Landsdale Childcare Centre
Acoustics Report
Development Application

18 May 2022 **Ref: 301251025**

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Stantec

Revision

Revision	Date	Comment	Prepared By	Approved By
001	18/05/2022	Development Application Issue	JLM	IK

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Executive Summary

Stantec were commissioned to undertake acoustic assessment to support the Development Application of the proposed Childcare Centre located in Landsdale.

The proposed development will be located at Lot 2 (#42) Pollino Gardens Landsdale and is located within the City of Wanneroo. The development will have the following architectural volumes:

- Ground floor - Foyer, Reception, Cot Room toilet, storage, Nappy Room, Staff room, Kitchen, Parent Pick-up/Lounge, 5 Group Rooms, external carpark area, Cafe and Outdoor Play Area
- Level 1 – Medical Centre

The following regulations and standards relevant to this development and addressed in this report are;

- WA Environmental Protection (Noise) Regulations 1997 (WA EPNR 1997)
- Australian Standard 2107:2016 – "Acoustics – Recommended design sound levels and reverberation times for building interiors"
- Association of Australasian Acoustical Consultants Guideline for Child Care Centre Acoustic Assessment V2.0
- State Planning Policy 5.4 (SPP 5.4) Road and Rail Noise Guidelines (September 2019)

Noise Intrusion Assessment

Traffic Corridors

As per the SPP 5.4 requirements, traffic noise assessment has been carried out and the minimum recommended external façade construction has been provided in the form of glazing, roof and wall configurations. The predicted noise levels at the building façades were obtained through the use of the 3D noise modelling software Package, SoundPLAN 8.2.

On-site unattended measurements have been conducted in order to calibrate the sound model.

Façade Glazing

Based on the highest predicted external noise levels, a detailed noise intrusion assessment was carried out. Recommended glazing configurations have been provided as summarized in the table below.

Location	Glazing Configuration	$R_W + C_{tr}$
Ground Floor Childcare Centre & Level 1 Medical Centre	Double Glazed Option 6mm glass + 12mm air gap + 6mm glass	**29 (36;-7)**
	Single Glazed Option 6.38mm laminated glass	**29 (32;-3)**
Ground Floor Cafe	Double Glazed Option 6mm glass + 12mm air gap + 6.38mm laminated glass	**33 (38;-5)**
	Single Glazed Option 10.38mm laminated glass	**32 (35;-3)**

Outdoor Play Area

A 3m high noise barrier is recommended to be incorporated at the location detailed in this report to manage noise levels into the outdoor area to a reasonable level that would maintain appropriate acoustic amenity.

Noise Emission Assessments

Outdoor Play Area

Noise emissions from the proposed development are to comply with the assigned noise levels indicated by the Western Australia Environmental Protection (Noise) Regulations 1997 (EPNR).

Noise modelling software SoundPLAN v8.2 was used to predict the noise levels at the closest noise sensitive receivers. The typical sound levels for groups of children playing for different age ranges were obtained from the AAAC's *"Guideline for Child Care Centre Acoustic Assessment".*

Noise emissions due to the outdoor play area were assessed assuming all children expected within the childcare may occupy the outdoor area at any given time. The maximum predicted noise levels predicted at closest noise sensitive receivers are compliant to the relevant EPNR criteria.

Ground Floor Café

Noise emissions from the café were assessed and are expected that noise generated from the Café to nearby noise sensitive receivers will be compliant to EPNR criteria based on the assumed intent of usage of the area.

It is assumed that associated outdoor areas may typically have 5-10 patrons at any give-time and is not expected to have loud music playing.

Additionally, the noise from major traffic corridor Gnangara Rd is expected to generate traffic noise during typical operating hours which shall provide a degree of sound masking to the noise emitted from Café and any associated outdoor areas.

Mechanical Services

Noise generated via the mechanical services from the proposed development is required to comply with EPNR criteria. At this stage, no information has been provided regarding mechanical equipment selection. It is expected that mechanical services will only be running during the day and turned off at night.

Mechanical service noise emission levels will be assessed when the information regarding the equipment is available. Appropriate noise control will be recommended if required to achieve compliance to EPNR criteria.

1. Introduction

Stantec were commissioned to undertake acoustic assessment to support the Development Application of the proposed Childcare Centre located in Landsdale.

The proposed development will be located at Lot 2 (#42) Pollino Gardens Landsdale and is located within the City of Wanneroo. The development will have the following architectural volumes:

- Ground floor - Foyer, Reception, Cot Room toilet, storage, Nappy Room, Staff room, Kitchen, Parent Pick-up/Lounge, 5 Group Rooms, external carpark area, Cafe and Outdoor Play Area
- Level 1 – Medical Centre

These have been illustrated in Figure 1 below.

Figure 1: Architectural Layout

No details have been provided regarding the maximum number of children expected within the proposed development.

The childcare has been assumed to accommodate up to 114 children based on the total Activity room surface area with the following age groups;

- 0 – 2 years: 46 Places
- 2 – 3 years: 22 Places
- 3 – 5 years: 46 Places

1.1 Site Description

The project site is located within the City of Wanneroo with major traffic corridor Gnangara Rd located to the north-east of the site. The area is situated a largely surrounded by residential development and commercial tenancies intermittently.

Figure 2 presents the project location in context to the aforementioned locations.

Source: Nearmap

Figure 2: Project site and surrounding areas

2. Acoustic Criteria

Environmental noise impacts resulting from the noise emissions from the project are addressed through the Environmental Protection Act 1986, with the regulatory requirements detailed in the Environmental Protection (Noise) Regulations 1997 (EPNR).

The EPNR establishes the maximum permissible noise emission levels (assigned levels) to be received at all adjacent noise-sensitive premises during specific periods of the day as a result of the cumulative noise emissions from all sources proposed for the project site. Compliance to relevant noise limits outlined in the EPNR is compulsory.

The EPNR states noise emissions from any premises are considered not to *significantly contribute to* the noise at a receiver if the noise emissions are 5 dB or below the assigned levels.

In brief, the assigned levels are determined by considering of the amount of commercial and industrial zones, as well as main transport corridors and sporting venues surrounding the noise sensitive premises. The assigned levels apply at premises receiving the noise (noise sensitive receiver) and not to areas within the project site or lot. In addition, the Environmental Protection (Noise) Regulations 1997 identify the following in Schedule 3, clause 2A:

> *"If the land within either of the circles is categorised on the land use map as land in respect of which mixed uses are permitted, the use of that land that results in the highest influencing factor is to be used in the determination of the influencing factor."*

The nearest noise sensitive receivers have been considered as the residential properties in the surrounding the area, with the closest measurable noise sensitive receiver located at 10 Pollino Gardens, Landsdale 6065.

The current District Planning Scheme 2 (DPS2) was accessed via the City of Wanneroo online mapping system.

Traffic data for roads surrounding the nearest noise sensitive receiver were obtained from Main Roads Western Australia (MRWA) on the 16th May 2022. The available traffic data has been presented in Table 1.

Table 1:Traffic count data (MRWA)

Transport Corridors	EPNR Classification 1)	Average Daily Traffic Volumes					
		2016/17	2017/18	2018/19	2019/2020	2020/2021	2021/2022
Gnangara Rd (West of Alexander Dr)	Major Road	-	32471	-	-	36439	38519

1) As defined by the EPNR. Secondary roads have between 6000-15000 vehicles per day. Major roads have greater than 15000 vehicles per day.

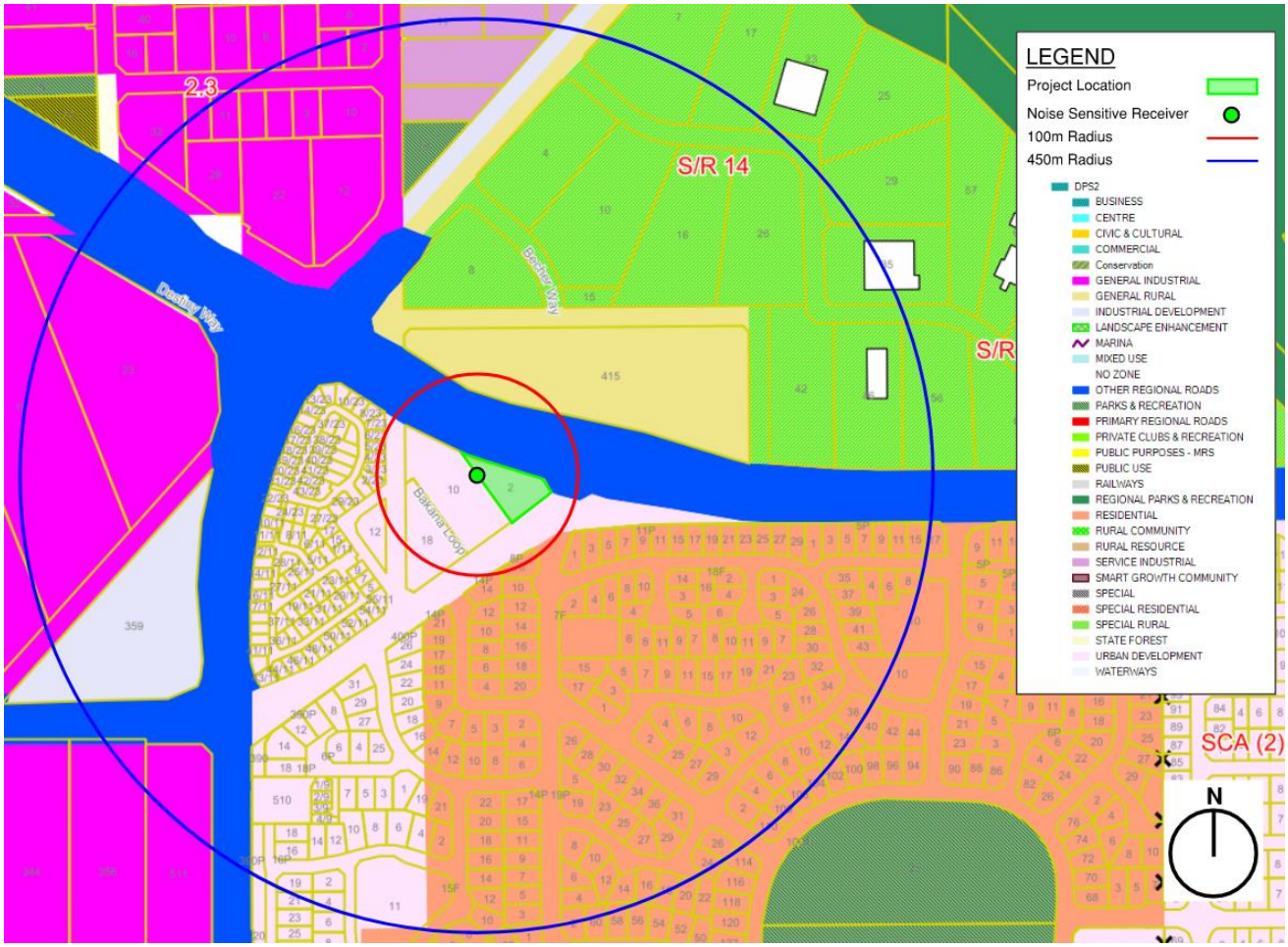
2.1.1 Influencing Factor for 10 Pollino Gardens

The influencing factor for 10 Pollino Gardens results from identifying major roads, commercial and industrial areas for all nearest noise sensitive receivers is 8 dB, as summarized in Table 2.

Table 2:Influencing factor (IF) noise sensitive at 10 Pollino Gardens

Noise Sensitive Premises	Commercial Zones	Industrial Zones	Transport Corridors	Influencing Factor
10 Pollino Gardens	5 % within a 100 m radius 5 % within a 450 m radius	16 % within a 450 m radius	Gnangara Rd within a 100m radius	**8 dB**

Figure 3 indicate the land use zones surrounding at 10 Pollino Gardens.



Source: City of Wanneroo Online Mapping System

Figure 3: Zoning map of areas surrounding 10 Pollino Gardens

2.1.2 Assigned Levels for Nearest Sensitive Receiver

Table 3 summarises the assigned levels at the nearest noise sensitive premises, which is added to the influencing factor calculated for the receiver detailed in Table 3. It is required that all noise emissions from the development are below the assigned level for all defined periods of the day and at the lot boundary of the receiver or 15m from any associated building. It is noted that the EPNR assigned levels only apply at the premises receiving the noise only and not to noise within the site.

Table 3: Assigned levels for 51 Oasis Dr

Type of premises receiving noise	Time of day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: Highly sensitive area	0700 to 1900 hours Monday to Saturday	53	63	73
	0900 to 1900 hours Sunday & public holidays	48	58	73
	1900 to 2200 hours all days	48	58	63
	2200 hours on any day to 0700 hours Monday to Saturday, and 0900 hours Sunday & public holidays	43	53	63

Type of premises receiving noise	Time of day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: any area other than highly sensitive areas	All Hours	60	75	80
Commercial premises	All Hours	60	75	80
Industrial and utility premises	All Hours	65	80	90

2.1.3 Noise Character Adjustment

Regulation 7 states that the noise character must be "free" of annoying characteristics, namely —

- Tonality, e.g. whining, droning;
- Modulation, e.g. like a siren; and
- Impulsiveness, e.g. banging, thumping.

Regulation 9 (1) establishes the methodology for determining noise characteristics. If these characteristics cannot be reasonably and practicably removed, a series of adjustments to the measured levels are required, indicated in Table 4.

Table 4: Noise character adjustment

Adjustment where noise emission is not music (Cumulative to a maximum of 15 dB)			Adjustment where noise emission is music	
Where tonality is present	Where modulation is present	Where impulsiveness is present	Where impulsiveness is not present	Where impulsiveness is present
+ 5 dB	+ 5 dB	+ 10 dB	+ 10 dB	+ 15 dB

In the case of this project, there is no noise character adjustment required for noise produced by children.

2.1.4 Mechanical Services - Noise Emission

It is important that noise emissions from the site do not present any form of tonality, modulation or impulsiveness (as defined by the EPNR).

Given that data from mechanical plant manufacturers is generally limited to broadband data or in 1/1 octave band value, it is not possible to objectively determine tonality, as it is described in the EPNR. 1/3 octave band data is required yet is typically unavailable.

Therefore, a 5 dB penalty shall be conservatively assigned to the noise criteria when assessing noise emissions from mechanical equipment. It is expected that mechanical services will only be running during the day and turned off at night. Therefore, the most stringent criterion at the closest external noise sensitive receiver for day-time criterion L_{A10} 53 dB(A).

2.2 Internal Noise Levels

2.2.1 Australian Standard AS2107

The internal noise level criteria detailed in this section are based on the recommendations provided in the Australian / New Zealand Standard AS 2107:2016 'Acoustics – Recommended design sound levels and reverberation times for building interiors' (AS 2107).

AS2107 provides recommended internal noise levels (defined as the equivalent continuous A-weighted sound pressure level — $L_{Aeq,t}$) for optimising the acoustic amenity in occupied spaces. The level of noise in an enclosed space typically consists of noise from building services and/or noise intrusion due to external sources (e.g. traffic).

The relevant internal noise level criteria have been outlined in Table 5.

Table 5: Recommended internal noise levels from AS2107

Type of occupancy/activity	Recommended design sound level, L_{eq} dB(A)
Corridor and lobby areas	< 50
Kitchen	< 55
Activity Room	35 – 45
Prep Room Nappy Room	45 – 55
Cot Room	35 – 40
Cafe	45 – 50
Medical Centre Admin/Private Consultation Staff room Reception Foyer	40 – 45

The internal noise level criteria in AS2107 recommend continuous equivalent (L_{Aeq}) levels for background noise. This document is a common reference for establishing satisfactory goals for quasi-static mechanical and external traffic noise ingress.

2.3 State Planning Policy 5.4 (2019)

State Planning Policy 5.4 2019 (SPP 5.4 2019) establishes the outdoor noise criteria that apply to a noise sensitive land use due to noise emissions from road and rail transport. A detailed assessment is required for any noise land use within 300 m of a major freeway.

Table 6: Outdoor noise criteria for SPP5.4

Proposal	New	Noise Targets		
		Outdoor		Indoor
		Day (LAeq (Day) dB) (6am - 10 pm)	Night (LAeq (Night) dB) (10pm - 6am)	LAeq dB
Noise-Sensitive land-use and/or development	New noise-sensitive land-use and/or development within the trigger distance of an existing/proposed transport corridor	55	50	LAeq (Day) 40 (living and work areas) LAeq (Night) 35 (Bedrooms)

3. Noise Survey

Unattended noise measurements were undertaken at the project site to establish the existing acoustic environment for use in the noise model calibration as required for SPP5.4 compliance. Unattended noise measurements were undertaken between 4th May 2022 to 10th May 2022. The measurement location presented in Figure 4.

Figure 4: Noise Logger Location

3.1 Noise Measurements

3.1.1 Test Methodology

Unattended measurements have been conducted using instrumentation equivalent to an integrating sound level meter equipped with one octave and one-third octave band filters, and an omni-directional condenser microphone. All instrumentation meets Type 1 specifications as per ANSI S1.4 and ANSI S1.43.

Noise logging was carried out for a period of Three 24-hour days adjacent to Wanneroo Rd, in compliance with the policy.

All sound level meters were calibrated by an authorised NATA (National Association of Testing Authorities) laboratory less than 2 years ago and have successfully passed all AS 1259 and AS/NZS 4476 standards and specifications.

The time constant for the RMS detector were set to a slow response (1 sec) for all measurements on all sound level meters. The sound level meters were calibrated before and after each measurement session using a Type 1 acoustic calibrator. The calibrator was also calibrated less than 2 years ago, and is in compliance with AS IEC 60942-2004.

A complete schedule of all equipment used during for acoustic measurements is provided in Table 7 below. A copy of calibration certificates for the relevant instrumentation may be provided upon request.

Table 7: Equipment and Calibration Details

Manufacturer / Model	Serial Number
Brüel & Kjær 4231 - Calibrator	3005155
NTi XL2 – Sound Level Meter	A2A-14416-E0

3.1.2 Noise Measurement Summary

The noise levels obtained from the unattended noise measurements have been provided in Figure 5 below.

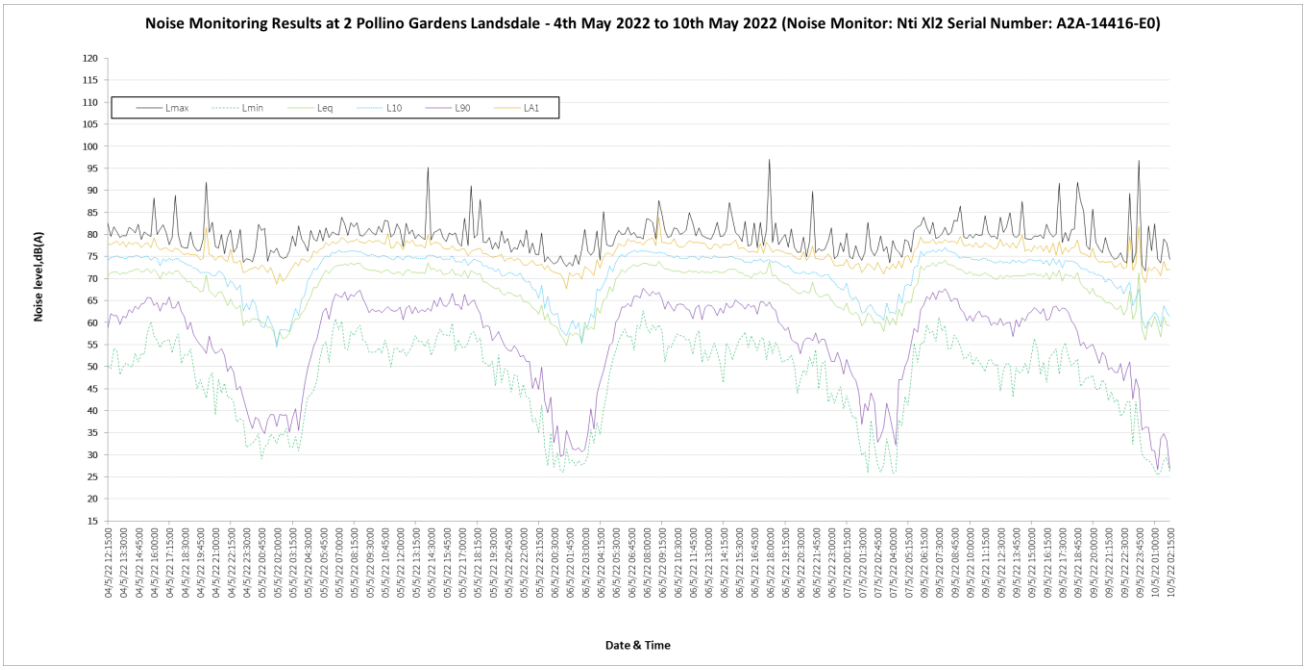


Figure 5: Unattended measurement data

Weather data from Bureau of Meteorology from Perth was used and was compared against the conditions defined by Main Roads WA. The data impacted due to adverse meteorological conditions has been excluded in the calculation of any relevant noise parameters used in the following assessment.

4. Noise Intrusion Assessment

4.1 Assessment Methodology

Noise Modelling was undertaken in accordance with SPP 5.4 to determine road traffic noise impacts affecting the project site.

Detailed methodology and assessment specifications are detailed in the SPP 5.4 *Road and Rail Noise Guidelines September 2019* (referred to as the Guidelines in the remainder of this report). Sound PLAN v8.2 (3D noise modelling software) was used to simulate noise emissions expected from road transport corridors and, subsequently, to determine noise levels 1 metre from the façade as well as external noise sensitive areas.

The noise modelling checklist used in the following assessment as provided by SPP5.4 has been given in Appendix B.

4.1.1 Noise Source Inputs

Topography

Topographical and elevation data for the project site and surrounding areas was based on data imported and modelled from data obtained from the Intergovernmental Committee on Surveying and Mapping online database. The model was calibrated using the latest satellite imagery obtained from Nearmap.

Ground Absorption

To suit the current conditions of the project location, a ground condition of 0.6 has been used in the model, which is in between a soft ground condition (1) and a reflective ground condition (0).

Road Traffic

The road traffic noise assessment has been conducted based on the methodology described by the Calculation of Road Traffic Noise algorithm (CoRTN, UK Transport Agency).

The CoRTN algorithm has been developed to calculate $L_{A10,18hr}$ noise levels. However, SPP5.4 requires road noise assessments to be based upon the energy averaged $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ noise descriptors for the daytime and night-time respectively. Conversions are applied using the method outlined in the DEFRA publication, *"Method for Converting the UK Road Traffic Noise Index $L_{A10,18hour}$ to the EU Noise Indices for Road Noise Mapping."*

This algorithm considers the following parameters;

- Traffic volume during each period of the day, and for current and future scenarios;
- Average traffic speeds;
- Height of each individual noise source (passenger vehicles, heavy vehicles – engine and exhaust);
- Percentage of heavy vehicles; and
- Gradient and surface of road.

Road traffic noise source heights were incorporated into the noise model in accordance to the description detailed by the Guidelines. The modelled heights of vehicle "strings" are provided below;

- Passenger vehicles: + 0.5 m
- Heavy vehicles — Engine noise: + 1.5 m
- Heavy vehicles — Exhaust: + 3.6 m

The Main Roads Traffic Modelling Branch was contacted on the 11th May 2022 (Contact Thomas Ng) and has provided traffic count and projection data for the surrounding Major transport corridors: Gnangara Rd. These have been provided in the form of a ROM24 2016 validation plot and 2016 and 2041 link volume plots. Validation and link volume plots used have been provided in Appendix C.

Historical hourly traffic volumes provided on the MRWA website were used to determine the proportion of vehicles during the day and night along transit Gnangara Rd.

SPP 5.4 requires all noise assessments to consider changes in traffic volumes expected over the next 20 years.

Using the data provided by Mainroads, the following traffic count growth rates have been calculated for each major transport corridor summarised in Table 8. Observed traffic count volumes were used as source inputs to model and assess a worst-case scenario.

Table 8: Major Transport Corridor Growth Rates

Major Transport Corridor	Overall Traffic count growth rate, %/y
Gnangara Rd (West of Alexander Dr)	0.8

The table below summarises the current and future predicted traffic volumes used in the assessment model.

Table 9: Current and Predicted Future Traffic Volumes

Road	Assessment Year	Predicted Daily Vehicle Volume	Day time 1) vehicle volume per hour	Heavy Vehicle Percentage	Mean Speed
Gnangara Rd (West of Alexander Dr)	Current – 2022	36804	2133	Day-time – 13%	80 km/h
	Future - 2042	43516	2521		

1) Day time period refers to 0600 AM – 2200 PM. Night-time refers to 2200 PM – 0600 AM.

4.1.2 Noise Model Calibration

The unattended measurement location was used to calibrate the model to simulate accurate noise emission from Gnangara Rd. The measured result ($L_{Aeq,16hrs}$) from the noise monitoring detailed in section 3.1.2 was compared to the predicted levels from the Sound PLAN model.

Noise data over the weekend period (7th May 2022 – 8th May 2022) has not been used in the calibration of the sound model as per SPP5.4.

Appropriate adjustments were made in order to attain little to no variation in the measured and predicted noise level at the receiver location.

Once the model was calibrated for the current year 2022 scenario, this was subsequently applied to future traffic volume projections to assess the 2042 scenario.

4.2 Noise Modelling Results

Road traffic noise impact for the future year (2042) predicted the highest external noise levels for the day-time period to be at the following façade location(s):

- North Façade, Day-time scenario; **74dB(A)**

Coloured noise maps are provided in Appendix D. The majority of the predicted noise levels at the façade are above the 'noise target' values in SPP5.4. Therefore, acoustic treatments are required to achieve compliance.

Detailed noise intrusion assessment and recommendations for the external envelope are provided to achieve compliance to the internal noise level criteria of SPP5.4. Details of assessment & recommendations are provided in the section 5.0.

4.2.1 Outdoor Area

Noise into the outdoor area from the Gnangara Rd has been assessed to achieve adequate noise levels to maintain appropriate acoustic amenity. This can be achieved by implementing a 3m high noise wall at the location shown in Figure 6.

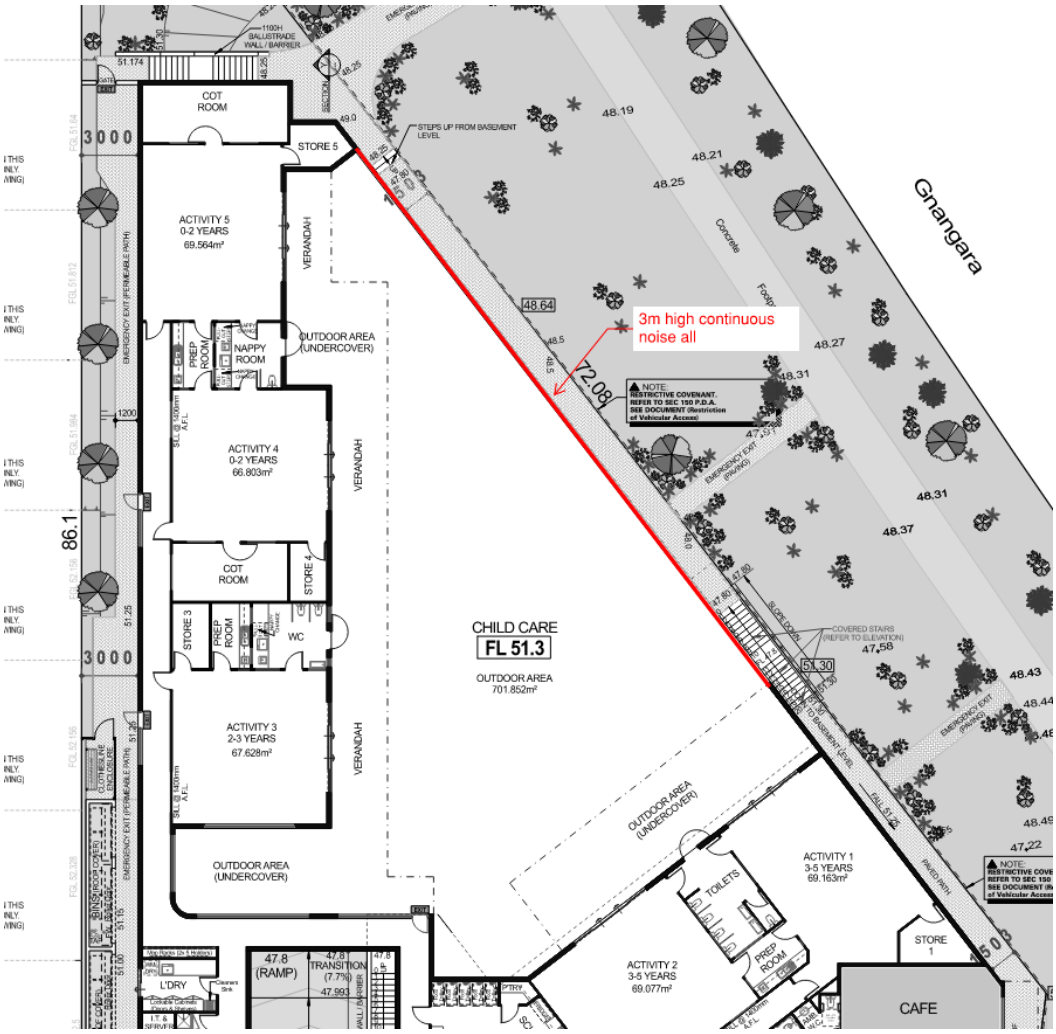


Figure 6: 3m high Noise Barrier location

The noise barrier shall be without air gaps or features that would allow sound to be transmitted through the material. Typical barrier shall be constructed using materials having a surface density of 15kg/m^2. Example materials include Fibre cement sheet or Perspex.

5. External Envelope

Noise intrusion calculations were undertaken following the methodology described in British Standard BS EN 12354:2000 and by utilizing the worst case (i.e. highest predicted) noise levels predicted at each façade to determine suitable glazing to achieve the required internal noise levels. Appropriate corrections were applied to the linear spectral noise levels to compensate for potential losses due to flanking paths and façade correction.

5.1 External Wall

The noise intrusion has been calculated for all façade elements, which is relative to their surface area.

Stantec recommends solid wall elements have a minimum performance of $R_w + C_{tr}$ 40 - 45. The proposed construction is typical in achieving the required performance:

1) 110mm Concrete Panel; OR

2) 110mm brick work + 50mm air gap + 90mm brickwork

Where lightweight construction is proposed, this will result in reduced acoustic performance specifically in the lower frequencies. As a result, this may have some impact on the recommended glazing types. The following constructions are recommended if lightweight walls are to be used (Table 10), to ensure compliance with the recommended internal noise levels for residential units as specified in SPP 5.4.

Table 10: Lightweight External Wall Configurations

Colour Code	Airborne Sound Insulation Performance	Configuration
EW - 1	$R_w + C_{tr}$ 45 – 48	One row of 92mm studs at 600mm centres with – • Min. 100mm thick glasswool insulation (min. density 14kg/m^3) positioned between row of studs; • Two layers 9mm thick fibre cement sheet to outside face; and • Two layers 13mm thick standard plasterboard fixed to the other side of the row of studs
EW - 2	R_w 45 – 50	One row of 64mm studs at 600mm centres with – • Min. 50mm thick glass wool insulation (min. density 14kg/m^3) positioned between row of studs; • One-layer 9mm fibre cement sheet to outside face; and • Two layers 13mm thick standard plasterboard fixed to the other side of the row of studs

Alternative construction may be used to achieve the required performance. This will, however, require review and approval of the Acoustic Engineer.

Locations of the above wall types are illustrated in Appendix E.

5.2 Glazing

Glazing systems and entryway elements typically provide lower airborne sound insulation performance than external walls, forming weak acoustic links in the building envelope.

To satisfy internal noise level design targets, glazed elements located at the façades are determined based on the composite sound reduction index (i.e. the combined sound insulation performance of all façade elements relative to their surface area).

Glazing types for each noise sensitive space located at each façade of the proposed development have been comparatively assessed against the noise levels detailed in this report. The table below provides the glazing performance and proposed locations required to satisfy internal noise level design targets.

The performance ratings outlined in Table 11 are required for compliance to internal noise level design targets and apply to the glazing system as a whole (i.e. frame, seals and window hardware), with a maximum allowable deviation of 2-3dB only.

Table 11: Glazing configuration

Location	Glazing Configuration	$R_w + C_{tr}$	Spectrum Sound Transmission Loss (dB)						
			63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2kHz	4k Hz
Ground Floor Childcare Centre & Level 1 Medical Centre	Double Glazed Option 6mm glass + 12mm air gap + 6mm glass	**29 (36;-7)**	22	23	19	36	45	41	43
	Single Glazed Option 6.38mm laminated glass	**29 (32;-3)**	15	19	24	29	33	35	41

Note: Glazing performance provided for glass only. Overall performance of the glazing system including the frames and seals shall not degrade by more than 3 dB as per the performance requirement stated.

5.3 Roof Construction

Roof construction should be adequately designed to control external noise intrusion from noise sources identified in this report to satisfactorily provide internal noise levels which are compliant with the criteria established in Section 2.2.

The following roof configurations in are expected to achieve the above objectives as shown in Table 12.

Table 12: Roof Construction Types

Roof/Ceiling Color Code	Acoustic Performance	Construction
CE – 1	$R_w + C_{tr}$ 40 – 45	• Colorbond sheet metal or similar (0.42 mm) • 50 mm thick high-density Anticon insulation hard-fixed to the underside of roof; • Min. 100 mm thick glasswool insulation (min. 11kg/m^3) • Cavity – Minimum 300mm air gap + Suspended ceiling system at 600mm stud spacing • Two layers of 13 mm sound rated plasterboard.
CE – 2	R_w 47 – 49	• Colorbond sheet metal or similar (0.42 mm) • 50 mm thick high-density Anticon insulation hard-fixed to the underside of roof; • Min. 100 mm thick glasswool insulation (min. 11kg/m^3)

Roof/Ceiling Color Code	Acoustic Performance	Construction
		• Cavity – Minimum 300mm air gap + Suspended ceiling system at 600mm stud spacing • One layer of 13 mm sound rated plasterboard.
CE – 3 	R_w 45	• Colorbond sheet metal or similar (0.42 mm) • 50 mm thick high-density Anticon insulation hard-fixed to the underside of roof; • Min. 100 mm thick glasswool insulation (min. 11kg/m^3) • Cavity – Minimum 300mm air gap + Suspended ceiling system at 600mm stud spacing • One layer of 13 mm standard plasterboard.

Locations of the above ceiling types are illustrated in Appendix E.

6. Noise Emission Assessment

Noise Emissions are expected to comply to the relevant EPNR assigned noise level criteria at the nearest noise sensitive receivers. The following sources have been identified as contributing to noise emission levels from the proposed development:

- Noise from children playing in the outdoor area
- Ground Floor Café; and
- Mechanical Services (Fans, Condensers serving childcare and medical centre)

6.1 Outdoor Play Area

Noise produced by the groups of children expected in the childcare center can result in noise levels that might affect any sensitive receivers that are located around the proposed project site. The proposed childcare center will consist of One outdoor play area. These play areas will accommodate children of 3 different age groups (0-2 year, 2-3 years, 3-5 years).

Noise modelling software SoundPLAN v8.2 was used to assess noise emissions from the outdoor area of the proposed childcare centre at the nearest noise sensitive receivers. The closest noise sensitive receivers being the following residential lots:

- 10 Pollino Gardens (Future residential housing)
- 3 – 7 Bakana Loop, Landsdale WA 6065
- 1 – 7 Valley Views Dr, Landsdale WA 6065

The noise assessment methodology and predicted noise levels are described in the following sections.

6.1.1 Methodology

The noise assessment has been conducted based on the methodology described in the standard ISO 9613-2: 1996 *"Attenuation of Sound During Propogation Outdoors Part 2: General Method of Calculation".*

Average heights of children in the age groups 0-2 and 2-3 years old were assessed at 0.5m high and children in the age group 3-5 years old were assessed at 0.8m high.

6.1.2 Typical sound levels of groups of children

The AAAC "Guideline for Child Care Centre Acoustic Assessment" provides recommendations for assessment methods of noise assessments used to accompany a Development Application for childcare centers. The guideline also states typical recommendations for noise control methods when designing a childcare center.

The typical ranges of sound power levels for groups of children playing were determined as per the AAAC guideline Section 6.0. As the example sound power levels in the AAAC guideline is given as ranges, the midpoint of the sound power level range was used in the noise assessment.

As summarized in Section 1, the maximum number of children is expected based on the follow age groups:

- 0 – 2 years: 46 Places
- 2 – 3 years: 22 Places
- 3 – 5 years: 46 Places

To assess a worst-case scenario, it is assumed that 100% capacity may occupy the outdoor area at any given time during typical operating hours.

Sound power level data of varying age groups were taken from AAAC *"Guideline for Child Care Centre Acoustic Assessment"* and presented in Table 13. The sound power levels are typically provided as a range. For the purposes of this modelling mid-point sound power levels were used. In addition, based on the above stated groups of children, sound levels were adjusted for the noise model.

Table 13: Effective sound power levels for groups of children playing

Location	Age Group Types	Typical Range of Sound Power Level dB(A)
Outdoor Play Area	46 children aged 0 to 2 years	84 – 87
	22 children aged 2 to 3 years	86 – 90
	46 children aged 3 to 5 years	91 – 97

6.1.3 Noise Modelling Results

The highest predicted sound power level at nearest noise sensitive receivers for the SoundPLAN v8.2 model have been summarized below in Table 14.

Table 14: Predicted noise levels at closest noise sensitive receivers generated from the outdoor area

Receiver	Predicted Noise Level L_{A10}, dB(A)	Day-time Criteria L_{A10}, dB(A)	Compliance
10 Pollino Gardens (Future residential housing)	51	53	**Yes.**
3 – 7 Bakana Loop	33		**Yes.**
1 – 7 Valley Views Dr	32		**Yes.**

The colored noise map for the noise modelling scenario has been presented in Appendix D.

Predicted noise levels are expected to be compliant at all nearest noise sensitive receivers for the worst-case scenario.

6.2 Ground Floor Café

The proposed development is expected to have a Café tenancy on ground floor at the location shown in Figure 7.

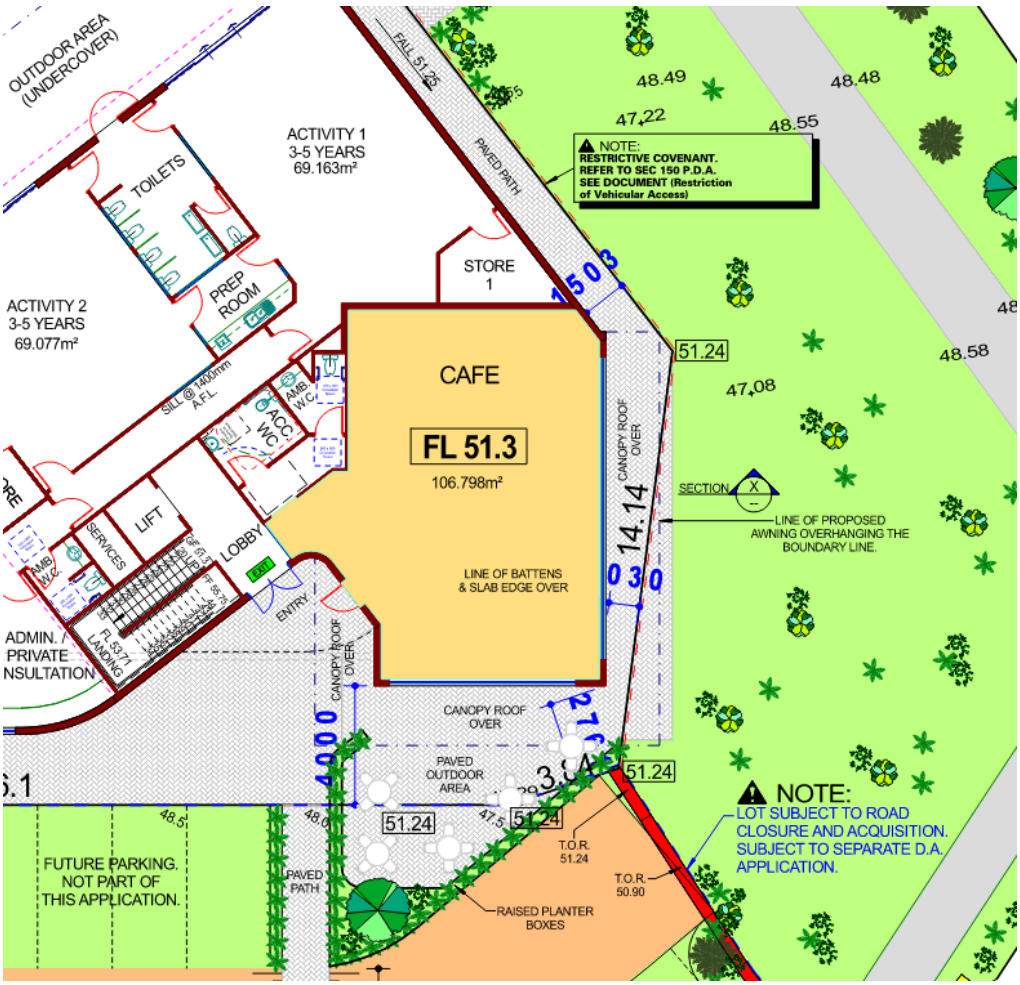


Figure 7: Ground Floor Café

At the time of assessment, a tenancy operator has not been selected. It is assumed that Cafe could potentially be used as a restaurant or café with seated dining with dominant noise being patron activity. It is not intended the café would have live music or events.

It is expected that noise generated from the Café to nearby noise sensitive receivers will be compliant to EPNR criteria based on the assumed intent of usage of the area. Additionally, to ensure noise generated from inside the future tenancy does not exceed EPNR criteria at the nearest noise sensitive receivers, it is recommended that the façade glazing is upgraded to the following performance in Table 15.

Table 15: Ground Floor Café recommended façade glazing configuration

Glazing Configuration	$R_W + C_{tr}$	Spectrum Sound Transmission Loss (dB)						
		63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2kHz	4k Hz
6mm glass + 12mm Air Gap + 6.38mm laminated glass	**33 (38;-5)**	22	24	24	35	43	44	49

Glazing Configuration	$R_W + C_{tr}$	Spectrum Sound Transmission Loss (dB)						
		63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2kHz	4k Hz
10.38mm laminated glazing	**32 (35;-3)**	20	23	28	32	35	37	47

Tenancy operator to provide their own noise mitigation plan to ensure noise levels generated from within the tenancy are compliant to the relevant EPNR noise criteria. It is assumed that associated outdoor areas may typically have 5-10 patrons at any give-time and is not expected to have loud music playing.

Any PA system proposed to play music will be primarily for background/ambient purposes and must be limited so it is not be audible at nearby receivers.

Additionally, the noise from major traffic corridor Gnangara Rd is expected to generate traffic noise during typical operating hours which shall provide a degree of sound masking to the noise emitted from Café and any associated outdoor areas.

6.3 Mechanical Services

Noise generated via the mechanical services from the proposed development is required to comply with EPNR criteria. At this stage, no information has been provided regarding mechanical equipment selection.

It is expected that mechanical services will only be running during the day and turned off at night. Therefore, the most stringent criterion at the closest external noise sensitive receiver for day-time criterion L_{A10} 53 dB.

Mechanical service noise emission levels will be assessed when the information regarding the plant is available. Appropriate noise control will be recommended if required to achieve compliance to EPNR criteria.

7. Conclusion

As part of the development approval process for the Landsdale Childcare Centre project, an acoustic assessment has been carried out as detailed in this report.

Traffic noise assessment has been carried out as per the SPP 5.4 and the minimum recommended external façade construction has been provided in the form of glazing, wall and roof configurations. The predicted noise levels at the building façades were obtained through the use of the 3D noise modelling software Package, SoundPLAN 8.2. On-site unattended measurements have been conducted in order to calibrate the model.

Façade recommendations have been provided to achieve compliance to the most stringent indoor noise criteria stated in AS2107 and SPP 5.4 guidelines.

Noise emissions due to the outdoor play area were assessed assuming all children expected within the childcare may occupy the outdoor area at any given time. The maximum predicted noise levels predicted at closest noise sensitive receivers are compliant to the relevant EPNR criteria.

It is expected that noise generated from the Café to nearby noise sensitive receivers will be compliant to EPNR criteria based on the assumed intent of usage of the area. Tenancy operator to provide their own noise management plan to ensure noise levels generated from within the tenancy are compliant to the relevant EPNR noise criteria. Additionally, the noise from major traffic corridor Gnangara Rd is expected to generate traffic noise during typical operating hours which shall provide a degree of sound masking to the noise emitted from Café and any associated outdoor areas.

Noise generated via the mechanical services from the proposed development is required to comply with EPNR criteria. At this stage, no information has been provided regarding mechanical equipment selection. It is expected that mechanical services will only be running during the day and turned off at night.

Mechanical service noise emission levels will be assessed when the information regarding the equipment is available. Appropriate noise control will be recommended if required to achieve compliance to EPNR criteria.

Appendix A Glossary of Acoustic Terms

NOISE	
Acceptable Noise Level:	The acceptable LAeq noise level from industrial sources, recommended by the EPA (Table 2.1, INP). Note that this noise level refers to all industrial sources at the receiver location, and not only noise due to a specific project under consideration.
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).
Acoustic Barrier:	Solid walls or partitions, solid fences, earth mounds, earth berms, buildings, etc. used to reduce noise.
Ambient Noise:	The all-encompassing noise associated within a given environment at a given time, usually composed of sound from all sources near and far.
Assessment Period:	The period in a day over which assessments are made.
Assessment Location	The position at which noise measurements are undertaken or estimated.
Background Noise:	Background noise is the term used to describe the underlying level of noise present in the ambient noise, measured in the absence of the noise under investigation, when extraneous noise is removed. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level.
Decibel [dB]:	The units of sound pressure level.
dB(A):	A-weighted decibels. Noise measured using the A filter.
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 3.5m 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).
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.
LAmax	The maximum A-weighted sound pressure level measured over a period.
LAmin	The minimum A-weighted sound pressure level measured over a period.
LA1	The A-weighted sound pressure level that is exceeded for 1% of the time for which the sound is measured.
LA10	The A-weighted sound pressure level that is exceeded for 10% of the time for which the sound is measured.
LA90	The A-weighted level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L90 noise level expressed in units of dB(A).
LAeq	The A-weighted “equivalent noise level” is the summation of noise events and integrated over a selected period of time.

LAeqT	The constant A-weighted sound which has the same energy as the fluctuating sound of the traffic, averaged over time T.
Reflection:	Sound wave changed in direction of propagation due to a solid object met on its path.
R-w:	The Sound Insulation Rating R-w is a measure of the noise reduction performance of the partition.
SEL:	Sound Exposure Level is the constant sound level which, if maintained for a period of 1 second would have the same acoustic energy as the measured noise event. SEL noise measurements are useful as they can be converted to obtain Leq sound levels over any period of time and can be used for predicting noise at various locations.
Sound Absorption:	The ability of a material to absorb sound energy through its conversion into thermal energy.
Sound Level Meter:	An instrument consisting of a microphone, amplifier and indicating device, having a declared performance and designed to measure sound pressure levels.
Sound Pressure Level:	The level of noise, usually expressed in decibels, as measured by a standard sound level meter with a microphone.
Sound Power Level:	Ten times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power.
Tonal noise:	Containing a prominent frequency and characterised by a definite pitch.

Appendix B Noise Modelling Checklist

Checklist item			Action
Road traffic input data			
Road name	**GnangaraRd (West of Alexander Dr) 2021/2022**		
	16-hr daytime road traffic volume		35710
	Percentage of heavy vehicles (daytime)		13
	8-hr night-time road traffic volume		2809
	Percentage of heavy vehicles (night-time)		10
Road pavement	Open Graded Asphalt		
Road traffic heights	Have the road emissions sources been modelled at the following heights?		Y
	Light and heavy vehicle tyre-road height at +0.5 m		Y
	Heavy vehicle engine height at +1.5 m		Y
	Heavy vehicle exhaust height at +3.6 m		Y
Traffic speed	What is the modelled road posted (signal) traffic speed?		80 km/h

Noise prediction corrections			
Traffic emission	If using the Calculation of Road Traffic Noise algorithms, have the following corrections been applied?		
	-0.8 dB correction to heavy vehicle engine emission?		Y
	-8.0 dB correction to the heavy vehicle exhaust emission?		Y
Road pavement	Has one of the following corrections been applied to the tyre/road emission?		Y
	14 mm chip seal	+3.5 dB	
	10 mm chip seal	+2.5 dB	
	5 mm chip seal	+1.5 dB	
	Dense graded asphalt	0.0 dB	
	Novachip	-0.2 dB	
	Stone mastic asphalt	-1.5 dB	
	Open graded asphalt	-2.5 dB	Y
Australian traffic	Has a -1.7 dB Australian Road Research correction or reasonable equivalent applied?		Y
Receptor façade	Has a +2.5 dB building façade correction been applied?		Y

Road noise barriers		
Noise barriers	Have noise barriers been modelled as being fully reflective?	N
	If noise barriers have not been modelled as being fully reflective, have absorptive barrier designs been considered?	Y

Environmental inputs		
Receivers	Were receiver heights modelled at 1.4 m above floor level?	Y
	Have noise levels been predicted at the most affected façade/s?	Y

Road traffic noise predictions		
Predicted noise levels	Have noise levels been predicted at all floors of the development?	Y
	Have the noise predictions considered the 20-year planning horizon?	Y

Appendix C Main roads Validation and Link Plot

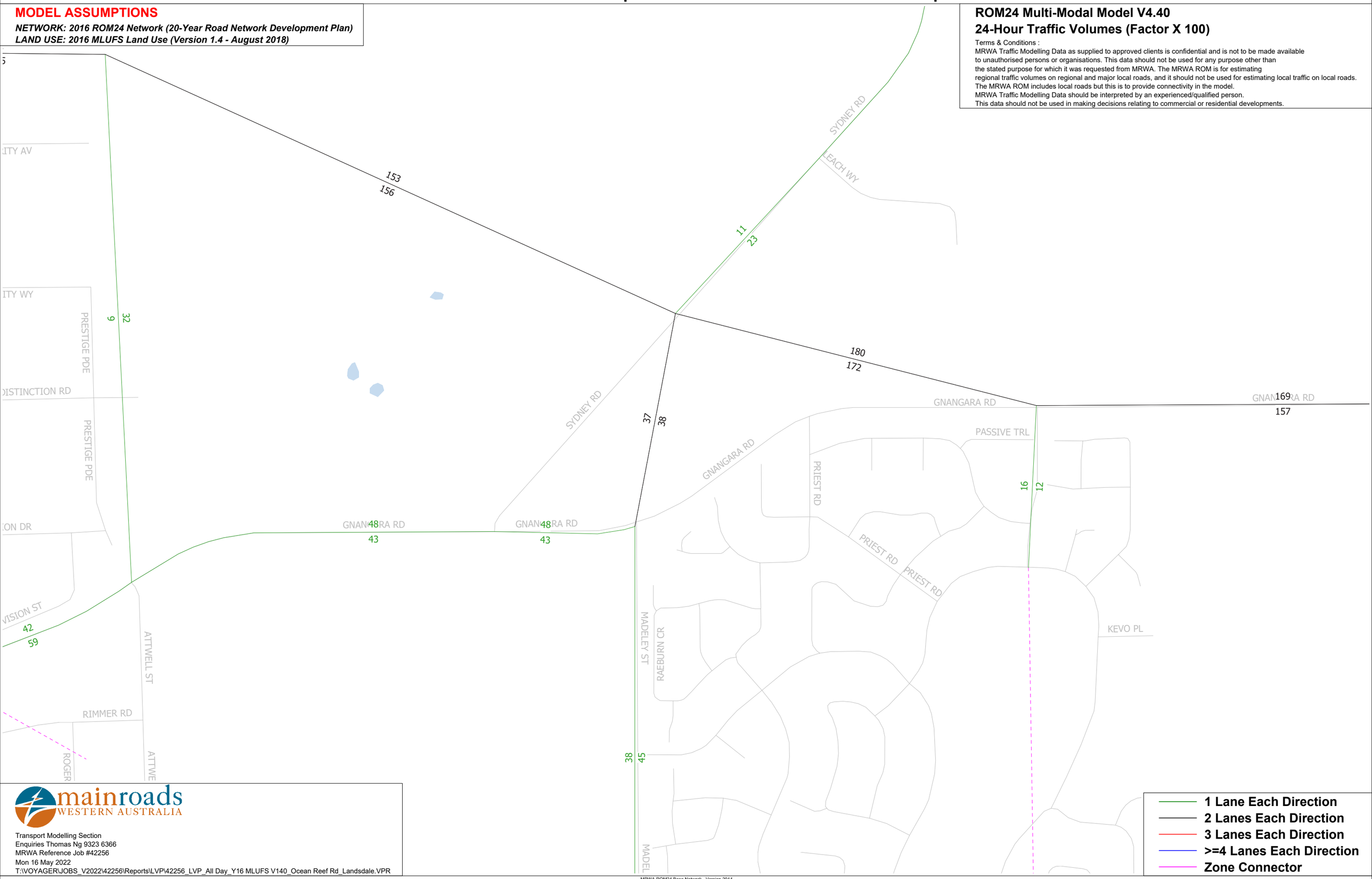
2016 ROM24 Scenario - Link Volume Plot for Ocean Reef Rd, Landsdale Noise Assessment
All Day
MLUFS Version 1.4 land use assumption with 20-Year Road Network Development Plan

MODEL ASSUMPTIONS

NETWORK: 2016 ROM24 Network (20-Year Road Network Development Plan)
LAND USE: 2016 MLUFS Land Use (Version 1.4 - August 2018)

ROM24 Multi-Modal Model V4.40
24-Hour Traffic Volumes (Factor X 100)

Terms & Conditions :
MRWA Traffic Modelling Data as supplied to approved clients is confidential and is not to be made available to unauthorised persons or organisations. This data should not be used for any purpose other than the stated purpose for which it was requested from MRWA. The MRWA ROM is for estimating regional traffic volumes on regional and major local roads, and it should not be used for estimating local traffic on local roads. The MRWA ROM includes local roads but this is to provide connectivity in the model.
MRWA Traffic Modelling Data should be interpreted by an experienced/qualified person.
This data should not be used in making decisions relating to commercial or residential developments.



mainroads WESTERN AUSTRALIA

Transport Modelling Section
Enquiries Thomas Ng 9323 6366
MRWA Reference Job #42256
Mon 16 May 2022
T:\VOYAGER\JOBS_V2022\42256\Reports\LVP\42256_LVP_All Day_Y16 MLUFS V140_Ocean Reef Rd_Landsdale.VPR

- 1 Lane Each Direction
- 2 Lanes Each Direction
- 3 Lanes Each Direction
- >=4 Lanes Each Direction
- Zone Connector

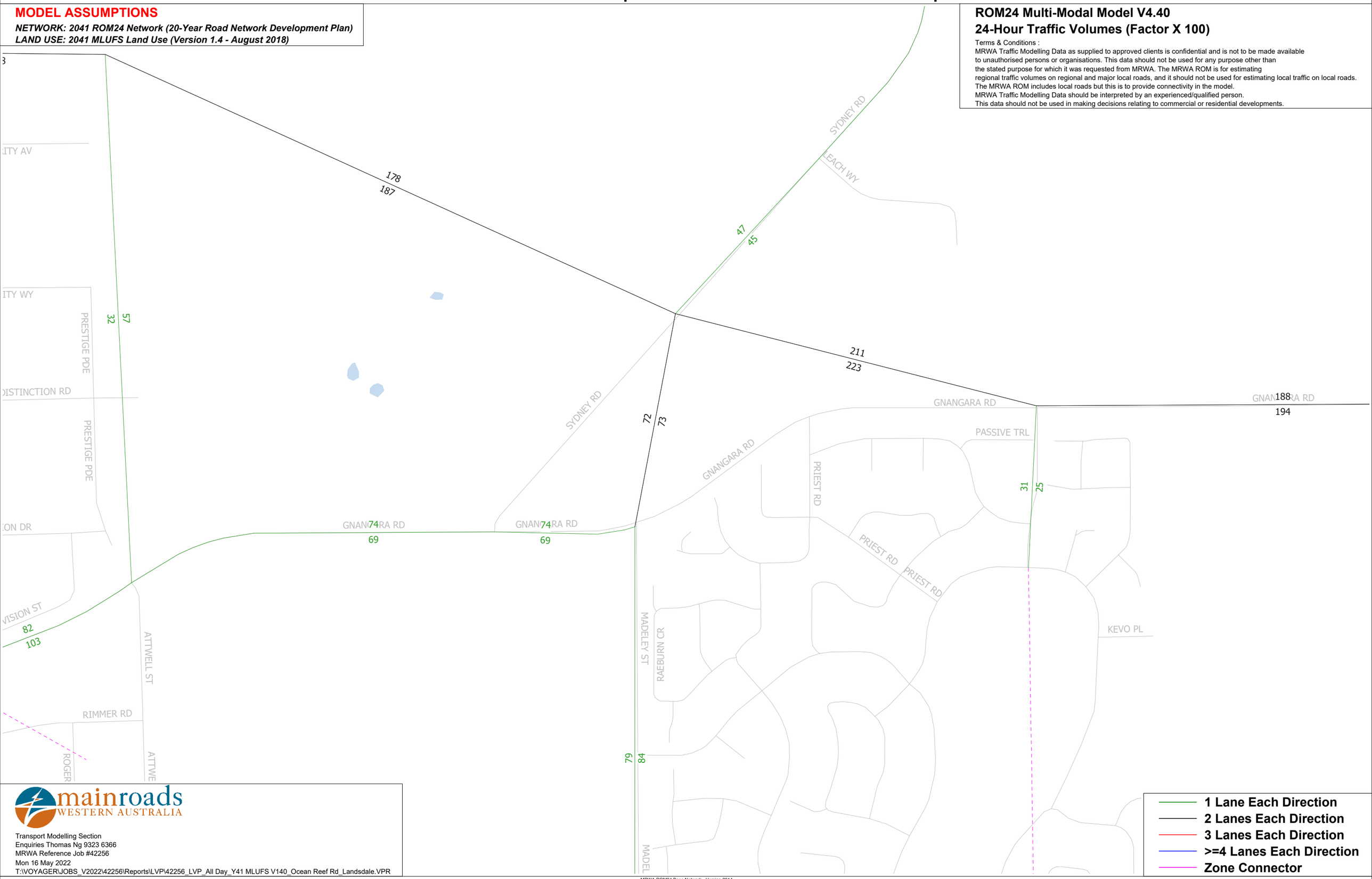
MRWA ROM24 Base Network - Version 2014

2041 ROM24 Scenario - Link Volume Plot for Ocean Reef Rd, Landsdale Noise Assessment
All Day
MLUFS Version 1.4 land use assumption with 20-Year Road Network Development Plan

MODEL ASSUMPTIONS

NETWORK: 2041 ROM24 Network (20-Year Road Network Development Plan)
LAND USE: 2041 MLUFS Land Use (Version 1.4 - August 2018)

ROM24 Multi-Modal Model V4.40
24-Hour Traffic Volumes (Factor X 100)



mainroads WESTERN AUSTRALIA

Transport Modelling Section
Enquiries Thomas Ng 9323 6366
MRWA Reference Job #42256
Mon 16 May 2022
T:\VOYAGER\JOBS_V2022\42256\Reports\LVP\42256_LVP_All Day_Y41 MLUFS V140_Ocean Reef Rd_Landsdale.VPR

MRWA ROM24 Base Network - Version 2014

cube (Licensed to)

2016 ROM24 Scenario - Validation Plot for Ocean Reef Rd, Landsdale Noise Assessment
All Day
MLUFS Version 1.4 land use assumption with 20-Year Road Network Development Plan

MODEL ASSUMPTIONS

NETWORK: 2016 ROM24 Network (20-Year Road Network Development Plan)
LAND USE: 2016 MLUFS Land Use (Version 1.4 - August 2018)

ROM24 Multi-Modal Model V4.40
24-Hour Traffic Volumes and Observed Counts

Terms & Conditions :
MRWA Traffic Modelling Data as supplied to approved clients is confidential and is not to be made available to unauthorised persons or organisations. This data should not be used for any purpose other than the stated purpose for which it was requested from MRWA. The MRWA ROM is for estimating regional traffic volumes on regional and major local roads, and it should not be used for estimating local traffic on local roads. The MRWA ROM includes local roads but this is to provide connectivity in the model.
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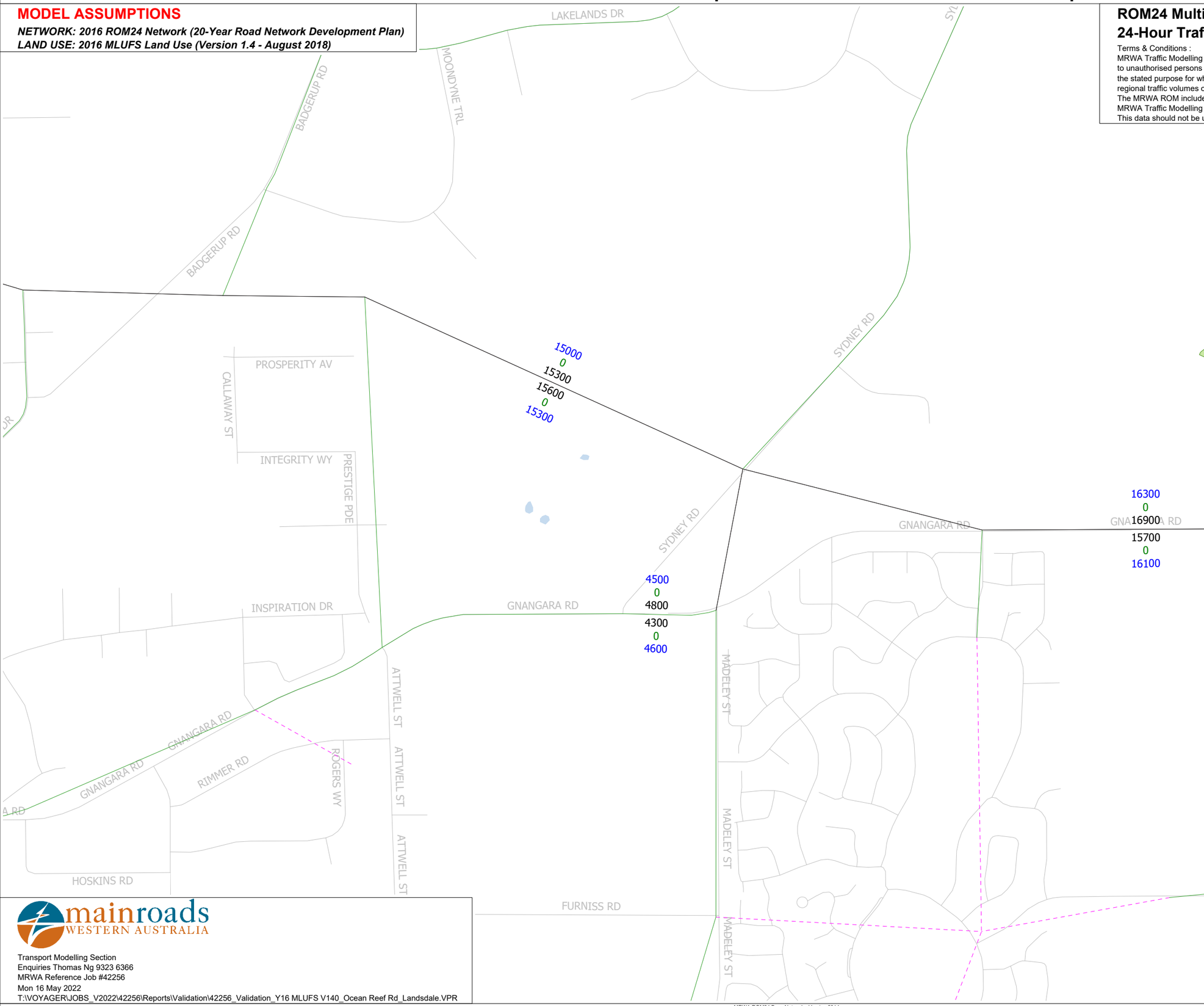
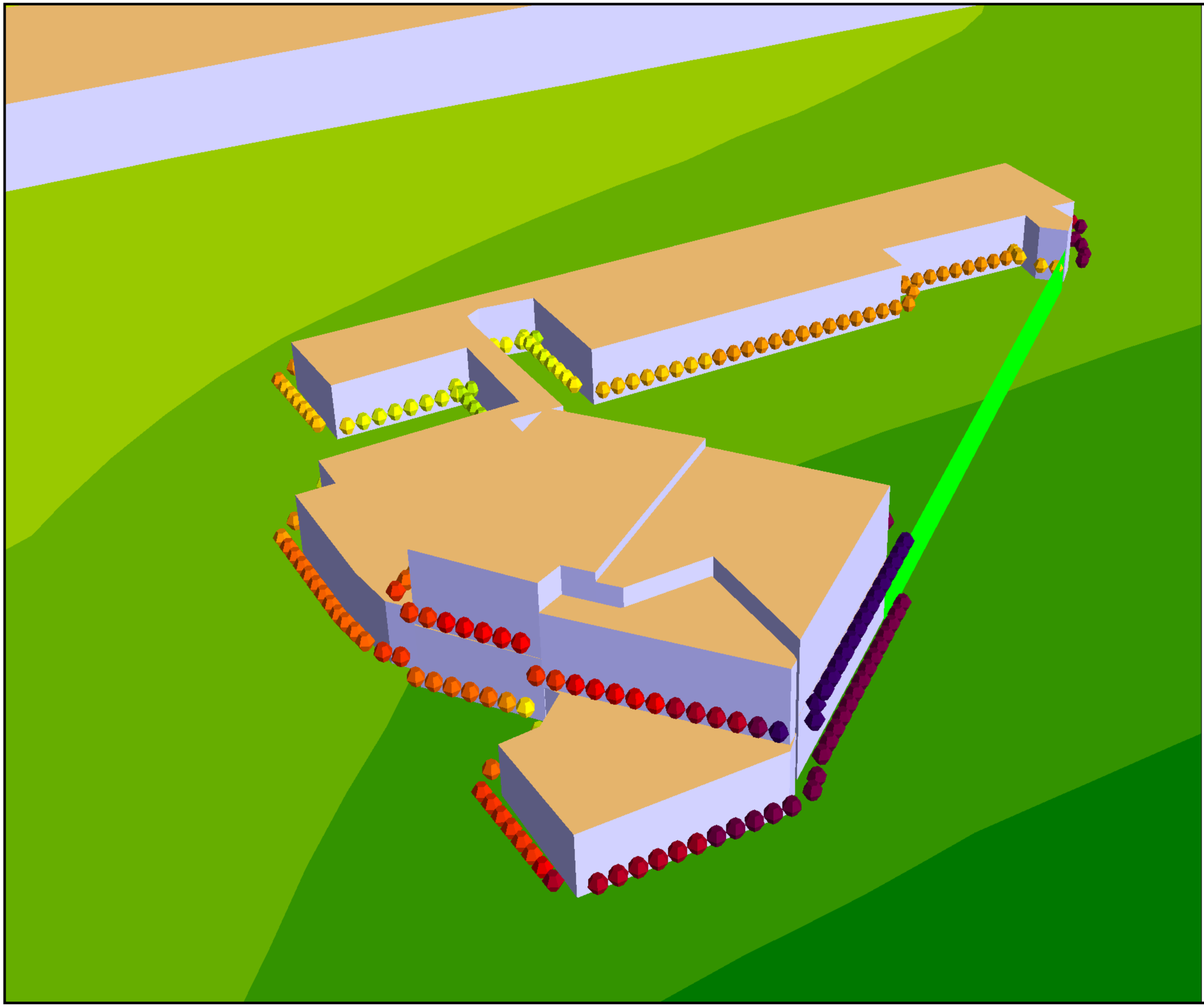


mainroads WESTERN AUSTRALIA

Transport Modelling Section
Enquiries Thomas Ng 9323 6366
MRWA Reference Job #42256
Mon 16 May 2022
T:\VOYAGER\JOBS_V2022\42256\Reports\Validation\42256_Validation_Y16 MLUFS V140_Ocean Reef Rd_Landsdale.VPR

MRWA ROM24 Base Network - Version 2014
MRWA Transport Modelling Data as supplied to approved clients is confidential and is not to be made available to unauthorised persons or organisations

Appendix D Noise Contours



Landsdale Childcare Centre

301251025
5/17/2022
JLM

FUTURE DAY TIME
SCENARIO (2042)

FACADE NOISE CONTOUR
(East)

Noise level
in dB(A)

	< 47.0
47.0 <=	< 49.0
49.0 <=	< 51.0
51.0 <=	< 53.0
53.0 <=	< 55.0
55.0 <=	< 57.0
57.0 <=	< 59.0
59.0 <=	< 61.0
61.0 <=	< 63.0
63.0 <=	< 65.0
65.0 <=	< 67.0
67.0 <=	< 69.0
69.0 <=	< 71.0
71.0 <=	< 73.0
73.0 <=	< 75.0
75.0 <=	< 77.0
77.0 <=	< 79.0
79.0 <=	

0 10 20 30 40 50 m

Stantec

Landsdale Childcare Centre

301251025
5/17/2022
JLM

FUTURE DAY TIME
SCENARIO (2042)

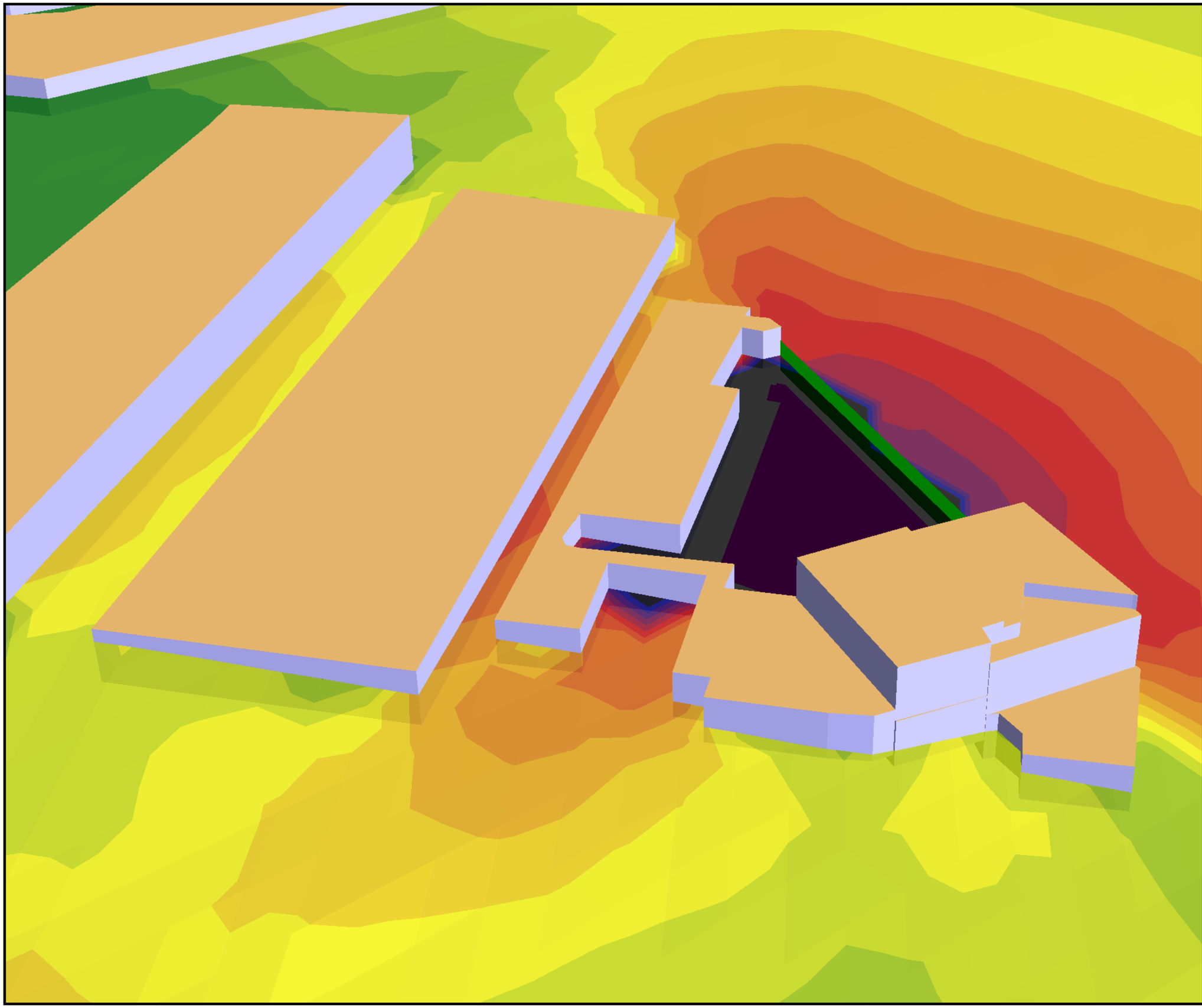
FACADE NOISE CONTOUR
(West)

Noise level
in dB(A)

	< 47.0
47.0 <=	< 49.0
49.0 <=	< 51.0
51.0 <=	< 53.0
53.0 <=	< 55.0
55.0 <=	< 57.0
57.0 <=	< 59.0
59.0 <=	< 61.0
61.0 <=	< 63.0
63.0 <=	< 65.0
65.0 <=	< 67.0
67.0 <=	< 69.0
69.0 <=	< 71.0
71.0 <=	< 73.0
73.0 <=	< 75.0
75.0 <=	< 77.0
77.0 <=	< 79.0
79.0 <=	

0 10 20 30 40 50 m

Stantec



Landsdale Childcare Centre

301251025
5/17/2022
JLM

OUTDOOR AREA
100% CAPACITY

NOISE CONTOUR AT
1.5m RECEIVER HEIGHT

Noise level
in dB(A)

	< 30.0
30.0 <=	< 32.0
32.0 <=	< 34.0
34.0 <=	< 36.0
36.0 <=	< 38.0
38.0 <=	< 40.0
40.0 <=	< 42.0
42.0 <=	< 44.0
44.0 <=	< 46.0
46.0 <=	< 48.0
48.0 <=	< 50.0
50.0 <=	< 52.0
52.0 <=	< 54.0
54.0 <=	< 56.0
56.0 <=	< 58.0
58.0 <=	< 60.0
60.0 <=	< 62.0
62.0 <=	< 64.0
64.0 <=	< 66.0

0 8 16 24 32 40 m

Stantec

Appendix E External Façade Mark Ups

Stantec

SKETCH TITLE BY: jalim

External Wall Mark Up

PROJECT No	SKETCH No	DATE	REV
301251025	AC-SK-001	05/18/2022	001

NOTE:
PLANS ARE SUBJECT T

LEGEND

EW - 1

EW - 2

Gnangara Road

Pollino Gardens

Priest Road

Concrete Footpath

DEEP PLANTING AREA

NOTE: RESTRICTIVE COVENANT. REFER TO SEC 150 P.D.A. SEE DOCUMENT (Restriction of Vehicular Access)

1100H BALUSTRADE WALL / BARRIER

EMERGENCY EXIT (PAVING)

STEPS UP FROM BASEMENT LEVEL

SECTION

SHADOW CAST ON THIS LOT BY FENCE ONLY. (NO OVERSHADOWING)

PROPOSED FFL TO ADJOINING LOT (SUBJECT TO CHANGE)

COT ROOM

STORE 5

ACTIVITY 5
0-2 YEARS
69.564m²

VERANDAH

EMERGENCY EXIT (PERMEABLE PATH)

NAPPY ROOM

PREP ROOM

OUTDOOR AREA (UNDERCOVER)

ACTIVITY 4
0-2 YEARS
66.803m²

STORE 4

STORE 3

WC

ACTIVITY 3
2-3 YEARS
67.628m²

OUTDOOR AREA (UNDERCOVER)

CLOTHESLINE ENCLOSURE

BINS (ROOF COVER)

CHILD CARE
FL 51.3

OUTDOOR AREA
701.852m²

ACTIVITY 1
3-5 YEARS
69.163m²

TOILETS

ACTIVITY 2
3-5 YEARS
69.077m²

STORE 1

CAFE
FL 51.3
106.798m²

LINE OF BATTENS & SLAB EDGE OVER

CANOPY ROOF OVER

LINE OF PROPOSED AWNING OVERHANGING THE BOUNDARY LINE.

NOTE: RESTRICTIVE COVENANT. REFER TO SEC 150 P.D.A. SEE DOCUMENT (Restriction of Vehicular Access)

NOTE: LOT SUBJECT TO ROAD CLOSURE AND ACQUISITION. SUBJECT TO SEPARATE D.A. APPLICATION.

L'DRY

I.T. & SERVER ROOM

STAFF WC

STAFF ROOM

ADMIN. STORAGE ROOM

PARENTS PICK-UP / LOUNGE

PORCH ENCLOSED w/- FENCE & GATE

FOYER

REC

ADMIN. / PRIVATE CONSULTATION

LOBBY

ENTRY

PAVED OUTDOOR AREA

RAISED PLANTER BOXES

PAVED PATH

RAMP (18.5%)

ALTERNATE REFUSE COLLECTION AREA FOR REAR LIFT BINS ON DESIGNATED BIN COLLECTION TIME / DAY.

RETAINING WALL

NOTE: MINIMUM 500mm CLEARANCE ZONE AROUND WESTERN POWER PILLAR REQUIRED.

PROPOSED VERGE PARKING
(TO OCCUR WHEN VERGE IS ADDED / AMALGAMATED TO THE ORIGINAL LOT)

FUTURE PARKING. NOT PART OF THIS APPLICATION.

CONTRAST PAVING

FOOTPATH TO CONTINUE AT GRADE THROUGH CROSSOVER

RECYCLING COLLECTION AREA FOR SIDE LIFT BINS

REFUSE COLLECTION AREA 1 FOR SIDE LIFT BINS

PSP- PRINCIPAL SHARED PATH

TO BE ADDED TO ORIGINAL LOT, TO CREATE 1 LOT.

Scale 1:200

0 2 4 6 8m

ISSUED FOR PLANNING AMENDMENT

Arasi CONSTRUCTIONS PTY. LTD.
A.C.N. 009 406 731
SUITE 6 / 19 OXLEIGH DRIVE, MALAGA, W.A. 6062
Ph: 9249 3333
Fax: 9249 3304

Project:
LANDSDALE MEDICAL

New residence on:
Lot 2 (#42)
POLLINO GARDENS
LANDSDALE

VARIATIONS / ISSUE

No	Description	Dwn	Date
1	REV 1 - FOR DISCUSSION & FEEDBACK		
2	REV 2 - FOR DISCUSSION & FEEDBACK		
3	REV 3 - APPROVED REVISIONS		
4	ISSUE 1 - PRELIMINARY PLANS 17/12/2021		
5	AMENDED PLANNING 02/02/2022		

GROUND FLOOR - CHILD CARE

SCALE 1 :200

JOB No.	COMMERCIAL	SHEET SIZE
15039	Custom Specification	A2
SHEET No. 2 of 7	Arasi Constructions Pty Ltd © COPYRIGHT	Rev. 8

Stantec

SKETCH TITLE BY: jalim

External Wall Mark Up

PROJECT No	SKETCH No	DATE	REV
301251025	AC-SK-001	05/18/2022	001

NOTE:
PLANS ARE SUBJECT TO CHANG

LEGEND

EW - 1

EW - 2

DISCLAIMER:
THIS DRAWING IS SUBJECT TO LOCAL AUTHORITY APPROVAL & RELEVANT AUTHORITY APPROVAL.
BUILDING SETBACKS ARE SUBJECT TO LOCAL AUTHORITY APPROVAL.

Scale 1:200
0 2 4 6 8m

ISSUED FOR PLANNING AMENDMENT

Arasi CONSTRUCTIONS PTY. LTD.
A.C.N. 009 406 731
SUITE 6 / 19 OXLEIGH DRIVE, MALAGA, W.A. 6062
Ph: 9249 3333
Fax: 9249 3304

Project:
LANDSDALE CHILDCARE

New residence on:
Lot 2 (#42)
POLLINO GARDENS
LANDSDALE

VARIATIONS / ISSUE

No	Description	Dwn	Date
1	REV 1 - FOR DISCUSSION & FEEDBACK		
2	REV 2 - FOR DISCUSSION & FEEDBACK		
3	REV 3 - APPROVED REVISIONS		
4	ISSUE 1 - PRELIMINARY PLANS 17/12/2021		
5	AMENDED PLANNING 02/02/2022		

VARIATIONS / ISSUE

No	Description	Dwn	Date

VARIATIONS / ISSUE

No	Description	Dwn	Date

FIRST FLOOR - MEDICAL CENTRE
SCALE 1 :200

JOB No.		SHEET SIZE
15039	COMMERCIAL Custom Specification	A2
SHEET No. 3 of 7	Arasi Constructions Pty Ltd 	Rev. 8

SKETCH TITLE BY: jalim

Ceiling Mark Up

PROJECT No	SKETCH No	DATE	REV
301251025	AC-SK-001	05/18/2022	001

NOTE:
PLANS ARE SUBJECT TO C

LEGEND

- CE - 1
- CE - 2
- CE - 3

PROPOSED FFL TO ADJOINING LOT (SUBJECT TO CHANGE)

CHILD CARE
FL 51.3
OUTDOOR AREA
701.852m²

ACTIVITY 5 0-2 YEARS 69.564m²
ACTIVITY 4 0-2 YEARS 66.803m²
ACTIVITY 3 2-3 YEARS 67.628m²
ACTIVITY 2 3-5 YEARS 69.077m²
ACTIVITY 1 3-5 YEARS 69.163m²
CAFE FL 51.3 106.798m²

COT ROOM
NAPPY ROOM
PREP ROOM
STORE 5
STORE 4
STORE 3
STORE 2
STORE 1
WC
TOILETS
ACC. WC
AMB. W.C.
LIFT
SERVICES
LOBBY
ENTRY
FOYER
REC
ADMIN. STORAGE ROOM
ADMIN. / PRIVATE CONSULTATION
PARENTS PICK-UP / LOUNGE
PREP KITCHEN
SCULLERY
FRONT OF HOUSE
STAFF ROOM
HIGHLIGHT WINDOW
L'DRY
Mop Racks (2x 5 Holders)
Cleaners Sink
Lockable Cabinets (Doors & Shelves)
I.T. & SERVER ROOM
STAFF WC
OUTDOOR AREA (UNDERCOVER)
VERANDAH
EMERGENCY EXIT (PERMEABLE PATH)
CLOTHESLINE ENCLOSURE
BINS (ROOF COVER)
TAP
PAVED OUTDOOR AREA
PAVED PATH
RAISED PLANTER BOXES
CANOPY ROOF OVER
PORCH ENCLOSED w/- FENCE & GATE
EMERGENCY EXIT (PAVING)
EMERGENCY EXIT
DEEP PLANTING AREA
DEEP PLANTING AREA
EMERGENCY EXIT (PAVING)
STEPS UP FROM BASEMENT LEVEL
SLOPE DOWN
COVERED STAIRS (REFER TO ELEVATION)
DOWN TO BASEMENT LEVEL
SILL @ 1400mm A.F.L.
SILL @ 1400mm A.F.L.
1100H BALUSTRADE WALL / BARRIER
1.0M HIGH WALL
RAMP
RAMP (18.5%)
TRANSITION (7.7%)
SECTION
RETAINING WALL
CONTRAST PAVING
FUTURE PARKING. NOT PART OF THIS APPLICATION.
PROPOSED VERGE PARKING
(TO OCCUR WHEN VERGE IS ADDED / AMALGAMATED TO THE ORIGINAL LOT)
FOOTPATH TO CONTINUE AT GRADE THROUGH CROSSOVER
RECYCLING COLLECTION AREA FOR SIDE LIFT BINS
REFUSE COLLECTION AREA 1 FOR SIDE LIFT BINS
ALTERNATE REFUSE COLLECTION AREA FOR REAR LIFT BINS ON DESIGNATED BIN COLLECTION TIME / DAY.
NOTE: MINIMUM 500mm CLEARANCE ZONE AROUND WESTERN POWER PILLAR REQUIRED.
LINE OF BATTENS & SLAB EDGE OVER
LINE OF PROPOSED AWNING OVERHANGING THE BOUNDARY LINE.
PSP- PRINCIPAL SHARED PATH
Concrete Footpath
Gnangara Road
Pollino Gardens
Priest Road

SHADOW CAST ON THIS LOT BY FENCE ONLY. (NO OVERSHADOWING)

NOTE:
RESTRICTIVE COVENANT.
REFER TO SEC 150 P.D.A.
SEE DOCUMENT (Restriction of Vehicular Access)

NOTE:
LOT SUBJECT TO ROAD CLOSURE AND ACQUISITION. SUBJECT TO SEPARATE D.A. APPLICATION.

TO BE ADDED TO ORIGINAL LOT, TO CREATE 1 LOT.
A
B

Scale 1:200
0 2 4 6 8m

ISSUED FOR PLANNING AMENDMENT

Arasi CONSTRUCTIONS PTY. LTD.
A.C.N. 009 406 731
SUITE 6 / 19 OXLEIGH DRIVE, MALAGA, W.A. 6062
Ph: 9249 3333
Fax: 9249 3304

Project:
LANDSDALE MEDICAL

New residence on:
Lot 2 (#42)
POLLINO GARDENS
LANDSDALE

VARIATIONS / ISSUE

No	Description	Dwn	Date
1	REV 1 - FOR DISCUSSION & FEEDBACK		
2	REV 2 - FOR DISCUSSION & FEEDBACK		
3	REV 3 - APPROVED REVISIONS		
4	ISSUE 1 - PRELIMINARY PLANS 17/12/2021		
5	AMENDED PLANNING 02/02/2022		

GROUND FLOOR - CHILD CARE
SCALE 1 :200

JOB No.		SHEET SIZE
15039	COMMERCIAL Custom Specification	A2
SHEET No. 2 of 7	Arasi Constructions Pty Ltd © COPYRIGHT	Rev. 8

SKETCH TITLE BY: jalim

Ceiling Mark Up

PROJECT No	SKETCH No	DATE	REV
301251025	AC-SK-001	05/18/2022	001

NOTE:
PLANS ARE SUBJECT TO CHANGE

NOTE:
LOT SUBJECT TO ROAD CLOSURE AND ACQUISITION. SUBJECT TO SEPARATE D.A. APPLICATION.

DISCLAIMER:
THIS DRAWING IS SUBJECT TO LOCAL AUTHORITY APPROVAL & RELEVANT AUTHORITY APPROVAL.
BUILDING SETBACKS ARE SUBJECT TO LOCAL AUTHORITY APPROVAL.

Scale 1:200
0 2 4 6 8m

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Ph: 9249 3333
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Project:
LANDSDALE CHILDCARE

New residence on:
Lot 2 (#42)
POLLINO GARDENS
LANDSDALE

VARIATIONS / ISSUE

No	Description	Dwn	Date
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VARIATIONS / ISSUE

No	Description	Dwn	Date

VARIATIONS / ISSUE

No	Description	Dwn	Date

FIRST FLOOR - MEDICAL CENTRE
SCALE 1 :200

JOB No.		SHEET SIZE
15039	COMMERCIAL Custom Specification	A2
SHEET No. 3 of 7	Arasi Constructions Pty Ltd © COPYRIGHT	Rev. 8

w

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Stantec

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