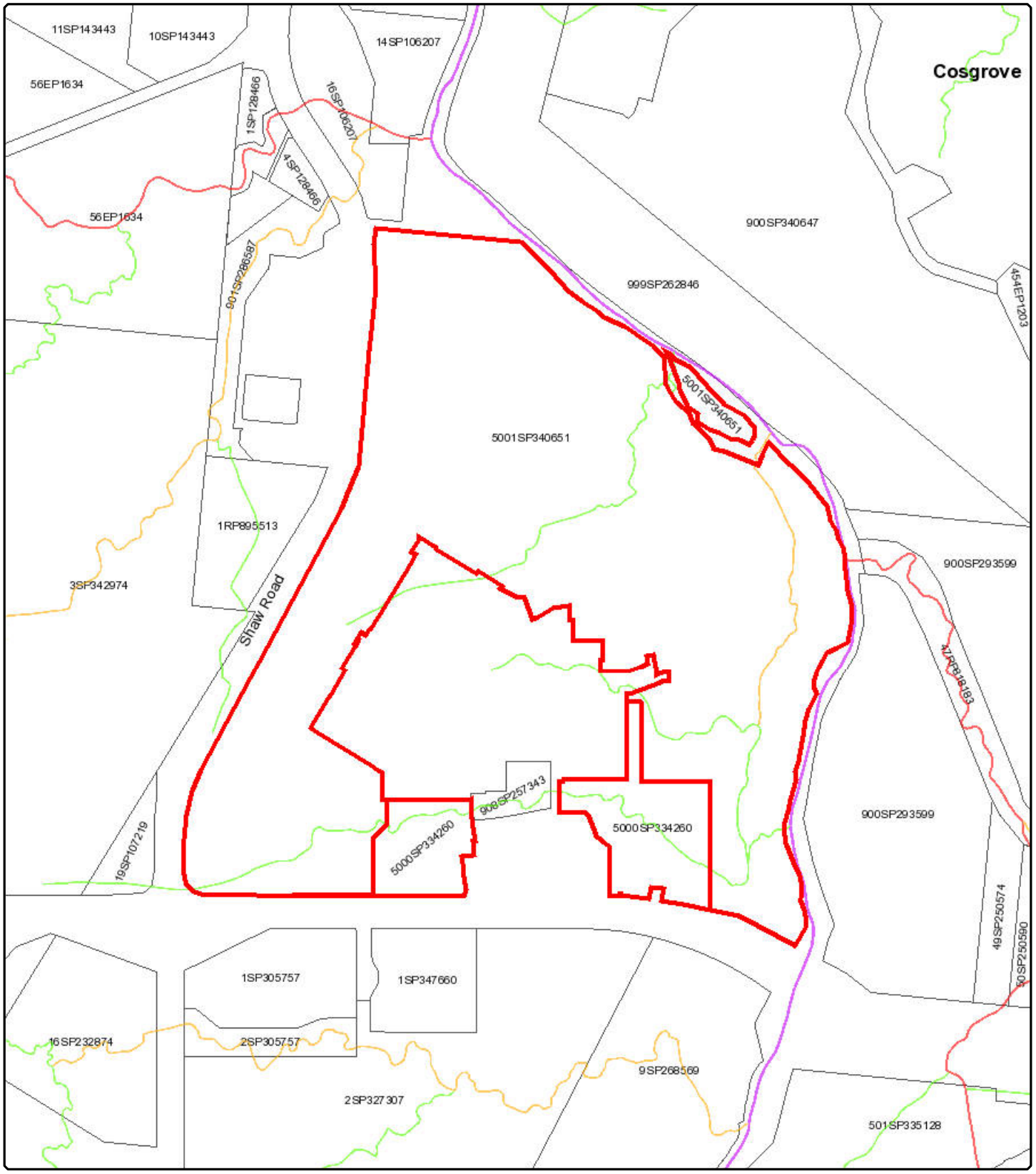
Matters of Interest for all selected Lot Plans

Queensland waterways for waterway barrier works
Regulated vegetation management map (Category A and B extract)
Coastal area - erosion prone area
Coastal area - medium storm tide inundation area
Coastal area - high storm tide inundation area
State-controlled road
Area within 25m of a State-controlled road

Matters of Interest by Lot Plan

Lot Plan: 5001SP340651 (Area: 1274940 m^2)
Coastal area - erosion prone area
Coastal area - medium storm tide inundation area
Coastal area - high storm tide inundation area
Queensland waterways for waterway barrier works
Regulated vegetation management map (Category A and B extract)
State-controlled road
Area within 25m of a State-controlled road

Lot Plan: 5000SP334260 (Area: 141292 m^2)
Queensland waterways for waterway barrier works
Regulated vegetation management map (Category A and B extract)



State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government

N

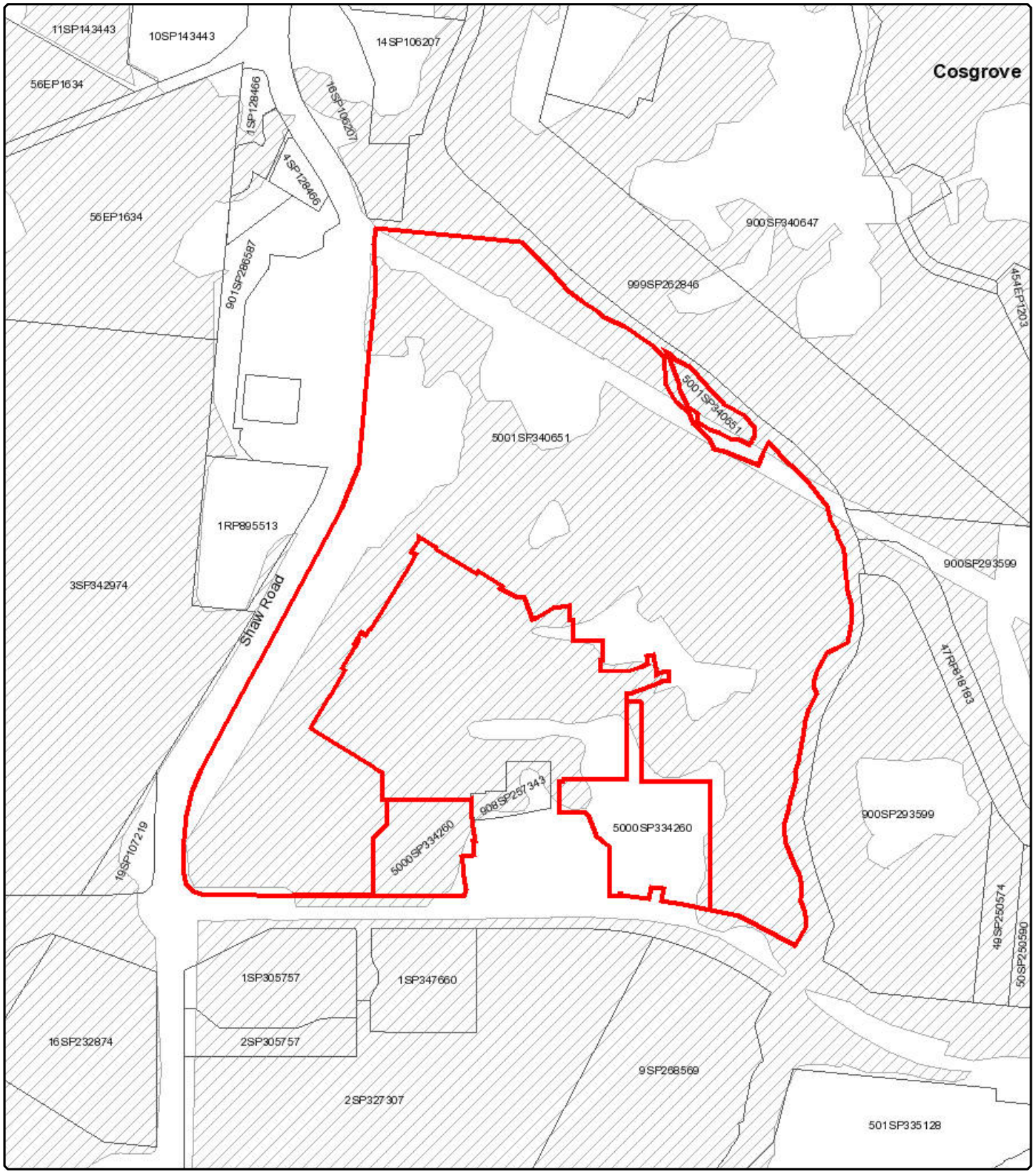
Legend

Queensland waterways for waterway barrier works

- Low
- Moderate
- High
- Major
- Major (tidal)

0 250 500 750 1,000

Metres



State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government

N

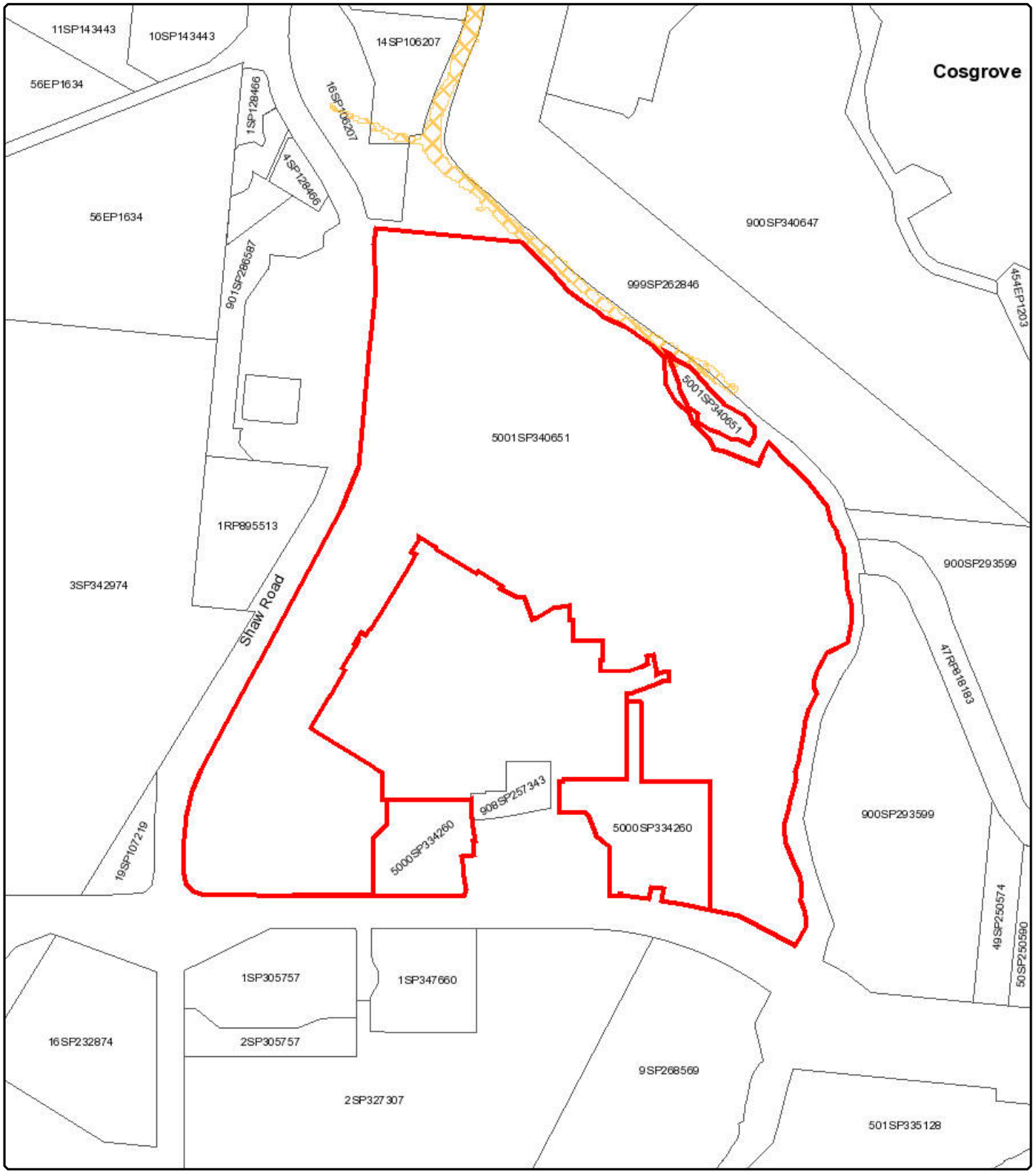
Legend

Regulated vegetation management map (Category A and B extract)

- Category A on the regulated vegetation management map
- Category B on the regulated vegetation management map

0 250 500 750 1,000

Metres



State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government

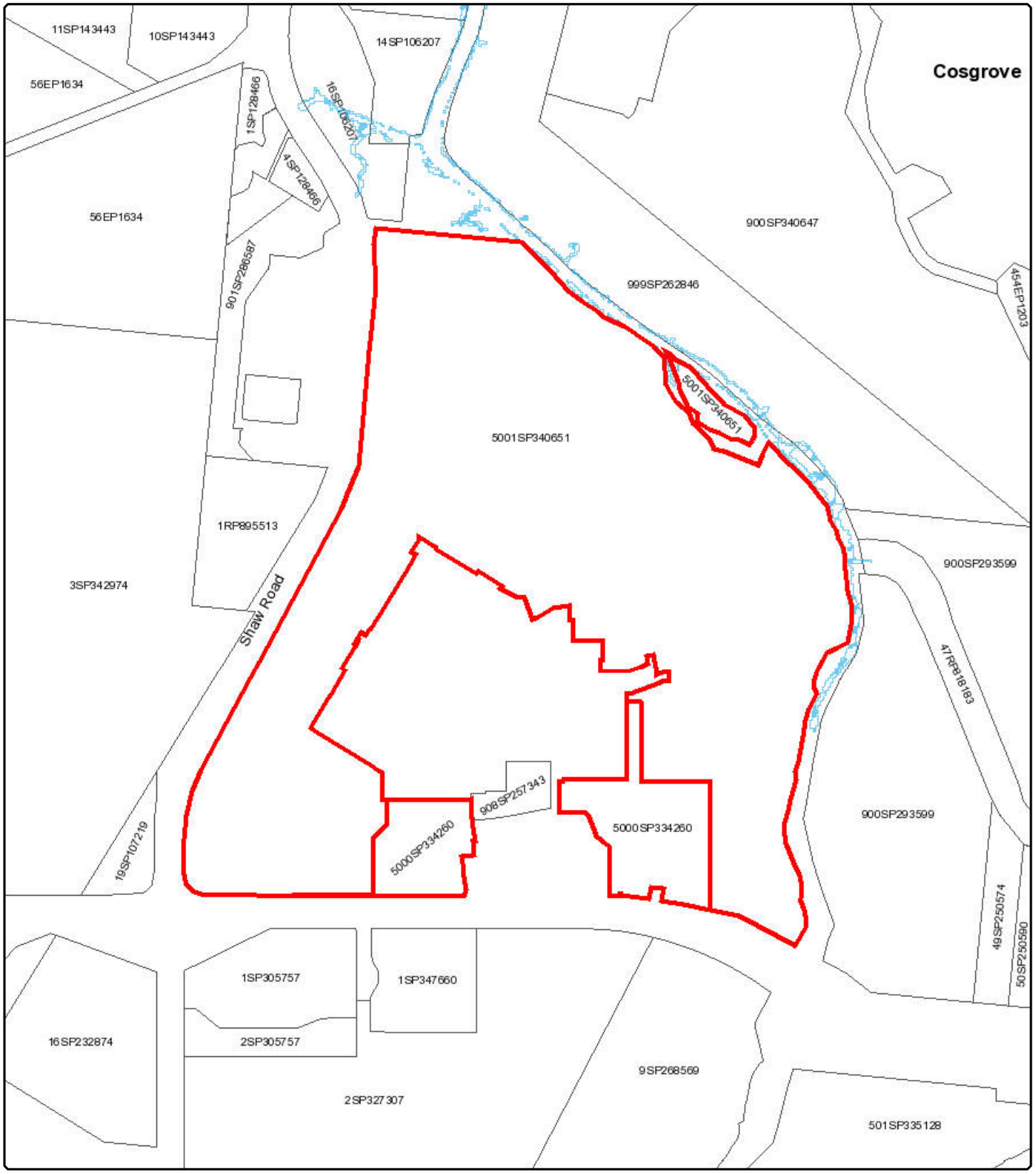
Legend

Coastal area - erosion prone area

Coastal area - erosion prone area

0 250 500 750 1,000

Metres



State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government

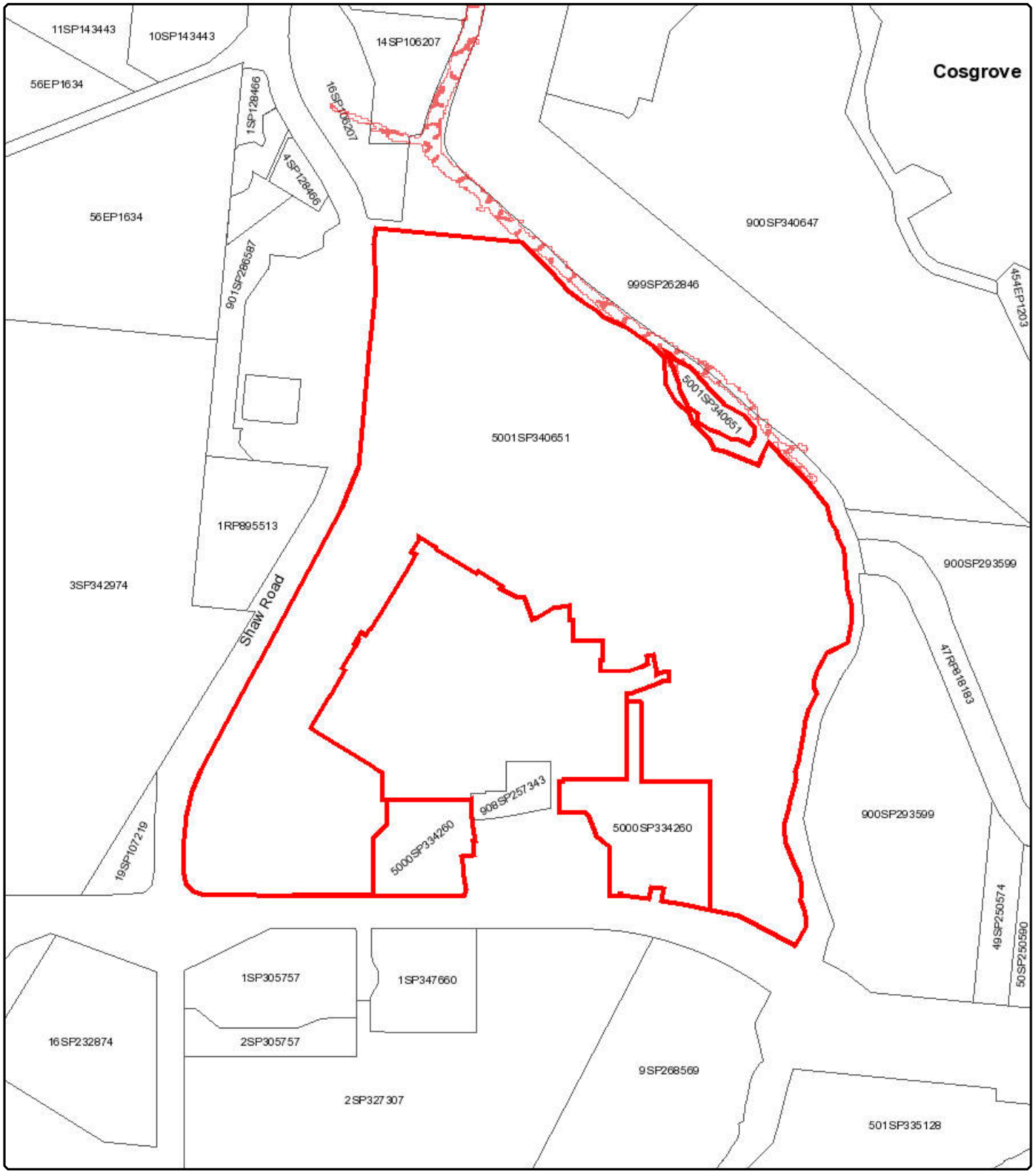
Legend

Coastal area - medium storm tide inundation area

Coastal area - medium storm tide inundation area

0 250 500 750 1,000

Metres



State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government

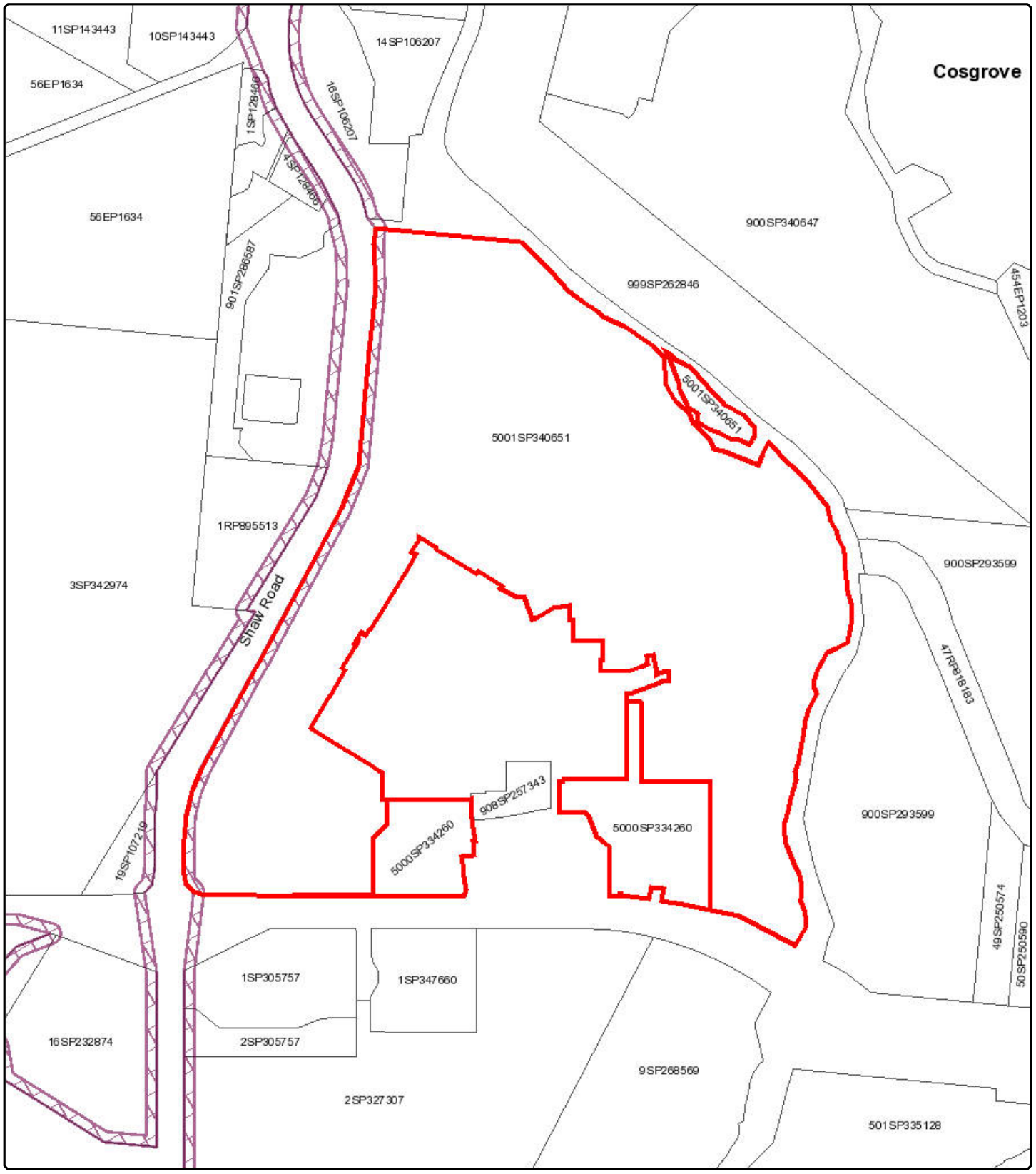
Legend

Coastal area - high storm tide inundation area

Coastal area - high storm tide inundation area

0 250 500 750 1,000

Metres



State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government

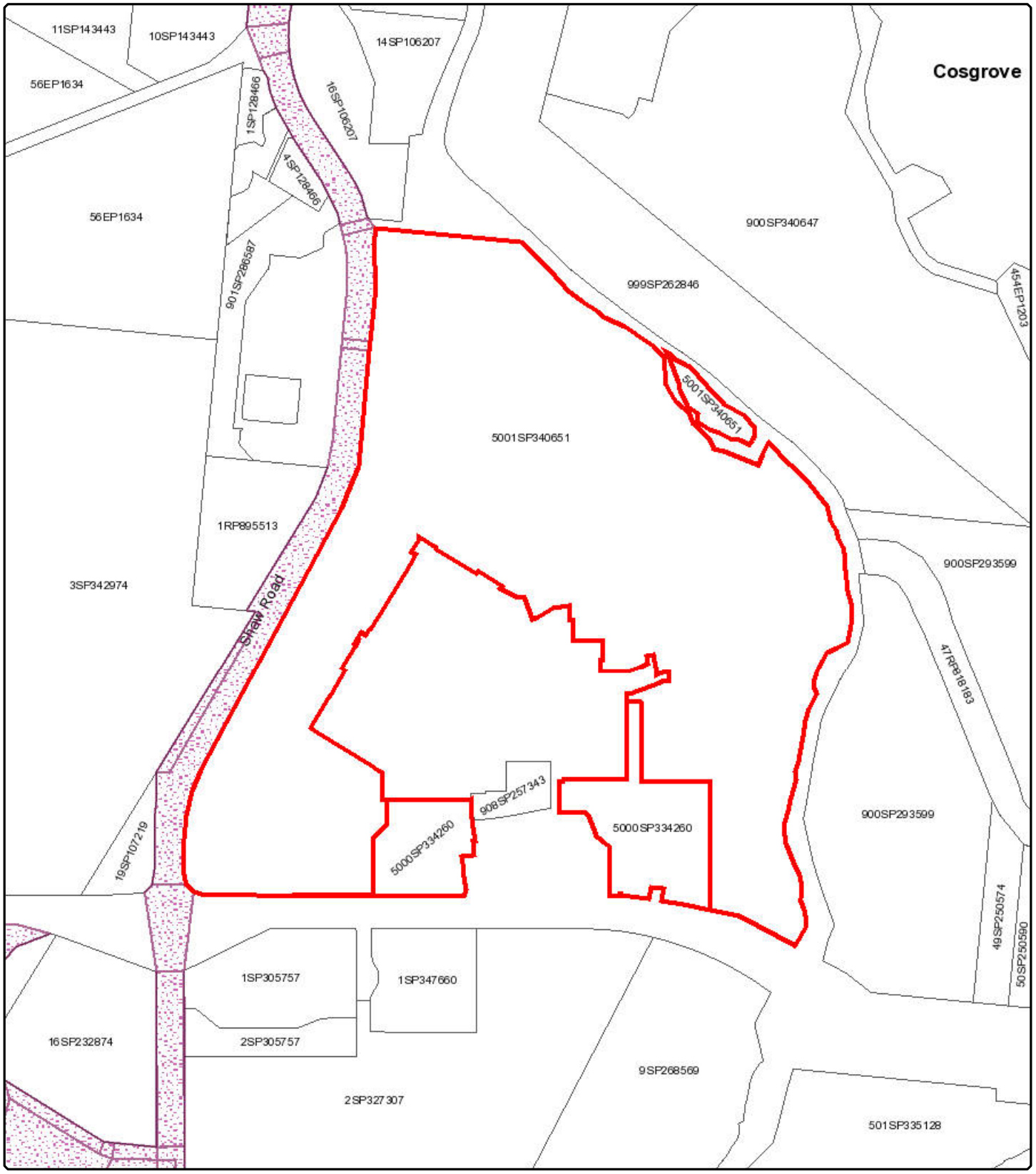
Legend

Area within 25m of a State-controlled road

Area within 25m of a State-controlled road

0 250 500 750 1,000

Metres



State Assessment and Referral Agency

Date: 30/10/2024

Queensland Government

Legend

State-controlled road

State-controlled road

0 250 500 750 1,000

Metres

APPENDIX J

Response to State Code 1: Development in a state-controlled road environment

State code 1: Development in a state-controlled road environment

Table 1.1 Development in general

Performance outcomes	Acceptable outcomes	Response
Buildings, structures, infrastructure, services and utilities		
PO1 The location of the development does not create a safety hazard for users of the **state-controlled road.**	**AO1.1** Development is not located in a **state-controlled road**. AND **AO1.2** Development can be maintained without requiring access to a **state-controlled road**.	**Complies with AO1.1** The development is not located in the SCR. AND **Complies with AO1.2** The development is wholly contained within the subject site.
PO2 The design and construction of the development does not adversely impact the **structural integrity** or physical condition of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO2** All construction will be carried out in accordance with current local and state policies and direction. It is not anticipated the development will impact the structural integrity of Shaw Road.
PO3 The location of the development does not obstruct **road transport infrastructure** or adversely impact the operating performance of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO3** The development is wholly contained within the subject site.
PO4 The location, placement, design and operation of advertising devices, visible from the **state-controlled road**, do not create a safety hazard for users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO4** All advertising will be wholly contained within the development site and sympathetic to the surrounding locality.
PO5 The design and construction of buildings and **structures** does not create a safety hazard by distracting users of the **state-controlled road**.	**AO5.1** Facades of buildings and **structures** fronting the **state-controlled road** are made of non-reflective materials. AND **AO5.2** Facades of buildings and **structures** do not direct or reflect point light sources into the face of oncoming traffic on the **state-controlled road**. AND	**Complies with AO5.1** The façade of the building fronting the SCR does not incorporate reflective materials. AND **Complies with AO5.2** All materials used for the façade of the communal services building fronting the SCR will not be reflective

Performance outcomes	Acceptable outcomes	Response
	AO5.3 External lighting of buildings and **structures** is not directed into the face of oncoming traffic on the **state-controlled road**. AND **AO5.4** External lighting of buildings and **structures** does not involve flashing or laser lights.	so to that they do not direct or reflect light into oncoming traffic. AND **Complies with AO5.3** All lighting associated with the development will be directed away from the SCR. AND **Complies with AO5.4** No flashing or laser lights are proposed. Standard conditions to safeguard these aspects are expected.
PO6 Road, pedestrian and bikeway bridges over a **state-controlled road** are designed and constructed to prevent projectiles from being thrown onto the **state-controlled road**.	**AO6.1** Road, pedestrian and bikeway bridges over the **state-controlled road** include throw protection screens in accordance with section 4.11 of the Design Criteria for Bridges and Other Structures Manual, Department of Transport and Main Roads, 2020.	**Not applicable** No roads or pedestrian and bikeway bridges are proposed as part of this development.
Landscaping		
PO7 The location of landscaping does not create a safety hazard for users of the **state-controlled road**.	**AO7.1** Landscaping is not located in a **state-controlled road**. AND **AO7.2** Landscaping can be maintained without requiring access to a **state-controlled road**. AND **AO7.3** Landscaping does not block or obscure the sight lines for vehicular access to a **state-controlled road**.	**Complies with AO7.1** No landscaping is proposed within the Shaw Road road reserve. AND **Complies with AO7.2** All proposed landscaping is contained within the site and does not require access to the SCR for maintenance. AND **Complies with AO7.3** No trees, shrubs or bushes are proposed within the site fronting the SCR that could obscure sight lights.
Stormwater and overland flow		

Performance outcomes	Acceptable outcomes	Response
PO8 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO8** Stormwater management was assessed by Premise which detailed that it is proposed that the runoff from the site will be conveyed to the west into Shoveler Court. Stormwater drainage shall be designed and constructed in accordance with the Townsville City Plan – Planning Scheme Policy – Schedule 6.4.4.4 Stormwater Drainage Design and associated reference documents. The development will be shaped to ensure positive drainage towards roadways or drainage reserves (ultimately east) as per Council requirements. A preliminary layout of the stormwater strategy is included in Appendix E of the Engineering Report in ***Appendix E.*** The design intent will ensure that the development does not discharge into Shaw Road to ensure that there are no increases in stormwater volume being discharged onto the state-controlled road. For further information refer to the Engineering Report in ***Appendix E.***
PO9 Stormwater run-off or overland flow from the development site does not result in a material worsening of the operating performance of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Compiles with PO9** As above.
PO10 Stormwater run-off or overland flow from the development site does not adversely impact the **structural integrity** or physical condition of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Compiles with PO10** As above.
PO11 Development ensures that stormwater is lawfully discharged.	**AO11.1** Development does not create any new points of discharge to a **state-controlled road.** AND **AO11.2** Development does not concentrate flows to a **state-controlled road**.	**Complies with AO11.1** No new points of discharge are created to Shaw Road. Major system (Q100 – 1% AEP) stormwater flows, surplus to the minor system capacity, shall be transported via the roadway systems to the main drainage paths, and discharged as per normal Council requirements. AND

Performance outcomes	Acceptable outcomes	Response
	AND **AO11.3** Stormwater run-off is discharged to a **lawful point of discharge**. AND **AO11.4** Development does not worsen the condition of an existing **lawful point of discharge** to the **state-controlled road**.	**Complies with AO11.2** The development will be shaped to ensure positive drainage towards roadways or drainage reserves (ultimately east) away from Shaw Road. AND **Complies with AO11.3** As above. For further information refer to the Engineering Report in ***Appendix E.***
Flooding		
PO12 Development does not result in a material worsening of flooding impacts within a **state-controlled road**.	**AO12.1** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (within +/- 10mm) to existing flood levels within a **state-controlled road**. AND **AO12.2** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (up to a 10% increase) to existing peak velocities within a **state-controlled road**. AND **AO12.3** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (up to a 10% increase) to existing time of submergence of a **state-controlled road**.	
Drainage Infrastructure		
PO13 Drainage infrastructure does not create a safety hazard for users in the **state-controlled road**.	**AO13.1** Drainage infrastructure is wholly contained within the development site, except at the **lawful point of discharge**. AND	**Complies with AO13.1** All infrastructure is contained within the development site as demonstrated in the Engineering Report in ***Appendix E.*** AND

Performance outcomes	Acceptable outcomes	Response
	AO13.2 Drainage infrastructure can be maintained without requiring access to a **state-controlled road**.	**Complies with AO13.2** All infrastructure is contained within the development site and does not require access to the SCR for maintenance.
PO14 Drainage infrastructure associated with, or within, a **state-controlled road** is constructed, and designed to ensure the **structural integrity** and physical condition of existing drainage infrastructure and the surrounding drainage network.	No acceptable outcome is prescribed.	**Complies with PO14** As above.

Table 1.2 Vehicular access, road layout and local roads

Performance outcomes	Acceptable outcomes	Response
Vehicular access to a state-controlled road or within 100 metres of a state-controlled road intersection		
PO15 The location, design and operation of a **new or changed access** to a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO15** A new left in left out access into the development site is proposed approximately 200m east of the state-controlled road intersection. All new accesses and roadways have been assessed by Premise as part of the Traffic Impact Assessment for stages 1 and 2 of the development. A copy of the TIA is included in ***Appendix F.***
PO16 The location, design and operation of a **new or changed access** does not adversely impact the **functional requirements** of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO16** Refer to the TIA is included in ***Appendix F.***
PO17 The location, design and operation of a **new or changed access** is consistent with the **future intent** of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO17** It is understood that the Shaw Road is expected to be handed back to Townsville City Council, therefore the development complies with the future intent of the road.
PO18 New or changed access is consistent with the access for the relevant **limited access road policy**: 1. **LAR 1** where direct access is prohibited; or 2. **LAR 2** where access may be permitted, subject to assessment.	No acceptable outcome is prescribed.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO19 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO19** Refer to the TIA included in ***Appendix F.***
PO20 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not adversely impact on the operating performance of the intersection.	No acceptable outcome is prescribed.	**Complies with PO20** Refer to the TIA included in ***Appendix F.***
Public passenger transport and active transport		
PO21 Development does not compromise the safety of users of **public passenger transport infrastructure**, **public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO21** Refer to the TIA included in ***Appendix F.***
PO22 Development maintains the ability for people to access **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO22** Refer to the TIA included in ***Appendix F.***
PO23 Development does not adversely impact the operating performance of **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO23** Refer to the TIA included in ***Appendix F.***
PO24 Development does not adversely impact the **structural integrity** or physical condition of **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO24** Refer to the TIA included in ***Appendix F.***

Table 1.3 Network impacts

Performance outcomes	Acceptable outcomes	Response
PO25 Development does not compromise the safety of users of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies with PO25** Given scale and intensity of the proposed development and its proximity to high traffic roadways, a TIA was required to be undertaken to ensure the development would comply with local and state government requirements. The TIA was prepared by Premise which assessed the impacts of traffic generated by Stages 1 and 2 of the Greater Ascot District Centre, noting that assumptions were made for footprint and traffic volumes for Stage 2 of the development. The TIA concluded that with the implementation of appropriate mitigation measures, the development is not expected to adversely impact on the existing road network. Premise conducted the following impact assessments: • Road safety; • Access and frontage; • Intersection delay; and • Intersection spacing. A copy of the TIA is included in ***Appendix F.***
PO26 Development ensures **no net worsening** of the operating performance of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies with PO26** Refer to the TIA included in ***Appendix F.***
PO27 Traffic movements are not directed onto a **state-controlled road** where they can be accommodated on the **local road** network.	No acceptable outcome is prescribed.	**Complies with PO27** Refer to the TIA included in ***Appendix F.***
PO28 Development involving haulage exceeding 10,000 tonnes per year does not adversely impact the pavement of a **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable.**
PO29 Development does not impede delivery of **planned upgrades** of **state-controlled roads**.	No acceptable outcome is prescribed.	**Not applicable.**

Performance outcomes	Acceptable outcomes	Response
PO30 Development does not impede delivery of **corridor improvements** located entirely within the **state-controlled road corridor**.	No acceptable outcome is prescribed.	**Not applicable.**

Table 1.4 Filling, excavation, building foundations and retaining structures

Performance outcomes	Acceptable outcomes	Response
PO31 Development does not create a safety hazard for users of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO31** No building foundations or retaining structures are proposed that would create safety hazards.
PO32 Development does not adversely impact the operating performance of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO32** Refer to the TIA included in ***Appendix F.***
PO33 Development does not undermine, damage or cause subsidence of a **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO33** Refer to the Engineering Report included in ***Appendix E.***
PO34 Development does not cause ground water disturbance in a **state-controlled road**.	No acceptable outcome is prescribed.	**Complies with PO34** The site for Stage 1 of the development is relatively flat, with minimal variation between existing surface elevations which range from 13 to 12m AHD. As the site is located between 5-20 m AHD, the risk of encountering Acid Sulfate Soils is considered low.
PO35 Excavation, boring, piling, blasting and fill compaction do not adversely impact the physical condition or **structural integrity** of a **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies with PO35** No major excavation or fill is required that would otherwise cause impact on the operating performance of the state-controlled road and intersection.
PO36 Filling and excavation associated with the construction of **new or changed access** do not compromise the operation or capacity of existing drainage infrastructure for a **state-controlled road.**	No acceptable outcome is prescribed.	**Complies with PO36** All work will be carried out in accordance with all relevant Australian standards and dtmr policy.

Table 1.5 Environmental emissions

Statutory note: Where a **state-controlled road** is co-located in the same transport corridor as a railway, the development should instead comply with Environmental emissions in State code 2: Development in a railway environment.

Performance outcomes	Acceptable outcomes	Response
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:	**Not applicable** The development does not create residential lots.

Performance outcomes	Acceptable outcomes	Response
	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 **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;	**Not applicable** The development does not create residential lots.

Performance outcomes	Acceptable outcomes	Response
	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; 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.	**Not applicable** The development is not for an accommodation activity.
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:	**Not applicable** The development is not for an accommodation activity.

Performance outcomes	Acceptable outcomes	Response
	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.	**Not applicable** The development is not for an accommodation activity.
Above ground floor level requirements (accommodation activity) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO42 Balconies, podiums, and roof decks include: 1. a continuous **solid gap-free structure** or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); 2. highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums, and roof decks.	No acceptable outcome is provided.	**Not applicable** The development is not for an accommodation activity.
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.	**Not applicable** The development is not for an accommodation activity.

Performance outcomes	Acceptable outcomes	Response
Material change of use (other uses)		
Ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO44 Development: 1. provides a noise barrier or earth mound that is designed, sited and constructed: a. to achieve the maximum free field acoustic level in reference table 2 (item 2.3) for all **outdoor education areas** and **outdoor play areas**; b. in accordance with: i. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; ii. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; iii. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 2. achieves the maximum free field acoustic level in reference table 2 (item 2.3) for all **outdoor education areas** and **outdoor play areas** by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.	No acceptable outcome is provided.	**Complies with PO44** The child care centre site on proposed Lot 2 is located approximately 380m east of Shaw Road and situated well outside projected noise contours. Despite this, a road traffic noise assessment was undertaken as part of the Acoustic Report included in ***Appendix G.*** Whilst a minimum noise reduction level has been assigned to the building envelope, standard construction is expected to result in compliance with internal noise level targets in sensitive uses. Openable elements to north, south and west aspects are required to be closed to achieve target noise levels; hence, mechanical services strategy may be required. In addition, the minimum performances nominated are expected to sufficiently control external noise ingress from proposed new developments assessed in the Acoustic Report.
PO45 Development involving a **childcare centre** or **educational establishment**: 1. provides a noise barrier or earth mound that is designed, sited and constructed: 2. to achieve the maximum building facade acoustic level in reference table 1 (item 1.2); 3. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise),	No acceptable outcome is provided.	**Complies with PO45** Refer to the Acoustic Report in ***Appendix G.***

Performance outcomes	Acceptable outcomes	Response
Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 4. achieves the maximum building facade acoustic level in reference table 1 (item 1.2) by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.		
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.	**Complies with PO46** Refer to the Acoustic Report in ***Appendix G.***
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.	**Not applicable** The development does not propose any second storeys.

Performance outcomes	Acceptable outcomes	Response
PO48 Development including: 1. **indoor education areas** and **indoor play areas** in a **childcare centre** or **educational establishment**; or 2. sleeping rooms in a **childcare centre**; or 3. **patient care areas** in a **hospital** located above ground level, is designed and constructed to achieve the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is provided.	**Not applicable** The development does not propose any second storeys.
Air, light and vibration		
PO49 Private open space, **outdoor education areas** and **outdoor play areas** are protected from air quality impacts from a **state-controlled road**.	**AO49.1** Each dwelling or unit has access to a **private open space** which is shielded from a **state-controlled road** by a building, **solid gap-free fence**, or other **solid gap-free structure**. OR **AO49.2** Each **outdoor education area** and **outdoor play area** is shielded from a **state-controlled road** by a building, **solid gap-free fence,** or other **solid gap-free structure**.	**Complies with AO49.2** Given the siting of the development, the outdoor play area will be well shielded from Shaw Road.
PO50 Patient care areas within **hospitals** are protected from vibration impacts from a **state-controlled road** or **type 1 multi-modal corridor**.	**AO50.1 Hospitals** are designed and constructed to ensure vibration in the patient treatment area does not exceed a vibration dose value of $0.1m/s^{1.75}$. AND **AO50.2 Hospitals** are designed and constructed to ensure vibration in the ward of a **patient care area** does not exceed a vibration dose value of $0.4m/s^{1.75}$.	**Not applicable**
PO51 Development is designed and sited to ensure light from infrastructure within, and from users of, a **state-controlled road** or **type 1 multi-modal corridor**, does not: 1. intrude into buildings during night hours (10pm to 6am);	No acceptable outcomes are prescribed.	**Complies with PO51** Given the siting of the development, light intrusion from Shaw Road will not be an issue.

Performance outcomes	Acceptable outcomes	Response
2. create unreasonable disturbance during evening hours (6pm to 10pm).		

Table 1.6: Development in a future state-controlled road environment

Performance outcomes	Acceptable outcomes	Response
PO52 Development does not impede delivery of a **future state-controlled road**.	**AO52.1** Development is not located in a **future state-controlled road**. OR ALL OF THE FOLLOWING APPLY: **AO52.2** Development does not involve filling and excavation of, or material changes to, a **future state-controlled road**. AND **AO52.3** The intensification of lots does not occur within a **future state-controlled road**. AND **AO52.4** Development does not result in the landlocking of parcels once a **future state-controlled road** is delivered.	**Not applicable**
PO53 The location and design of **new or changed access** does not create a safety hazard for users of a **future state-controlled road**.	**AO53.1** Development does not include **new or changed access** to a **future state-controlled road**.	**Not applicable**
PO54 Filling, excavation, building foundations and **retaining structures** do not undermine, damage or cause subsidence of a **future state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**
PO55 Development does not result in a material worsening of stormwater, flooding, overland flow or drainage impacts in a **future state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO56 Development ensures that stormwater is lawfully discharged.	AO56.1 Development does not create any new points of discharge to a **future state-controlled road**. AND AO56.2 Development does not concentrate flows to a **future state-controlled road**. AND AO56.3 Stormwater run-off is discharged to a **lawful point of discharge**. AND AO56.4 Development does not worsen the condition of an existing **lawful point of discharge** to the **future state-controlled road**.	Not applicable