NOISE IMPACT ASSESSMENT

NEIGHBOURHOOD CENTRE

SERVICE STATION AND INDOOR SPORT AND RECREATION

1 -15 HALCYON WAY LOGAN RESERVE

Prepared for:
Logan Reserve Central Pty Ltd

Prepared by:
MWA Environmental

6 May 2022

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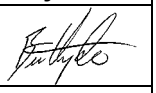
1 Report	06.05.2022	ES		BH	
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1.0 INTRODUCTION

1.1 Scope of Assessment

MWA Environmental has been engaged to prepare a Noise Impact Assessment for a development application for Material Change of Use for a Neighbourhood Centre development at 1- 15 Halcyon Way, Logan Reserve. There is an existing development approval for a Neighbourhood Centre including retail outlets (shops) and a childcare centre at the site. This development application seeks to amend the Neighbourhood Centre development to include service station with speciality store, childcare, health care services, food and drink outlet, indoor sport and recreation and shop.

MWA Environmental has previously prepared the report *'Noise Impact Assessment, Proposed Neighbourhood Centre and Childcare Centre'* dated 22 December 2017 and subsequent report for a minor change application on 26 April 2022 in support of the currently approved development.

This development application assessment methodology is consistent with the original reporting with additional assessment of noise from food and drink outlet, service station and indoor sport and recreation (gym). The method of assessment has included site inspections, ambient noise measurements, derivation of appropriate noise criteria and noise predictions on the basis of the proposed uses.

The scope of this report includes consideration of the impacts of on-site activities to determine compliance with relevant criteria and any necessary noise mitigation measures to achieve compliance with these criteria at the nearest noise sensitive zone boundaries.

1.2 Site Description

The subject site is bounded by Logan Reserve Road to the west and a historical cemetery access pathway along the southern boundary. Existing and future residential uses are to the north and south of the neighbourhood centre with approved childcare centre and Arcare Aged Care accommodation adjacent the eastern side of the development.

The real property description for the site is Lot 2 on SP292432. The site location is shown on **Figure 1**.

The site and surrounding land zoning is Emerging Community and Recreation and Open Space zone under the Logan City Council Planning Scheme 2015. An aerial photo showing the existing site and surrounding land uses is included as **Figure 2.** The current zoning is shown on **Figure 3**.

The acoustic environment at the site and surrounds is relatively quiet with traffic noise from Logan Reserve Road being the primary influence. Ongoing development of the surrounding residential land to the north, east and south in addition to substantial developments in the broader locality will progressively increase ambient noise levels.

1.3 Proposed Development

The development application seeks approval for:

Building B: Service Station & Speciality

Building D: Change Retail / Commercial Tenancy to Indoor Sport and Recreation (Gym)

Whilst not forming part of this application, this report assumes that the Food and Drink Outlet, Retail and Commercial Activities (Buildings A, C and D) currently being assessed as MCUC/56/2022 and the Childcare Centre currently being assessed as COM/69/2017/A are approved.

The assessed childcare centre operating hours are 6am to 10pm as per the original noise assessment, with outdoor play area use to be restricted to the 7am to 6pm period.

Vehicular ingress and egress will remain via Halcyon Way at the northern boundary with a new access directly to Logan Reserve Road.

The assessed retail and commercial uses will operate within the 7am to 10pm period with the food and drink to trade 24 hours a day, 7 days a week as per the original noise assessment.

The proposed service station with attached specialty store and indoor sport and recreation (gym) are proposed to trade 24 hours a day, 7 days a week.

The proposed site plan is shown on **Attachment 1.**

The development will incorporate appropriate amenity controls, in the form of site layout, acoustic treatment of fixed plant and equipment, acoustic barriers and/or screens and restriction of hours of use to ensure that the proposal does not adversely impact on amenity of the nearest sensitive zone boundaries.

2.0 AMBIENT NOISE LEVELS

In order to characterise the existing noise environment and determine ambient background noise levels, noise measurements were undertaken at the site by MWA Environmental.

Ambient noise monitoring was undertaken at a location considered representative of the ambient noise levels at the nearest noise sensitive receptor. The noise measurement location is shown on **Figure 4**. Monitoring occurred continuously between 5 to 12 April 2022.

The noise datalogger used was an Rion NL22 noise datalogger, pre-calibrated to 94 dB at 1kHz using a Sound Level Calibrator. At post-calibration, the datalogger exhibited less than ±0.5 dB deviation. The microphone was positioned at a height of 1.2 metres above ground level and fitted with a windshield throughout the recording period. An averaging time of 15 minutes was adopted. The weather was mostly fine with minor rainfall and wind during the noise measurement period. Periods of rainfall was recorded on the 8th and 10th of April and thus the recorded noise levels with evidence of rain effect on these days were removed from assessment.

Based on site observations the acoustic environment at the residential area is characterised by road traffic noise from Logan Reserve Road.

The recorded noise levels are presented as statistical components, which are described as:

L_1: Noise level exceeded for 1 percent of the measurement period, referred to as the adjusted maximum sound pressure level.

L_{10}: Noise level exceeded for 10 percent of the measurement period, referred to as the averaged maximum sound pressure level.

L_{90}: Noise level exceeded for 90 percent of the measurement period. AS1055.1–1997[1] notes that the L_{90} is described as the background sound pressure level.

L_{eq}: An “average” measurement, and as per AS1055.1–1997 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.

Table 1 presents a summary of the recorded noise levels for daytime (7am-6pm), evening (6pm-10pm) and night-time (10pm-7am) for parameters L_1, L_{10}, L_{90} and L_{eq}. Graphical representations of noise level verses time are provided in **Attachment 2**.

[1] Australian Standard *AS 1055.1-1997 Acoustics – Description and measurement of environmental noise, Part 1: General procedures*

Table 1: **Recorded Noise Level Ranges (dB(A))**
5 to 12 April 2022

PARAMETER	PERIOD	RECORDED NOISE LEVELS - dBA		
		MINIMUM	MAXIMUM	AVERAGE
L_1	Daytime (7am-6pm)	53.3	74.7	62.8
	Evening (6pm-10pm)	52.1	61.8	56.6
	Nighttime (10pm-7am)	44.4	68.3	54.5
L_{10}	Daytime (7am-6pm)	47.3	59.6	53.8
	Evening (6pm-10pm)	46.8	54.3	50.9
	Nighttime (10pm-7am)	38.4	58.4	48.8
L_{90}	Daytime (7am-6pm)	39.4	51.8	45.0
	Evening (6pm-10pm)	38.4	50.3	43.6
	Nighttime (10pm-7am)	33.6	53.2	40.7
L_{eq}	Daytime (7am-6pm)	44.8	60.3	52.4
	Evening (6pm-10pm)	44.3	54.0	48.9
	Nighttime (10pm-7am)	37.1	56.5	46.3

The recent noise monitoring undertaken as compared to the 2017 data demonstrates an increase in the ambient noise at the locality which was expected due to extensive residential development and new infrastructure.

Therefore, using the latest background noise monitoring results, the relevant Logan Planning Scheme 2015 noise assessment criteria have increased from the previous assessments based upon the 2017 data.

3.0 ASSESSMENT NOISE CRITERIA

Under the Logan City Council Planning Scheme 2015 (LPS 2015) the subject site is zoned Emerging Community and shares a boundary with similarly zoned land parcels. As such, the Residential Amenity Noise Criteria applies to the operations of the site as per Table 3.2.1.1 (below) of the Logan Planning Scheme 2015 Planning Scheme Policy 3 – Environmental Management for protection of residential amenity in Emerging community zone.

Table 3.2.1.1—Noise emission standards for the protection of residential amenity

Noise level at the boundary of premises			
Noise type	Time period	Monday to Saturday	Sunday and public holidays
Non-steady sound*	Day 7:00am – 6:00pm	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)
	Evening 6:00pm to 10:00pm	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 5 dB(A)
	Night 10:00 – 7:00am	$L_{Aeq,adj,T} \leq L_{A90}$ plus 0 dB(A) and $L_{Amax} \leq$ 60dB(A)	$L_{Aeq,adj,T} \leq L_{A90}$ plus 0 dB(A) and $L_{Amax} \leq$ 60dB(A)
Continuous noise*	Anytime	$L_{A90,T}$ plus 0dB(A)	$L_{A90,T}$ plus 0dB(A)

Editor's note—* as defined in AS1055.1-1997 Acoustics –Description and measurement of environmental noise

Note—Adjustments for tonality and impulsiveness to be included in accordance with AS1055.1-1997 Acoustics— Description and measurement of environmental noise.

3.1 Applicable Noise Limits

Based upon the measured noise levels and applicable noise criteria, the following noise limits are adopted for this assessment:

Table 2: Noise Criteria

Period	**Day 7am to 6pm**	**Evening 6pm to 10pm**	**Night 10pm to 7am**
	L_{A90} – dB(A)		
Continuous Noise	45	44	41
	L_{Aeq}(1hr) – dB(A)		
Non-steady Sound	50	49	41
	L_{Amax} – dB(A)		
Non-steady Sound	-	-	60

4.0 NOISE IMPACT ASSESSMENT

4.1 Continuous Noise Sources - Plant and Equipment Noise

The noise criteria to be adopted for the new plant and equipment noise assessment is background plus excess criteria as outlined in *Policy 3 – Environmental Management - Table 3.2.1.1* for continuous noise. To provide a conservative assessment, the existing night-time background (L_{90}) noise levels recorded by the noise datalogger have been adopted for the purpose of this assessment:

Table 3: Adopted Continuous Noise Criteria – dB(A)

Time Period	Ambient Night-time L_{90} Noise Level – dB(A)	Adopted Continuous Noise Criterion L_{Aeq} – dB(A)
Anytime	41	41

The above criteria are appropriate for noise of plant and equipment such as air-conditioning units, refrigeration equipment, exhaust fans and similar equipment typical to a service station and retail/ commercial development.

The noise criteria adopted in **Table 3** reflect the maximum allowable noise level at residential amenity zones of **41 dB(A)** for night-time periods as a conservative basis for design of plant and equipment. It is recognised that the service station will have mechanical plant such as refrigeration equipment that will operate 24 hours.

As such, any mechanical plant and equipment associated with the proposed development should be located and acoustically treated and/or shielded to achieve the noise limit to surrounding zone boundaries. This design standard can be achieved with appropriate plant layout, plant selection and acoustic treatment measures.

The noise limits do not necessarily apply to a single item of plant, but rather should constitute the additive noise component levels of all plant and equipment proposed and in operation during the assessed period, measured at the nearest residential receptor(s).

The detailed design of the plant area requirements has not yet been determined but experience with other similar developments provides a basis for assessment of the likely designs that may be used.

The proposed uses may have roof mounted mechanical plant deck. Any roof mounted plant will likely require acoustic screening around the perimeter of the plant area to a nominal height of 600mm above the tallest plant for all proposed roof top plant.

Based upon typical requirements for mechanical plant for similar developments, the following mechanical plant items were represented in the SoundPLAN model:

Childcare Centre
2 x package air-conditioning units - 78 dB(A) SWL

Building C and D
1 x package air-conditioning unit per tenancy - 78 dB(A) SWL
3 x package air-conditioning for Gym - 78 dB(A) SWL

Food and Drink
1 x refrigeration unit - 83 dB(A) SWL
2 x package air-conditioning units - 78 dB(A) SWL
Kitchen exhaust fan – 76.5 dB(A) SWL
Washup exhaust fan – 69.5 dB(A) SWL
Toilet exhaust fan – 53.7 dB(A) SWL

Service Station and Speciality Store
1 x refrigeration unit - 83 dB(A) SWL
3 x package air-conditioning units - 78 dB(A) SWL
2 x Exhaust fan –72.7 dB(A) SWL

The predicted resultant mechanical plant noise levels at the most exposed sensitive zone boundaries are summarised in **Table 4** below. The results of the continuous sources noise modelling as noise contour maps of the predicted noise levels across the model domain are presented in **Attachment 3**.

Table 4: Predicted Mechanical Plant Noise Levels

RECEPTOR	PREDICTED MECHANICAL PLANT NOISE LEVEL NIGHT-TIME – dB(A)
East – Aged Care Centre (Emerging Community Zone)	32
South – Future Residential (Emerging Community Zone)	38
North – Future Residential (Emerging Community Zone)	34
West – Future Residential (Emerging Community Zone)	38
CRITERION	***41***

The predicted noise levels demonstrate that the relevant noise criteria can be achieved. At the detailed design phase mechanical plant selections, locations and acoustic treatments shall be assessed to achieve the design noise limit.

4.2 Non-Steady Noise Sources - Site Traffic, Servicing Arrangement, Carparking and Operational Noise Activities

This section addresses potential noise amenity impacts from the time-varying short duration noise sources (non-steady) due to vehicle movements, outdoor play area, servicing activities, gym noise, order point system and carparking noise associated with the proposed uses. The noise sources are likely to include:

- slow-speed vehicle movements on-site;
- carparking noise;
- childcare centre outdoor play area noise;
- drive-through order point speakers;
- gymnasium noise (amplified speakers and patrons)
- slow-speed truck movements (delivery vehicle); and
- servicing activities (airbrake, reversing beeper, refuse collection, unloading noise).

The noise criteria applied by Logan City Council in assessing non-steady noise from a development are that the L_{Aeq} noise from the development are not to exceed the existing ambient background noise levels by more than 5 dB(A) during the daytime and evening periods and by more than 0 dB(A) during the night-time period.

The projected peak hour traffic volumes through the site have been based on traffic engineering advice provided to MWA Environmental by Bitzios Consulting traffic engineers as summarised in **Table 5**. Bitzios has advised that it is assumed that 75% of the total GFA would be commercial and the remaining 25% as retail.

Table 5: Peak On-Site Traffic Generation

USE	TRAFFIC GENERATION RATE	QUANTITY	TOTAL PEAK HOUR TRAFFIC GENERATED
Childcare Centre	0.45 trips/enrolment	116 children	52
Retail	12.3 trips/100sq.m GFA	218 m^2	27
Commercial	1.6 trips/100sq.m GFA	652 m^2	10
Food and Drink	Trips/tenancy	1	100
Service Station	66 Trips / 100 m^2 GFA	200 m^2	132
Indoor Sport and Recreation	9.5 Trips / 100 m^2 GFA	550 m^2	52
Total Trip Generation			**373**

Servicing and deliveries will generally be conducted at the allocated loading areas for each building. One loading and refuse collection areas is provided to the eastern side of Building C, one at the western side of Building A and a shared loading zone along the southern boundary to be used by the speciality store and Building B and D.

Servicing for the childcare centre will be conducted by van or SRV at the allocated service bay to the south-eastern part of the childcare building within the proposed carparking area.

Access to the loading areas will be via the vehicle entrance and exit points via Halcyon Way to the north and the new Entry 3 to Logan Reserve Road.

For the purpose of this assessment, all servicing activities are assumed to be conducted by MRV or larger vehicles, including refuse collection. Deliveries by van and SRV may be undertaken on a 24 hour basis.

SoundPLAN model was conservatively setup to consider servicing activities for the site as two heavy service vehicle movements (i.e. two loads) per hour for each loading area with one refuse collection per hour concurrent with peak passenger vehicle traffic.

Servicing arrangements for the proposed retail/ commercial and food and drink are assessed to be the limited to the day and evening periods only (7am to 10pm), including refuse collection.

Bulk refuelling tanker deliveries were modelled as one delivery per hour be the limited to day and evening periods only (7am to 10pm).

The childcare centre design includes outdoor play areas which have been represented using the SoundPLAN computer model consistent with the recent Minor Change application reporting. The outdoor play noise has been modelled as an area source over the entire outdoor play area with sound power levels assigned based upon different ages groups. A conservative estimate is that half the children from each age group will simultaneously use the play area during daytime hours 7am to 6pm.

Source noise levels for vehicle movements, operational activities, outdoor play, car parking and servicing activities have been recorded by MWA Environmental and others and the sound power levels (SWLs) are summarised in **Table 6** below.

Table 6: Summary of Non-steady Noise Sources

Noise Source	SWL – dB(A)		Source Height (m)
	L_{eq}	L_{max}	
Food and Drink car movement	49/m[2]	89	0.5
Food and Drink drive-thru	52/m[3]	89	0.5
Order point	81.6	84.6	1.0
Paybooth	77.9	80.9	1.0
Food and Drink carparking	79.2[4]	89	0.5
Retail/ Childcare car movement	46/m[5]	89	0.5
Retail car parking	86.2[6]	89	0.5
Childcare car parking	74.8-89.7[7]	89	0.5
Slow moving truck	61/m[8]	99	2.5
Truck loading per loading area	76	98	2.0
Refuse Collection per loading area	82	101	2.0
Reversing Beeper per loading area	103[9]	103	1.0
Carpark conversation noise	85.4	90.4	1.5
Outdoor play area	95.1[10]	95.1	1.0
Bulk refuel tanker	64/m[11]	101	2.5
Tanker airline bleed	110[12]	110	0.5
Service Station car parking	78.1 [13]	90	0.5
Bowser car parking (includes car starts / door slams)	83.8 [14]	90	0.5
Service station car movement	49 dB/m [15]	89	0.5
Pump bowsers	62.5	65.5	1.0

[2] SWL per vehicle movement at 10km/hr, adjusted for peak hour traffic generation of 100 trips which is reduced to 50% for evening period and 25% for night-time period.

[3] SWL per vehicle movement at 5km/hr, adjusted for 70% of peak hour traffic using drive-thru facility which is reduced to 50% for evening period and 25% for night-time period.

[4] Represents 0.5 carparking bay movements per bay per hour during day period, 0.25 per bay during evening and 0.1 per bay during night-time for 33 carparking bays.

[5] SWL per vehicle movement at 20km/hr, adjusted for peak hour traffic generation of 113 trips which is reduced to 50% for evening period.

[6] Represents 1 carparking bay movements per bay per hour during day period and 0.5 per bay during evening for the retail/ commercial uses for 90 carparking bays.

[7] Represents 1.5 carparking bay movements per bay per hour during day period and 0.75 per bay during evening and night-time for 35 parking bays

[8] Based on 2 truck movement per hour. Truck source levels includes reversing beeper and airline bleed.

[9] SWL adjusted for 30 second noise event per servicing event.

[10] Based on 32 children aged 0-2 years, 62 children aged 2-3 years and 22 children aged 3-5 years.

[11] SWL per tanker movement at 5km/hr

[12] SWL adjusted for 3 second noise event per servicing event.

[13] 13 parking bays with a peak turnover rate of 1 movement per hour per bay during day period and 0.5 movement per hour per bay during evening and 0.25 movement per hour per bay during night period.

[14] 8 bowsers bays with a peak turnover rate of 6 movement per hour per bay during day period and 3 movement per hour per bay during evening and 1.5 movement per hour per bay during night period.

[15] SWL per vehicle movement distributed across the site based on Table 5 traveling at average 10km/hr

The development includes a proposed indoor sport and recreational use within Building D which would likely be a gymnasium. This assessment has considered the proposed gymnasium as a 24 hours a day, 7 days a week use. The gymnasium would have fitness and training activities including, personal training, use of exercise machines, weights and group/ individual gym activities.

MWA Environmental has previously measured internal noise source level of a fitness centre during a group fitness class which included noise source from the instructor, patrons, background music and equipment use. The proposed gym has been modelled as an industrial building source with internal noise sources as follows:

- Area source of patron noise – 94 dB(A) SWL for 100 patrons at any one time
- Point source for speaker noise – 90 dB(A) at 3 metres.

For the purpose of the noise model, it has been assumed that the internal noise levels including instructor noise, background music, patron noise and gym activities remained at a constant level throughout a 1 hour period for all periods of the day. In reality, where classes are not occurring, noise levels are significantly lower most of the time when the instructors are not speaking and music is at lower levels.

The gym noise has been modelled as an industrial building source in SoundPLAN. The Sound Transmission Loss (STL) through the walls, roof and doors of the source building have been adopted as per **Table 7** above.

Table 7: Modelled Building Component Sound Transmission Loss

CONSTRUCTION ELEMENT	SOUND TRANSMISSION LOSS - dB(A) FREQUENCY BAND (Hz)								Rw
	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
Roof (steel cladding with insulation and plasterboard)	-	13	21	35	42	50	-	-	**36**
Rear Doors (closed)	-	15	17	22	27	32	38	-	**27**
Front Glazing – 6.38mm	19	20	22	28	34	40	34	34	**32**
Concrete External Walls	22	36	36	41	51	59	65	65	**47**

The SoundPLAN noise model has been utilised to determine appropriate noise barrier heights to achieve the adopted noise criteria. Based upon the modelling undertaken it is recommended that a **2.0 to 2.5 metre high acoustic barrier** be constructed along the southern boundary with a **2.0 metre high acoustic barrier** be constructed along the eastern boundary of the subject site on top of any retaining wall structures**.**

The location and alignment of the recommend acoustic barriers are presented in **Figure 5**. The recommended acoustic barriers and operational noise control measures (i.e. no servicing to be conducted during night-time period) have been represented in the modelling.

The SoundPLAN model predicted the resultant noise levels of the above retail / commercial, indoor sport and recreation, childcare centre and food and drink noise sources at the nearest zone boundaries. The predicted L_{Aeq} and L_{Amax} noise levels during the day (7am to 6pm) evening (6pm to 10pm) and night periods (10pm – 7am) are summarised in **Table 8**.

The results of the non-steady source noise modelling are presented in **Attachment 4** as contours of the predicted L_{Aeq} and L_{Amax} noise levels across the model domain.

Table 8: Predicted Non-Steady Noise Levels

Receptor	Predicted Noise Level			
	L_{Aeq} dB(A) Day	**L_{Aeq} dB(A) Evening**	**L_{Aeq} dB(A) Night-time**	**L_{Amax} dB(A) Night-time**
East – Aged Care Centre (Emerging Community Zone)	50	43	38	54
South – Future Residential (Emerging Community Zone)	49	49	39	58
North – Future Residential (Emerging Community Zone)	48	46	39	48
West – Future Residential (Emerging Community Zone)	47	46	35	44
CRITERIA	**50**	**49**	**41**	**60**

The predicted L_{Aeq} and L_{Amax} night-time noise levels comply with the adopted noise criteria based upon the proposed operating hours, structural noise control measures and the restriction of heavy vehicle servicing activities.

5.0 CONCLUSION

MWA Environmental has been engaged to prepare a Noise Impact Assessment for a development application for Material Change of Use for a Neighbourhood Centre development at 1- 15 Halcyon Way, Logan Reserve. There is an existing development approval for a Neighbourhood Centre including retail outlets (shops) and a childcare centre at the site. This development application seeks to amend the Neighbourhood Centre development to include retail outlets, childcare, health care services, food and drink outlet, service station, indoor sport and recreation and shop.

MWA Environmental has previously prepared the report *'Noise Impact Assessment, Proposed Neighbourhood Centre and Childcare Centre'* dated 22 December 2017 and subsequential report for a minor change application on the 26 April 2022 in support of the currently approved development.

The scope of this report includes consideration of the impacts of on-site activities to determine compliance with relevant criteria and any necessary noise mitigation measures to achieve compliance with these criteria. The assessment methodology is consistent with the original reporting with additional assessment of noise from service station with speciality store and indoor sport and recreation uses.

The assessment has determined the appropriate noise criteria for plant and equipment associated with the development. The assessment has demonstrated that plant and equipment can be selected, located and/or acoustically treated to achieve the relevant noise amenity criteria. Detailed assessment of mechanical plant noise shall be undertaken at the detailed design stage of the project.

Assessment of the impact of noise from car parking activities, service vehicles, loading activities, gymnasium (amplified speakers) and drive-thru order point noise has determined that the relevant amenity outcomes can be achieved with the recommendation of the following noise control measures:

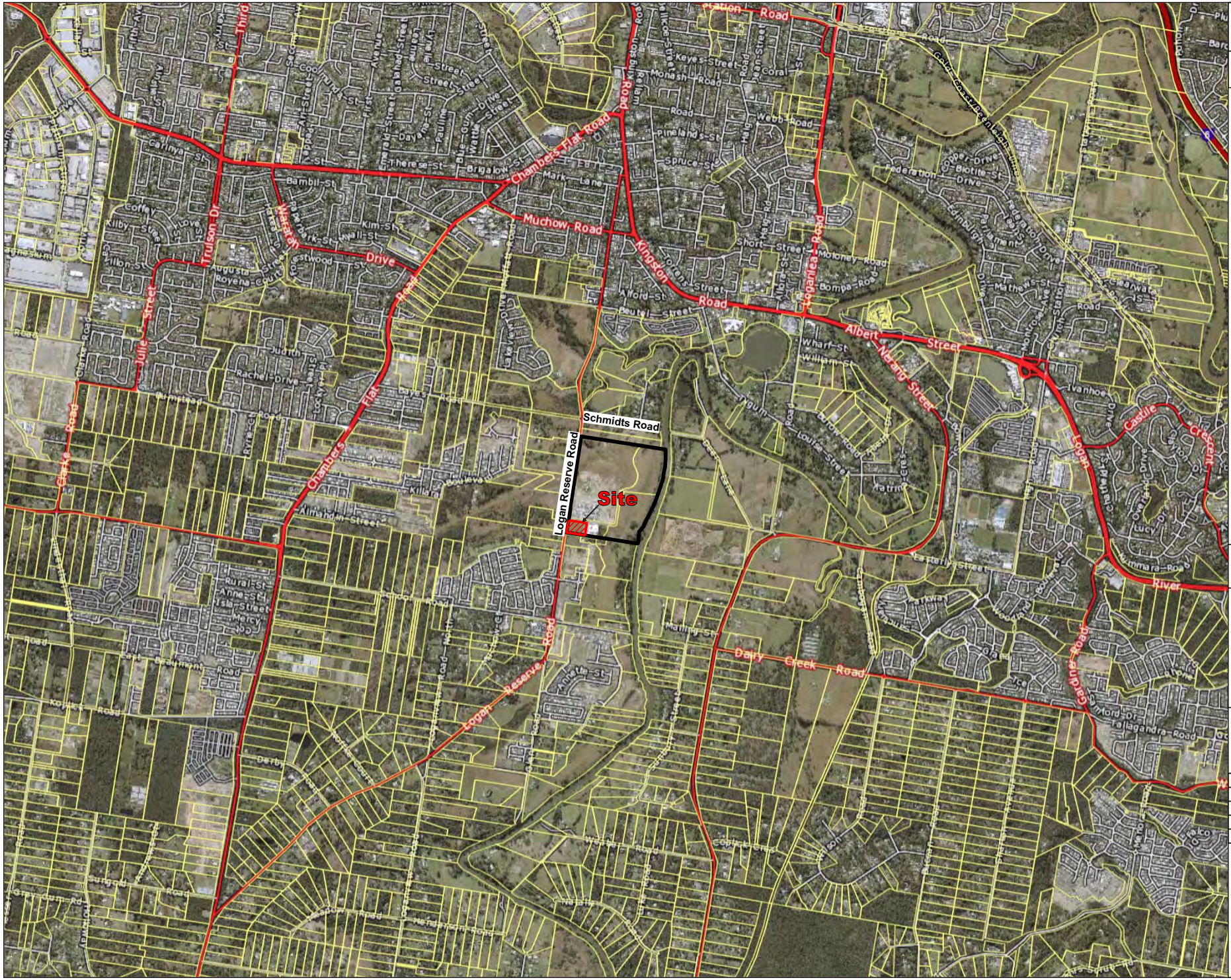
- **2.0 to 2.5 metre high acoustic barrier** be constructed along the southern boundary on top of any retaining wall structure;
- **2.0 metre high acoustic barrier** be constructed along the eastern boundary on top of any retaining wall structure**;**
- Servicing (deliveries) by heavy vehicles for the are to be limited to the day and evening periods (7am and 10pm) only;
- Bulk refuelling for the service station to be limited to the day and evening periods (7am and 10pm) only; and
- Deliveries by van and SRV may be undertaken on a 24 hour basis.
- The proposed indoor sport and recreational building to be constructed with materials to meet the minimum Rw as specified in **Table 7** of this report

The extents of the proposed acoustic barriers are shown on **Figure 5**. Any acoustic barrier/ wall constructed should be gap free and constructed of materials achieving a minimum surface density of 12.5 kg/m^2.

In summary the assessment undertaken demonstrates that the proposed development can operate in accordance with the relevant amenity standards and is recommended for approval with reasonable and relevant conditions.

MWA Environmental
6 May 2022

FIGURES



LEGEND

PROPERTY BOUNDARY

SUBJECT SITE BOUNDARY

DRAWING REFERENCE

N

0 0.5 1km

CLIENT

LOGAN RESERVE CENTRAL PTY LTD

PROJECT

NOISE IMPACT ASSESSMENT

NEIGHBOURHOOD CENTRE INDOOR SPORTS AND RECREATION AND SERVICE STATION
1-15 HALCYON WAY
LOGAN RESERVE QLD

TITLE

SITE LOCATION

JOB	LOGAN RESERVE	**FIGURE 1**
JOB NO.	17-166	
DATE	29/04/22	DWG NUMBER
SCALE	1:40000 (A4)	**17-166-DA2-1**
REV.		

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LEGEND

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SUBJECT SITE BOUNDARY

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LOGAN RESERVE CENTRAL PTY LTD

PROJECT
NOISE IMPACT ASSESSMENT
NEIGHBOURHOOD CENTRE
INDOOR SPORTS AND RECREATION
AND SERVICE STATION
1-15 HALCYON WAY
LOGAN RESERVE QLD

TITLE
SURROUNDING LAND USES

JOB	LOGAN RESERVE	FIGURE 2
JOB NO.	17-166	
DATE	29/04/22	DWG NUMBER
SCALE	1:18000 (A4)	17-166-DA2-2
REV.		

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ABN 94 010 833 084

LEGEND

PROPERTY BOUNDARY
SUBJECT SITE BOUNDARY

Logan Planning Scheme 2015 Zones

- Centre
- Community facilities
- Emerging community
- Environmental management and conservation
- Low density residential
- Low impact industry
- Low-medium density residential
- Low density residential
- Medium impact industry
- Mixed use
- Priority development area
- Recreation and open space
- Rural
- Rural residential
- Special purpose
- Specialised centre

DRAWING REFERENCE
LOGAN CITY COUNCIL PLANNING SCHEME 2015, INTERACTIVE MAPPING, ZONING MAP.

0 100 200 300m

CLIENT
LOGAN RESERVE CENTRAL PTY LTD

PROJECT
NOISE IMPACT ASSESSMENT
NEIGHBOURHOOD CENTRE
INDOOR SPORTS AND RECREATION AND SERVICE STATION
1-15 HALCYON WAY
LOGAN RESERVE QLD

TITLE
LOGAN PLANNING SCHEME 2015 ZONING MAP

JOB	LOGAN RESERVE	FIGURE 3
JOB NO.	17-166	
DATE	29/04/22	DWG NUMBER
SCALE	1:10000 (A4)	17-166-DA2-3
REV.		

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LEGEND

- PROPERTY BOUNDARY
- SUBJECT SITE BOUNDARY
- D NOISE DATALOGGER LOCATION (UNATTENDED)

DRAWING REFERENCE
© THE STATE OF QUEENSLAND DNRM&E QLDGLOBE.

0 50 100 150 200 250m

CLIENT
LOGAN RESERVE CENTRAL PTY LTD

PROJECT
NOISE IMPACT ASSESSMENT
NEIGHBOURHOOD CENTRE INDOOR SPORTS AND RECREATION AND SERVICE STATION 1-15 HALCYON WAY LOGAN RESERVE QLD

TITLE
NOISE MONITORING LOCATION

JOB	LOGAN RESERVE	**FIGURE 4**
JOB NO.	17-166	
DATE	29/04/22	DWG NUMBER
SCALE	1:8000 (A4)	**17-166-DA2-4**
REV.		

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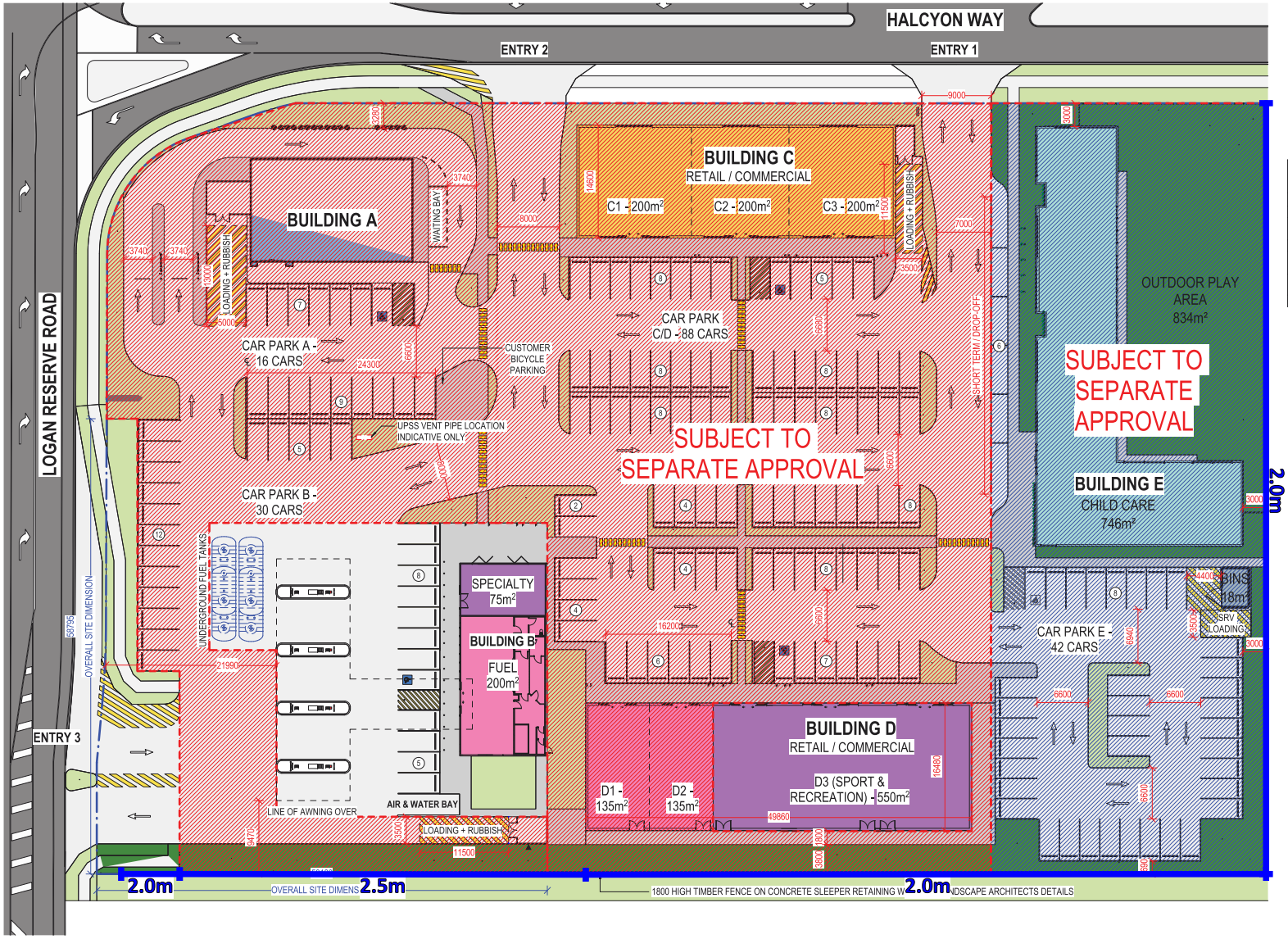

LEGEND

2.5m BARRIER HEIGHT ACOUSTIC BARRIER

DEVELOPMENT SCHEDULE, STAGE 02
(PARKING SPACE NUMBERS)

USE:	GFA:	CARS RATIO:	CARS
FAST FOOD	280m²	1/17m²	
SHOPS (C1-3, D1-2)	870m²	1/17m²	
SPECIALTY	75m²	1/17m²	
SERVICE STATION	200m²	*SEE CLAUSE*	
SPORT & RECREATION	550m²	1/15m²	
TOTAL	**1975m²**		

CARS

***SERVICE STATION PARKING RATE** - 2 spaces; plus 1 sp
25m² of GFA for a Shop of less than 150m²; plus 1 spaces p
GFA of Shop area exceeding 150m².

LANDSCAPED AREA - STAGE 02

NAME	AREA	PERCENT
HARD SURFACE - STAGE 02	9842 m²	87%
LANDSCAPED AREA	1435 m²	13%
SITE AREA	11277 m²	

SITE COVER - STAGE 02

NAME	AREA	PERCEN
SITE COVER - STAGE 02	2379 m²	21%
NOT COVERED	8898 m²	79%
SITE AREA	11277 m²	

CLIENT
LOGAN RESERVE CENTRAL PTY LTD

PROJECT
NOISE IMPACT ASSESSMENT
**NEIGHBOURHOOD CENTRE
INDOOR SPORTS AND RECREATION
AND SERVICE STATION
1-15 HALCYON WAY
LOGAN RESERVE QLD**

TITLE
ACOUSTIC BARRIER LOCATIONS

JOB	LOGAN RESERVE	**FIGURE 5**
JOB NO.	17-166	
DATE	29/04/22	DWG NUMBER
SCALE	1:800 (A4)	**17-166-DA2-5**
REV.		

0 2 4 6 10 20m

4	2022-04-29	REVISED DA PLAN	YH
3	2022-03-30	REVISED DA ISSUE	YH
2	2022-03-28	REVISED SITE PLAN FOR REVIEW	YH
1	2022-03-22	DRAFT DA SET FOR REVIEW	YH
rev	date	details	init

LOGAN RESERVE NEIGHBOURHOOD SHOPPING CENTRE
266 LOGAN RESERVE ROAD, LOGAN RESERVE (TBC)

LOGAN RESERVE CENTRAL PTY LTD ATF - LOGAN RESERVE CENTRAL UNIT TRUST

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DEVELOPMENT APPLICAT

STAGE 02 - SITE PLAN

As indicated @ A1 2022-04-29

A-DA-2.11 **rev. 4**

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W www.mwaenviro.com.au
ABN 94 010 833 084

Attachment 1

Development Site Plans

DEVELOPMENT SCHEDULE, STAGE 02
(PARKING SPACE NUMBERS)

USE:	GFA:	CARS RATIO:	CARS REQUIRED:
FAST FOOD	280m²	1/17m²	17
SHOPS (C1-3, D1-2)	870m²	1/17m²	52
SPECIALTY	75m²	1/17m²	5
SERVICE STATION	200m²	*SEE CLAUSE*	11
SPORT & RECREATION	550m²	1/15m²	37
TOTAL	**1975m²**		**122**

CARS PROVIDED: 134

***SERVICE STATION PARKING RATE** - 2 spaces; plus 1 space per 25m² of GFA for a Shop of less than 150m²; plus 1 spaces per 20m² of GFA of Shop area exceeding 150m².

LANDSCAPED AREA - STAGE 02

NAME	AREA	PERCENTAGE
HARD SURFACE - STAGE 02	9842 m²	87%
LANDSCAPED AREA	1435 m²	13%
SITE AREA	11277 m²	

SITE COVER - STAGE 02

NAME	AREA	PERCENTAGE
SITE COVER - STAGE 02	2379 m²	21%
NOT COVERED	8898 m²	79%
SITE AREA	11277 m²	

0 2 4 6 10 20 m

rev	date	details	init.
4	2022-04-29	REVISED DA PLAN	YH
3	2022-03-30	REVISED DA ISSUE	YH
2	2022-03-28	REVISED SITE PLAN FOR REVIEW	YH
1	2022-03-22	DRAFT DA SET FOR REVIEW	YH

LOGAN RESERVE NEIGHBOURHOOD SHOPPING CENTRE

266 LOGAN RESERVE ROAD, LOGAN RESERVE (TBC)

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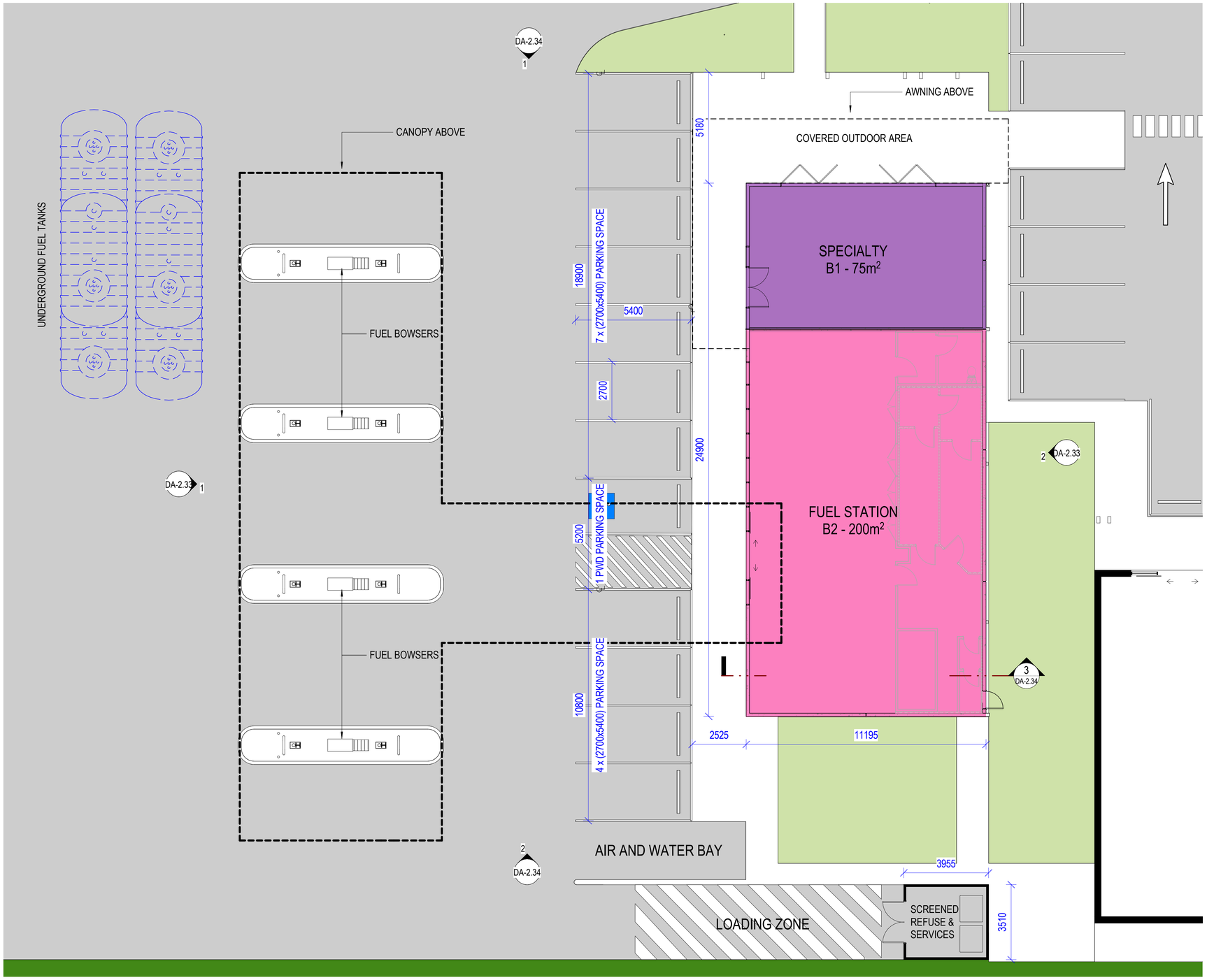
DEVELOPMENT APPLICATION

STAGE 02 - SITE PLAN

As indicated @ A1 | 2022-04-29

A-DA-2.11 | **rev. 4**



0 1 2 3 5 10m

rev	date	details	init.
2	2022-03-30	REVISED DA ISSUE	YH
1	2022-03-22	DRAFT DA SET FOR REVIEW	YH

LOGAN RESERVE NEIGHBOURHOOD SHOPPING CENTRE

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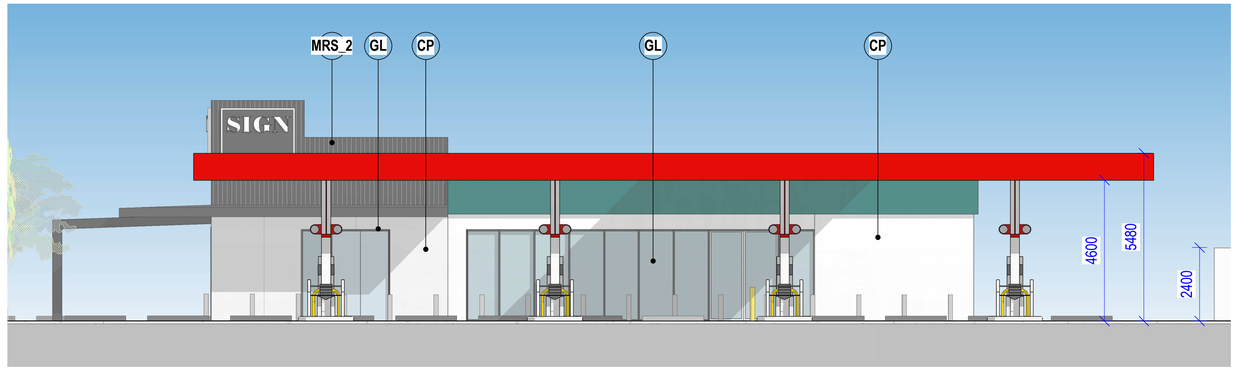
DEVELOPMENT APPLICATION

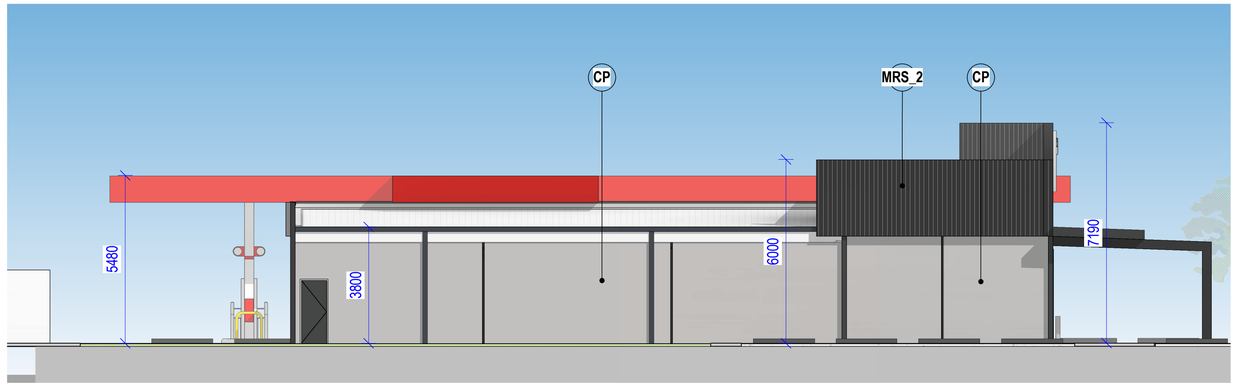
BUILDING B - FLOOR PLAN

1 : 100 @ A1 | 2022-03-30

A-DA-2.31 | **rev. 2**



1 BUILDING B - WEST ELEVATION
1 : 100



2 BUILDING B - EAST ELEVATION
1 : 100

MATERIAL PALETTE

SHOPFRONT & CLEAR GLAZING

LAMINATED SAFETY GLASS. ALUMINUM FRAME WITH POWDERCOAT FINISH. COLORBOND MONUMENT

CORRUGATED METAL ROOF SHEETING

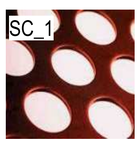
LYSAGHT KLIP-LOK. COLORBOND SURFMIST

METAL ROOF SHEETING

LYSAGHT LONGLINE. COLORBOND BASALT

TILT-UP CONCRETE PANEL

EXTERIOR PAINT. WHITE



PERFORATED METAL SCREEN

LOCKER GROUP. POWDERCOAT FINISH. BRAND COLOUR

STAINLESS STEEL

BOLLARS, BIKE RACKS, TRELLIS WIRE

CFC CLADDING EXPRESS JOINTS

JAMES HARDIE EXOTEC OR SIMILAR. WHITE FINISH

CFC CLADDING EXPRESS JOINTS

JAMES HARDIE EXOTEC OR SIMILAR. BRAND COLOUR FINISH

TIMBER-LOOK CLADDING

CEMINTEL WOODLANDS TEAK OR SIMILAR.

METAL WALL SHEETING

POWDERCOAT FINISH. COLORBOND MONUMENT

0 1 2 3 5 10m

rev	date	details	init.
2	2022-03-30	REVISED DA ISSUE	YH
1	2022-03-22	DRAFT DA SET FOR REVIEW	YH

LOGAN RESERVE NEIGHBOURHOOD SHOPPING CENTRE

266 LOGAN RESERVE ROAD, LOGAN RESERVE (TBC)

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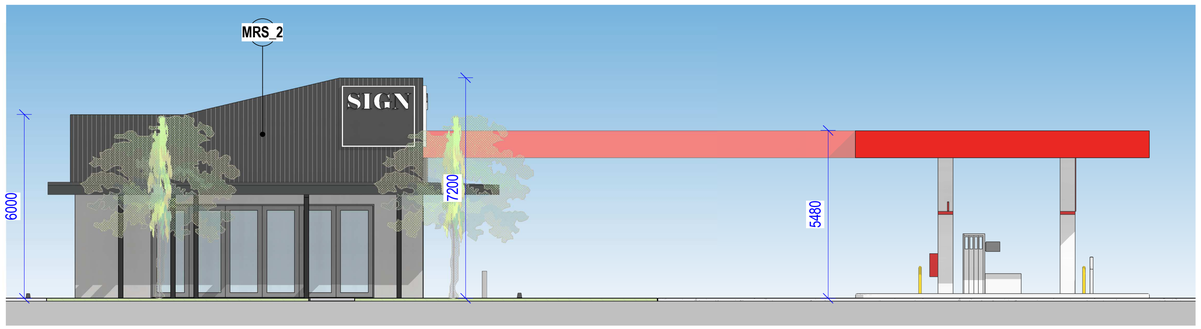
DEVELOPMENT APPLICATION

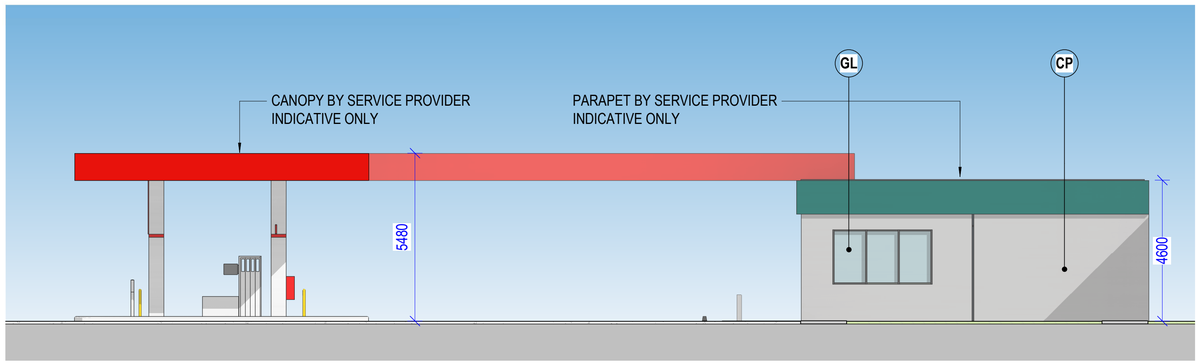
BUILDING B - ELEVATIONS

1 : 100 @ A1 | 2022-03-30

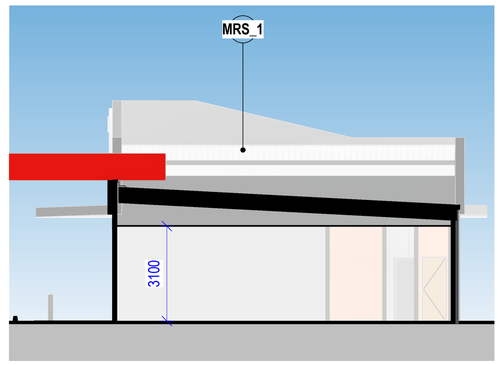
A-DA-2.33 | **rev. 2**



1 BUILDING B - NORTH ELEVATION
1 : 100



2 BUILDING B - SOUTH ELEVATION
1 : 100



3 BUILDING B - SECTION
1 : 100

MATERIAL PALETTE

SHOPFRONT & CLEAR GLAZING

LAMINATED SAFETY GLASS. ALUMINUM FRAME WITH POWDERCOAT FINISH. COLORBOND MONUMENT

CORRUGATED METAL ROOF SHEETING

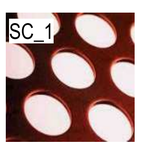
LYSAGHT KLIP-LOK. COLORBOND SURFMIST

METAL ROOF SHEETING

LYSAGHT LONGLINE. COLORBOND BASALT

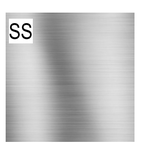
TILT-UP CONCRETE PANEL

EXTERIOR PAINT. WHITE



PERFORATED METAL SCREEN

LOCKER GROUP. POWDERCOAT FINISH. BRAND COLOUR



STAINLESS STEEL

BOLLARS, BIKE RACKS, TRELLIS WIRE

CFC CLADDING EXPRESS JOINTS

JAMES HARDIE EXOTEC OR SIMILAR. WHITE FINISH

CFC CLADDING EXPRESS JOINTS

JAMES HARDIE EXOTEC OR SIMILAR. BRAND COLOUR FINISH

TIMBER-LOOK CLADDING

CEMINTEL WOODLANDS TEAK OR SIMILAR.

METAL WALL SHEETING

POWDERCOAT FINISH. COLORBOND MONUMENT

0 1 2 3 5 10m

rev	date	details	init.
2	2022-03-30	REVISED DA ISSUE	YH
1	2022-03-22	DRAFT DA SET FOR REVIEW	YH

LOGAN RESERVE NEIGHBOURHOOD SHOPPING CENTRE

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DEVELOPMENT APPLICATION

BUILDING B - ELEVATIONS / SECTION

1 : 100 @ A1 | 2022-03-30

A-DA-2.34 | **rev. 2**

BUILDING B - VIEW LOOKING AT NORTHWEST CORNER

rev	date	details	init.
1	2022-03-30	REVISED DA ISSUE	YH

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DEVELOPMENT APPLICATION

BUILDING B - PERSPECTIVE VIEW

@ A1 2022-03-30

A-DA-2.38 **rev. 1**

BUILDING B - VIEW LOOKING AT NORTHEAST CORNER

rev	date	details	init.
1	2022-03-30	REVISED DA ISSUE	YH

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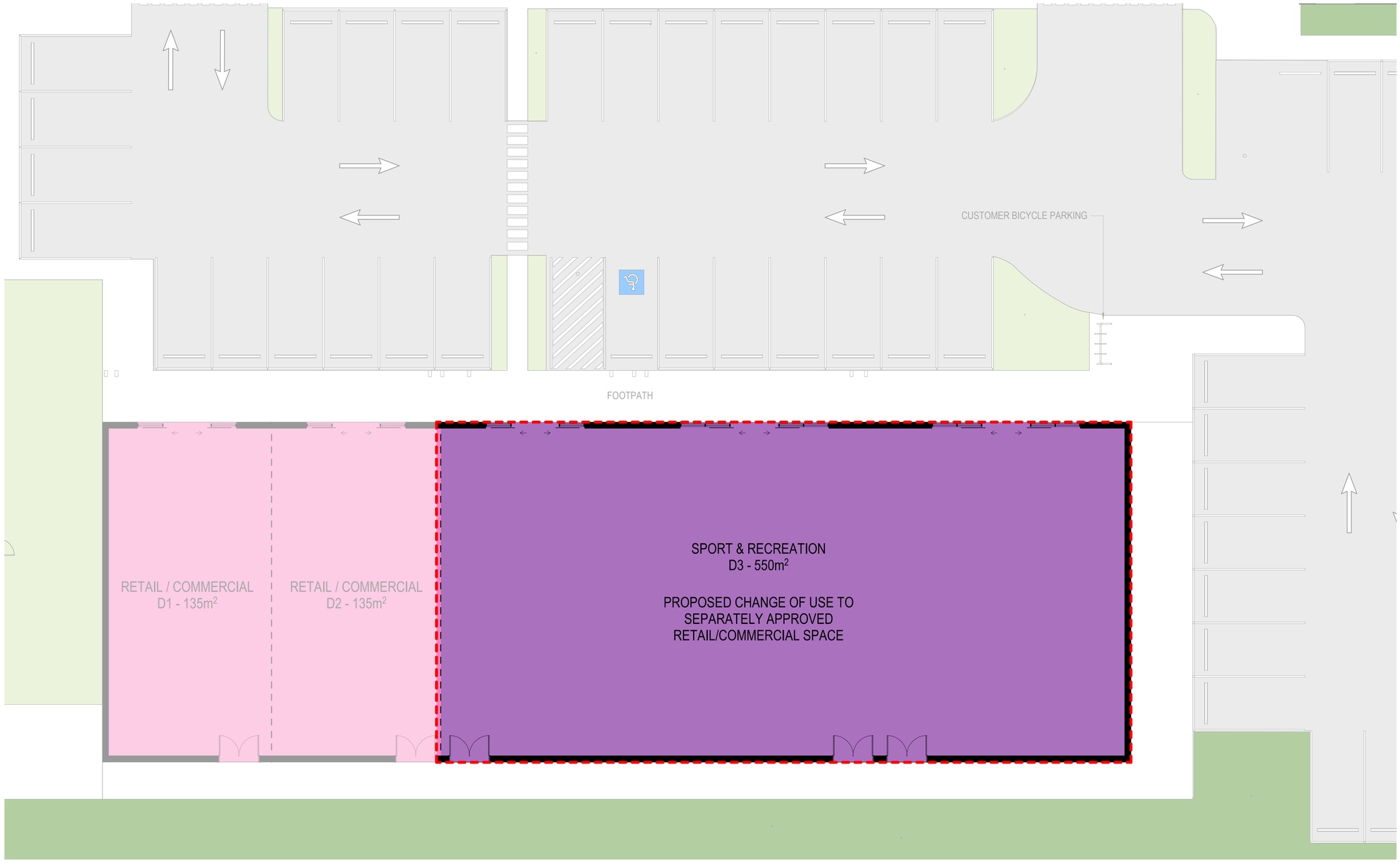
DEVELOPMENT APPLICATION

BUILDING B - PERSPECTIVE VIEW

@ A1	2022-03-30
A-DA-2.39	**rev. 1**



1 BUILDING D - FLOOR PLAN
1 : 100

0 1 2 3 5 10m

rev	date	details	init.
2	2022-03-30	REVISED DA ISSUE	YH
1	2022-03-22	DRAFT DA SET FOR REVIEW	YH

LOGAN RESERVE NEIGHBOURHOOD SHOPPING CENTRE

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DEVELOPMENT APPLICATION

BUILDING D - FLOOR PLAN

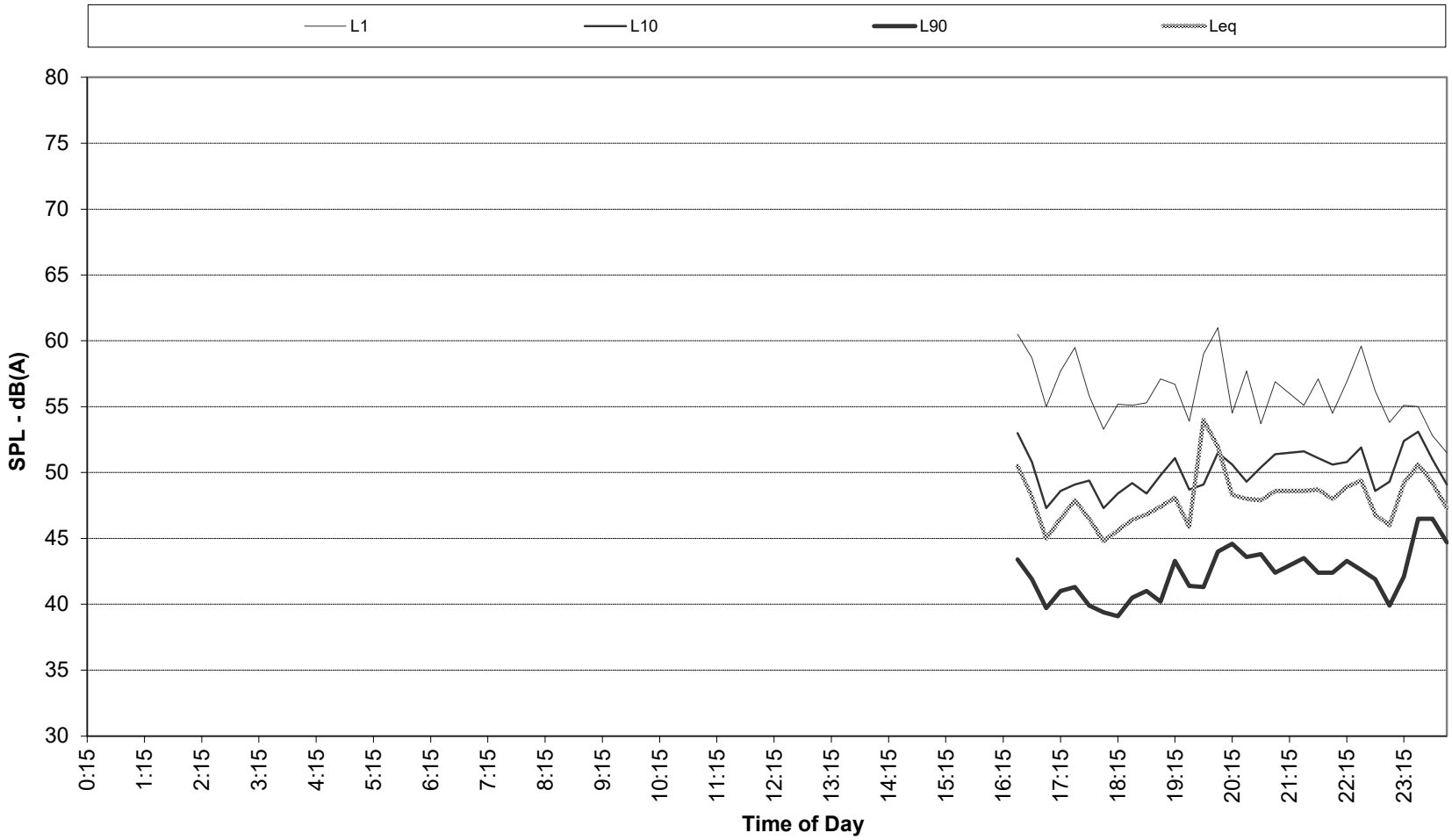
1 : 100 @ A1 | 2022-03-30

A-DA-2.51 | **rev. 2**

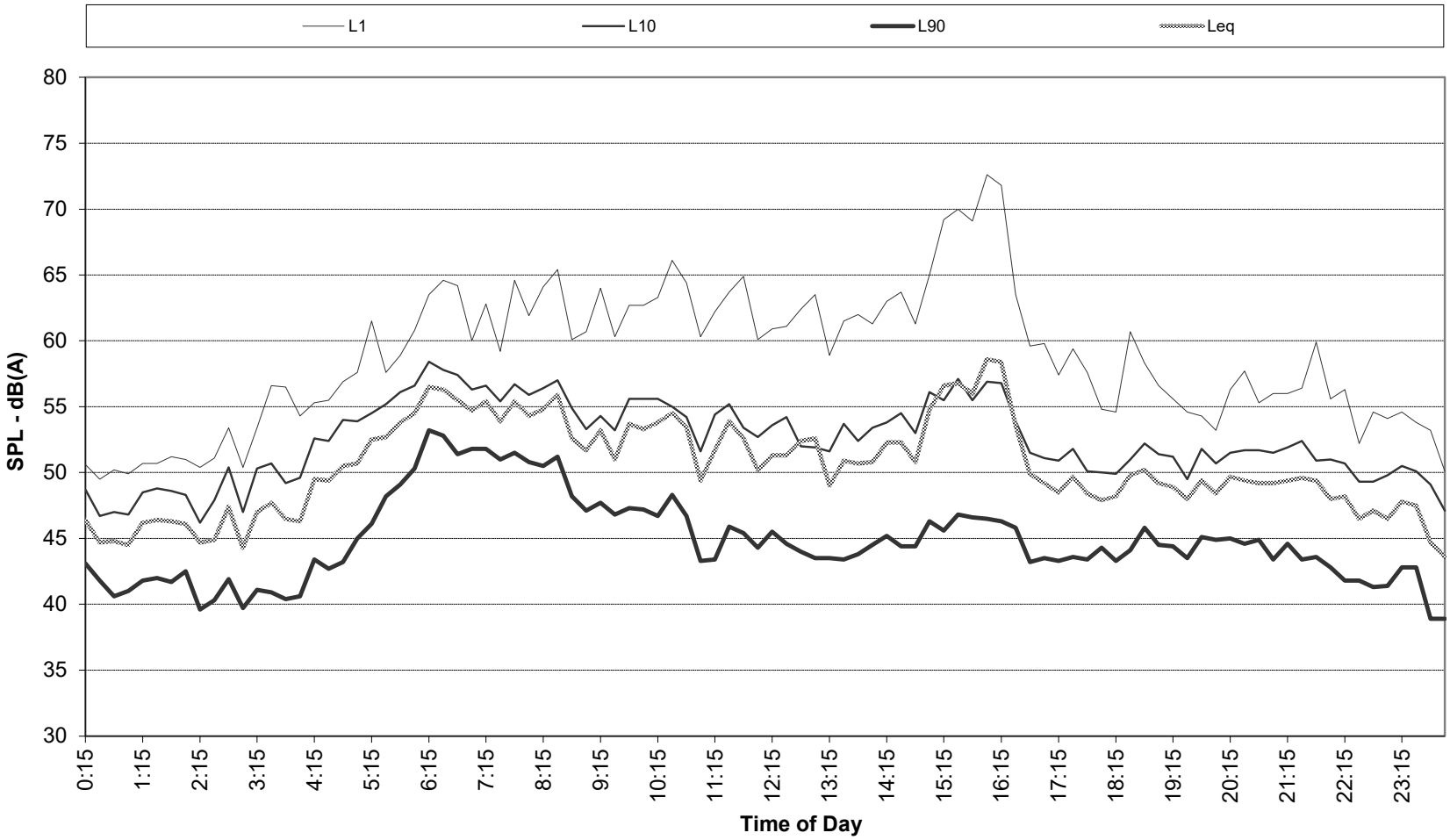
Attachment 2

Noise Datalogger Plots

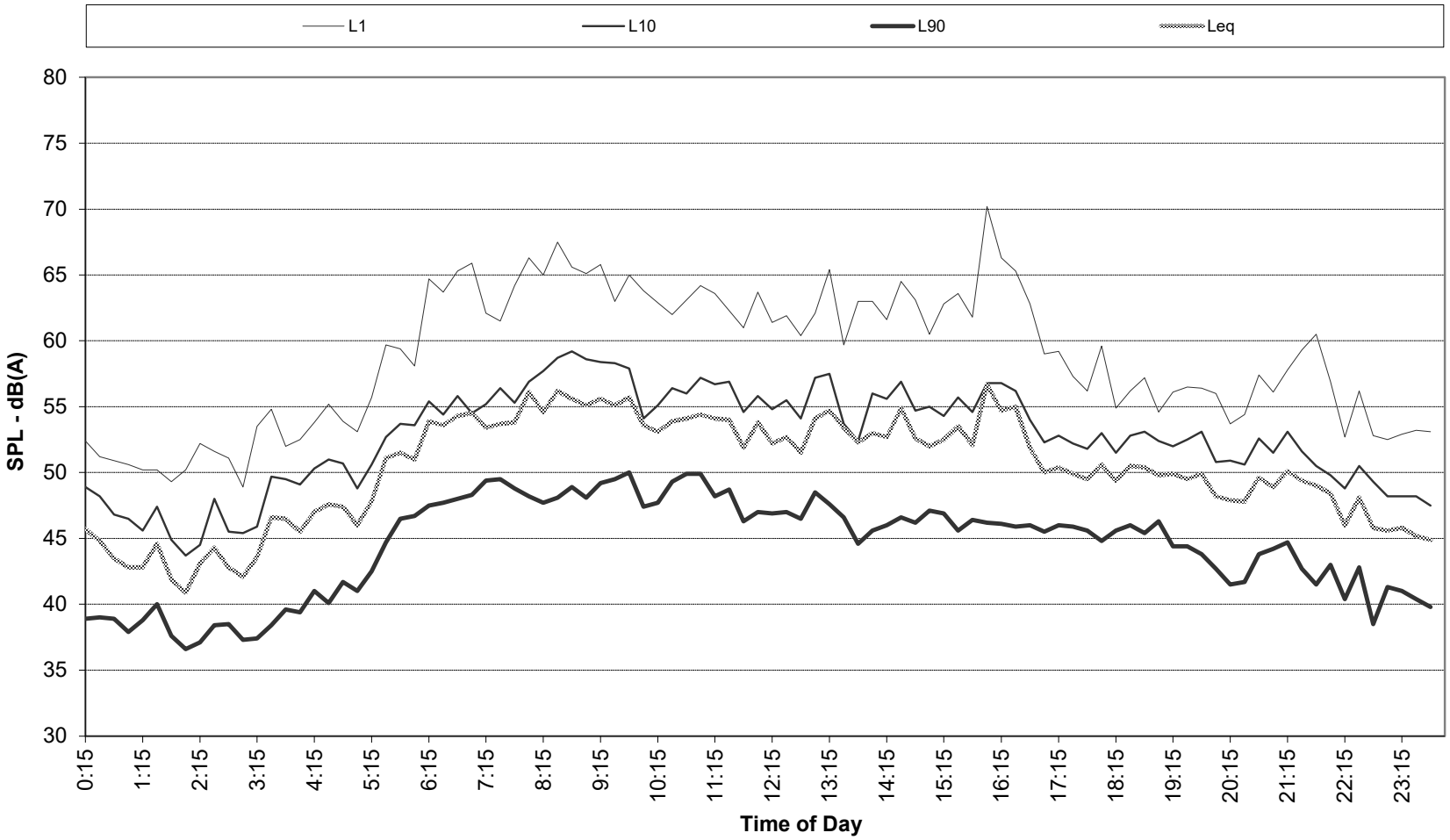
Recorded Statistical Noise Levels for Logan Reserve 17-166 - - 05-Apr-2022 - Tuesday



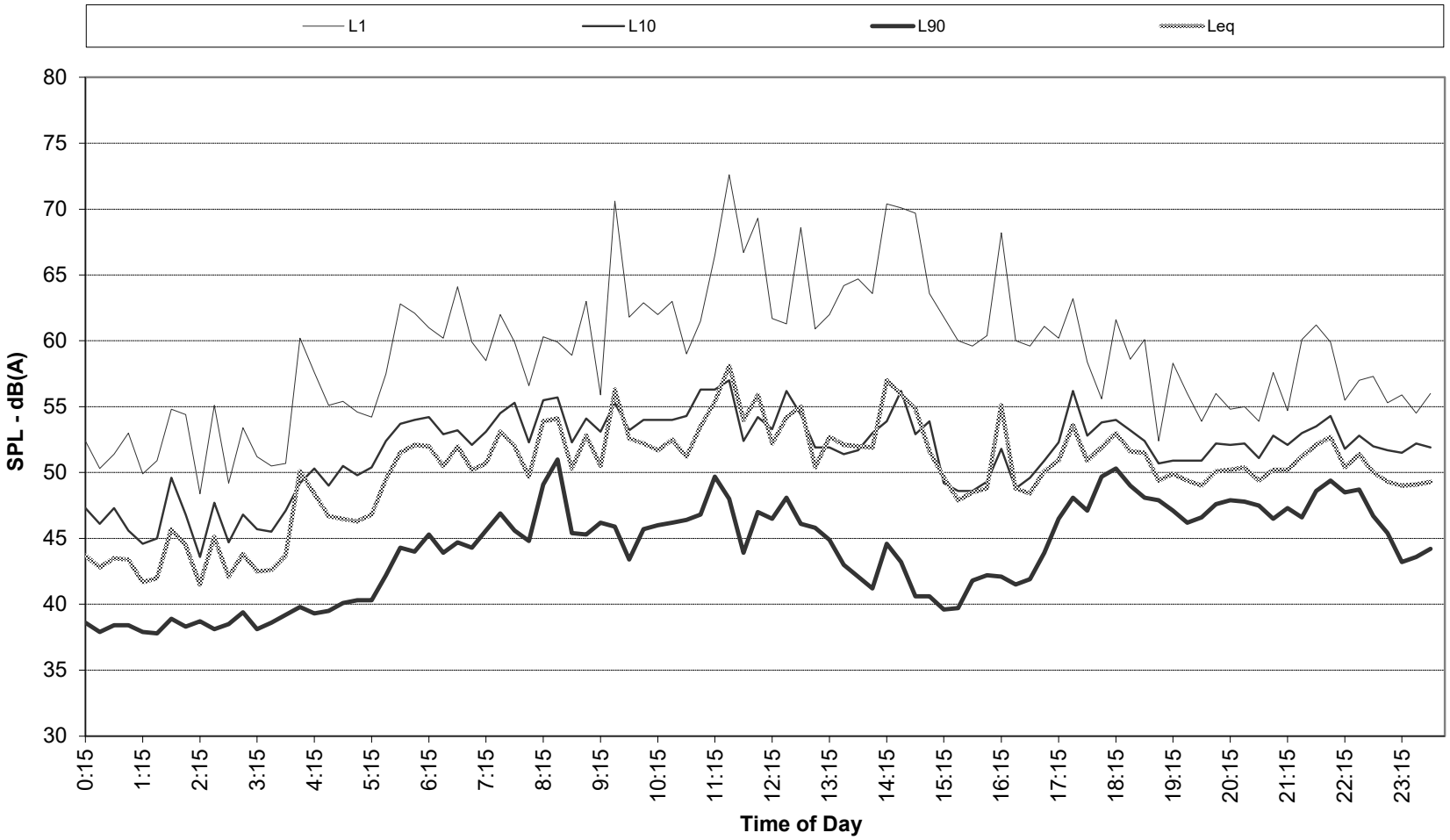
Recorded Statistical Noise Levels for Logan Reserve 17-166 - - 06-Apr-2022 - Wednesday



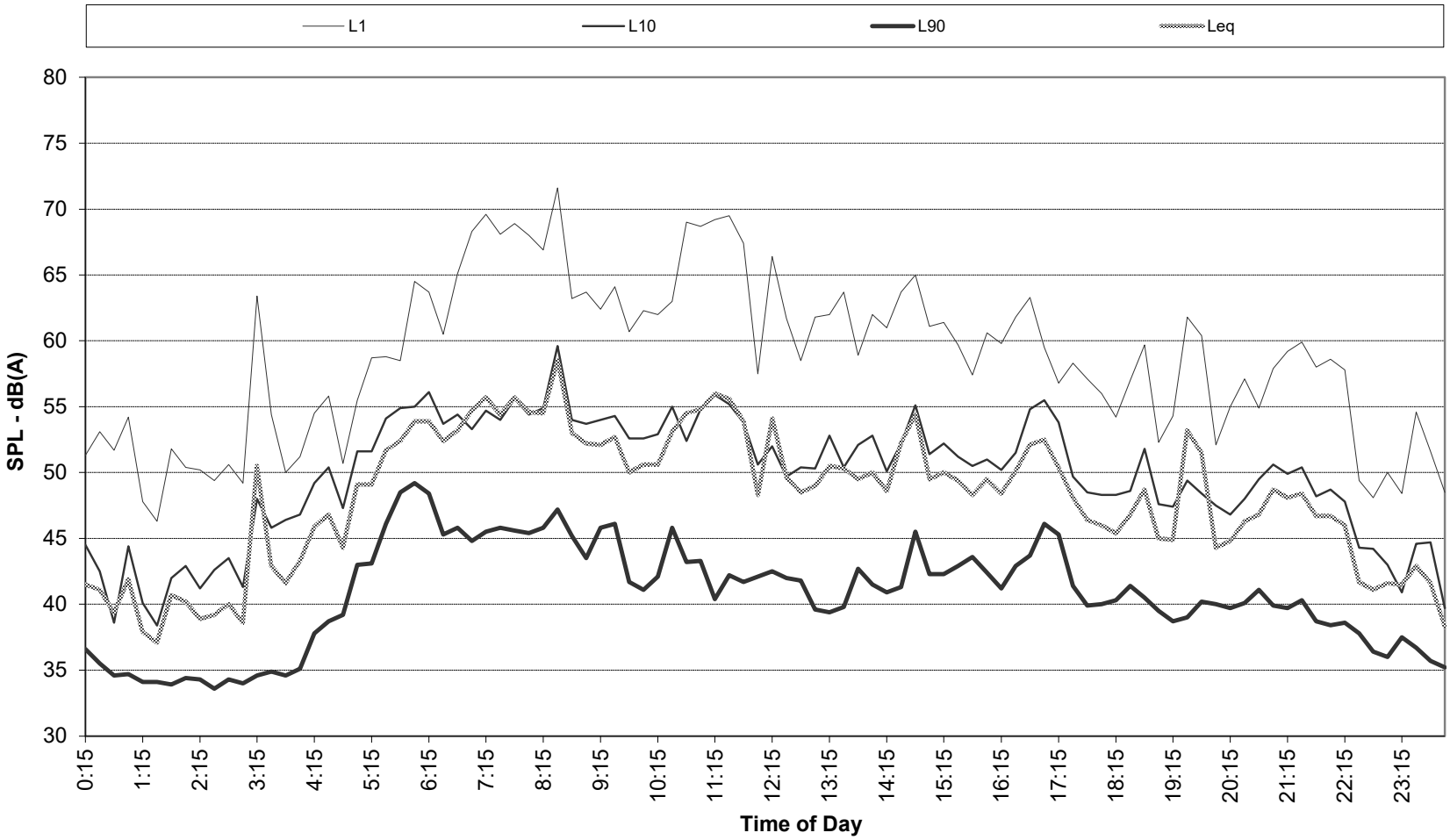
Recorded Statistical Noise Levels for Logan Reserve 17-166 - - 07-Apr-2022 - Thursday



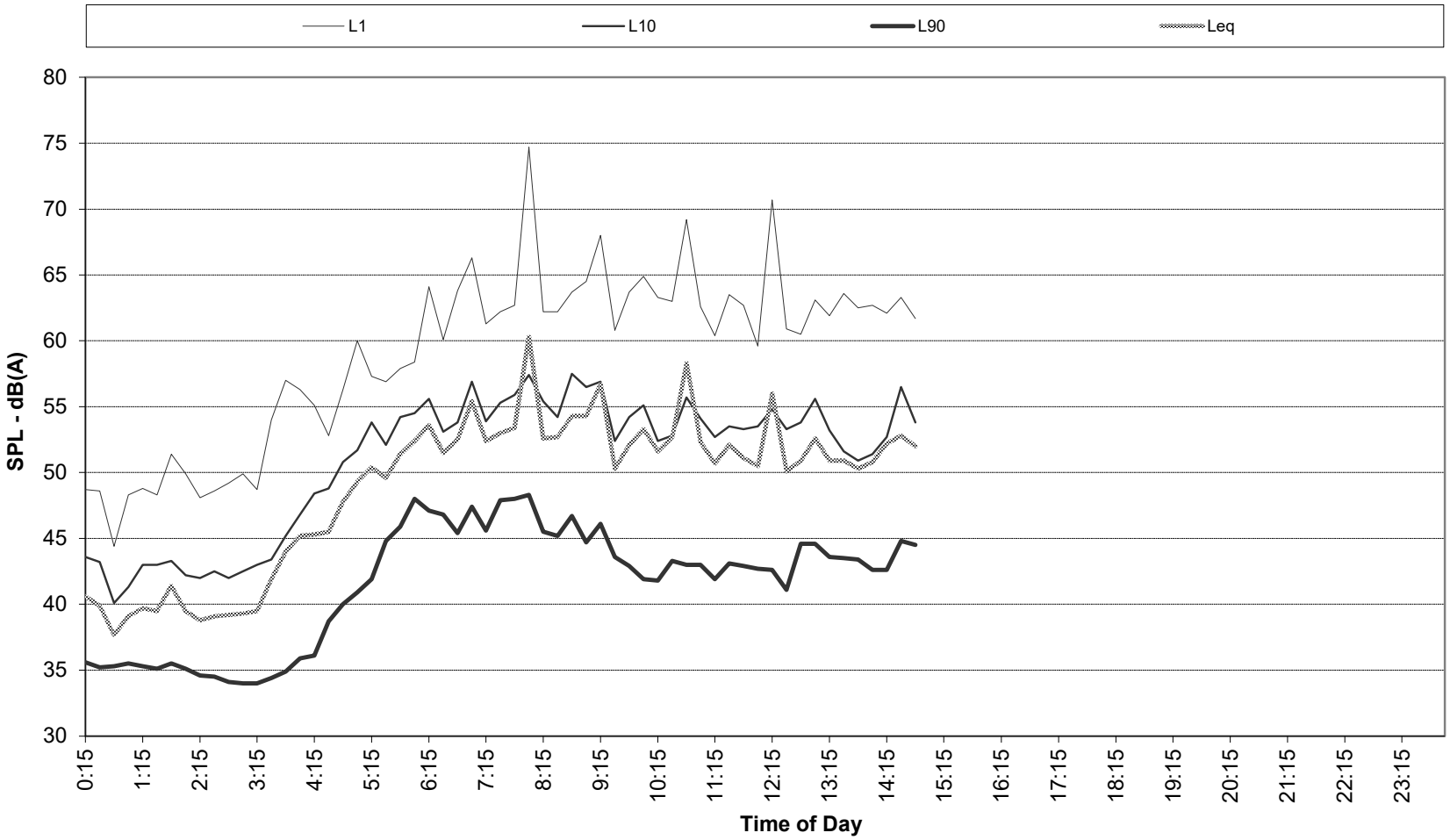
Recorded Statistical Noise Levels for Logan Reserve 17-166 - - 09-Apr-2022 - Saturday



Recorded Statistical Noise Levels for Logan Reserve 17-166 - - 11-Apr-2022 - Monday

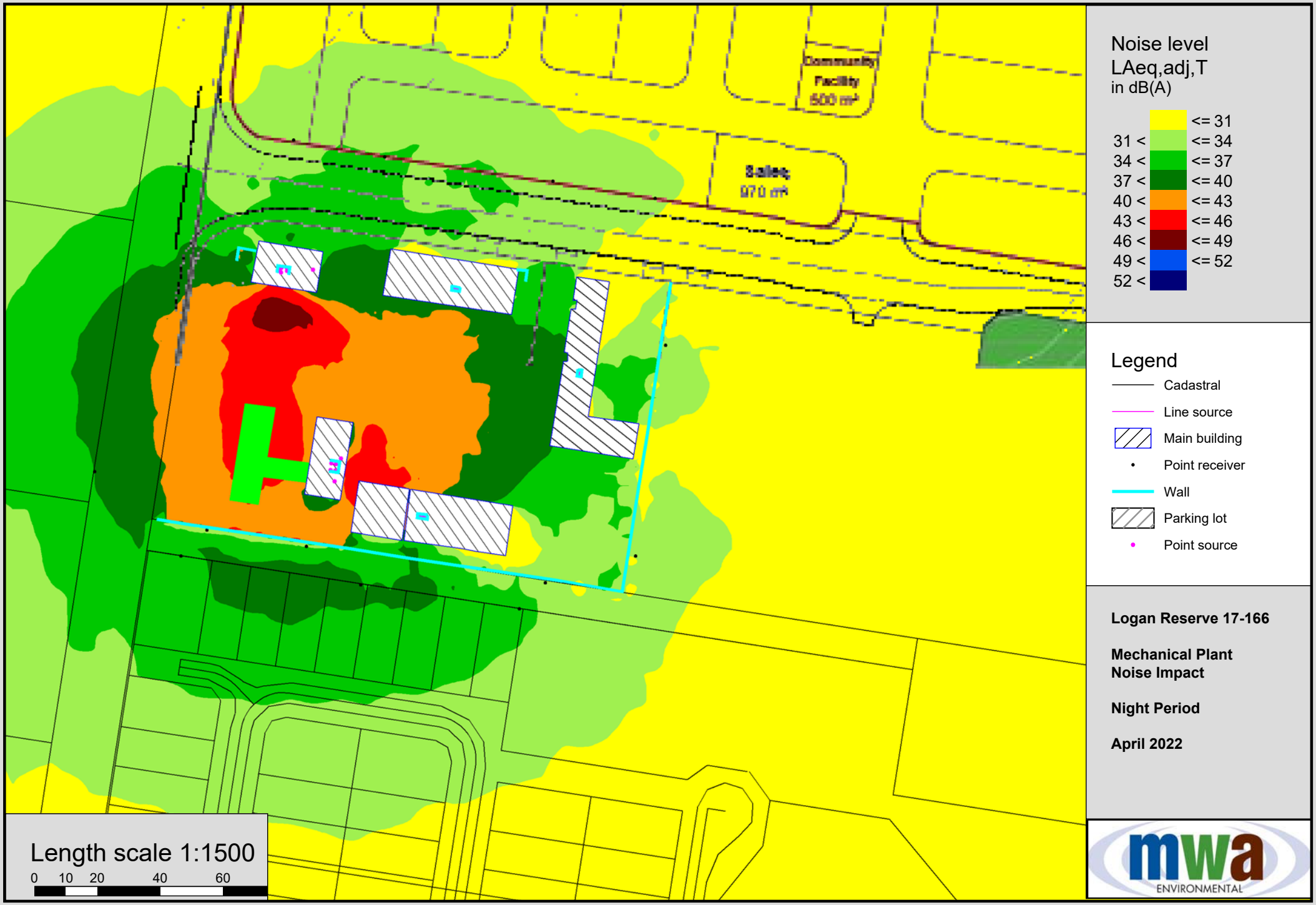


Recorded Statistical Noise Levels for Logan Reserve 17-166 - - 12-Apr-2022 - Tuesday



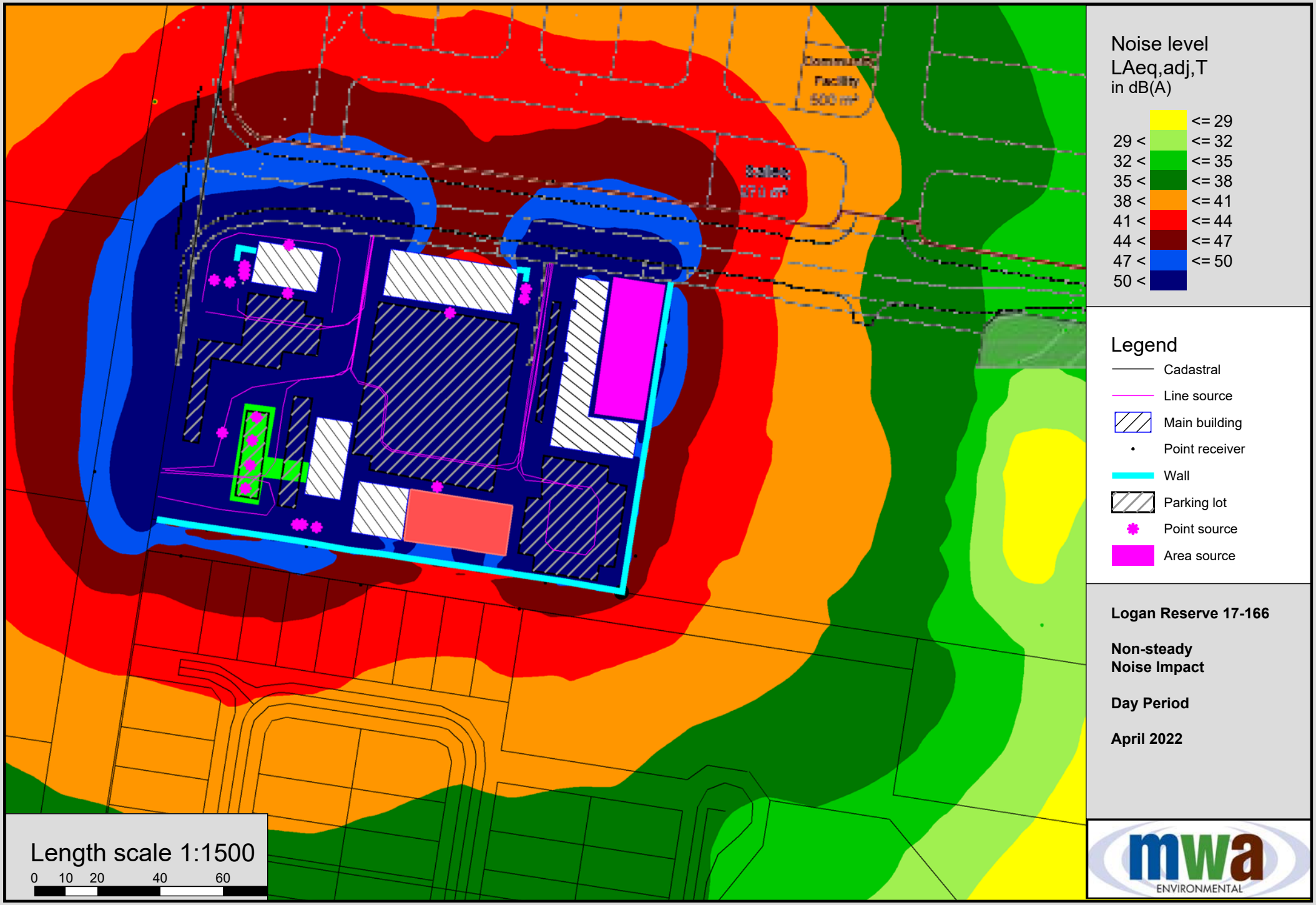
Attachment 3

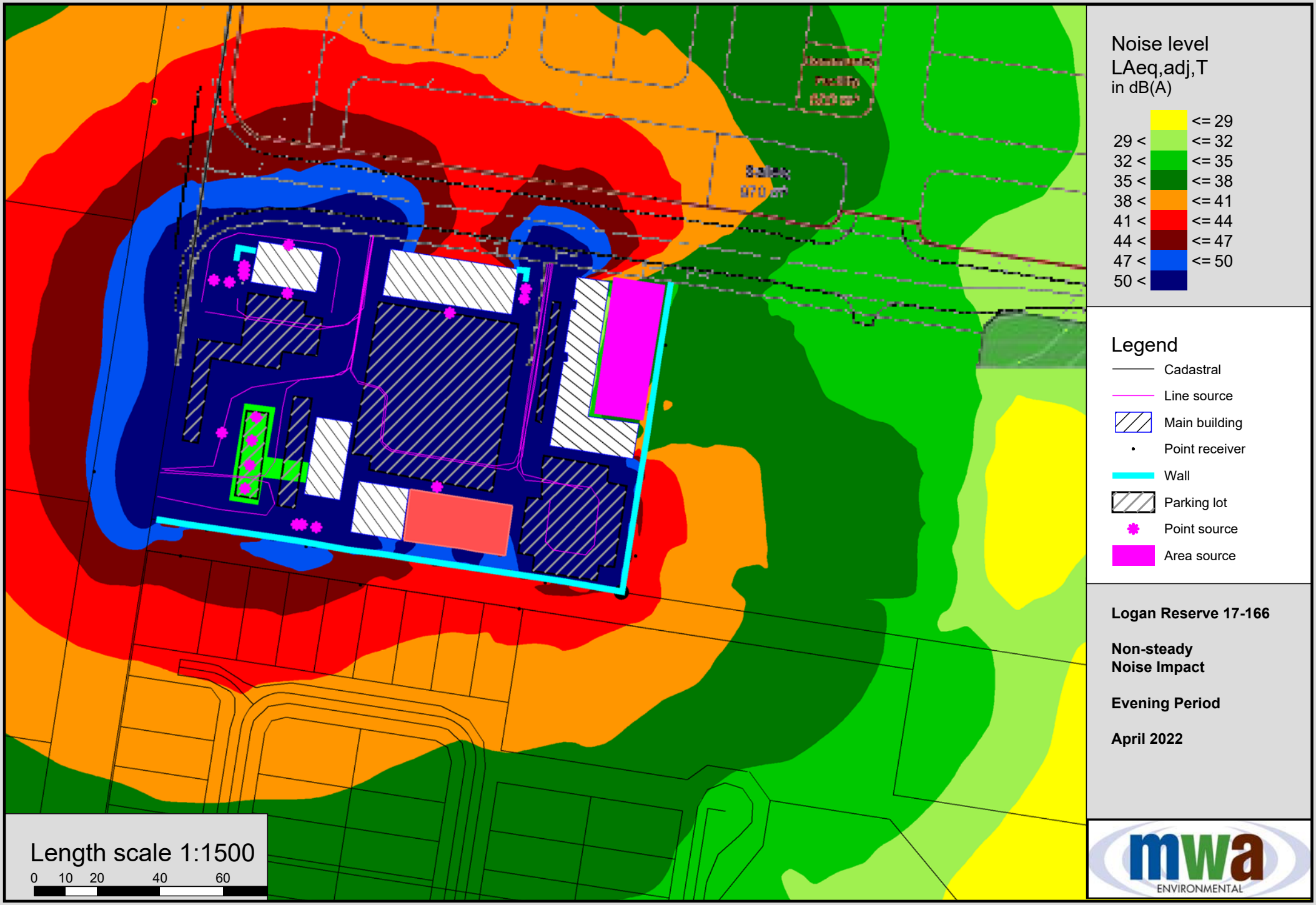
SoundPLAN 8.2 Noise Model Results
Plant & Equipment Noise Prediction


Noise level
LAeq,adj,T
in dB(A)
<= 31
31 < <= 34
34 < <= 37
37 < <= 40
40 < <= 43
43 < <= 46
46 < <= 49
49 < <= 52
52 <
Legend
Cadastral
Line source
Main building
Point receiver
Wall
Parking lot
Point source
Logan Reserve 17-166
Mechanical Plant
Noise Impact
Night Period
April 2022
Length scale 1:1500
0 10 20 40 60
mwa
ENVIRONMENTAL

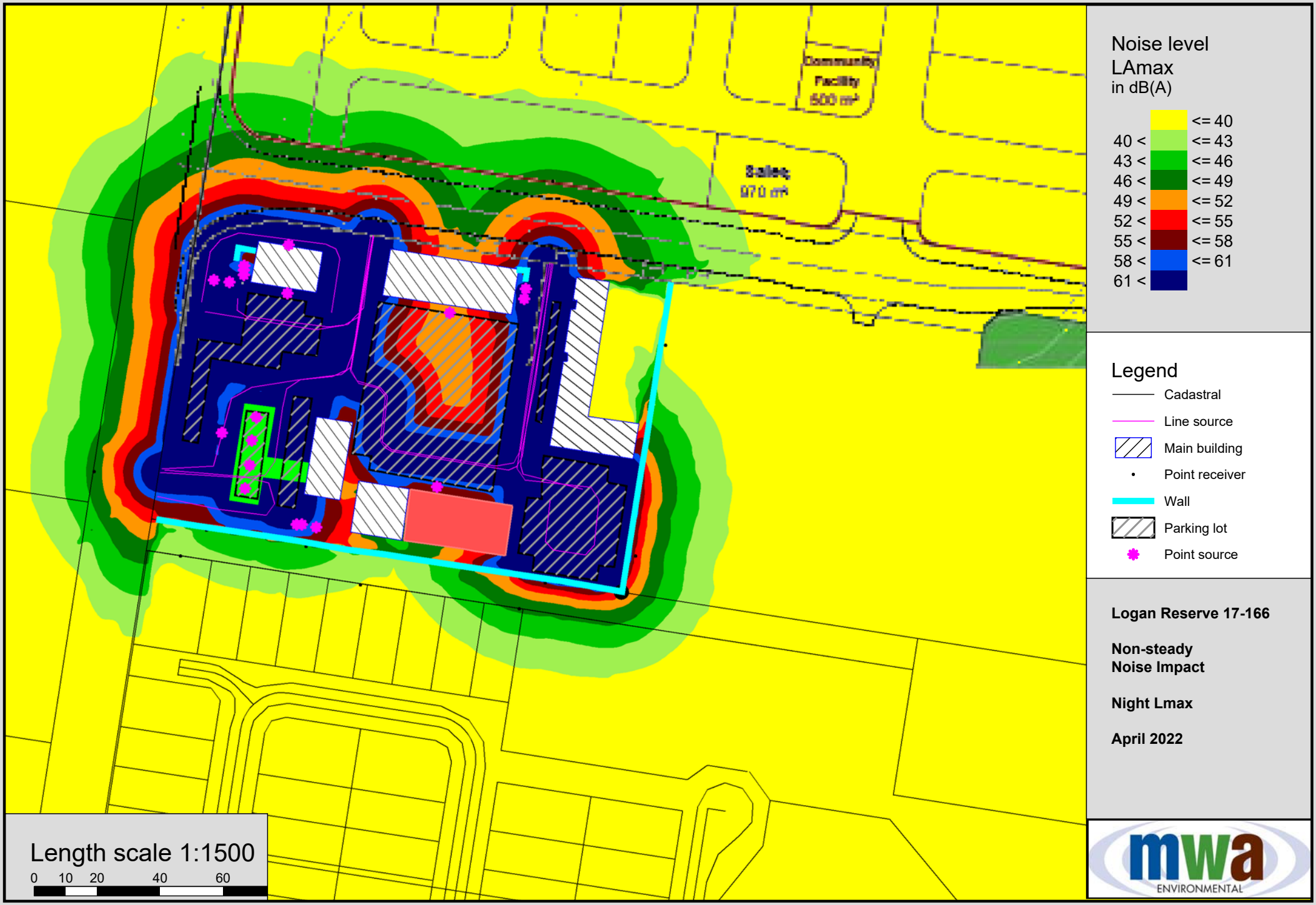
Attachment 4

SoundPLAN 8.2 Noise Model Results
Site Traffic, Servicing and Car Parking Noise Prediction


Noise level
LAeq,adj,T
in dB(A)
<= 29
29 < <= 32
32 < <= 35
35 < <= 38
38 < <= 41
41 < <= 44
44 < <= 47
47 < <= 50
50 <
Legend
Cadastral
Line source
Main building
Point receiver
Wall
Parking lot
Point source
Area source
Logan Reserve 17-166
Non-steady
Noise Impact
Day Period
April 2022
Length scale 1:1500
0 10 20 40 60
mwa
ENVIRONMENTAL


Noise level
LAeq,adj,T
in dB(A)
<= 29
29 < <= 32
32 < <= 35
35 < <= 38
38 < <= 41
41 < <= 44
44 < <= 47
47 < <= 50
50 <
Legend
Cadastral
Line source
Main building
Point receiver
Wall
Parking lot
Point source
Area source
Logan Reserve 17-166
Non-steady
Noise Impact
Evening Period
April 2022
Length scale 1:1500
0 10 20 40 60
mwa
ENVIRONMENTAL


Noise level
LAeq,adj,T
in dB(A)
<= 29
29 < <= 32
32 < <= 35
35 < <= 38
38 < <= 41
41 < <= 44
44 < <= 47
47 < <= 50
50 <
Legend
Cadastral
Line source
Main building
Point receiver
Wall
Parking lot
Point source
Logan Reserve 17-166
Non-steady
Noise Impact
Night Period
April 2022
Length scale 1:1500
0 10 20 40 60
mwa
ENVIRONMENTAL


Community Facility 500 m²
Scaling 970 m²
Noise level
LAmax
in dB(A)
<= 40
40 < <= 43
43 < <= 46
46 < <= 49
49 < <= 52
52 < <= 55
55 < <= 58
58 < <= 61
61 <
Legend
Cadastral
Line source
Main building
Point receiver
Wall
Parking lot
Point source
Logan Reserve 17-166
Non-steady
Noise Impact
Night Lmax
April 2022
Length scale 1:1500
0 10 20 40 60
mwa
ENVIRONMENTAL