



NOISE ASSESSMENT

PROPOSED CHILDCARE CENTRE

LOT 8100 MUSGRAVE CRESCENT

BANYA

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

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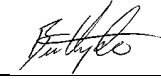
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1.0 INTRODUCTION

1.1 STUDY BRIEF

MWA Environmental has been engaged to prepare a Noise Assessment for a proposed childcare centre development at Lot 8100 Musgrave Crescent, Banya. The report has been prepared to support a development application to Economic Development Queensland (EDQ).

This assessment has considered the potential noise amenity impact of the proposed childcare centre upon nearby sensitive land uses. The assessment is based on ambient noise monitoring conducted in the locality, noise measurements previously conducted on typical sources associated with the use and detailed noise propagation modelling.

The assessment also addresses the potential road traffic noise impact upon the childcare centre from adjoining existing and proposed local roadways. This assessment includes detailed computer noise modelling considering estimates of design horizon traffic volumes.

A review of state-road traffic noise impact (i.e. Bruce Highway traffic noise impact) at the proposed childcare centre is also provided with reference to the Aura Development Precinct 15 (West) masterplan acoustic report.

1.2 SITE DESCRIPTION

The subject site is located at Lot 8100 Musgrave Crescent, Banya.

The subject site and adjoining land are currently undeveloped, with operational works underway through the precinct.

As per the overall precinct planning for Aura Estate, the site is intended for a childcare centre development.

The adjacent roadways to the site are as follows:

- Western Drive is located to the east of the site;
- Walsh Street (a 26 metre wide local access roadway under construction) is located to the south of the site;
- Gowler Street (a 17.5 metre wide local access roadway under construction) is located to the southwest of the site; and,
- Musgrave Crescent (a 15.5 metre wide local access roadway under construction) is located to the west of the site.

An existing acoustic barrier, approximately 2.5 metre high, is located on the eastern side of Western Drive.

The intended residential uses on land to the north and beyond roadways to the west, southwest and east of the site have been considered as noise sensitive receptors for the purpose of this assessment. Land to the south is intended to be developed as centre and park uses.

The site location and surrounding land uses are shown on **Figure 1**.

1.3 PROPOSED DEVELOPMENT

The proposed development is for a 147 place childcare centre with associated outdoor play areas and carparking.

The development provides 41 car parking bays on the southwestern part of the site.

Outdoor play areas are located adjacent to the childcare centre building.

The proposed development plans are included as **Attachment 1**.

The earthworks layout plan for the childcare centre site and adjacent roadways was provided by Egis Group¹.

The proposed operating hours for the childcare centre are 6:30am to 6:00pm Monday to Friday.

¹ *Aura – Precinct 15 West Package 1 – Stages 50, 51, 52, 58, 59 & 64, Project No. 21-000307, dated 15.10.25, Revision D.*

2.0 EXISTING NOISE ENVIRONMENT

Noise measurements have been undertaken using a noise datalogger located on the eastern site boundary over a 5 day period from 23 to 27 January 2026. Operational works are currently taking place at the site and on surrounding land, and as such, the noise logging period was chosen over a long weekend period that included three days of noise measurements uninterrupted by construction activities. The statistical noise levels recorded by the noise datalogger are listed below in **Table 1**, with the free-field datalogger location shown on **Figure 2**.

The noise datalogger used was a Norsonic Nor139 with NATA calibration, programmed to provide statistical analysis results based on 15-minute sampling periods. The datalogger was pre-calibrated to 94 dB at 1kHz using a Bruel & Kjaer Sound Level Calibrator, Type 4231, and displayed a deviation of less than ± 0.5 dB from this level at post-calibration. Weather conditions during the monitoring period were generally fine with light to moderate winds.

The results of the datalogger noise monitoring are provided in **Table 1**. The recorded noise levels are presented as statistical components, which are described as:

- L₁: Noise level exceeded for 1 percent of the measurement period, referred to as the adjusted maximum sound pressure level.
- L₁₀: Noise level exceeded for 10 percent of the measurement period, referred to as the averaged maximum sound pressure level.
- L₉₀: Noise level exceeded for 90 percent of the measurement period. AS1055-2018² notes that the L₉₀ is described as the background sound pressure level.
- L_{eq}: An “average” measurement, and as per AS1055–2018 defined as the value of the sound pressure level of a continuous steady sound state, that within a measurement period, has the same mean square sound pressure as a sound under consideration whose level varies with time.

² Australian Standard AS 1055-2018 *Acoustics – Description and measurement of environmental noise*

**Table 1: Ranges of Recorded Noise Levels
24 to 26 January 2026**

PARAMETER	PERIOD	RECORDED NOISE LEVELS - dB(A)		
		MINIMUM	MAXIMUM	AVERAGE
L₁	Daytime (7am-6pm)	46	70	56
	Evening (6pm-10pm)	44	68	53
	Nighttime (10pm-7am)	40	70	50
L₁₀	Daytime (7am-6pm)	42	60	48
	Evening (6pm-10pm)	43	54	47
	Nighttime (10pm-7am)	38	58	46
L₉₀	Daytime (7am-6pm)	35	50	42
	Evening (6pm-10pm)	34	45	41
	Nighttime (10pm-7am)	32	48	39
L_{eq}	Daytime (7am-6pm)	41	58	47
	Evening (6pm-10pm)	39	61	46
	Nighttime (10pm-7am)	36	57	43

The datalogger recorded noise levels are included as graphical traces of noise level versus time for the statistical noise level descriptors L₁, L₁₀, L₉₀ and L_{eq} as **Attachment 2**.

Key recorded statistical noise level parameters are presented below for weekdays only.

Minimum L_{A90,1hr} noise level 6am to 7am = 42 dB(A)

Average Background Level – Daytime (7am to 6pm) = 42 dB(A)

It is considered that the ambient noise levels will likely be higher than those measured at the subject site and surrounding uses once the childcare centre, centre and residential uses and adjacent roadways are fully developed. It is also considered that ambient noise levels would be higher on weekdays due to increased traffic rather than the measured weekend / public holiday days. As such, the average background noise levels measured, and used as basis for setting noise criteria, are conservative.

3.0 NOISE IMPACT ASSESSMENT

3.1 RELEVANT NOISE CRITERIA

The proposed development is located within Precinct 15 of the Caloundra South Priority Development Area (PDA). Part 2.5.6 of the PDA Development Scheme requires that noise emissions impacting sensitive uses be managed and minimised generally in accordance with the *Environmental Protection (Noise) Policy 2008*.

3.1.1 ACOUSTIC QUALITY OBJECTIVES

The *Environmental Protection (Noise) Policy 2008* specifies Acoustic Quality Objectives for sensitive receptors to enhance or protect acoustic amenity. The applicable Acoustic Quality Objectives from Schedule 1 of the policy are presented in **Table 2**.

Table 2: Adopted Acoustic Quality Objectives

SENSITIVE RECEPTOR	PERIOD	ACOUSTIC QUALITY OBJECTIVES (MEASURED AT THE RECEPTOR) dB(A)			ENVIRONMENTAL VALUE
		(L _{Aeq,adj,1-} hour)	(L _{A10,adj,1-} hour)	(L _{A1,adj,1-} hour)	
Dwelling (for outdoors)	7am to 10pm	50	55	65	Health and wellbeing
Dwelling (for indoors)	7am to 10pm	35	40	45	Health and wellbeing
	10pm to 7am	30	35	40	Health and wellbeing in relation to the ability to sleep

Previous experience with noise measurements conducted at similar facilities demonstrates that the most stringent of the Acoustic Quality Objective parameter for dwellings are the L_{Aeq} levels for each period of the day.

Comparison of the Acoustic Quality Objectives and the measured existing noise levels at the locality, as presented in **Table 1**, demonstrates that the Acoustic Quality Objectives are expected to be exceeded at the subject site. Therefore, the Acoustic Quality Objectives are not considered an appropriate basis for determination of project noise criteria to prevent environmental nuisance at surrounding residential land uses in this instance.

3.1.2 CONTROLLING BACKGROUND CREEP

Part 4, Section 10 of the *Environmental Protection (Noise) Policy (2008)* provides 'controlling background creep' noise criteria for the assessment of amenity impacts for an activity involving noise from the development (such as vehicle movements, car parking, outdoor play activity and mechanical plant and equipment). These 'background plus excess' noise criteria assess amenity impacts based upon the 'intrusiveness' of noise from the activity above the prevailing background noise.

Considering the nature of noise emissions from a childcare centre, the relevant 'controlling background creep' criteria are those specified for both 'continuous noise and noise that varies over time', as follows:

10 Controlling Background Creep

(1) *This section states the management intent for an activity involving noise.*

Note—

See section 51 of the Environmental Protection Regulation 2008.

(2) *To the extent that it is reasonable to do so, noise from an activity must not be—*

- (a) for noise that is continuous noise measured by $L_{A90,T}$ – more than nil dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$; or*
- (b) for noise that varies over time measured by $L_{Aeq,adj,T}$ - more than 5 dB(A) greater than the existing acoustic environment measured by $L_{A90,T}$.*

As such, the adopted noise criteria for this assessment of noise impacts from the proposed development are that:

- the noise from **mechanical plant** (continuous steady-state noise) measured as the $L_{A90,adj,T}$ does not exceed the otherwise prevailing $L_{A90,T}$; and
- the **overall noise** from the use measured as the $L_{Aeq,adj,T}$ including vehicle, carparking and outdoor play activities (noise that varies over time) does not exceed the otherwise prevailing $L_{A90,T}$ by more than 5 dB(A).

The applicable criteria, conservatively based upon minimum recorded Rating Background Levels, are presented in **Table 3**.

Table 3: Adopted Background Creep Noise Criteria

Period	Background Noise Level (L_{A90}) – dB(A)	Mechanical Plant Noise Criteria (L_{A90}) – dB(A)	Overall Noise Criteria (L_{Aeq}) – dB(A)
Daytime (7:00am to 6:00pm)	42	42	47
Early Morning (6:30am to 7:00am)	42	42	47

3.1.3 SLEEP DISTURBANCE

As the development will operate during the night period (early morning 6:30am to 7:00am), it is appropriate to consider the potential for sleep disturbance at nearby sensitive receptors. Queensland *Ecoaccess Guideline: Noise - Planning for Noise Control* (2016) indicates that unreasonable sleep disturbance impacts due to maximum instantaneous noise levels from events such as car starts and door slams can occur at levels of 45 to 50 dB(A) within a bedroom, depending upon the number of noise events per night. Consideration of potential sleep disturbance noise criteria should also give regard to the existing noise environment i.e. whether existing noise from vehicles on public roads results in noise levels above the default planning criteria.

An internal sleep disturbance noise criterion of 45 dB(A) L_{Amax} within a bedroom has been conservatively adopted for assessment of noise peaks from the development during the 6:30am to 7:00am night period. Adopting a typical 7³ dB(A) noise reduction through an open window relates to a **sleep disturbance criterion of L_{Amax} 52 dB(A) external to a bedroom window**.

³ AS3671 states approximate 10 dB(A) noise reduction through a façade with 10% open area. Thus approximately 7 dB(A) noise reduction through a façade with 20% open area. A large 1200x1800 sliding window relates to approximately 10% open area. A large 2100x2300 sliding glass door represents approximately 20% open area. Thus, 7dB(A) noise reduction is conservatively adopted based upon a large sliding glass door in the affected façade. Openings larger than 20% open area are unlikely to be necessary for ventilation during the night period.

3.2 NEAREST NOISE SENSITIVE RECEPTORS

The overall precinct planning for Aura Estate has been used to determine locations of the nearest surrounding sensitive land uses, which are future residential uses intended on land to the north, west and east of the proposed childcare centre site. The following receptor locations have been identified and considered as noise sensitive receptors for the purposes of this assessment:

- R1: Future residential uses on land to the north of the subject site.
- R2: Future residential uses on land to the west of the subject site, across a proposed roadway.
- R3: Future residential uses on land to the southwest of the subject site, across a proposed roadway.
- R4: Future residential uses on land to the east of the subject site, across Western Drive.

The nominated receptors are shown on an aerial image base on **Figure 3**.

Two storey receptor heights have been considered for surrounding future residential receptors located to the north, west and east. Five storey receptor heights have been considered for surrounding future residential receptors located to the southwest.

In the noise model, the receiver point locations were placed at indicative minimum residential building setbacks from future residential allotment boundaries.

3.3 MECHANICAL PLANT NOISE

No detailed specification for external mechanical plant associated with the development is available at this stage. However, external mechanical plant is likely to include split system air-conditioning units and exhaust fans for the kitchen and amenities.

The appropriate noise criteria for the assessment of plant noise impact from any external plant and equipment is 42 dB(A) for the approved operating hours.

The relevant noise criteria apply to surrounding sensitive land uses which include future residential uses to the north, west and east. Any mechanical plant and equipment associated with the development should thus be selected, located and acoustically treated and/or shielded to achieve the relevant noise criteria.

The relevant noise criteria do not necessarily apply to a single item of plant, but rather should constitute the additive noise component levels of all plant and equipment in operation during the assessed period, measured at the nearest sensitive receptors.

Experience dictates that appropriate modern air conditioning and exhaust ventilation systems achieve noise emission levels capable of ensuring that residential amenity is not adversely impacted by the required plant and equipment.

Indicative air-conditioning plant have been considered in the overall noise modelling assessment presented in **Section 3.4** and are noted to readily comply with the identified noise criteria for mechanical plant noise at all surrounding residential uses.

More detailed assessment of acoustic treatments required for the plant and equipment installations should be undertaken at the detailed design stage of the development. Experience with many other similar developments and given the proximity to sensitive land uses dictates that appropriate noise controls are feasible to ensure that plant and equipment can achieve the noise limits. This is considered a matter for future detailed design and can be readily conditioned in a development approval.

3.4 TIME VARYING NOISE ASSESSMENT

Noise emissions from carparking, vehicles, servicing and outdoor play areas associated with the proposed childcare centre have been assessed using the SoundPLAN 9.0 computer noise model.

The source noise levels for the childcare outdoor play area were determined using the *Association of Australian Acoustical Consultants Technical Guideline Child Care Centre Noise Assessment* (September 2020, Version 3).

As per the guideline, the noise levels of children playing can vary depending on the age of the children and the type of activity. Sound power levels of children are presented in the guideline as per **Table 4** below.

Table 4: Typical Sound Power Levels for Children Playing as per AAAC Technical Guideline

AGE GROUP	NUMBER OF CHILDREN	SOUND POWER LEVEL DB(A) ($L_{EQ\ 15MIN}$)
0 to 2 years	10	78
2 to 3 years	10	85
3 to 5 years	10	87

Assessment noise emissions from outdoor play areas has been conservatively based upon an indicative 75% outdoor play area occupation coinciding with peak carparking activity during the 7am to 6pm period. For the early morning 6:30am to 7am period, attendance will be lower and an indicative 25% outdoor play area occupation has been considered.

The relevant outdoor play area sound power level for the proposed development is:

Outdoor Play 01, 28 Children (0-2 years):	82.5 dB(A) SWL
Outdoor Play 02, 24 Children (0-2 years):	81.8 dB(A) SWL
Outdoor Play 03, 40 Children (2-3 years):	91.0 dB(A) SWL
Outdoor Play 04, 55 Children (3-5 years):	94.4 dB(A) SWL

The noise from outdoor play was modelled as four (4) separate area sources in the SoundPLAN noise model.

The modelled peak hour traffic volumes through the site have been based on traffic engineering advice provided by Q Traffic Engineering Consultants, the project traffic engineers. The peak traffic through site is projected to be as follows:

AM Peak:	96 trips per hour (total in and out)
PM Peak:	70 trips per hour (total in and out)

For the purpose of the noise modelling, the childcare centre traffic has been conservatively assessed as a peak hour traffic of 96 trips per hour between 7am and 6pm. Additionally, 25% of the daytime peak hour has been considered for the early morning period.

Servicing of the centre will generally be via vans which do not generate materially different noise to passenger vehicles. The modelled trip volumes adequately account for van deliveries of approximately 2 per day which are unlikely to coincide with peak drop off and pick up periods.

Refuse collections are not likely to coincide with peak hour traffic through the development. Typically, 2 to 3 refuse collections per week are likely to occur for childcare centres with the overall noise amenity impact negligible.

Carparking vehicle movements were represented as a line⁴ source with the following sound power levels:

6:30am to 7am:	<u>L_{Aeq} 60 dB(A)/m⁵ SWL</u>
7am to 6pm:	<u>L_{Aeq} 69 dB(A)/m⁶ SWL</u>
All hours:	<u>L_{Amax} 89 dB(A) SWL</u>

For carparking noise the parking lot area source was represented in the model for car parking areas with source noise levels based upon peak parking rates of 96 vehicle movements per hour during the day and 12 vehicle movements during the early morning period. These parking rates are consistent with the adopted carpark trips for each period of the day.

Noise emissions from external mechanical plant have been represented as point sources as follows:

Air-Conditioning Units (x3):	L_{Aeq} 75 dB(A) SWL each
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⁴ moving point source

⁵ Based upon an instantaneous maximum level of 89 dB(A) and an average speed of 10 km/h extrapolated to represent 12 vehicle movements between 6:30am and 7am.

⁶ Based upon an instantaneous maximum level of 89 dB(A) and an average speed of 10 km/h extrapolated to represent 96 vehicle movements as the peak hour between 7am to 6pm.

The air-conditioning units have been represented at the services area located adjacent the western façade of the childcare centre building.

The noise modelling has included design earthworks levels for the site, surrounding areas and adjacent roadways. The noise modelling has considered the childcare centre building, access driveway, carparking areas and outdoor play areas as per the development application plan included as **Attachment 1**.

The noise modelling has also considered the shielding effect of the existing acoustic barrier, approximately 2.5 metre high, that is located on the eastern side of Western Drive.

The assessment has determined whether overall noise levels from the vehicle movements through the site, car parking activities, outdoor play area noise and mechanical plant noise will comply with the noise criteria as per **Section 3.1** at the nearest surrounding sensitive receptors.

To satisfy the noise criteria at the nearest surrounding residential land uses, a **2.0 metre high acoustic barrier is recommended to the east of the proposed outdoor play areas**.

The proposed acoustic barrier is presented on **Figure 4**.

The acoustic barrier element should be gap free and constructed of materials achieving a minimum surface density of 12.5kg/m².

The predicted noise levels at the nearest surrounding residences are summarised in **Table 5** below. Where multiple receptor locations were assessed, the highest noise predictions are displayed for each floor level assessed.

The results of the overall development noise modelling are also presented in **Attachment 3** as contours of the predicted L_{Aeq} and L_{Amax} noise levels across the model domain.

Table 5: Predicted Noise Levels – Overall Development Noise

RECEPTOR	FLOOR LEVEL	PREDICTED NOISE LEVEL L _{Aeq} dB(A) 7AM-6PM	PREDICTED NOISE LEVEL L _{Aeq} dB(A) 6:30AM-7AM	PREDICTED NOISE LEVEL L _{Amax} dB(A) 6:30AM-7AM
R1	Ground	46	41	43
	Level 1	46	42	44
R2	Ground	44	39	49
	Level 1	45	40	49
R3	Ground	41	36	47
	Level 1	42	36	47
	Level 2	42	37	47
	Level 3	42	37	46
	Level 4	42	37	46
R4	Ground	38	33	35
	Level 1	46	42	43
CRITERIA		47	47	52

The predicted resultant noise levels satisfy the relevant noise criteria at the nearest surrounding residential uses with the recommended acoustic barrier. Two and five storey residential uses have been considered on the nearest land uses intended for residential development on land to the north, west and east of the site. In the noise model, the receiver point locations were placed at typical minimum residential building setbacks from residential allotment boundaries.

All other surrounding sensitive land uses are predicted to experience lower noise levels than those summarised in **Table 5**.

4.0 ROAD TRAFFIC NOISE ASSESSMENT

4.1 TRAFFIC NOISE CRITERIA

The following acoustic considerations are considered relevant to the Childcare Centre development with reference to the Plan of Development (PoD) approved by Economic Development Queensland (EDQ):

- *Buildings are to meet the requirements of Australian Standard 2107:2016 Acoustics - Recommended noise and reverberation design criteria within buildings to ensure a healthy, comfortable and productive environment for the occupants and users.*
- *The external noise criteria at all facades of the building envelope shall be ≤ 58 dB(A) L_{10} (1 hour) façade corrected (maximum hour during normal opening hours), and*
- *The external noise criteria in each outdoor education area or outdoor play area shall be ≤ 63 dB(A) L_{10} (12 hour) free field (between 6am and 6pm).*

MWA Environmental notes that the 58 dB(A) L_{10} (1 hour) noise criterion level at building facades is drawn from PO45 of State Code 1 SDAP v3.5. This criterion has previously been shown to not directly address road traffic noise amenity at indoor or outdoor educational areas and has been deemed by SARA on other projects as non-essential to achieve the Purpose Statement of State Code 1.

Based on experience in conducting road traffic noise assessments for similar developments, it is not considered appropriate to construct large walls around the childcare building to achieve a noise criterion level at building facades (i.e. 58 dB(A) L_{10} (1 hour)) and to also acoustically treat the building facades to achieve relevant internal noise criteria (i.e. AS2107:2016). It is considered that achievement of the relevant traffic noise criteria at outdoor play areas and at internal childcare spaces such as play and sleeping areas will ensure that suitable traffic noise amenity is provided to occupants. As such, the following traffic noise criteria have been adopted for this assessment:

Outdoor play areas: ≤ 63 dB(A) L_{10} (12 hour) *free field (6am and 6pm)*

Indoor play and sleeping areas: 35 dB(A) L_{Aeq} (1 hour)

4.2 TRAFFIC VOLUME DATA

Given the adjacent roadways have either not yet been constructed or have recently been completed, estimates of design horizon traffic volumes for adjacent roadways have been used for the purposes of this assessment. It is considered that the traffic volumes adopted for this assessment are conservative and actual traffic volumes will likely be lower than those considered in the traffic noise modelling.

Future traffic volumes for Western Drive past the site have been obtained from the *Aura Development – Precinct 15 (West) – Road Traffic Noise Assessment*⁷ report which estimated a Year 2037 traffic volume of 8,305 vehicles per day and a heavy vehicle content of 3%.

It is considered that other roadways adjacent the site to the west and south will carry significantly lower traffic volumes than Western Drive. There were no available relevant estimates for ultimate traffic volumes for these roadways however conservative volumes have been adopted for the purposes of this assessment. A volume of 3,000 vehicles per day has been adopted for Walsh Street to the south of the site, a volume of 1,500 vehicles per day has been adopted for Gowler Street to the southwest of the site and a volume of 750 vehicles per day has been adopted for Musgrave Crescent to the west of the site.

In accordance with typical assumptions, the estimated daily volume was converted to 1 hour peak hour traffic volume as 10% of the daily volume and 12 hour (6am to 6pm) traffic volume as 75% of the daily volume.

The relevant traffic volumes for adjacent roadways past the proposed childcare centre site are summarised in **Table 6**.

⁷ Prepared by Trinity Consultants Australia, reference 227401.0008.R04V05, dated 25 July 2024

Table 6: Year 2037 Traffic Volumes Used for Assessment

ROADWAY	ESTIMATED YEAR 2037 TRAFFIC VOLUMES			ASSESSED SPEED LIMIT (KM/HR)	ASSESSED CV%
	Daily Traffic Volume	Peak Hour Traffic Volume	12hr 6am to 6pm Traffic Volume		
Western Drive	8,305	831	6,229	60	3
Walsh Street	3,000	300	2,250	60	3
Gowler Street	1,500	150	1,125	50	3
Musgrave Crescent	750	75	563	50	3

4.3 TRAFFIC NOISE MODELLING

Road traffic noise levels from Western Drive, Walsh Street, Gowler Street and Musgrave Crescent past the site have been predicted using the SoundPLAN 9.0 computer noise model applying the CoRTN methodology for traffic noise prediction. This method is accepted by regulatory bodies in Queensland.

The earthworks layout plan for the childcare centre site and adjacent roadways was provided by Egis Group⁸ and has been considered in the traffic noise modelling.

Adjustment of CoRTN predictions has been made for Australian roads as per the Department of Transport and Main Roads - *Transport Noise Management Code of Practice*. Corrections of -0.7 dB for free-field predictions and -1.7 dB for façade adjusted predictions have been applied.

The traffic noise modelling has considered the proposed building structure and outdoor play area locations as per the development application plans included as **Attachment 1**. The traffic noise modelling has also considered the recommended acoustic barrier as described in **Section 3.4** and shown on **Figure 4**.

The traffic noise model was used to predict $L_{10} (12 \text{ hour})$ traffic noise levels at outdoor play areas for assessment against the adopted 63 dB(A) $L_{10} (12 \text{ hour})$ traffic noise criterion. The graphical noise contours of the predicted $L_{10} (12 \text{ hour})$ traffic noise levels at outdoor play areas are presented in **Attachment 4** and demonstrate **that the 63 dB(A) $L_{10} (12 \text{ hour})$ free field noise level will be achieved at all proposed outdoor play areas.**

Assessment has also been conducted to determine measures required to achieve suitable internal noise amenity such that the childcare centre indoor educational, sleeping and play areas are designed and constructed to achieve maximum internal noise level of 35 dB(A) $L_{eq} (1 \text{ hour})$.

The SoundPLAN model was used to predict the external $L_{eq} (1 \text{ hour})$ traffic noise levels⁹ for the exposed indoor educational, sleeping and play areas facades under conservative estimated design horizon traffic flow conditions for Western Drive and other adjacent roadways to the west and south.

A summary of the predicted traffic noise levels external to proposed educational, sleeping and play areas of the proposed childcare centre is provided in **Table 7** below including a summary of the required façade transport noise reduction to achieve an indoor noise level of 35 dB(A) $L_{eq} (1 \text{ hour})$.

⁸ Aura – Precinct 15 West Package 1 – Stages 50, 51, 52, 58, 59 & 64, Project No. 21-000307, dated 15.10.25, Revision D.

⁹ Adjustment from $L_{A10}(1 \text{ hour})$ to $L_{Aeq} (1 \text{ hour})$ as per CoRTN methodology

**Table 7: Traffic Noise Level Predictions
Childcare Centre Façades (Includes Façade Reflection)**

Room	Façade	Predicted External Noise Level $L_{Aeq,1hr}$ dB(A)*	Façade Transport Noise Reduction Required To Achieve 35 dB(A) $L_{Aeq,1hr}$ Criteria at Indoor Education/Sleeping Areas
Activity Room 01	North	59	24
Activity Room 02	North	58	23
Activity Room 03	West	54	19
Activity Room 04	West	54	19
Activity Room 05	East	56	21
Activity Room 06	East	57	22
Activity Room 07	East	56	21
Activity Room 08	East	57	22
	South	60	25
	West	56	21
Sleep Room	East	57	22
	North	56	21
Sleep Room	West	55	20

*façade reflection adjusted

As such, in order to achieve appropriate internal traffic noise levels, childcare building facades to indoor activity and sleeping rooms will need to achieve traffic noise reductions of up to 25 dB(A).

Australian Standard AS3671-1989 – Acoustics – Road traffic noise intrusion – Building siting and construction states that a traffic noise reduction of approximately 25 dB(A) is expected through standard construction materials, with doors and windows closed. Therefore, no specific acoustic upgrades are required in this instance by the relevant Australian Standard. Notwithstanding, it is **recommended that glazing (doors and windows) to educational and sleeping rooms be specified to achieve minimum Rw 27** which will assist in minimising road traffic noise intrusion and noise breakout from internal childcare spaces.

Otherwise, standard construction materials will suffice, with the provision of mechanical ventilation and/or air-conditioning allowing doors and windows to be shut as deemed appropriate by staff.

5.0 REVIEW OF BRUCE HIGHWAY TRAFFIC NOISE IMPACTS

Further to the traffic noise assessment detailed in **Section 4**, we have also conducted a review of traffic noise impacts from the Bruce Highway (state-controlled roadway) that is located to the west of the proposed childcare centre.

The Bruce Highway is located more than 250 metres to the west of the proposed childcare centre site. Year 2037 Bruce Highway traffic noise predictions were assessed in the *Aura Development – Precinct 15 (West) – Road Traffic Noise Assessment*¹⁰ report. From this report, based on detailed traffic noise modelling, the following Year 2037 Bruce Highway traffic noise predictions were made at the Lot 8100 childcare centre site:

Predicted $L_{A10,12hr}$ free field traffic noise level = 60 dB(A)

Predicted $L_{A10,1hr}$ façade corrected traffic noise level = 63 dB(A)

As such, it is considered that suitable traffic noise amenity will be provided for childcare centre occupants given that the Year 2037 Bruce Highway traffic noise predictions indicate that:

- 1. Bruce Highway traffic noise at outdoor play areas will be below the relevant 63 dB(A) $L_{A10,12hr}$ free field traffic noise criterion.**
- 2. Bruce Highway traffic noise at childcare centre building facades will be up to 60 dB(A) $L_{Aeq,1hr}$ ¹¹ façade correction adjusted which relates to noise reductions of up to 25 dB(A) to achieve the relevant internal noise criterion of 35 dB(A) $L_{Aeq,1hr}$ to indoor education and sleeping rooms. As per Section 4.3 above, 25 dB(A) noise reduction is expected via standard construction materials, with doors and windows closed.**

It is further noted that future intervening development on land located between the proposed childcare centre site and the Bruce Highway will provide significant road traffic noise shielding from the Bruce Highway to proposed outdoor play areas and to the childcare centre building.

As such, it is not considered that any specific state-controlled road noise reduction measures are required for the proposed childcare centre considering the substantial buffering to the Bruce Highway located to the west.

¹⁰ Prepared by Trinity Consultants Australia, reference 227401.0008.R04V05, dated 25 July 2024

¹¹ Adjustment from $L_{A10}(1\text{ hour})$ to $L_{Aeq}(1\text{ hour})$ as per CoRTN methodology

6.0 CONCLUSION

MWA Environmental has been engaged to prepare a Noise Assessment for a proposed childcare centre development at Lot 8100 Musgrave Crescent, Banyu. The report has been prepared to support a development application to Economic Development Queensland (EDQ).

This assessment has considered the potential noise amenity impact of the childcare centre upon nearby sensitive receptors. The assessment has also addressed the potential road traffic noise impact upon the childcare centre from adjoining roadways.

To satisfy the noise criteria at the nearest surrounding residential land uses, a **2.0 metre high acoustic barrier is recommended to the east of the proposed outdoor play areas.**

The proposed acoustic barrier is presented on **Figure 4.**

The acoustic barrier element should be gap free and constructed of materials achieving a minimum surface density of 12.5kg/m².

Traffic noise levels using conservative estimates of design horizon traffic volumes on adjacent roadways were predicted at outdoor play areas and external to childcare centre facades. The traffic noise modelling demonstrated that the relevant outdoor play area noise criterion will be satisfied with the acoustic barrier as detailed above and on **Figure 4.**

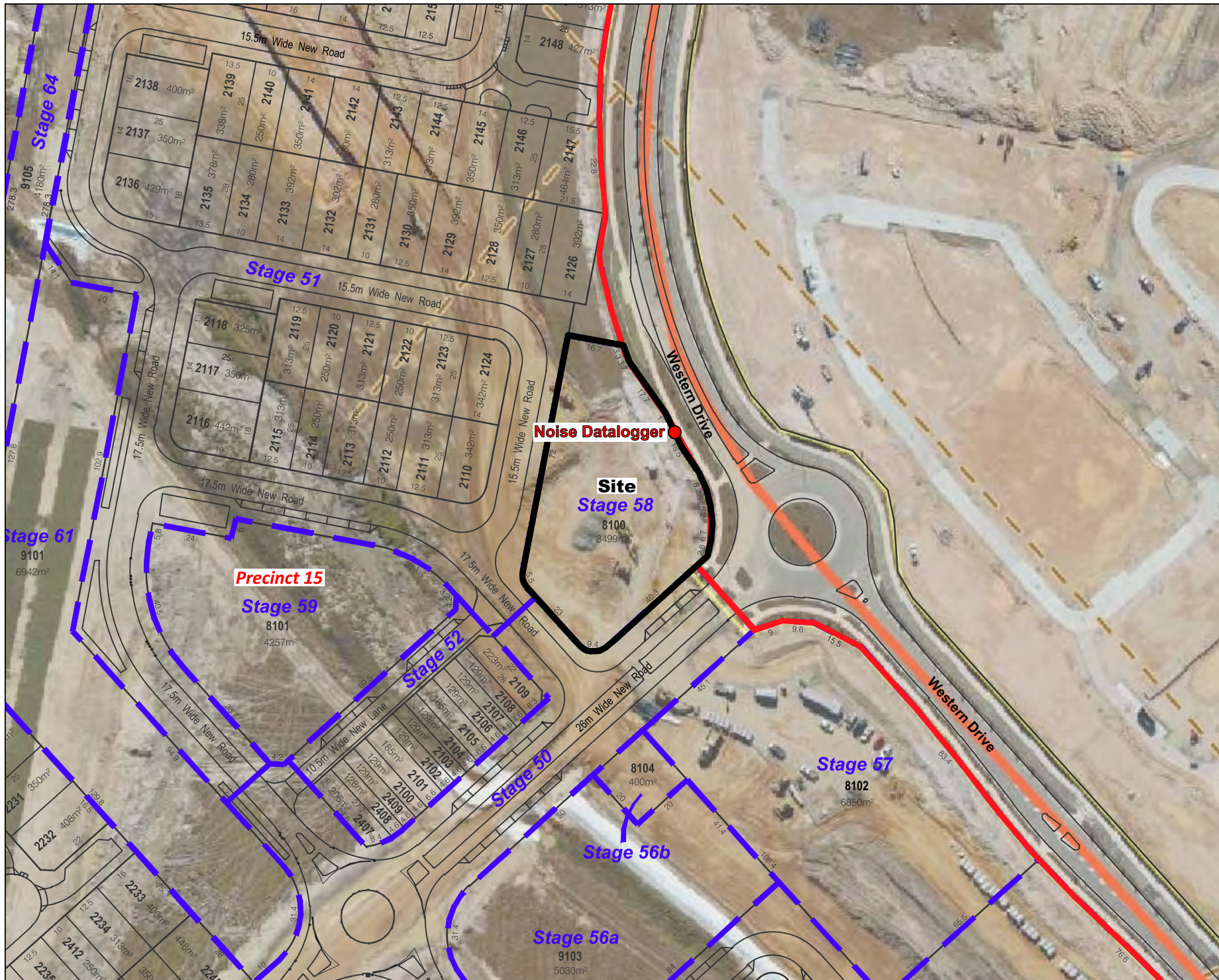
It is **recommended that glazing (doors and windows) to educational and sleeping rooms be specified to achieve minimum Rw 27** which will assist in minimizing road traffic noise intrusion and noise breakout from the internal spaces. Otherwise, standard construction materials will suffice, with the provision of mechanical ventilation and/or air-conditioning allowing doors and windows to be shut as deemed appropriate by staff.

A review of state-road traffic noise impact (i.e. Bruce Highway traffic noise impact) at the proposed childcare centre was also conducted. It is not considered that any specific state-controlled road noise reduction measures are required for the proposed childcare centre considering the substantial buffering to the Bruce Highway located to the west.

The noise assessment undertaken demonstrates that the development will satisfy the relevant noise amenity criteria subject to provision of the recommended acoustic barrier and minimum glazing specifications.

MWA Environmental
25 February 2026

FIGURES



LEGEND

- SITE LOCATION
- AURA PRECINCT 15
- NOISE DATALOGGER LOCATION

DRAWING REFERENCES

- © THE STATE OF QUEENSLAND 2026 (DEPARTMENT OF NATURAL RESOURCES AND MINES, MANUFACTURING AND REGIONAL AND RURAL DEVELOPMENT) QLDGLOBE
- URBIS, JOB # P0037213, AURA - PRECINCT 15 ROL - OVERALL, DWG ROL-01, 21/05/25.

0 10 20 30 40 50m

CLIENT
BANYA ELC PROPERTY ONE PTY LTD
ATF BANYA ELC PROPERTY ONE TRUST

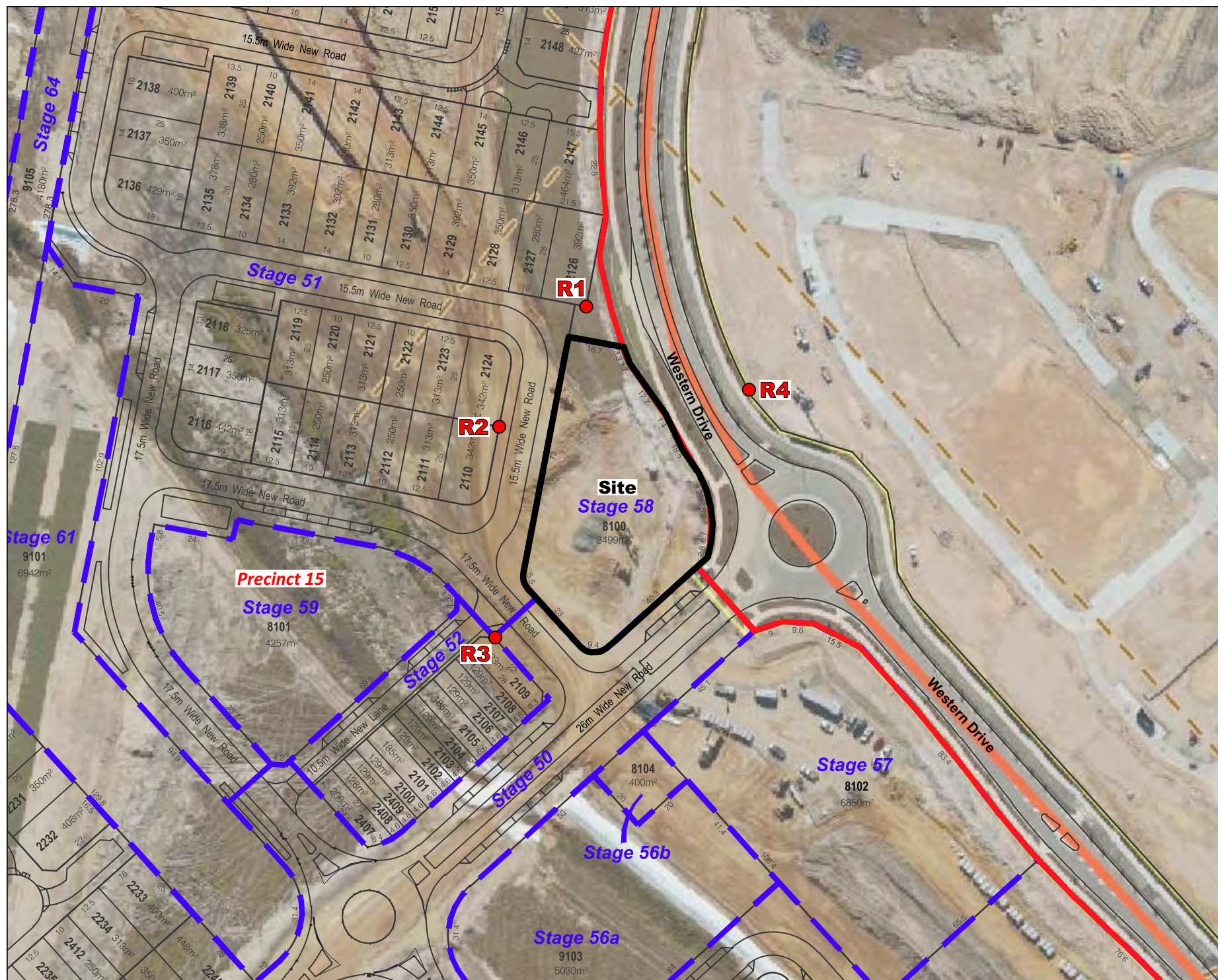
PROJECT
**NOISE ASSESSMENT
PROPOSED CHILDCARE
CENTRE DEVELOPMENT
LOT 8100 WESTERN DRIVE
BANYA QLD**

TITLE
**NOISE MONITORING
LOCATION**

JOB	AURA WEST	FIGURE 2
JOB NO.	26007	
DATE	25/02/26	DWG NUMBER
SCALE	1:1500 (A4)	26007-2
REV.		

mwa
ENVIRONMENTAL

Max Winders & Associates Pty Ltd t/as MWA Environmental
Level 8, 241 Adelaide St, Brisbane, GPO BOX 3137, Brisbane Qld 4001
P 07 3002 5500 E mail@mwaenviro.com.au
W www.mwaenviro.com.au
ABN 94 010 833 084



SITE LOCATION

AURA PRECINCT 15

OR4

SENSITIVE RECEPTOR LOCATIONS (R1-R4)

DRAWING REFERENCES

- © THE STATE OF QUEENSLAND 2026
(DEPARTMENT OF NATURAL RESOURCES AND MINES, MANUFACTURING AND REGIONAL AND RURAL DEVELOPMENT)
QLDGLOBE
- URBIS, JOB # P0037213, AURA - PRECINCT 15 ROL - OVERALL, DWG ROL-01, 21/05/25.

N

0

10

20

30

40

50m

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PROJECT

**NOISE ASSESSMENT
PROPOSED CHILDCARE
CENTRE DEVELOPMENT
LOT 8100 WESTERN DRIVE
BANYA QLD**

TITLE

**SENSITIVE RECEPTOR
LOCATIONS**

JOB	AURA WEST	FIGURE 3
JOB NO.	26007	
DATE	25/02/26	DWG NUMBER
SCALE	1:1500 (A4)	26007-3
REV.		

mwa

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Max Winders & Associates Pty Ltd has MWA Environmental
Level 8, 241 Adelaide St, Brisbane, GPO BOX 3137, Brisbane Qld 4001
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W www.mwaenviro.com.au
ABN 94 010 833 084

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PROJECT

**NOISE ASSESSMENT
PROPOSED CHILDCARE
CENTRE DEVELOPMENT
LOT 8100 WESTERN DRIVE
BANYA QLD**

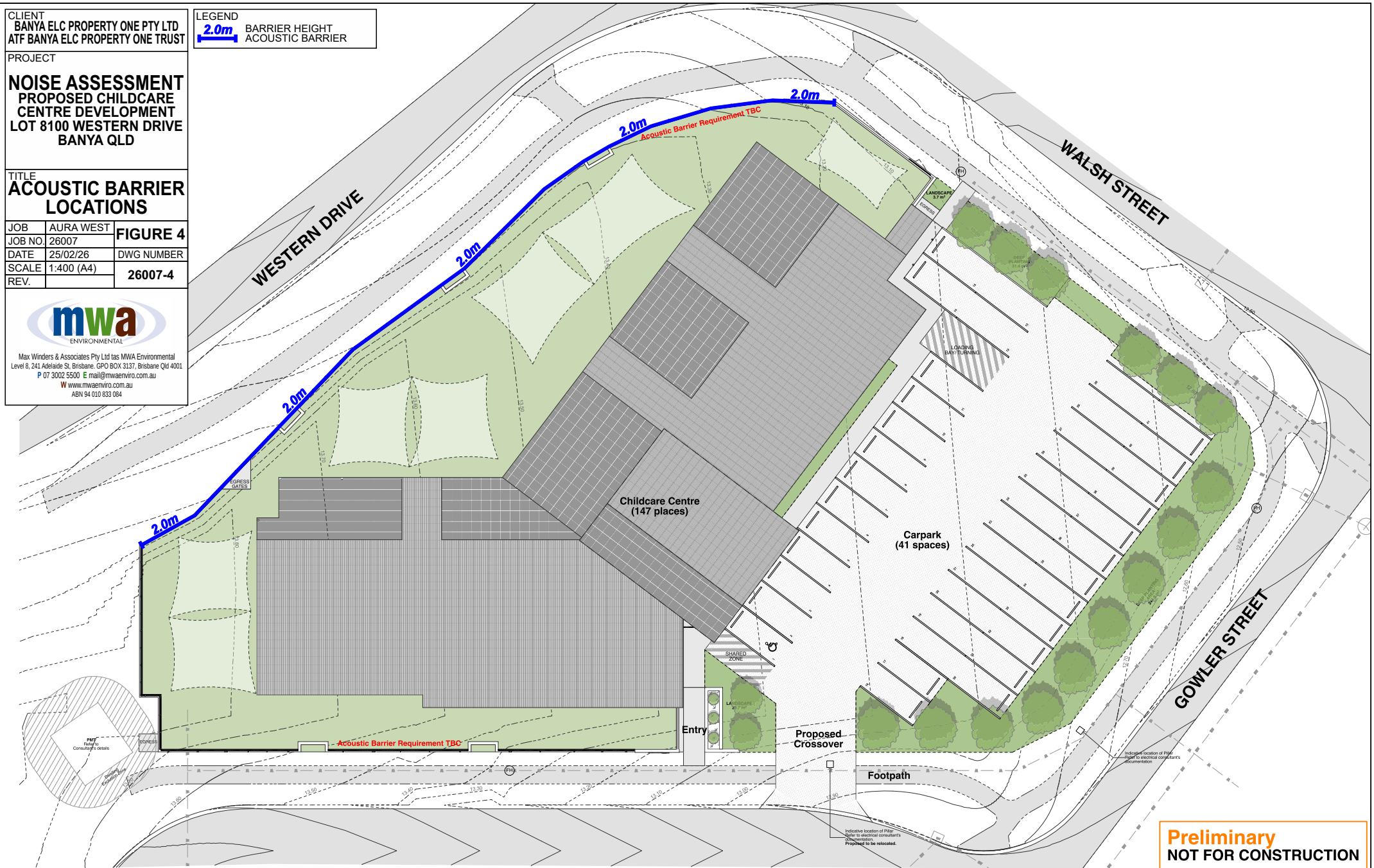
TITLE
**ACOUSTIC BARRIER
LOCATIONS**

JOB	AURA WEST	FIGURE 4
JOB NO	26007	
DATE	25/02/26	DWG NUMBER
SCALE	1:400 (A4)	26007-4
REV.		



Max Winders & Associates Pty Ltd t/as MWA Environmental
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W www.mwaenviro.com.au
ABN 94 010 833 084

LEGEND
2.0m BARRIER HEIGHT
ACOUSTIC BARRIER



**Preliminary
NOT FOR CONSTRUCTION**

elevation architecture

Contact
(07) 3251 6900
20 Prospect St, Fortitude Valley QLD 4006
info@elevationarchitecture.com.au

Revision		
A	Preliminary DA Issue	16/02/2026
B	Preliminary DA Issue	17/02/2026

Project
Aura West Early Learning Centre
Lot 8100 Musgrave Crescent, Banyu QLD 4551

Client
Griffith Group

Stage
Preliminary DA

Status
Preliminary
NOT FOR CONSTRUCTION

Architect
PH + MT

Drawn
MT

Project No.
1149-44

Scale
1:300 at A3



Proposed Site Plan
A-DA-01.02 **B**

Attachment 1

Development Application Plans

Aura West Early Learning Centre

Lot 8100 Musgrave Crescent, Banya Qld 4551



SITE INFORMATION

Real Property Description: Lot 8100 Musgrave Crescent, Banya Qld 4551

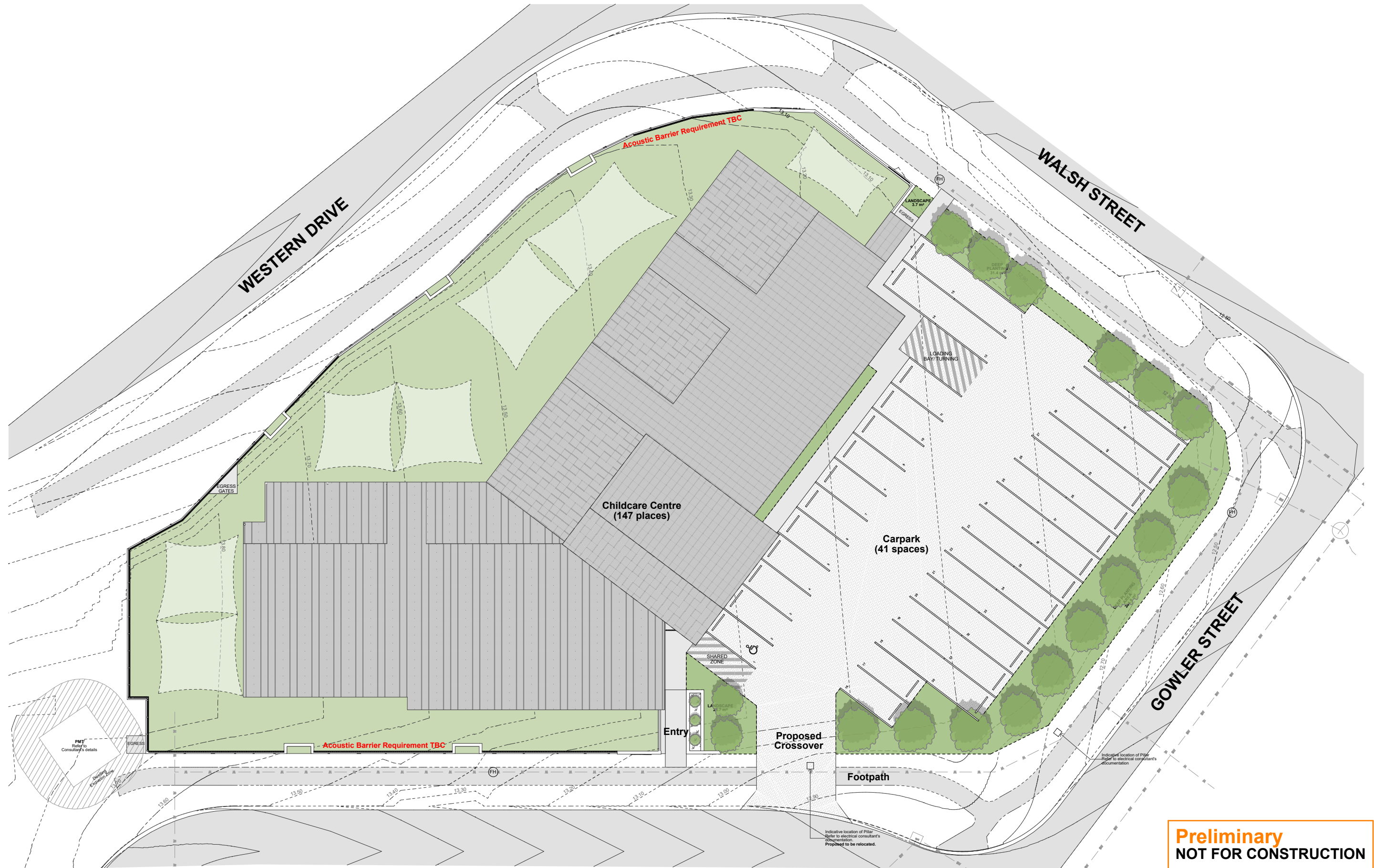
Local Authority: Sunshine Coast City Council
Site Area: 3,495 m²
Site Cover: 1,263 m²
Carparking Provided: 41 (Ratio of 1:3.59)

GFA:
Ground 1,017.4m²
First 111.3m²
Total 1,128.7m²

Landscape (Incl. outdoor play): 1,371m² (39.2%)

Outdoor Play Calculations							
Zone	Age Group		Area Required		Area Provided		Occupancy
	Outdoor Play 01	0-2 yrs		196.00		202.96	28
	Outdoor Play 02	0-2 yrs		168.00		172.03	24
	Outdoor Play 03	2-3 yrs		280.00		283.56	40
	Outdoor Play 04	3-5 yrs		385.00		389.37	55
			1,029.00 m²		1,047.92 m²		147
Activity Room Calculations							
Level	Room	Age Group	Area Required	Area Provided	Staff Ratio	No. of Staff	Occupancy
Ground Floor							
	Activity Room 01	0-24 mnths	39.00	39.96	1:4	3	12
	Activity Room 02	0-24 mnths	39.00	43.17	1:4	3	12
	Activity Room 03	12-24 mnths	52.00	54.76	1:4	4	16
	Activity Room 04	18-24 mnths	39.00	41.85	1:4	3	12
	Activity Room 05	2-3 yrs	65.00	66.28	1:5	4	20
	Activity Room 06	2-3 yrs	65.00	65.92	1:5	4	20
	Activity Room 07	3-5 yrs	71.50	72.28	1:11	2	22
	Activity Room 08	3-5 yrs	107.25	111.47	1:11	3	33
			477.75 m²	495.69 m²		26	147

Preliminary
NOT FOR CONSTRUCTION



Preliminary
NOT FOR CONSTRUCTION



LEGEND

B

FH

FI

MH

Bollard

Fire Hydrant

Field Inlet

Refer to engineer's detail

Manhole

SEW

W

SW

Proposed Sewer Reticulation

Refer to engineer's detail

Proposed Water Reticulation

Refer to engineer's detail

Proposed Stormwater Reticulation

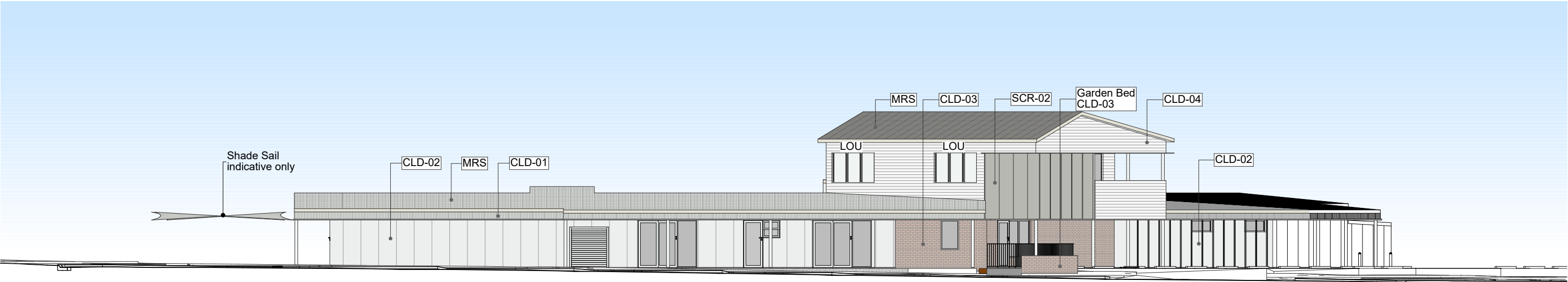
Refer to engineer's detail

Notes

1.

Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.



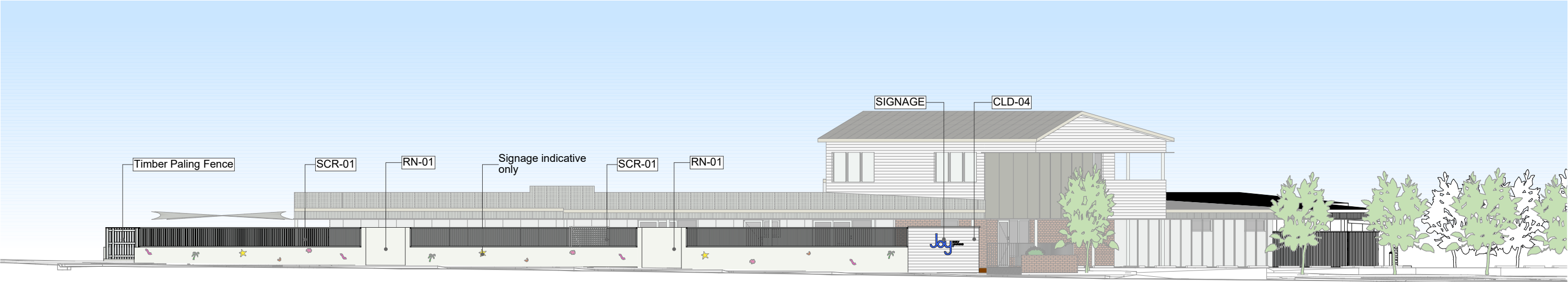


1

Musgrave Cre. Elevation

-

Scale 1:200



2

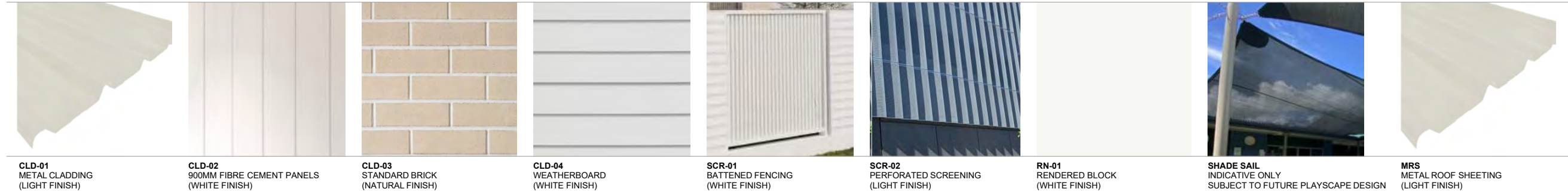
Musgrave Cre. Elevation - Fencing

-

Scale 1:200

Preliminary

NOT FOR CONSTRUCTION

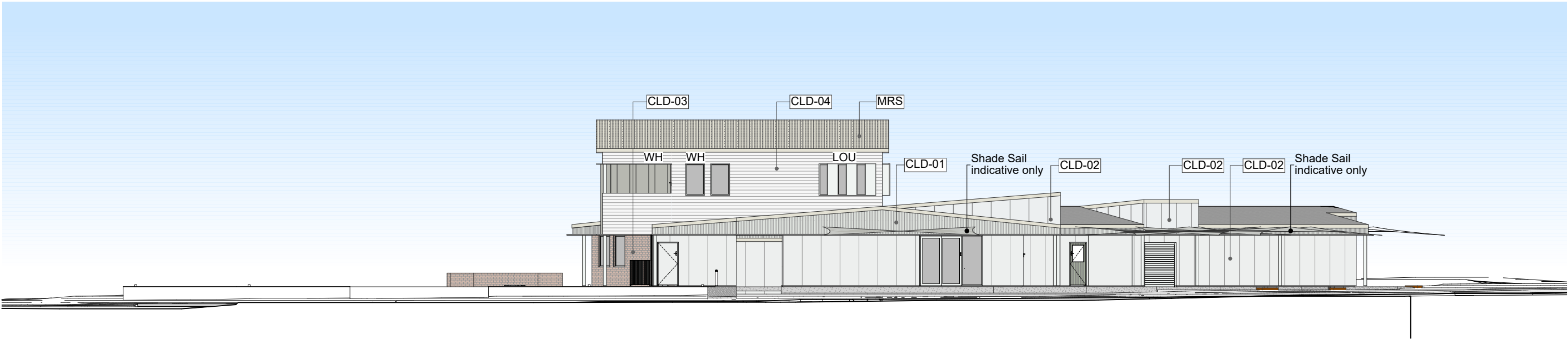


LEGEND

B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

1. Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
2. Refer to consultant's drawing for landscaping and streetscape detail.

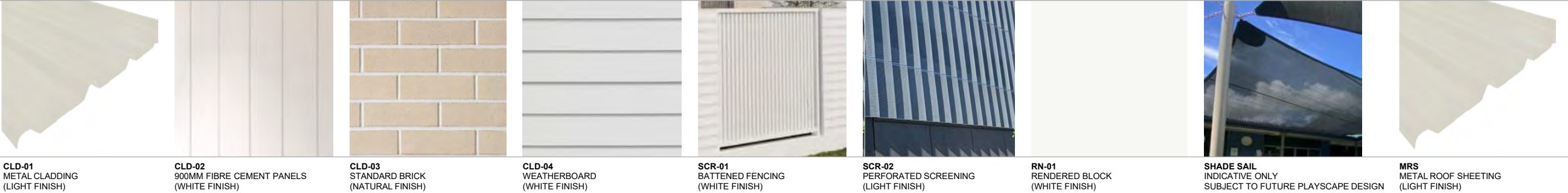


1 Walsh St. Elevation
- Scale 1:200



2 Walsh St. Elevation - Fencing
- Scale 1:200

Preliminary
NOT FOR CONSTRUCTION

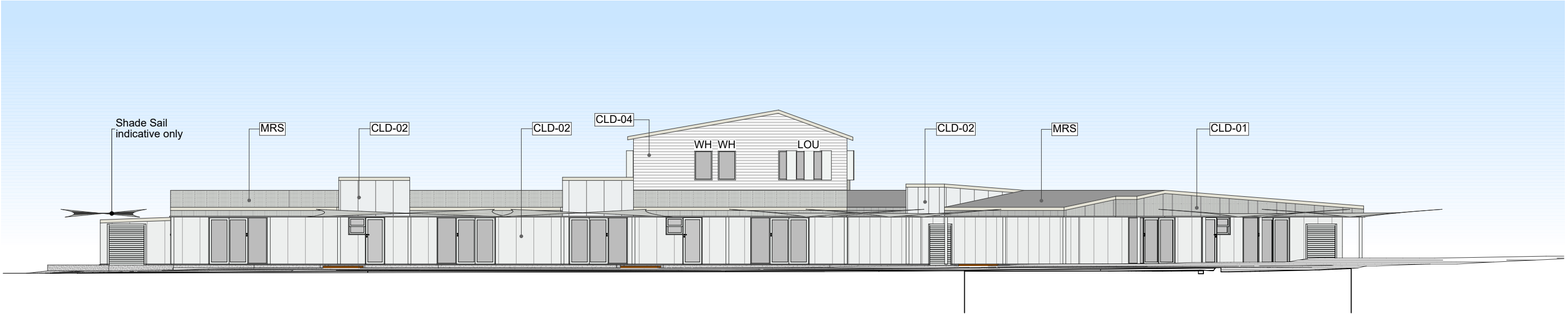


LEGEND

B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

- Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
- Refer to consultant's drawing for landscaping and streetscape detail.

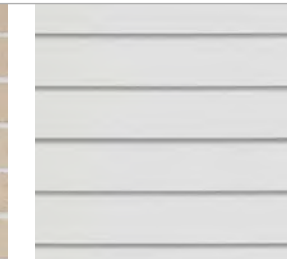
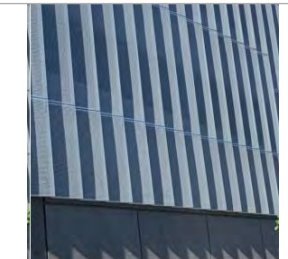
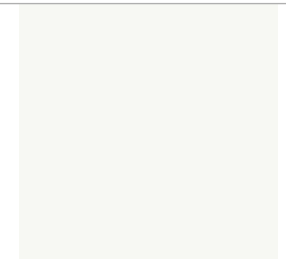


1 Western Dr. Elevation
Scale 1:200

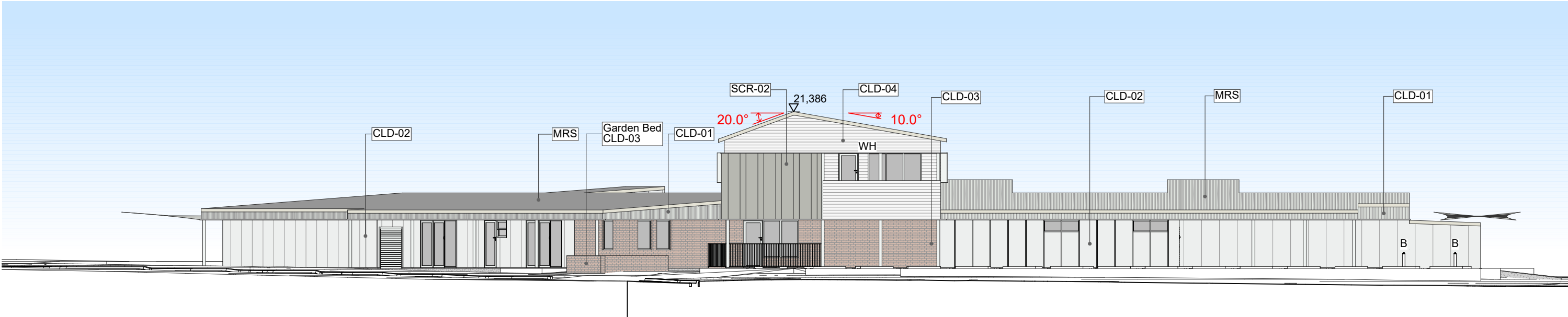


2 Western Dr. Elevation - Fencing
Scale 1:200

Preliminary
NOT FOR CONSTRUCTION

								
CLD-01 METAL CLADDING (LIGHT FINISH)	CLD-02 900MM FIBRE CEMENT PANELS (WHITE FINISH)	CLD-03 STANDARD BRICK (NATURAL FINISH)	CLD-04 WEATHERBOARD (WHITE FINISH)	SCR-01 BATTENED FENCING (WHITE FINISH)	SCR-02 PERFORATED SCREENING (LIGHT FINISH)	RN-01 RENDERED BLOCK (WHITE FINISH)	SHADE SAIL INDICATIVE ONLY SUBJECT TO FUTURE PLAYScape DESIGN	MRS METAL ROOF SHEETING (LIGHT FINISH)

- LEGEND**
- | | |
|-----|--------------|
| B | Bollard |
| LOU | Fixed Louvre |
| WH | Window Hood |
- Notes**
- Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
 - Refer to consultant's drawing for landscaping and streetscape detail.



1 Gowler St. Elevation
- Scale 1:200



2 Gowler St. Elevation - Fencing
- Scale 1:200

Preliminary
NOT FOR CONSTRUCTION

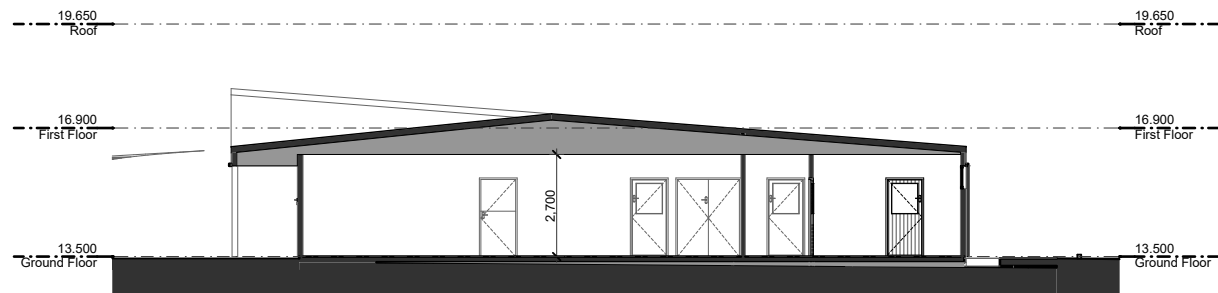
CLD-01 METAL CLADDING (LIGHT FINISH)	CLD-02 900MM FIBRE CEMENT PANELS (WHITE FINISH)	CLD-03 STANDARD BRICK (NATURAL FINISH)	CLD-04 WEATHERBOARD (WHITE FINISH)	SCR-01 BATTENED FENCING (WHITE FINISH)	SCR-02 PERFORATED SCREENING (LIGHT FINISH)	RN-01 RENDERED BLOCK (WHITE FINISH)	SHADE SAIL INDICATIVE ONLY SUBJECT TO FUTURE PLAYSCAPE DESIGN	MRS METAL ROOF SHEETING (LIGHT FINISH)

LEGEND

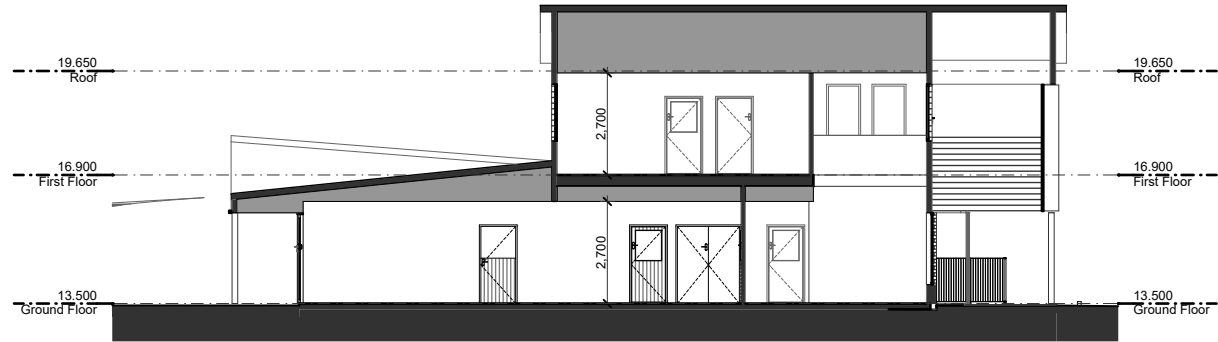
B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

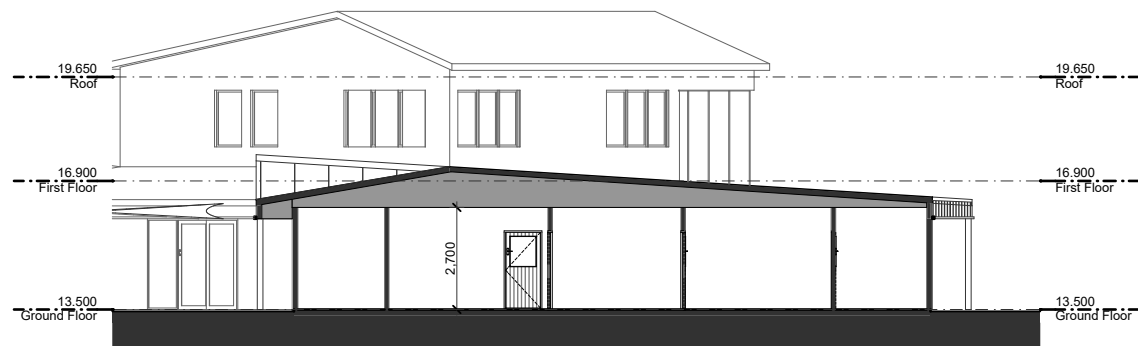
- Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
- Refer to consultant's drawing for landscaping and streetscape detail.



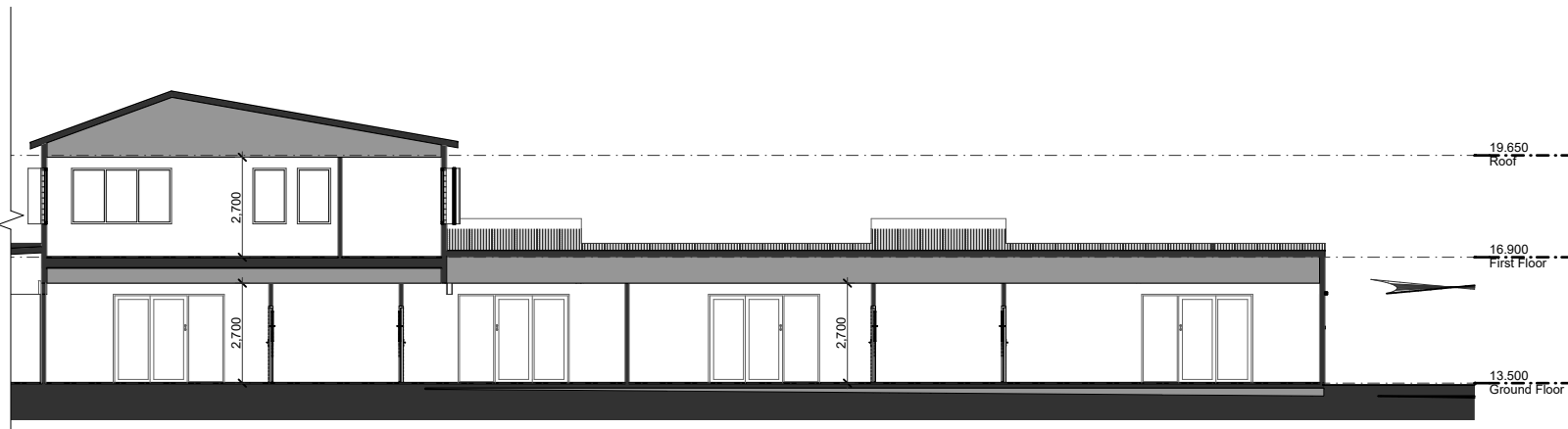
1 Section 1
- Scale 1:200



2 Section 2
- Scale 1:200



3 Section 3
- Scale 1:200



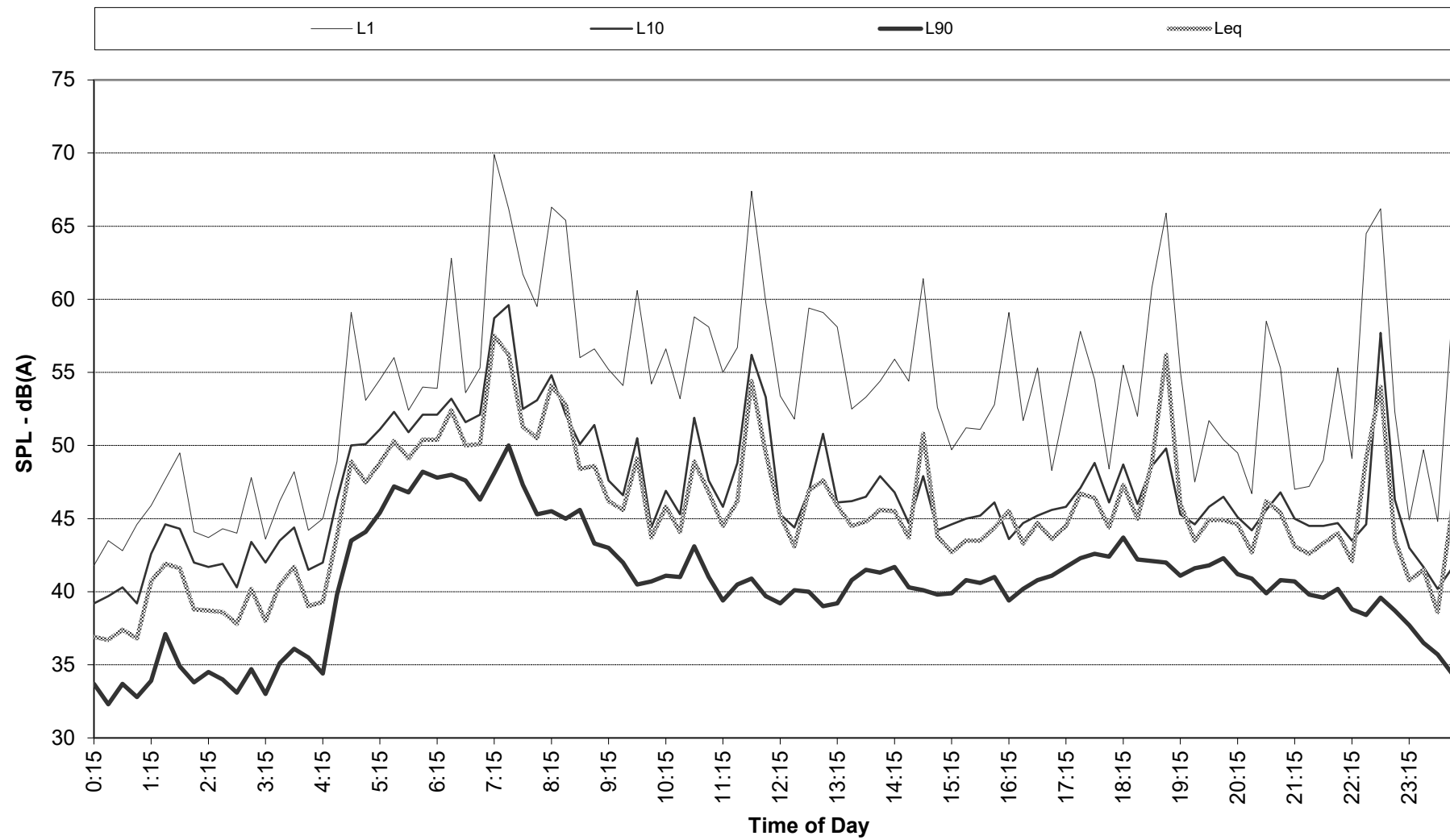
4 Section 4
- Scale 1:200

Preliminary
NOT FOR CONSTRUCTION

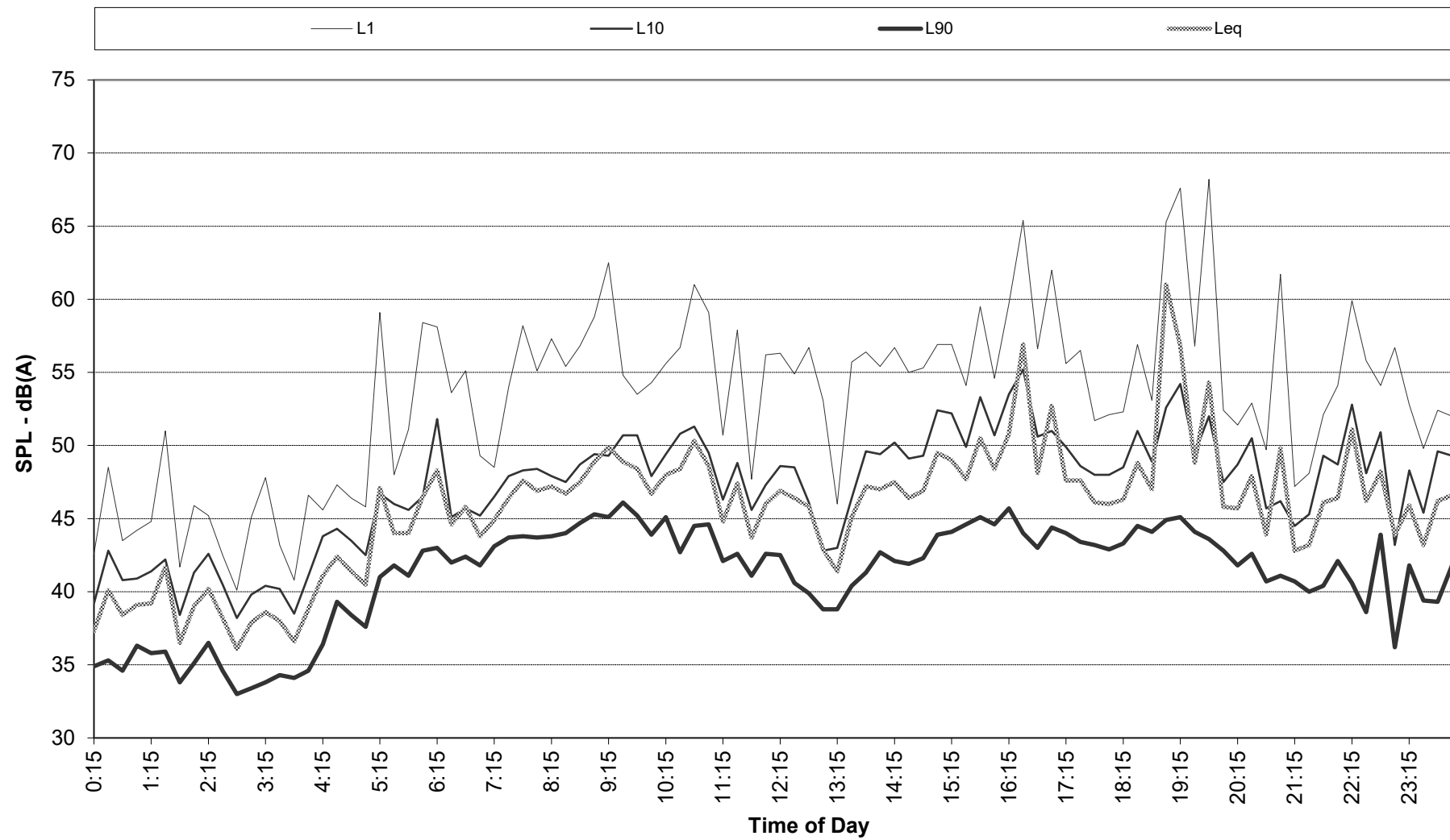
Attachment 2

Noise Data Logger Results

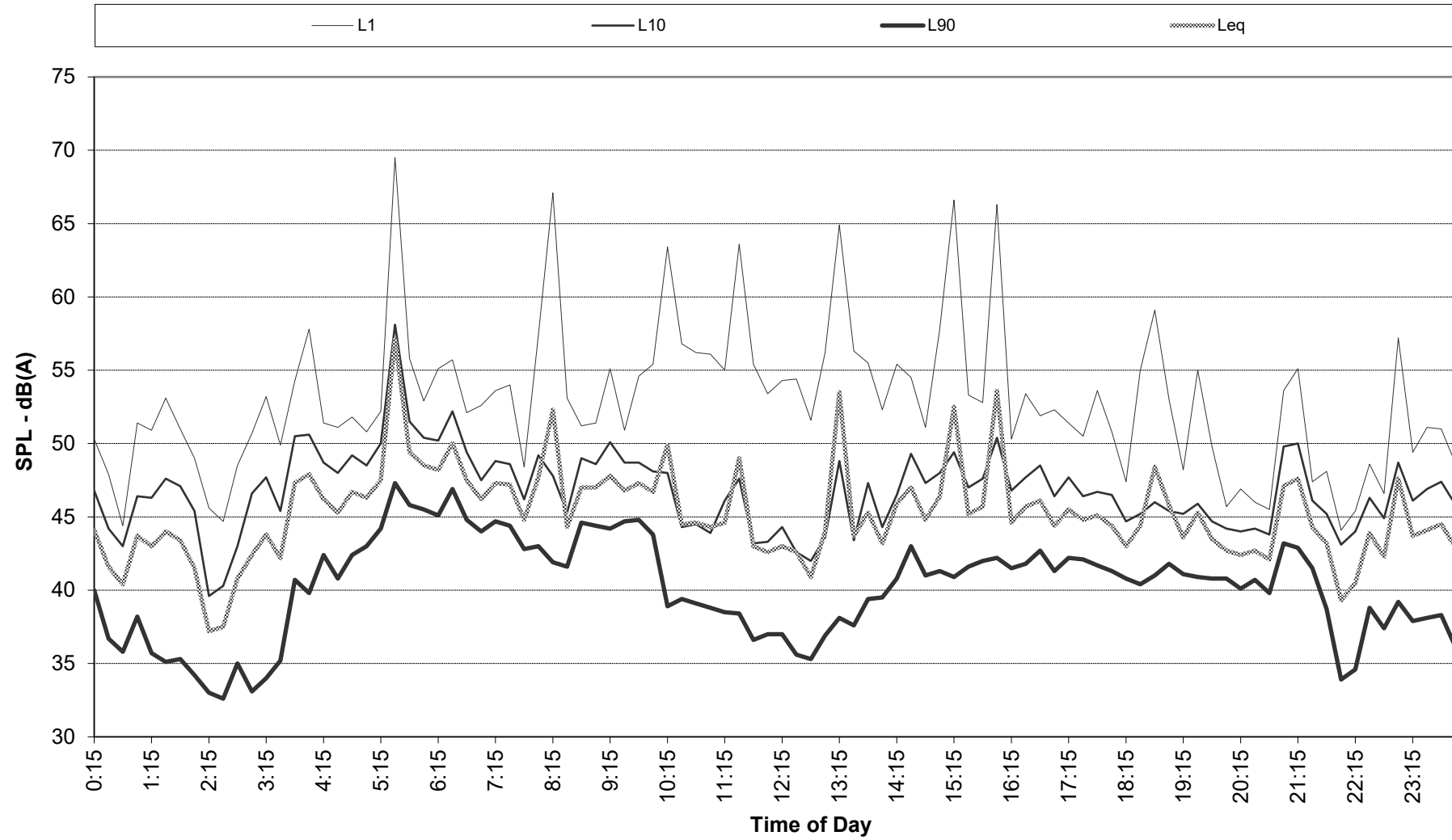
Recorded Statistical Noise Levels for Aura West 26007 - - 24-Jan-2026 - Saturday



Recorded Statistical Noise Levels for Aura West 26007 - - 25-Jan-2026 - Sunday

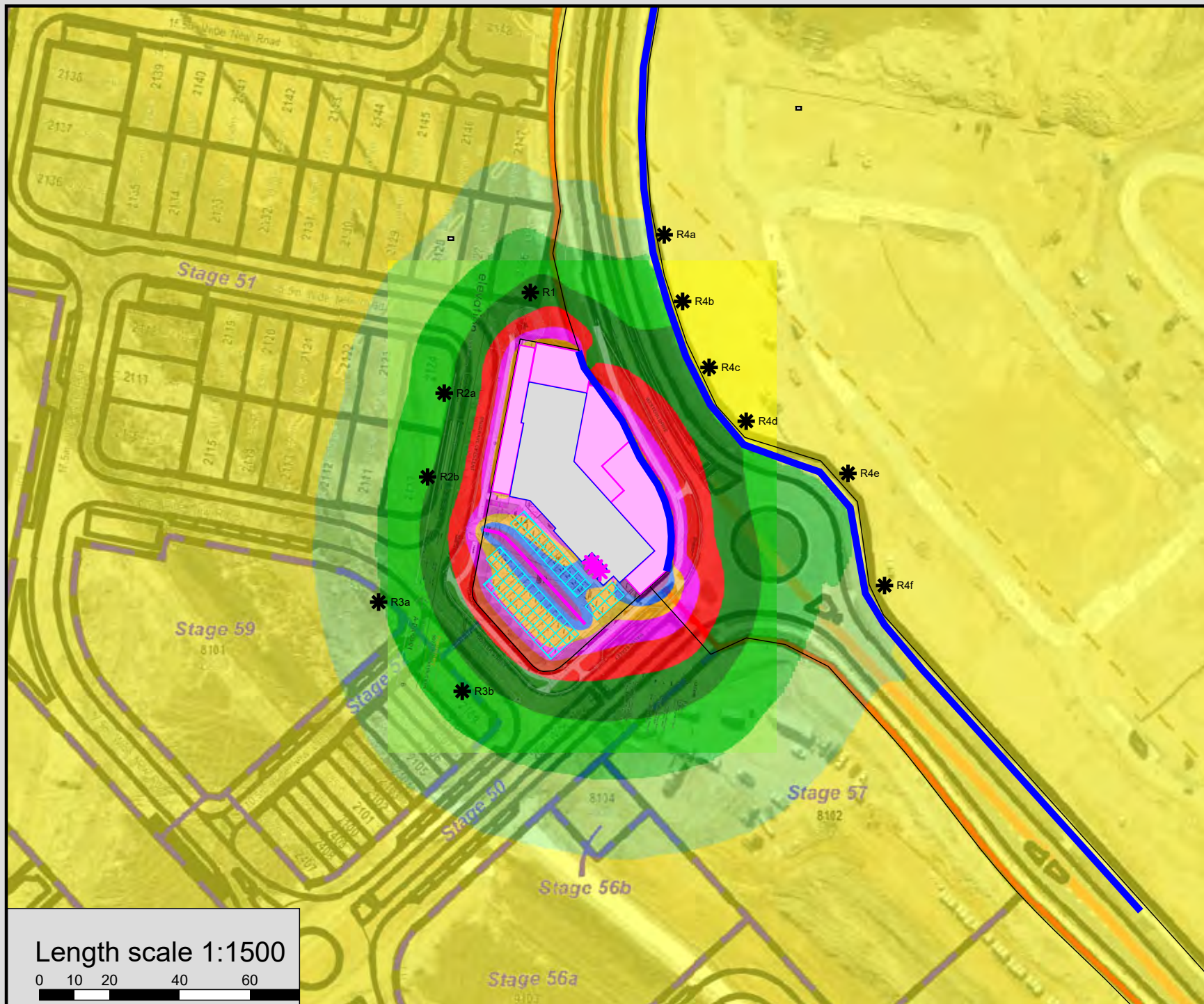


Recorded Statistical Noise Levels for Aura West 26007 - - 26-Jan-2026 - Monday



Attachment 3

*SoundPLAN
Noise Impact Assessment Model Results*



Noise level
LAeq,T
in dB(A)

	<= 38
38 <	<= 41
41 <	<= 44
44 <	<= 47
47 <	<= 50
50 <	<= 53
53 <	<= 56
56 <	<= 59
59 <	

Legend

- Point source
- Parking lot
- Line source
- Area source
- Main building
- Acoustic Barrier
- Point receiver

Aura West 26007

**Day Period 7am to 6pm
Noise Predictions**

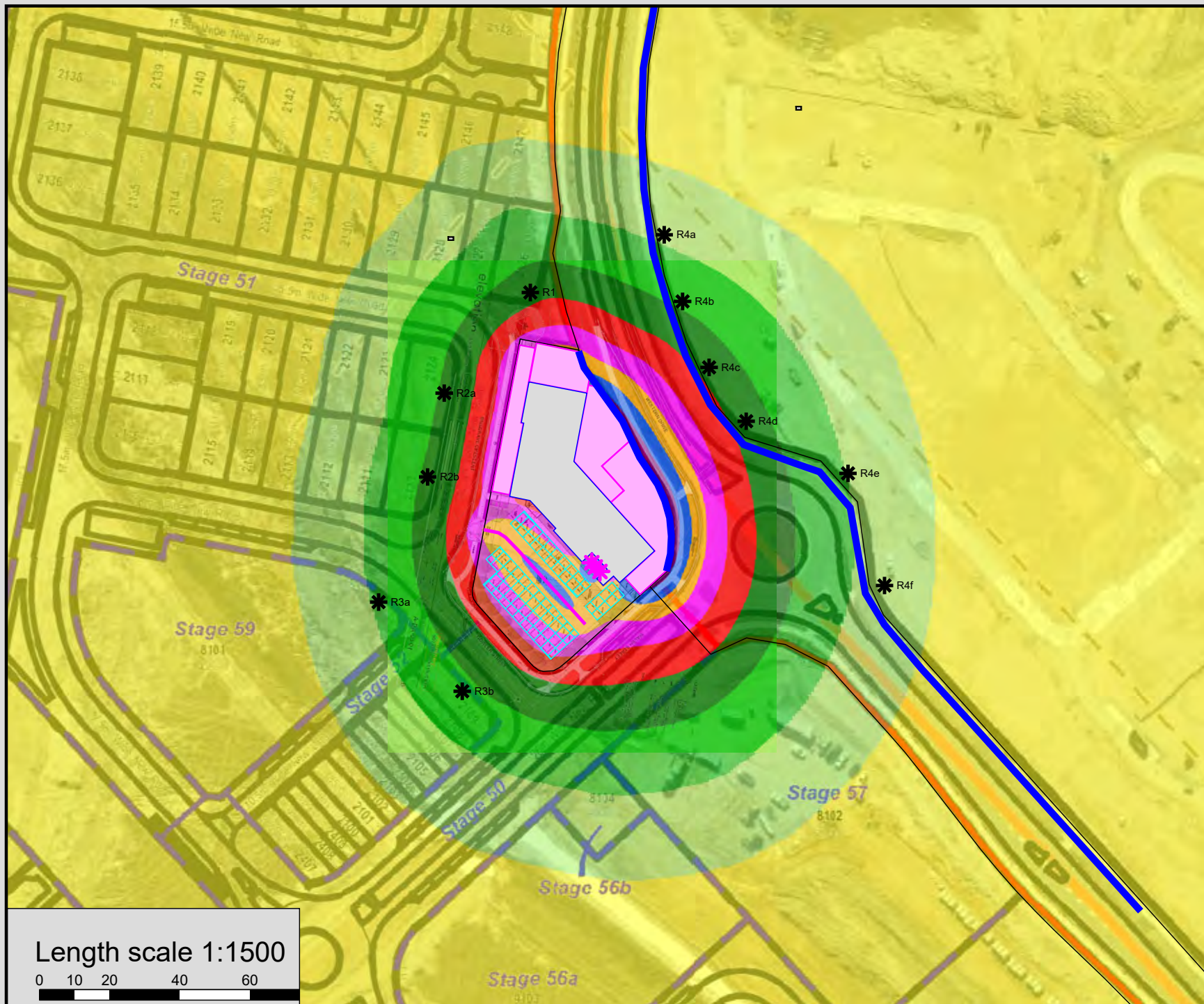
**Ground Level Receiver
Heights (GL +1.5m)**

February 2026



Length scale 1:1500

0 10 20 40 60



Noise level
 $L_{Aeq,T}$
 in dB(A)

		≤ 38
38 <		≤ 41
41 <		≤ 44
44 <		≤ 47
47 <		≤ 50
50 <		≤ 53
53 <		≤ 56
56 <		≤ 59
59 <		

Legend

- Point source
- Parking lot
- Line source
- Area source
- Main building
- Acoustic Barrier
- Point receiver

Aura West 26007

**Day Period 7am to 6pm
 Noise Predictions**

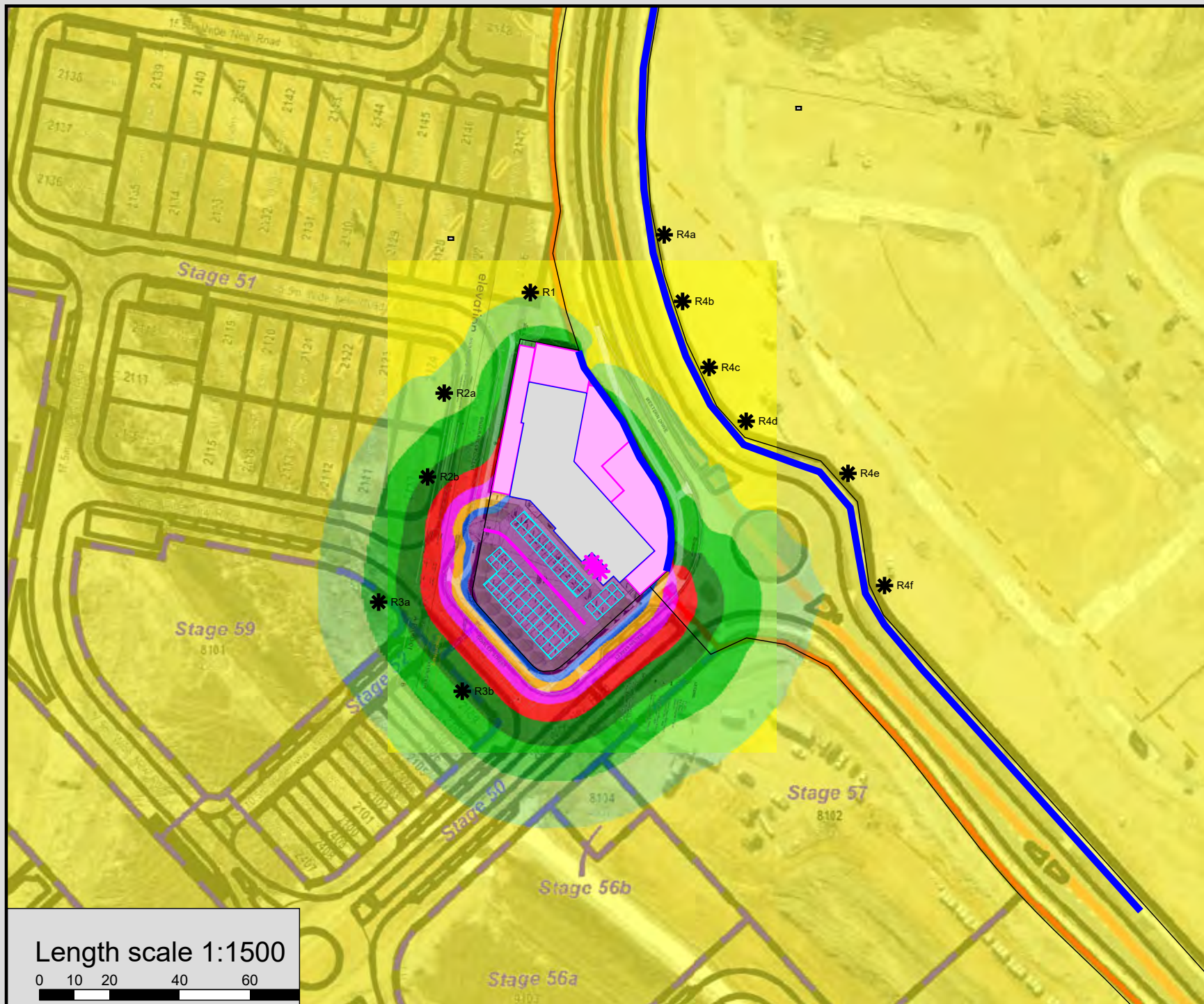
**Upper Level Receiver
 Heights (GL +4.5m)**

February 2026



Length scale 1:1500

0 10 20 40 60



Noise level
L_Amax
in dB(A)

	<= 43
43 <	<= 46
46 <	<= 49
49 <	<= 52
52 <	<= 55
55 <	<= 58
58 <	<= 61
61 <	<= 64
64 <	

Legend

- Point source
- Parking lot
- Line source
- Area source
- Main building
- Acoustic Barrier
- Point receiver

Aura West 26007

**Early Morning Period
6:30 to 7am
L_{max} Noise Predictions**

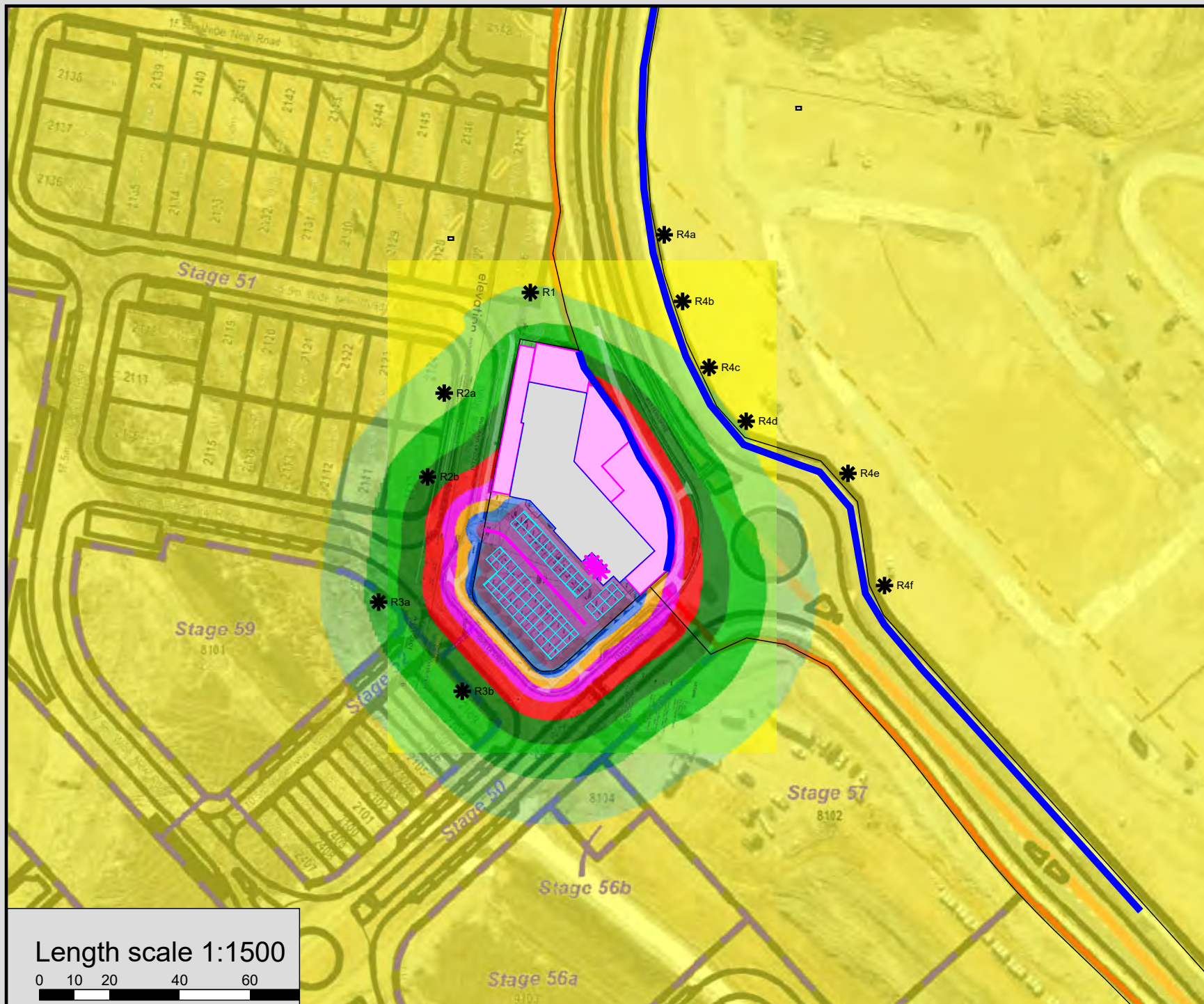
**Ground Level Receiver
Heights (GL +1.5m)**

February 2026

Length scale 1:1500

0 10 20 40 60





Noise level
L_Amax
in dB(A)

	<= 43
43 <	<= 46
46 <	<= 49
49 <	<= 52
52 <	<= 55
55 <	<= 58
58 <	<= 61
61 <	<= 64
64 <	

Legend

- Point source
- Parking lot
- Line source
- Area source
- Main building
- Acoustic Barrier
- Point receiver

Aura West 26007

**Early Morning Period
6:30 to 7am
L_{max} Noise Predictions**

**Upper Level Receiver
Heights (GL +4.5m)**

February 2026

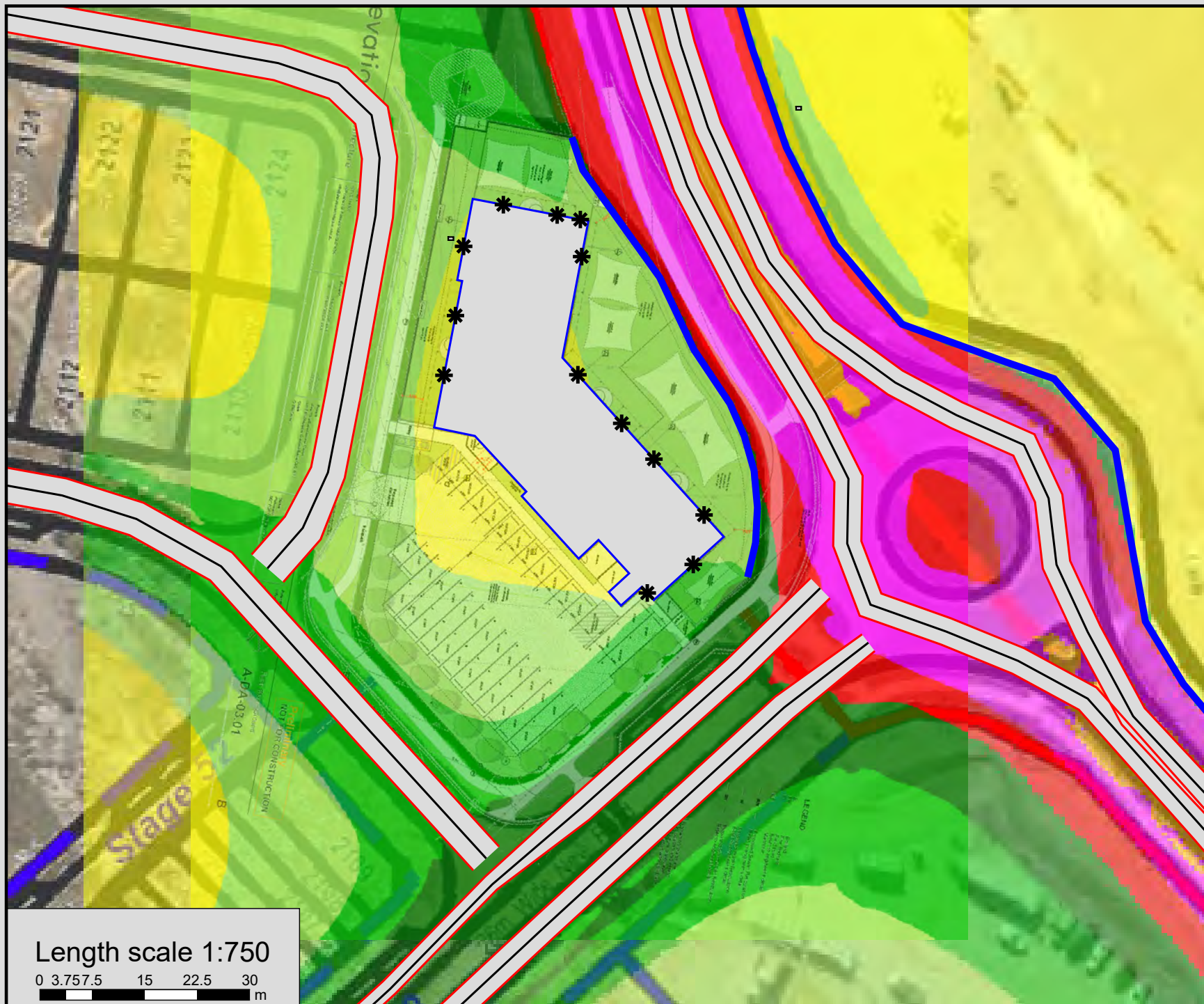


Length scale 1:1500

0 10 20 40 60

Attachment 4

SoundPLAN Traffic Noise Assessment Model Results



Noise level
LA10,12hr
free field
in dB(A)

≤ 54	≤ 54
54 < ≤ 57	≤ 57
57 < ≤ 60	≤ 60
60 < ≤ 63	≤ 63
63 < ≤ 66	≤ 66
66 < ≤ 69	≤ 69
69 < ≤ 72	≤ 72
72 < ≤ 75	≤ 75
75 <	

Legend

- Main building
- Acoustic Barrier
- Point receiver
- Road axis
- Emission line
- Surface

Aura West 26007

Traffic Noise Predictions
At Outdoor Play Areas

February 2026

