APPENDIX I

State Road Transport Noise Assessment prepared by MWA

STATE ROAD TRANSPORT NOISE ASSESSMENT

RETIREMENT FACILITY

BOHLE PLAINS

Prepared for:
Ruby Developments Pty Ltd

Prepared by:
MWA Environmental

20 August 2024

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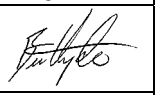
1 DA Report	20/08/24	ES		BH	
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1.0 INTRODUCTION

1.1 STUDY BRIEF

MWA Environmental has been commissioned by Ruby Developments Pty Ltd to prepare a State Road Transport Noise Assessment report in support of a Material Change of Use application for a Retirement Facility within the existing 'Harris Crossing' estate at Bohle Plains. The site has a real property description of Lots 908 & 1002 on SP340654.

The report has considered the noise impact of traffic on the State-controlled Townsville Ring Road ("**TRR**") located to the west of the subject site. The assessment has provided solutions necessary to comply with the relevant State Code 1 traffic noise criteria considering a 10 year design horizon.

MWA Environmental has previously undertaken traffic noise assessments for the broader 'Harris Crossing' estate, with majority of the stages of the development now complete with dwellings established on the allotments.

The road traffic noise model setup incorporates the proposed development layout, civil earthworks design for the proposed development and the as-constructed TRR ultimate design. The noise model input data includes

- Road sources based upon current and future forecast traffic volumes as obtained from Department of Transport and Main Roads ('**TMR'**);
- As-constructed road levels for TRR for surveyor levels by AJ Lerch Surveyors;
- Design traffic speeds as posted;
- Pavement surface type corrections as reported in the State Planning Policy Mapping ;
- Corrections for Queensland conditions as per TMR Transport Noise Management Code of Practice
- The civil earthworks design of the proposed development as provided by Westera Partners
- The operational works design of developed stages of Harris Crossing estate as provided by Maidment Group.

The requirement for acoustic barriers and acoustic treatment of future dwellings within the proposed development has been assessed by MWA Environmental to with regard to State Code 1: *Development in a state-controlled road environment* and the provisions of Queensland Development Code MP4.4 *Buildings in a Transport Noise Corridor*.

1.2 SITE DESCRIPTION

The proposed development is located to the east of the Townsville Ring Road and west of Hogarth Drive within the 'Harris Crossing' estate at Bohle Plains (refer **Figure 1**).

The proposed development is a 292 dwelling Retirement Facility plus internal access roads, park / recreational areas, communal facilities, RV parking and balance area (e.g. stormwater management lots).

The proposed development layout plan is shown on Masterplan, Lot 908 and 1002 on SP340654 Rev F.4 (refer **Attachment 1**)**.**

The site topography, design earthworks levels including the proposed dwelling site layout and numbering, was provided by Solis Estudio and Western Partners in digital CAD format:

- *Harris Crossing Townsville – Masterplan – Rev F.4.dwg*
- S24-020 Design Surface_Email 20240719-MGA94.dwg

The civil earthworks drawing used in the noise model are provided in **Attachment 2.**

2.0 EXISTING NOISE ENVIRONMENT

Long-term noise measurements have been undertaken at the site using a noise datalogger placed at free-field location at the subject site in proximity to Townsville Ring Road over a continuous nine day period.

The datalogger was placed adjacent the western boundary of the site from 1 to 9 March 2024. MWA Environmental understand that there were no roadworks or other disruptions to traffic flows on the Townsville Ring Road during this period.

The datalogger location is shown on **Figure 2.**

Graphical traces of noise level versus time are provided in **Attachment 3**.

The datalogger used was a Norsonic NOR139 noise datalogger, pre-calibrated to 94 dB at 1kHz using a Bruel & Kjaer Sound Level Calibrator, Type 4231. At post-calibration the dataloggers exhibited less than ±0.1 dB deviation.

The noise measurement results are summarised in **Table 1** below. Weather conditions during the noise monitoring period were generally fine but with some rainfall recorded on 5 and 6 March 2024. Any adverse weather conditions affecting the recorded noise data was removed from the analysis.

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

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. AS1055–2018[1] notes that the L_{90} is described as the background sound pressure level.

L_{eq}: An "average" measurement, and as per AS1055–2018 defined as the value of the sound pressure level of a continuous steady sound state, that within a measurement period, has the same mean square sound pressure as a sound under consideration whose level varies with time.

[1] Australian Standard *AS 1055-2018 Acoustics – Description and measurement of environmental noise, Part 1: General procedures*

Table 1: **Ranges of Datalogger Recorded Noise Levels**
1 to 9 March 2024 - (Full Weekdays)
Free-field

DAY	DATE	RECORDED AVERAGE STATISTCIAL NOISE LEVELS - dB(A)		
		L10 (18 hour)	L90 (18 hour)	L90 (8 hour)
Monday	4/03/2024	56.3	46.2	43.2
Tuesday	5/03/2024	-	-	43.1
Wednesday	6/03/2024	-	-	-
Thursday	7/03/2024	58.3	49.5	43.9
Friday	8/03/2024	59.0	50.1	44.0
WEEKDAY AVERAGE		**57.9**	**48.6**	**43.5**

3.0 REVELANT NOISE CRITERIA

3.1 STATE CODE 1 NOISE ASSESSMENT CRITERIA

The proposed development is for a Material Change of Use that adjoins a state-controlled road. The noise impact assessment has been prepared in accordance with Table 1.5: Environmental Emissions from the SDAP State Code 1, version 3.0. This table provides the following Performance Outcome PO39 and Acceptable Outcomes relevant to the proposed development:

Material change of use (accommodation activity)	
Ground floor level requirements adjacent to a state-controlled road or type 1 multi-modal corridor	
PO39 Development minimises noise intrusion from a **state-controlled road** in **private open space**.	AO39.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.2) for **private open space** at the ground floor level; 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR
	AO39.2 Development achieves the maximum free field acoustic level in reference table 2 (item 2.2) for **private open space** by **alternative noise attenuation measures** where it is not practical to provide a noise barrier or earth mound.

Table 2: Maximum free field acoustic levels

Applicable use	Acoustic levels
2.1: Private open space for **residential lots**	a. ≤57 dB(A) L_{10} (18 hour) free field (measured L_{90} (18 hour) free field between 6am and 12 midnight ≤45 dB(A)) OR b. ≤60 dB(A) L_{10} (18 hour) free field (measured L_{90} (18 hour) free field between 6am and 12 midnight >45 dB(A))
2.2: Private open space for an **accommodation activity** (including lots created for a **future accommodation activity**)	
2.3: Outdoor education areas and **outdoor play areas** in a **childcare centre** or **educational establishment**	≤63 dB(A) L_{10} (12 hour) free field (between 6am and 6pm)

The noise monitoring conducted by MWA Environmental demonstrates that the L_{90} (18 hour) are >45dB(A). On this basis, the relevant road traffic noise criterion for the acoustic barrier design assessment is:

- **60 dB(A) L_{10} (18 hour) free-field at private open spaces, as per AO39.1.**

It is noted that the future residential dwellings within the development will be 'relevant residential buildings' as defined in State Code 1 and the Queensland Development Code Mandatory Part 4.4: Buildings in a Transport Noise Corridor. As such, Performance Outcomes PO40 and PO41 are not applicable to this Material Change of Use application.

3.2 QDC MP4.4 BUILDINGS IN A TRANSPORT NOISE CORRIDOR

Since implementation in August 2010, assessment of internal road traffic noise amenity (i.e. within habitable rooms) for dwellings adjacent to state-controlled roads is regulated by the Queensland Development Code (QDC) MP4.4 *Buildings in a Transport Noise Corridor* ("**QDC MP4.4**").

It is noted that the State Planning Policy (SPP) interactive mapping indicates that land within 100 metres of the current TRR carriageway adjacent to the site has been designated as being within a transport noise corridor. The extent of the gazetted transport noise corridor and the default noise categories are shown on **Figure 3**. Any future dwelling building envelopes within the transport noise corridor are subject to acoustic treatment requirements in accordance with QDC MP4.4.

When building a dwelling within a gazetted transport noise corridor there is the option to either accept the default mapped QDC MP4.4 noise category or to undertake a 'site-specific assessment' to consider the shielding effect of intervening terrain, the dwelling structure etc. Traffic noise modelling may be applied to provide a 'site-specific assessment' of noise categories.

This report provides an assessment of which QDC MP4.4 noise categories are appropriate for proposed dwelling sites within the transport noise corridor extent. The criteria for determining the relevant noise category are presented in **Table 2** below.

Table 2: **QDC MP4.4 Noise Categories**

Noise Category	Level of transport noise (L_{A10}, 18hr) for State-controlled roads and designated local government roads
Category 4	≥ 73 dB(A)
Category 3	68 - 72 dB(A)
Category 2	63 – 67 dB(A)
Category 1	58 - 62 dB(A)
Category 0	≤ 57 dB(A)

4.0 TRAFFIC NOISE ASSESSMENT

4.1 DESCRIPTION OF TOWNSVILLE RING ROAD

The TRR past the subject site has been constructed as a dual lane each way divided carriageway located approximately 40 metres to the west of the subject site.

The design of the TRR was integrated into the SoundPLAN computer noise model based on as-constructed survey data provided by AJ Lerch Surveyors [2] for the purposes of this assessment.

The upgraded Townsville Ring Road has the following characteristics:

- Highway lanes Stone Mastic Asphalt ('**SMA'**) surface
- Highway speed limit of 100km/hr
- Off ramp speed limits of 70 km/h

Plate 1 below presents the segments of road that are State-controlled based upon SPP mapping.

Plate 1 – State-controlled road segments

[2] TRR5 ASCON SURVEY 240314 provided by Mr Adam Lerch

4.2 TRAFFIC VOLUME DATA

The Annual Volume for Townsville Ring Road, Site ID 92183, located 800 metres south of Kalynda Parade was obtained from the Queensland Government traffic census for the Queensland state-declared road network. It is noted that the Year 2022 was the most recent data available from TMR. The historical data showed an overall 3.4% per annum increase over the past 10 years.

As a conservative approach, the 2022 AADT volume data was extrapolated at a conservative 4% per annum for growth rate to the noise monitoring Year 2024 and the planning horizon of Year 2036 to calculate the AADT.

The predicted traffic flows for the ultimate planning horizon were scaled down to represent the 94-percent of AADT traffic flow in the 18 hour period from 6:00am to midnight.

The traffic volumes applied in the SoundPLAN model are summarised in **Table 3** below.

Table 3: Year 2024 and 2036 Design Horizon Traffic Volumes

ROADWAY	EXISTING AND DESIGN HORIZON TRAFFIC				HV%
	2022 AADT	Validation 2024 18hr	Design Year 2036 AADT [3]	Design Year 2036 18hr	
Townsville Ring Road	16,397	16,671	28,394	26,691 [4]	15.4

4.3 TRAFFIC NOISE MODEL

Road traffic noise levels from the State-controlled Road have been predicted using the SoundPLAN 9.0 computer noise model applying the CoRTN methodology for traffic noise prediction. This method is accepted by regulatory bodies in Queensland.

A terrain model was developed based upon the earthwork design level as provided by Westera Partners for the site (S24-020 Design Surface_Email 20240719-MGA94.dwg – Attachment 2), as constructed levels for Townsville Ring Road provided by AJ Lerch Surveyors and topographical survey covering the surrounding areas obtained from Department of Natural Resources and Mines and Energy.

[3] Traffic growth rate of 4% p.a. was applied.
[4] Estimated based upon standard 94% 18 hour volume assumption.

Adjustment has been made for Australian conditions as per Department of Transport and Main Roads – Road Traffic Noise Management Code of Practice ("**the CoP**"), as follows:

Free field Predictions:	- 0.7 dB(A)
Façade Correction:	-1.7 dB(A)

Road surface corrections have been applied as per the CoP, as follows:

Stone Mastic Asphalt:	-1 dB(A)

The following additional factors were considered in the model:

- The speed of the vehicles on the TRR is 100km/h.
- The graphical presentations of the calculated noise levels (noise contours) for private open space are for a receiver height of 1.5m above finished surface level of the development.
- The SoundPLAN grid spacing is one metre while the increment for angle of view is 1º.

4.4 MODEL VALIDATION

The first step in the predictive traffic noise modelling process is to validate the model to the recorded noise levels i.e. the aim being to predict to within +2dB of the recorded level, with selected parameters used in the future traffic (Year 2036 design horizon) noise modelling scenarios.

The existing average $L_{10\ (18\ hour)}$ noise level measured at the noise datalogger location was 57.9 dB(A).

The Year 2024 validation model predicted a free-field $L_{10\ (18\ hour)}$ of 59.7 dB(A). The predicted level is higher than the measured L10 (18 hour) but within a 2 dB(A) tolerance, therefore no adjustment was applied to the model.

The SoundPLAN validation model layout is provided in **Attachment 4.**

4.5 TRAFFIC NOISE CONTROL MEASURES

The traffic noise modelling determined that noise control measures will be required to achieve the noise criterion applied in AO39.1 of State Code 1 for a 10 year planning horizon.

MWA Environmental has determined that the following acoustic barriers are required for the development to comply with the 60 dB(A) L_{10} (18 hour) (free-field) for outdoor recreational areas:

- **2.4 to 4.6 metre high acoustic barrier along part of the southern boundary of the residential footprint and the drainage easement**
- **2.9 to 5.4 metre high acoustic barrier along the western boundary of the development**
- **2.0 to 2.8 metre high acoustic barrier along part of the northern boundary of the site**

The recommended acoustic barrier alignment and heights are presented as either on top of the finished earthworks level or above natural surface level as shown on **Figure 4.** The modelled 'top of barrier' RLs also presented on the **Figure 4**.

The acoustic barrier should be constructed in accordance with the requirements of the *Main Roads Technical Standard MRTS15 – Noise Fences* and *Main Roads Specification MRS15 – Noise Fences*.

In discussions with the project team, in particular the hydraulic engineers, it is understood that the proposed development requires appropriate drainage to convey the hydraulic flows. The acoustic barrier along the common boundary with the TRR will require drainage gaps to base of the acoustic barrier.

Drainage gaps at a height of 100mm and width of 1000mm may be provided in accordance with TMR Standard Drawing No. 1608 and MRTS15. In previous consultation with TMR, it was advised that gaps greater than 3 percent of the barrier surface area are considered to significantly reduce the acoustical effectiveness. As such, in order to allow hydraulic flows, the acoustic barriers may include 100mm high x 1000mm wide 'drainage gaps' at appropriate locations.

4.6 10 YEAR DESIGN HORIZON MODELING

The results of the SoundPLAN grid noise map modelling with the shielding effect of the recommended acoustic barriers are presented in **Attachment 5** as plots of the predicted L_{10} (18 hour) (free-field) noise levels over the site plan for a ground level (+1.5m) receiver height.

The results of the modelling considering the recommended acoustic barrier indicate that, the 60 dB(A) L_{10} (18-hour) (free-field) criterion will be satisfied for all proposed private open space including communal recreational spaces.

The SoundPLAN model predictions are also presented as plots of predicted Year 2036 $L_{10\ (18\ hour)}$ traffic noise levels (including +2.5dB façade reflection) to determine the QDC MP4.4 Noise Categories with the recommended acoustic barriers over the development plan for ground level (+1.8m AGL) receptor heights representative of future dwellings. No two storey dwellings are expected within the retirement community development.

The assessment of the site-specific QDC MP4.4 noise categories based upon the noise modelling results are summarised in **Table 4** below and in **Attachment 6**.

Based upon the 10 year design horizon modelling, the highest QDC noise category that will apply for single storey dwellings within the proposed development is Noise Category 1. The majority of the dwelling sites fall outside the gazetted transport noise corridor and thus no acoustic treatment is required for these dwellings.

Table 4: Assessed 10 Year Design Horizon QDC MP4.4 'Noise Categories' for Dwelling Sites within the Transport Noise Corridor

QDC MP4.4 Noise Categories	
Site #	**Single storey house / ground floor**
41	Category 1
42	Category 1
43	Category 1
44	Category 1
45	Category 1
46	Category 1
47	Category 1
48	Category 1
49	Category 1

Table 4 – Continued

QDC MP4.4 Noise Categories	
Lot #	**Single storey house / ground floor**
50	Category 1
51	Category 1
52	Category 1
53	Category 1
54	Category 1
55	Category 1
56	Category 1
57	Category 1
58	Category 1
59	Category 1
60	Category 1
61	Category 1
64	Category 1
65	Category 1
66	Category 1
67	Category 1
68	Category 1
69	Category 1
70	Category 1
71	Category 1
72	Category 1
73	Category 1
74	Category 1
75	Category 1
76	Category 1
77	Category 1
78	Category 1
79	Category 1
80	Category 1
81	Category 1
82	Category 1
83	Category 1
84	Category 1
85	Category 1
86	Category 1
87	Category 1
88	Category 1
89	Category 1

Table 4 – Continued

QDC MP4.4 Noise Categories	
Lot #	**Single storey house / ground floor**
90	Category 1
91	Category 1
92	Category 1
93	Category 1
94	Category 1
95	Category 1
96	Category 1
97	Category 1
98	Category 1
99	Category 1
100	Category 1
261	Category 1
262	Category 1
263	Category 1
264	Category 1
265	Category 1
266	Category 1
267	Category 1
268	Category 1
269	Category 1
270	Category 1
271	Category 1
272	Category 1
273	Category 1
274	Category 1
275	Category 1
276	Category 1
277	Category 1
278	Category 1
279	Category 1
280	Category 1
281	Category 1
282	Category 1

5.0 CONCLUSION

MWA Environmental has been commissioned by Ruby Developments Pty Ltd to prepare a State Road Transport Noise Assessment report in support of a Material Change of Use application for a Retirement Facility within the existing 'Harris Crossing' estate at Bohle Plains. The site has a real property description of Lots 908 & 1002 on SP340654.

The report has considered the noise impact of traffic on the State-controlled Townsville Ring Road located to the west of the subject site. The assessment has provided solutions necessary to comply with the relevant State Code 1 traffic noise criteria considering a 10 year design horizon.

Traffic noise levels have been predicted across the development site using SoundPLAN model to assess traffic noise levels for private open space areas for a 10 year design horizon (Year 2036).

MWA Environmental has determined that the following acoustic barriers are required for development to comply with the 60 dB(A) L_{10} (18 hour) (free-field) noise criterion for private open space areas as per the AO39.1 of the State Code 1:

- **2.4 to 4.6 metre high acoustic barrier along part of the southern boundary of the residential footprint and the drainage easement**
- **2.9 to 5.4 metre high acoustic barrier along the western boundary of the development**
- **2.0 to 2.8 metre high acoustic barrier along part of the northern boundary of the site**

The recommended acoustic barrier alignment and heights are presented as either on top of the finished earthworks level or above natural surface level as shown on **Figure 4.** The modelled 'top of barrier' RLs also presented on the **Figure 4**.

The acoustic barriers should be constructed in accordance with the requirements of the *Main Roads Technical Standard MRTS15 – Noise Fences* and *Main Roads Specification MRS15 – Noise Fences*. Drainage gaps at a height of 100mm and width of 1000mm may be provided in accordance with TMR Standard Drawing No. 1608 and MRTS15 to allow for hydraulic flows.

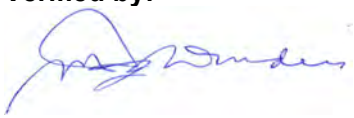
Dwellings on allotments within a designated 'transport noise corridor' are required to be acoustically treated to achieve suitable indoor road traffic noise amenity. The current SPP transport noise corridor mapping including default QDC MP4.4 'noise categories' and the proposed development are shown on **Figure 3**.

Site-specific road traffic noise modelling including the shielding effect of the proposed acoustic barriers was carried out to determine the appropriate QDC MP4.4 'noise categories' for the dwelling sites within the designated Transport Noise Corridor under 10 year design horizon traffic conditions. The assessment of the site-specific QDC MP4.4 noise categories is presented in **Table 4** and **Attachments 6.**

The highest QDC noise category that will apply for single storey dwellings within the proposed development is Noise Category 1. The majority of the dwelling sites are outside the gazetted transport noise corridor and thus no acoustic treatment is required for these dwellings.

MWA Environmental
20 August 2024

Verified by:



M.F. Winders - RPEQ 642

FIGURES

mwa ENVIRONMENTAL Max Winders & Associates Pty Ltd tas MWA Environmental Level 7, 241 Adelaide St, Brisbane. GPO BOX 3137, Brisbane Qld 4001 P 07 3002 5500 E mail@mwaenviro.com.au W www.mwaenviro.com.au ABN 94 010 833 084	PROJECT **STATE ROAD NOISE ASSESSMENT** **RESIDENTIAL LAND LEASE DEVELOPMENT** **LOT 1003 HARRIS CROSSING BOHLE PLAINS QLD**	TITLE **SITE LOCATION AND SURROUNDING LAND USES**	
	CLIENT **RUBY DEVELOPMENTS PTY LTD**	JOB: BOHLE PLAINS	**FIGURE 1**
		JOB NO.: 24008	
	DRAWING REFERENCE © THE STATE OF QUEENSLAND (DEPARTMENT OF RESOURCES) QLDGLOBE.	DATE: 20/08/24	DRAWING NUMBER
		SCALE: 1:10000 (A4)	**24008-1**

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PROJECT **STATE ROAD NOISE ASSESSMENT**
RESIDENTIAL LAND LEASE DEVELOPMENT
LOT 1003 HARRIS CROSSING BOHLE PLAINS QLD

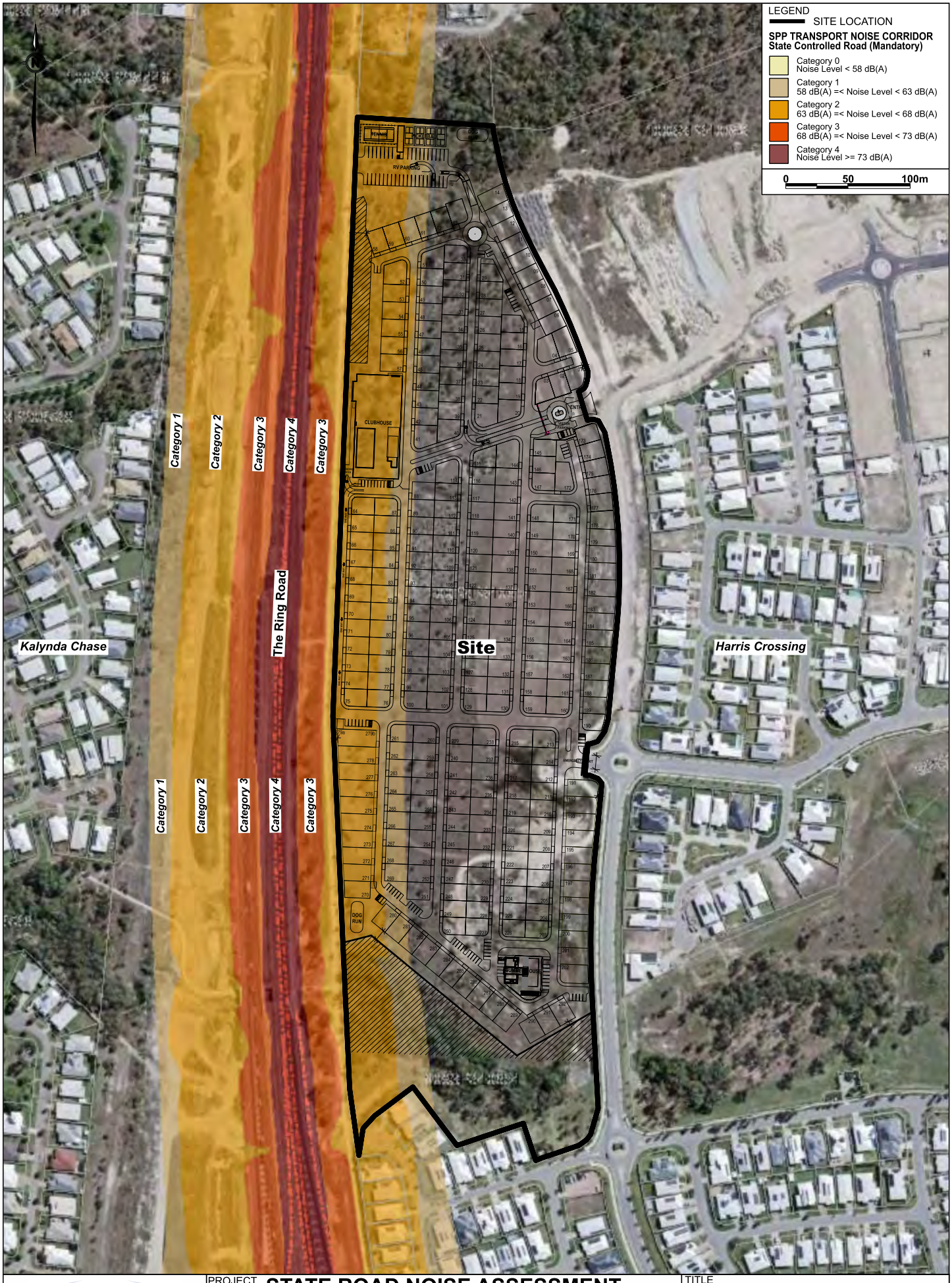
CLIENT **RUBY DEVELOPMENTS PTY LTD**

DRAWING REFERENCE

TITLE **NOISE MONITORING LOCATION**

JOB	BOHLE PLAINS
JOB NO.	24008
DATE	20/08/24
SCALE	1:4000 (A4)

FIGURE 2
DRAWING NUMBER
24008-2



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PROJECT **STATE ROAD NOISE ASSESSMENT**
RESIDENTIAL LAND LEASE DEVELOPMENT
LOT 1003 HARRIS CROSSING BOHLE PLAINS QLD

TITLE **SPP TRANSPORT NOISE CORRIDOR STATE CONTROLLED ROAD**

CLIENT **RUBY DEVELOPMENTS PTY LTD**

DRAWING REFERENCES
- SOLIS ESTUDIO, PROJECT HOA23-19, GENERAL MASTERPLAN, DWG SK-005 REV F.4.
- © THE STATE OF QUEENSLAND, STATE PLANNING POLICY IMS TRANSPORT NOISE CORRIDOR, STATE CONTROLLED ROAD (MANDATORY).

JOB	BOHLE PLAINS
JOB NO.	24008
DATE	20/08/24
SCALE	1:4000 (A4)

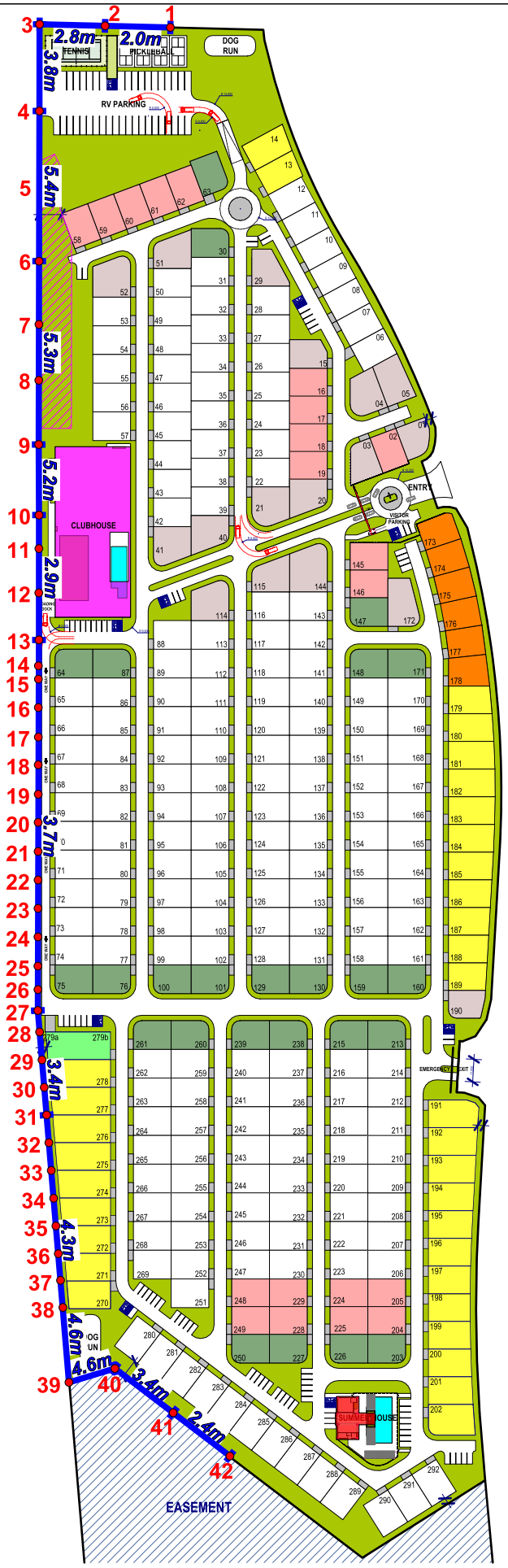
FIGURE 3
DRAWING NUMBER
24008-3

LEGEND

2.4m BARRIER HEIGHT
ACOUSTIC BARRIER

42 NODE ID NUMBER
BARRIER NODE LOCATION

0 25 50 75 100m



Node ID	Easting	Northing	Barrier Height	Top of Barrier
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2	468107	7865391	2.8	14.80
3	468075	7865393	3.8	16.14
4	468073	7865351	5.4	18.31
5	468072	7865314	5.4	19.42
6	468070	7865278	5.3	17.92
7	468069	7865247	5.3	17.81
8	468068	7865219	5.3	17.60
9	468066	7865188	5.2	18.11
10	468065	7865154	2.9	18.53
11	468064	7865137	2.9	18.42
12	468064	7865116	2.9	18.27
13	468063	7865093	3.7	18.91
14	468062	7865080	3.7	19.00
15	468062	7865074	3.7	19.04
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28	468056	7864901	3.4	20.74
29	468056	7864888	3.4	20.59
30	468057	7864874	3.4	20.48
31	468057	7864861	4.3	20.90
32	468058	7864847	4.3	20.48
33	468059	7864834	4.3	20.19
34	468059	7864820	4.3	20.17
35	468060	7864807	4.3	20.09
36	468060	7864793	4.3	19.99
37	468061	7864780	4.3	19.60
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40	468086	7864736	3.4	19.58
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42	468140	7864691	2.4	18.05

MASTERPLAN
1:3000

SOLIS ESTUDIO

REVISION NO.	SHEET SIZE.
REV F.4	A3
DRAWING NO.	PLOT DATE:
SK-005	13/08/2024

mwa ENVIRONMENTAL
Max Winders & Associates Pty Ltd tas MWA Environmental
Level 7, 241 Adelaide St, Brisbane. GPO BOX 3137, Brisbane Qld 4001
P 07 3002 5500 E mail@mwaenviro.com.au
W www.mwaenviro.com.au
ABN 94 010 833 084

PROJECT **STATE ROAD NOISE ASSESSMENT**
RESIDENTIAL LAND LEASE DEVELOPMENT
LOT 1003 HARRIS CROSSING BOHLE PLAINS QLD

CLIENT **RUBY DEVELOPMENTS PTY LTD**

DRAWING REFERENCE SOLIS ESTUDIO, PROJECT HOA23-19, GENERAL MASTERPLAN, DWG SK-005 REV F.4, 13/08/24.

TITLE
ACOUSTIC BARRIER LOCATIONS

JOB	BOHLE PLAINS
JOB NO.	24008
DATE	20/08/24
SCALE	1:3000 (A4)

FIGURE 4
DRAWING NUMBER
24008-4

ATTACHMENT 1

Development Plan

HARRIS CROSSING DEVELOPMENT

HARRIS CROSSING - MASTERPLAN

LOT 908 & 1002 ON SP340654 TOWNSVILLE, QLD

TRANSMITTAL

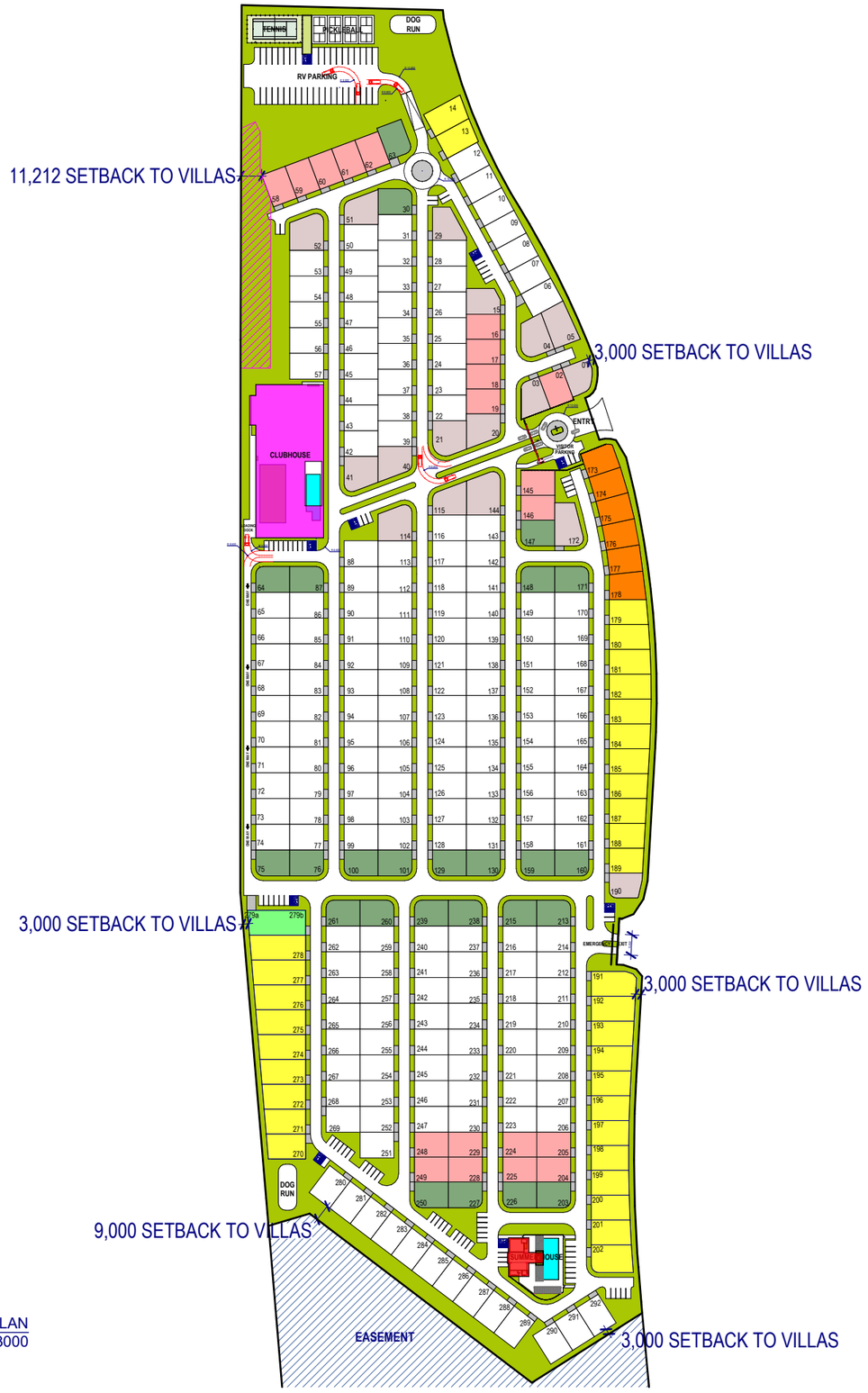
30/07/2024

SOLIS ESTUDIO

KEY **FA** - FOR APPROVAL **AP** - APPROVED **FC** - FOR CONSTRUCTION **FCO** - FOR COORDINATION **REV** - REVISION **TEN** - TENDER

DISTRIBUTION		CLIENT GEMLIFE	CERTIFIER	CIVIL	HYDRAULIC	LANDSCAPE	MECHANICAL	PLANNER	SERVICES	STRUCTURAL	CONTRACTOR	TRAFFIC	
26.06.24		FA											
04.07.24		FA	FA	FA		FA						FA	
24.07.24		FCO		FCO									
30.07.24		FCO		FCO									
09.08.24		FCO											
13.08.24		FCO										FA	

REF	DRAWING TITLE	Revision
000	TRANSMITTAL	F.4
SK-005	MASTERPLAN	F.4



MASTERPLAN
1:3000

YIELD

TOTAL NUMBER OF LOTS		**292**
LOT SIZE		
	14.0m x 21.0m STANDARD LOTS	191
	13.5m x 21.0m STANDARD LOTS	20
	13.5m x 21.0m+ VARIOUS LENGTH LOTS	34
	14m x 21.0m CORNER VILLA LOTS	25
	13.5m x 21.0m SPLAYED LOTS	6
	SPECIAL LOTS	17
	DUPLEX LOT (279a & 279b)	1

STATISTICS

VISITOR CAR PARKING	82
RV PARKING	40
SITE AREA	136,728 m2
SITE COVER	%
TOTAL SITE COVER (LOTS + ROADS + FACILITIES)	%
OPEN SPACE (MIN.DIMENSION OF 2m)	31,700 m^2
SITE PERIMETER	1.778 m^2

AREAS

CLUB HOUSE (UNDER ROOF)	3117m^2
SUMMER HOUSE (INCL. WORKSHOP)	970m^2
DOG RUN STRUCTURES	250m^2
ENTRY STATEMENT & GATE HOUSE	20m^2
TENNIS COURT	450m^2
PICKLEBALL COURT	495m^2

FOR APPROVAL
NOT FOR CONSTRUCTION

PROJECT NO.	HOA23-19
STATUS	CONCEPT
CLIENT	GEMLIFE
DRAWING TITLE :	GENERAL MASTERPLAN
SITE :	HARRIS CROSSING - MASTERPLAN LOT 908 & 1002 ON SP340654 TOWNSVILLE, QLD
REVISION NO.	REV F.4
SHEET SIZE.	A3
DRAWING NO.	SK-005
PLOT DATE:	13/08/2024

SOLIS ESTUDIO PTY LTD
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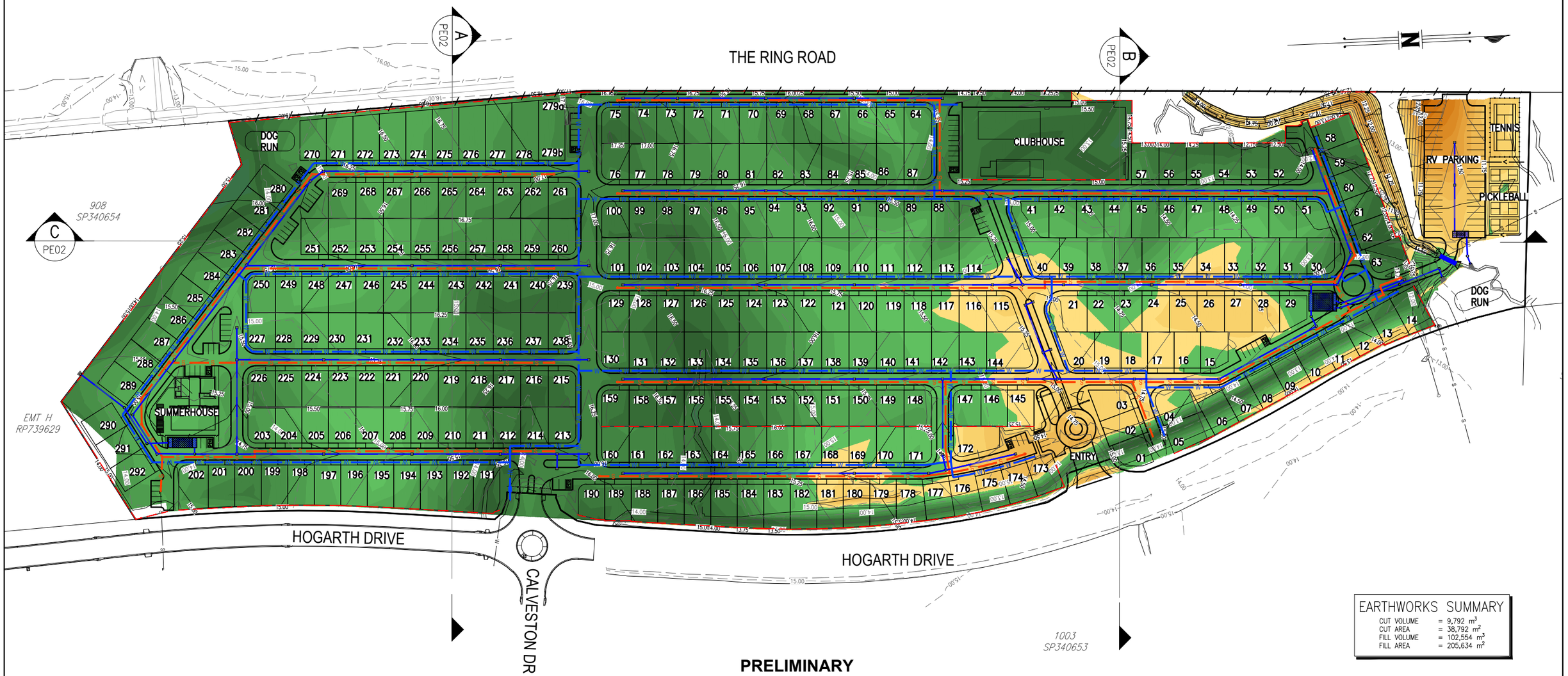
QBCC 15 122 439
3 Short Street, Southport, QLD 4215
PO Box 3080, Southport BC QLD 4215
+61 7 55602100
SOLISESTUDIO.COM.AU
SOLIS ESTUDIO

ATTACHMENT 2

Earthworks Design Drawings



PRELIMINARY EARTHWORKS PLAN

SCALE 1:1000 (A1 SIZE) 0 10 20 30 40 50

EARTHWORKS SUMMARY

CUT VOLUME	=	9,792 m^3
CUT AREA	=	38,792 m^2
FILL VOLUME	=	102,554 m^3
FILL AREA	=	205,634 m^2

EARTHWORKS LEGEND

DEPTH OF CUT TABLE	DEPTH OF FILL TABLE
0.0m - 0.25m	0.0m - 0.25m
0.25m - 0.5m	0.25m - 0.5m
0.5m - 0.75m	0.5m - 0.75m
0.75m - 1.0m	0.75m - 1.0m
1.0m - 1.25m	1.0m - 1.25m
1.25m - 1.5m	1.25m - 1.5m
1.5m - 1.75m	1.5m - 1.75m
1.75m - 2.0m	1.75m - 2.0m
2.0m - 2.25m	2.0m - 2.25m
2.25m - 2.5m	2.25m - 2.5m
> 2.5m	2.5m - 3.5m
	> 3.5m

GENERAL NOTES:

1. IN CASE OF DOUBT – ASK!
2. ALL LEVELS TO AHD, DIMENSIONS IN METERS U.N.O
3. ALL LIAISON WITH LOCAL, STATE & STATUTORY AUTHORITIES IS THE CONTRACTOR'S RESPONSIBILITY.
4. THE LOCATION OF EXISTING SERVICES IS FOR CONTRACTOR'S INFORMATION ONLY, THE LOCATION OF SERVICES WILL BE CONFIRMED BY THE CONTRACTOR PRIOR TO THE COMMENCEMENT OF WORKS.
5. ANY DAMAGE CAUSED TO THE EXISTING SERVICE WILL BE MADE GOOD AT THE CONTRACTORS EXPENSE.
6. EARTHWORKS PROCEDURES ARE TO BE CARRIED OUT IN ACCORDANCE WITH AS 3798 – 2007 "GUIDELINES ON EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS".
7. EARTHWORKS OPERATIONS ARE TO BE CARRIED OUT IN GENERAL ACCORDANCE WITH THE GEOTECHNICAL REPORT.
8. WORKS NOT SPECIFICALLY REFERRED TO, ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE GENERAL DRAWINGS AND SPECIFICATIONS OF THE LOCAL AUTHORITY.
9. THE CONTRACTOR IS TO ALLOW FOR ALL FEES AND HAULAGE COSTS ASSOCIATED WITH DISPOSAL OF MATERIAL FROM THE SITE.
10. ALL COSTS ASSOCIATED WITH NOISE AND DUST SUPPRESSION FOR SITE WORKS ARE DEEMED THE CONTRACTOR'S RESPONSBILITY.
11. COMPACTION STANDARDS
    - 'MODIFIED' TO AS 1289 TEST 5.2.1
    - 'STANDARD TO AS 1289 TEST 5.1.1
12. PRIOR TO COMMENCEMENT OF WORKS THE CONTRACTOR WILL PROVIDE SCOUR AND EROSION PROTECTION INCLUDING PROVISION OF SILT TRAPS AND FENCES TO MINIMISE DEPOSITION OF MATERIAL DOWNSTREAM OF THE PROPERTY.
13. NO BLASTING WILL BE PERMITTED.
14. THE LOCATION OF THE SITE SHEDS, SITE OFFICE AND AMENITIES BUILDING WILL BE LOCATED TO SUIT TEMPORARY UTILITY SERVICES OR AS AGREED WITH THE MANAGER.
15. TESTING FREQUENCY AS 3798 – 2007 SECTION 8.0 OR AS APPROVED BY THE GEOTECHNICAL ENGINEER.
16. AT COMPLETION OF CONSTRUCTION THE CONTRACTOR SHALL ARRANGE FOR AN INDEPENDENT LICENSED SURVEYOR TO CARRY OUT A "WORKS AS CONSTRUCTED" SURVEY AND SUBMIT THE DETAIL PLAN TO THE MANAGER.
17. THE LOCATION OF TEMPORARY STOCKPILES DURING CONSTRUCTION IS TO BE AGREED WITH THE MANAGER.

No.	DATE	REVISIONS	DES	DRN	CHK	APD

DESIGNED S.C.M
DRAWN J.J.D
CHECKED J.M.H
APPROVED J.M.H
DATE JULY 2024
DOCUMENT CONTROL

For and on behalf of WESTERA PARTNERS PTY. LTD.
APPROVED

WESTERA PARTNERS
STRUCTURAL+CIVIL+ENVIRONMENTAL ENGINEERS
www.westerapartners.com.au | ABN 52 097 417 975

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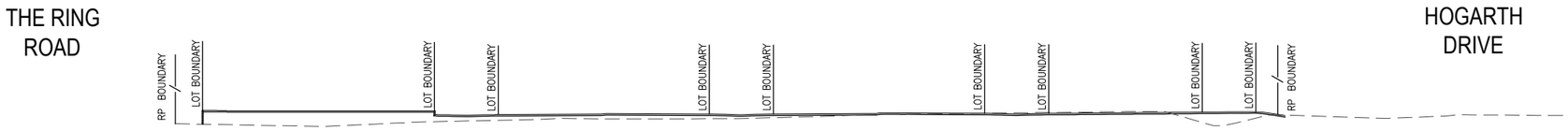
NORTHERN NSW T 02 6674 8047 E nsw@westerapartners.com.au
CENTRAL VICTORIA T 03 5441 0922 E centralvic@westerapartners.com.au

SURVEYOR BRAZIER MOTTI PHONE 07 4772 1144
DATUM A.H.D. PSM 95569 R.L. 17.143

PROJECT PROPOSED RETIREMENT LIVING DEVELOPMENT
LOCATION LOT 1002 ON SP340654 99 HOGARTH DRIVE, BOHLE PLAINS
TITLE PRELIMINARY EARTHWORKS PLAN
CLIENT RUBY DEVELOPMENTS PTY LTD

DRAWING STATUS PRELIMINARY N.F.C.
DRAWING NUMBER S24-020-PE01
SHEET NUMBER 01 OF 02
REVISION

SECTION A
SCALE A1 – 1 : 500
A3 – 1 : 1000
PE01



SECTION B
SCALE A1 – 1 : 500
A3 – 1 : 1000
PE01

SECTION C
SCALE A1 – 1 : 1000
A3 – 1 : 2000
PE01

No.	DATE	REVISIONS	DES	DRN	CHK	APD

DESIGNED S.C.M
DRAWN J.J.D
CHECKED J.M.H
APPROVED J.M.H
DATE JULY 2024
DOCUMENT CONTROL

For and on behalf of WESTERA PARTNERS PTY. LTD.
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SURVEYOR
BRAZIER MOTTI
PHONE 07 4772 1144

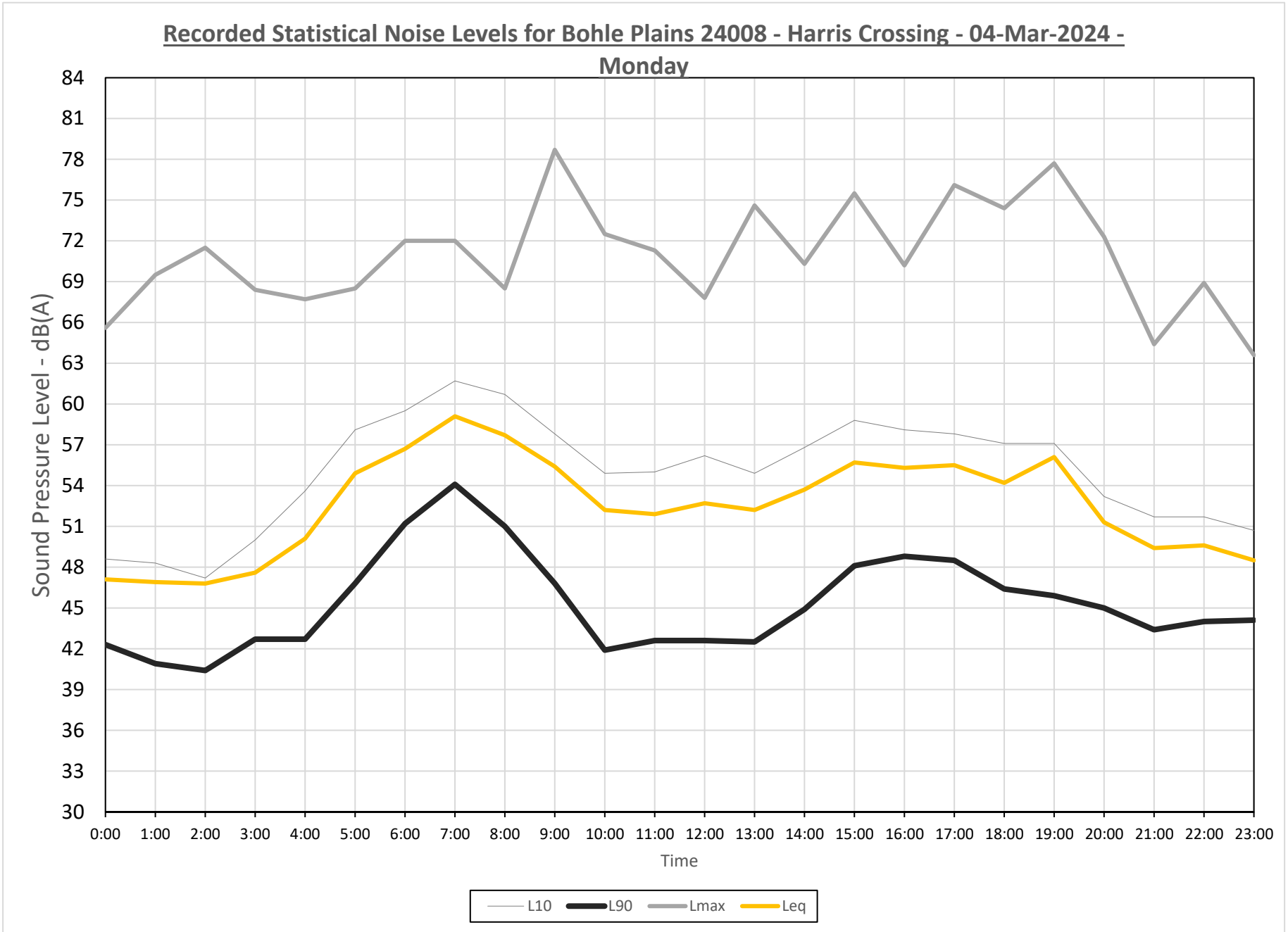
DATUM A.H.D.
PSM 95569
R.L. 17.143

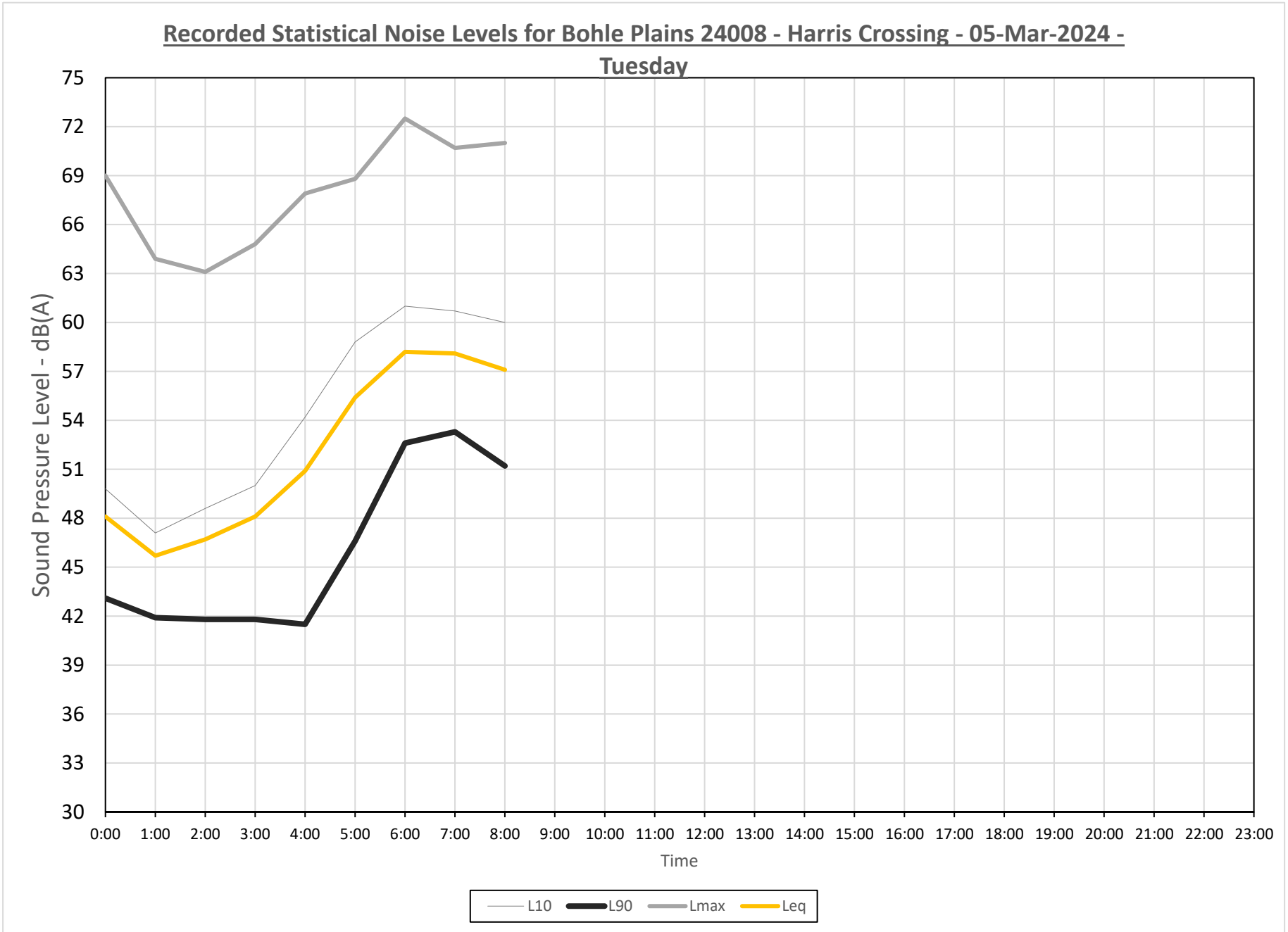
PROJECT PROPOSED RETIREMENT LIVING DEVELOPMENT
LOCATION LOT 1002 ON SP340654
99 HOGARTH DRIVE, BOHLE PLAINS
TITLE PRELIMINARY EARTHWORKS SECTIONS
CLIENT RUBY DEVELOPMENTS PTY LTD

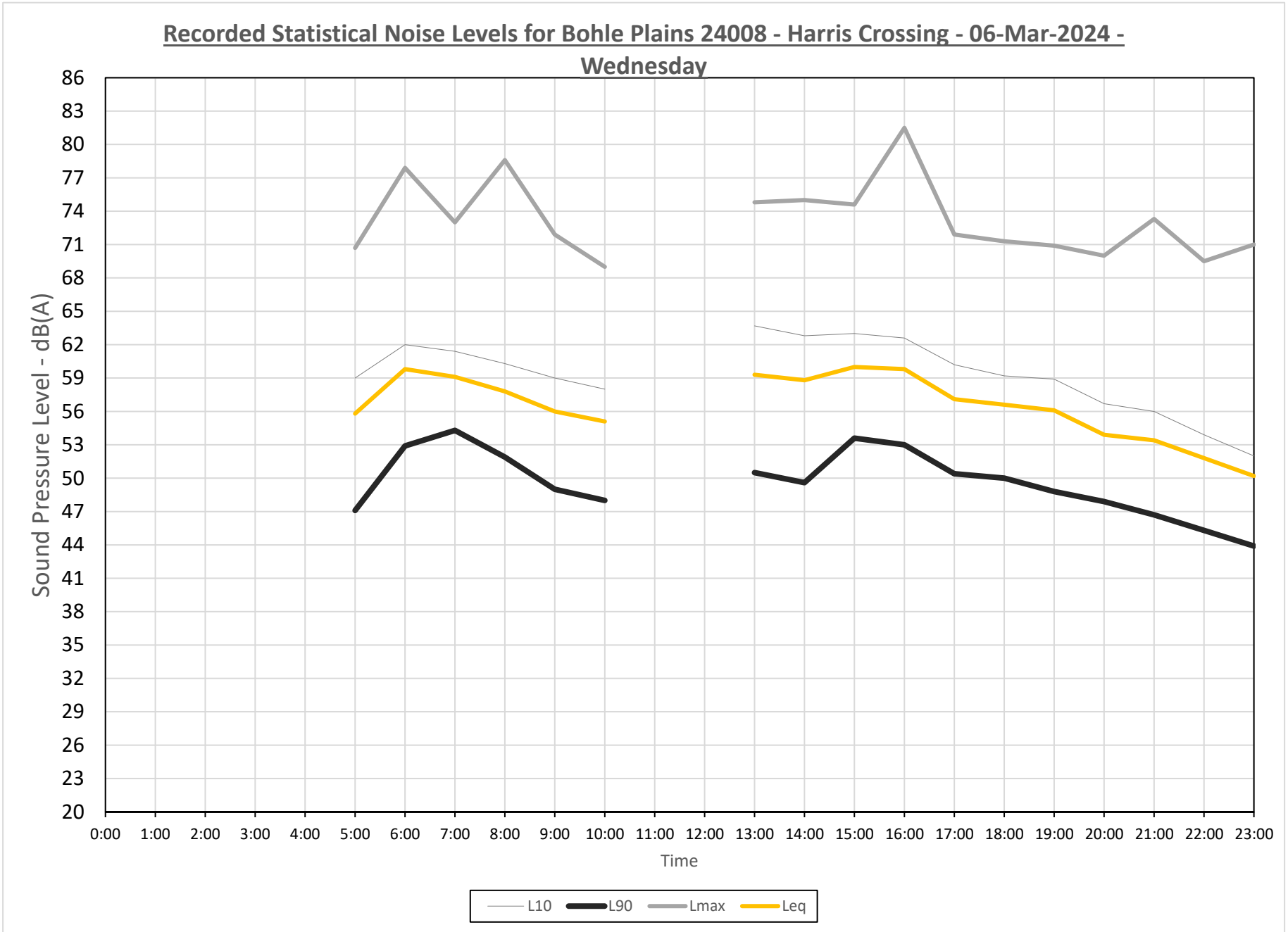
DRAWING STATUS PRELIMINARY N.F.C.
DRAWING NUMBER S24-020-PE02
SHEET NUMBER 02 OF 02
REVISION

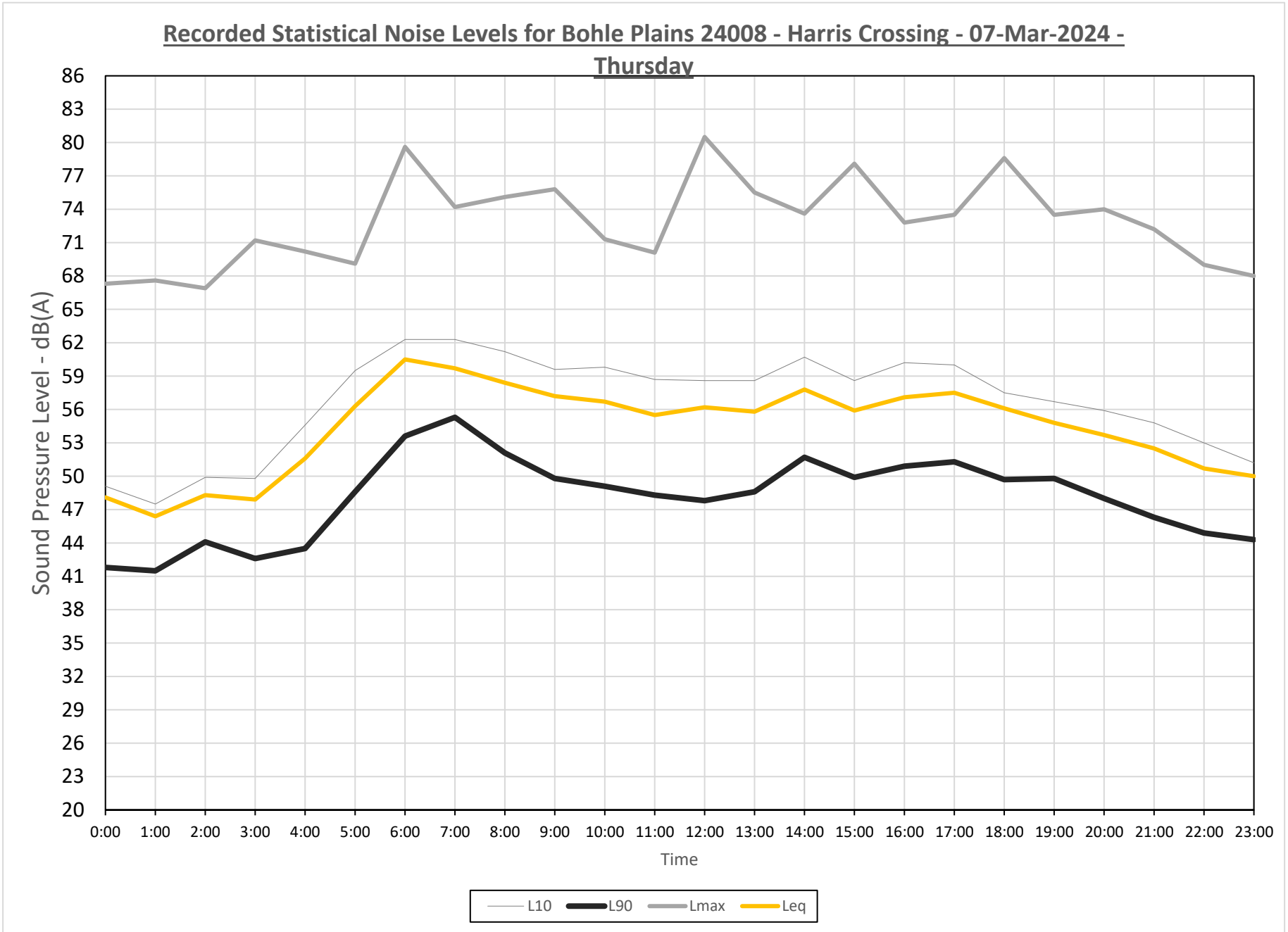
ATTACHMENT 3

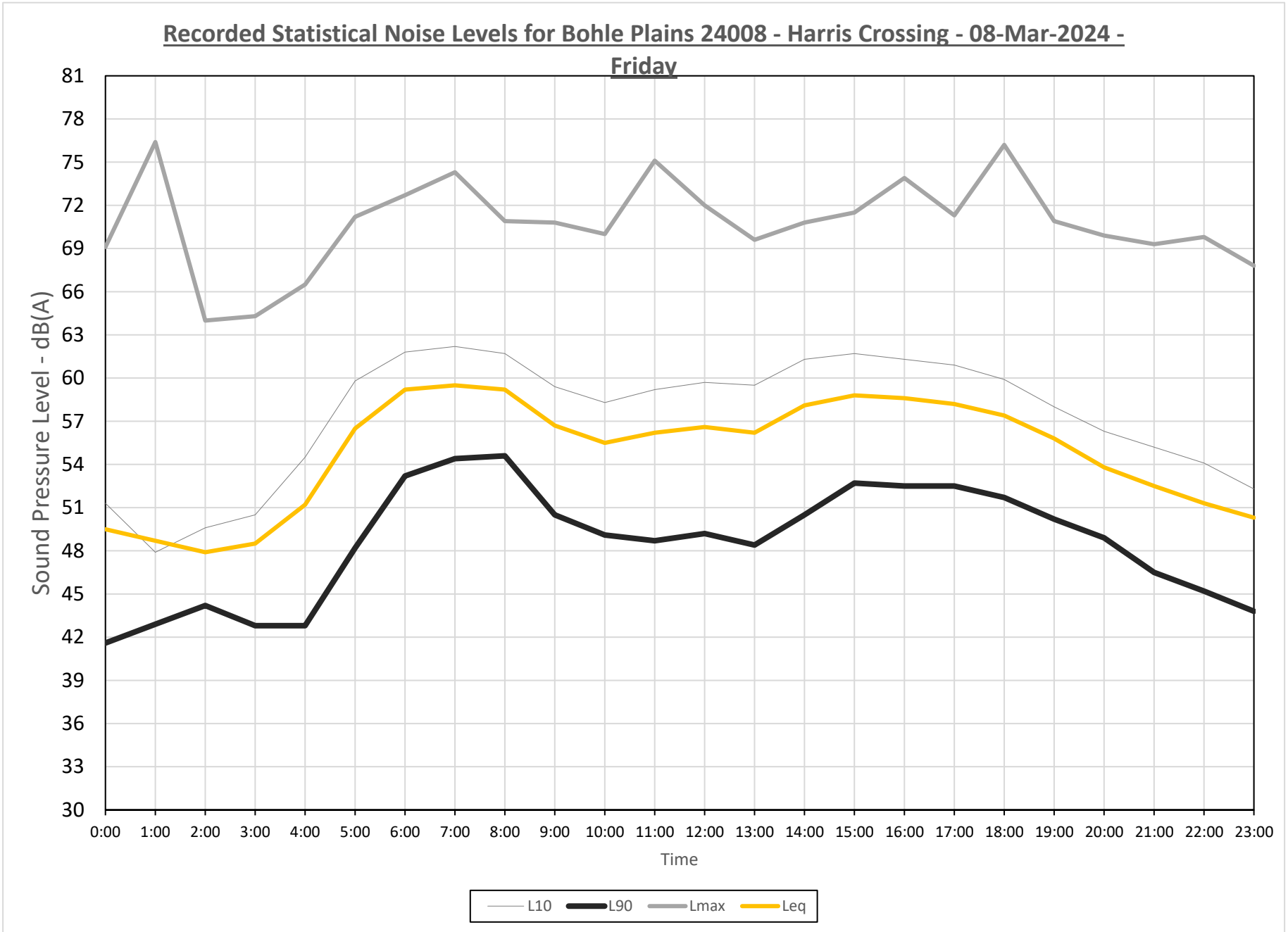
Datalogger Traces





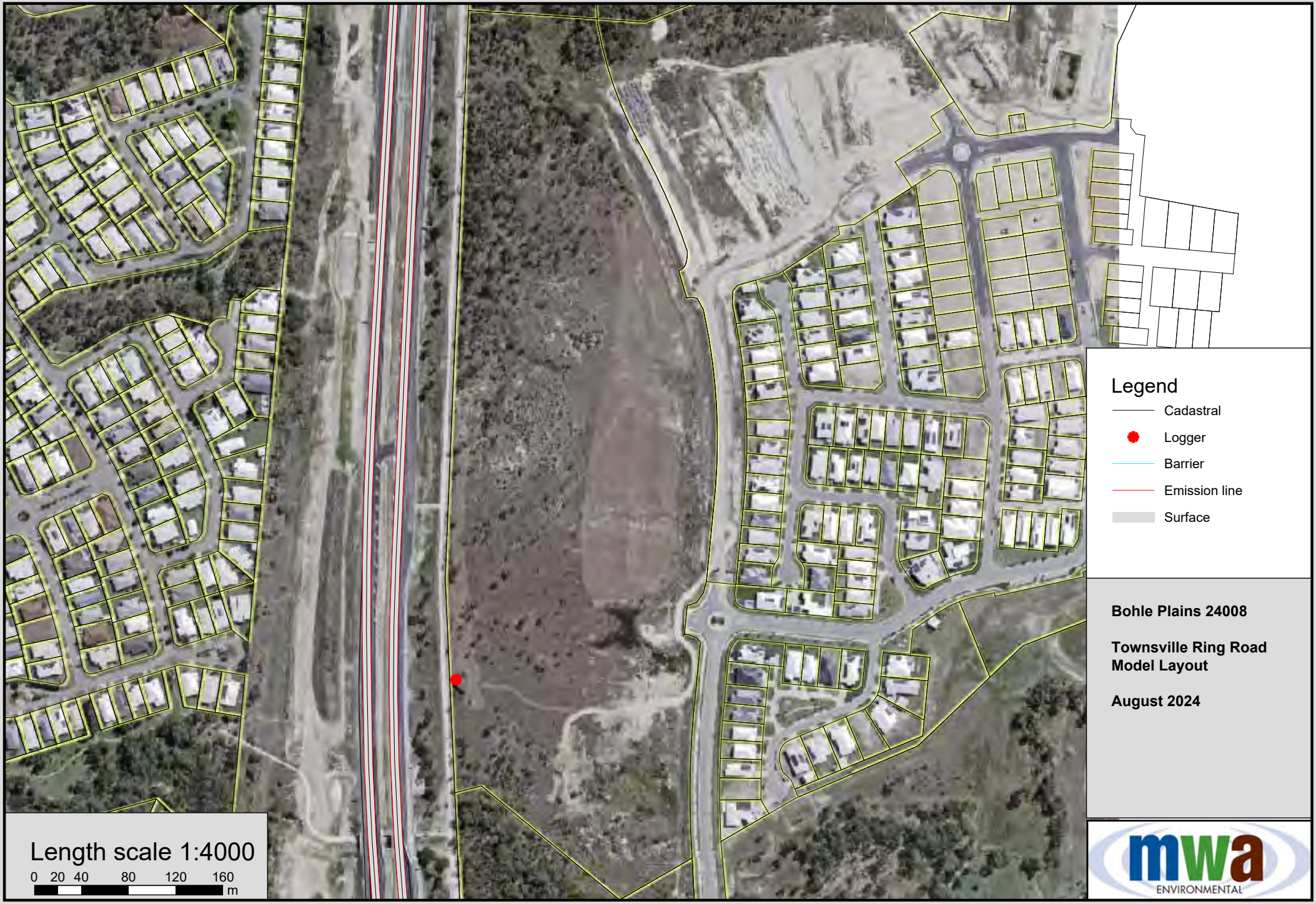






ATTACHMENT 4

SoundPLAN Model Layout



Bohle Plains 24008

Townsville Ring Road Model Layout

August 2024

mwa ENVIRONMENTAL

Document Set ID: 26063023
Version: 1, Version Date: 10/09/2024

ATTACHMENT 5

Assessed 10 Year Horizon

Grid Noise Map 1.5m
With Noise Barrier Fence

Document Set ID: 26063023
Version: 1, Version Date: 10/09/2024

ATTACHMENT 6

QDC MP4.4 Categories

Document Set ID: 26063023
Version: 1, Version Date: 10/09/2024

APPENDIX J

State Code 1 and 6

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

Table 1.1 Development in general

Performance outcomes	Acceptable outcomes	Response
Buildings, structures, infrastructure, services and utilities		
PO1 The location of the development does not create a safety hazard for users of the **state-controlled road.**	**AO1.1** Development is not located in a **state-controlled road**. AND **AO1.2** Development can be maintained without requiring access to a **state-controlled road**.	**Complies** The proposed development is contained within the site boundaries. AND **Complies** The proposed development will gain entry from Hogarth Drive. The main site entry will be from the northern round about (to be constructed) with a secondary emergency exit to the southern round about. Minimal external roadworks will be required, limited to what will be required to tie in with the existing road network to provide the site access points. It is further noted that an internal traffic assessment was prepared by Premise to demonstrate compliance of the proposed internal street network. Refer to ***Appendix G***.
PO2 The design and construction of the development does not adversely impact the **structural integrity** or physical condition of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** It is not anticipated that this work will adversely impact the structural integrity of the road transport infrastructure.
PO3 The location of the development does not obstruct **road transport infrastructure** or adversely impact the operating performance of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** Adequate setbacks have been adopted. Existing access arrangements will remain unchanged.
PO4 The location, placement, design and operation of advertising devices, visible from the **state-controlled road**, do not create a safety hazard for users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO5 The design and construction of buildings and **structures** does not create a safety hazard by distracting users of the **state-controlled road**.	**AO5.1** Facades of buildings and **structures** fronting the **state-controlled road** are made of non-reflective materials. AND **AO5.2** Facades of buildings and **structures** do not direct or reflect point light sources into the face of oncoming traffic on the **state-controlled road**. AND **AO5.3** External lighting of buildings and **structures** is not directed into the face of oncoming traffic on the **state-controlled road**. AND **AO5.4** External lighting of buildings and **structures** does not involve flashing or laser lights.	**Complies** Buildings will be appropriately setback from the SCR and all lighting associated with the development will be directed away from the SCR. No flashing or laser lights are proposed. Standard conditions to safeguard these aspects are expected.
PO6 Road, pedestrian and bikeway bridges over a **state-controlled road** are designed and constructed to prevent projectiles from being thrown onto the **state-controlled road**.	**AO6.1** Road, pedestrian and bikeway bridges over the **state-controlled road** include throw protection screens in accordance with section 4.11 of the Design Criteria for Bridges and Other Structures Manual, Department of Transport and Main Roads, 2020.	**Not applicable** No roads or pedestrian and bikeway bridges are proposed as part of this development.
Landscaping		
PO7 The location of landscaping does not create a safety hazard for users of the **state-controlled road**.	**AO7.1** Landscaping is not located in a **state-controlled road**. AND **AO7.2** Landscaping can be maintained without requiring access to a **state-controlled road**. AND	**Complies** No landscaping is proposed within the SCR. AND **Complies** All existing and proposed landscaping is contained within the site and does not require access to the SCR for maintenance. AND

Performance outcomes	Acceptable outcomes	Response
	AO7.3 Landscaping does not block or obscure the sight lines for vehicular access to a **state-controlled road**.	**Complies** No trees, shrubs or bushes are proposed within the site fronting the SCR that could obscure sight lights.
Stormwater and overland flow		
PO8 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** Refer to ***Appendices E*** and ***F***.
PO9 Stormwater run-off or overland flow from the development site does not result in a material worsening of the operating performance of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** As above.
PO10 Stormwater run-off or overland flow from the development site does not adversely impact the **structural integrity** or physical condition of the **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** As above.
PO11 Development ensures that stormwater is lawfully discharged.	**AO11.1** Development does not create any new points of discharge to a **state-controlled road.** AND **AO11.2** Development does not concentrate flows to a **state-controlled road**. AND **AO11.3** Stormwater run-off is discharged to a **lawful point of discharge**. AND	**Complies** No additional discharge points to the state-controlled road are required to facilitate the development.

Performance outcomes	Acceptable outcomes	Response
	AO11.4 Development does not worsen the condition of an existing **lawful point of discharge** to the **state-controlled road**.	
Flooding		
PO12 Development does not result in a material worsening of flooding impacts within a **state-controlled road**.	**AO12.1** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (within +/- 10mm) to existing flood levels within a **state-controlled road**. AND **AO12.2** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (up to a 10% increase) to existing peak velocities within a **state-controlled road**. AND **AO12.3** For all flood events up to 1% **annual exceedance probability**, development results in negligible impacts (up to a 10% increase) to existing time of submergence of a **state-controlled road**.	**Complies** Stormwater drainage for the proposed development will ensure no adverse impact on upstream, downstream or adjoining properties. The proposed lawful points of discharge for the development shall be the existing mapped waterways. The southern catchment of the proposed development is to discharge to an existing mapped waterway located within the adjoining easement (EMT H RP739629) which then flows beneath Hogarth Drive via an existing culvert. The northern portion of the site and RV compound area are proposed to discharge to an existing mapped waterway which then connects to Three Mile Creek. New on-site stormwater infrastructure shall be constructed to direct stormwater to the lawful point of discharge to ensure no adverse impacts on adjacent properties. An overland flow analysis has been prepared by Engeny to inform the Civil Engineering design and storm water management strategies (Appendix E and Appendix F) and it has identified no adverse impacts off site as a result of the increase in impervious area fraction from the development. The proposed development is required to meet the Queensland Government's State Planning Policy (July 2017) and TCC requirements as the site exceeds the 2,500m^2 minimum site area.

Performance outcomes	Acceptable outcomes	Response
		To ensure compliance stormwater treatment is proposed to be managed on-site through primary treatment from filter basket inserts into the field inlets on the road and tertiary treatment from ATLAN filter cartridges in the treatment tanks. MUSIC modelling has been undertaken to demonstrate runoff from the development site achieves the water quality pollution load reduction targets of the TCC & State Planning Policy. For additional details, please refer to the detailed Stormwater Management Report (***Appendix F***) prepared by Westera Partners Pty Ltd.
Drainage Infrastructure		
PO13 Drainage infrastructure does not create a safety hazard for users in the **state-controlled road**.	**AO13.1** Drainage infrastructure is wholly contained within the development site, except at the **lawful point of discharge**. AND **AO13.2** Drainage infrastructure can be maintained without requiring access to a **state-controlled road**.	**Complies** All infrastructure is contained within the development site. AND **Complies** All infrastructure is contained within the development site and does not require access to the SCR for maintenance.
PO14 Drainage infrastructure associated with, or within, a **state-controlled road** is constructed, and designed to ensure the **structural integrity** and physical condition of existing drainage infrastructure and the surrounding drainage network.	No acceptable outcome is prescribed.	**Complies** As above

Table 1.2 Vehicular access, road layout and local roads

Performance outcomes	Acceptable outcomes	Response
Vehicular access to a state-controlled road or within 100 metres of a state-controlled road intersection		
PO15 The location, design and operation of a **new or changed access** to a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable** No additional access to the SCR is proposed.
PO16 The location, design and operation of a **new or changed access** does not adversely impact the **functional requirements** of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable** No additional access to the SCR is proposed.
PO17 The location, design and operation of a **new or changed access** is consistent with the **future intent** of the **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable** No additional access to the SCR is proposed.
PO18 New or changed access is consistent with the access for the relevant **limited access road policy**: 1. **LAR 1** where direct access is prohibited; or 2. **LAR 2** where access may be permitted, subject to assessment.	No acceptable outcome is prescribed.	**Not applicable** The site is not located on a limited access road.
PO19 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not compromise the safety of users of the **state-controlled road**.	No acceptable outcome is prescribed.	**Complies** No changes to the anticipated access points are required.
PO20 New or changed access to a **local road** within 100 metres of an intersection with a **state-controlled road** does not adversely impact on the operating performance of the intersection.	No acceptable outcome is prescribed.	**Complies** The proposed development will gain entry from Hogarth Drive. The main site entry will be from the northern round about (to be constructed) with a secondary emergency exit to the southern round about. Minimal external roadworks will be required, limited to what will be required to tie in with the existing road network to provide the site access points. It is further noted that an internal traffic assessment was prepared by Premise to demonstrate compliance of the proposed internal street network. Refer to ***Appendix G***.

Performance outcomes	Acceptable outcomes	Response
Public passenger transport and active transport		
PO21 Development does not compromise the safety of users of **public passenger transport infrastructure**, **public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable** No public passenger transport infrastructure, public passenger services or active transport infrastructure is located within the vicinity of the site.
PO22 Development maintains the ability for people to access **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable** No public passenger transport infrastructure, public passenger services or active transport infrastructure is located within the vicinity of the site.
PO23 Development does not adversely impact the operating performance of **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable** No public passenger transport infrastructure, public passenger services or active transport infrastructure is located within the vicinity of the site.
PO24 Development does not adversely impact the **structural integrity** or physical condition of **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable** No public passenger transport infrastructure, public passenger services or active transport infrastructure is located within the vicinity of the site.

Table 1.3 Network impacts

Performance outcomes	Acceptable outcomes	Response
PO25 Development does not compromise the safety of users of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies** The traffic assessment in ***Appendix G*** also considers investigations with respect to the changes undertaken for Harris Crossing estate:- *The Harris Crossing Residential Estate is a master planned subdivision located off Hervey Range Road in Bohle Plains, Townsville, which is developing along Hogarth Drive. Originally vacant land, approval was gained through a combined Material Change of Use (MCU) and Reconfiguring a Lot (ROL) development application in a process involving the legacy Queensland Government Department of Main Roads and Townsville City Council (TCC). This process commenced in 2009, and Maidment Group has*

Performance outcomes	Acceptable outcomes	Response
		progressively planned and developed the site through staged releases of residential lots. Premise, under legacy company UDP, delivered the "Harris and Hogarth Land Traffic Operation Assessment" (PLD0200/R01revA) in 2015 as part of initial master planning for Harris Crossing Residential Estate. ***Construction of some residential lots in addition to the Eden Academy childcare centre in the site's south has been completed. "Harris Crossing Development: Traffic Impact Assessment" (P000463/R01revA) dated 8 March 2024 by Premise for Maidment Group was prepared to address changes in the Harris Crossing Residential Estate yield and internal layout associated with the proposed Harris Crossing Land Lease Community (LLC). P000463/R01revA adopted 592 low-density residential lots, a childcare centre of 130 children, and 280 residential dwellings in the LLC for analysis. The conclusions of P000463/R01revA are summarised as follows:*** *-The traffic generated by the proposed development in its design year 2040 was assessed utilising SIDRA Intersection Software (SIDRA) for the Hervey Range Road / Hogarth Drive intersection. It was found that the network performed adequately in terms of degree of saturation, level of service and lane blockage probability. Therefore, no additional connections to the state-controlled road network, or upgrades to the existing signalised intersection, are required.* *-A road safety risk assessment was also completed, considering the crashes in the study area for the last 16 years. Introducing the development traffic resulted in an increase in the risk of intersection crashes at signalised intersections. Full control of right turns at Hervey Range Road signalised intersections mitigates the risk.*

Performance outcomes	Acceptable outcomes	Response
		-A road environment safety assessment found that a road safety audit was not required for any of the studied roads or the proposed internal road network. However, a road safety assessment is required, and can be conducted by an accredited road safety auditor or a registered professional engineer of Queensland (RPEQ). This requirement would be satisfied by safety reports prepared in accordance with Section 295 of the Work Health and Safety Regulation 2011 as part of the design process.
PO26 Development ensures **no net worsening** of the operating performance of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies** As above.
PO27 Traffic movements are not directed onto a **state-controlled road** where they can be accommodated on the **local road** network.	No acceptable outcome is prescribed.	**Complies**
PO28 Development involving haulage exceeding 10,000 tonnes per year does not adversely impact the pavement of a **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**
PO29 Development does not impede delivery of **planned upgrades** of **state-controlled roads**.	No acceptable outcome is prescribed.	**Complies**
PO30 Development does not impede delivery of **corridor improvements** located entirely within the **state-controlled road corridor**.	No acceptable outcome is prescribed.	**Complies**

Table 1.4 Filling, excavation, building foundations and retaining structures

Performance outcomes	Acceptable outcomes	Response
PO31 Development does not create a safety hazard for users of the state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	**Complies**
PO32 Development does not adversely impact the operating performance of the state-controlled road.	No acceptable outcome is prescribed.	**Complies** Refer to ***Appendices E*** and ***F***.
PO33 Development does not undermine, damage or cause subsidence of a state-controlled road.	No acceptable outcome is prescribed.	**Complies** Refer to ***Appendices E*** and ***F***.
PO34 Development does not cause ground water disturbance in a state-controlled road.	No acceptable outcome is prescribed.	**Complies** Refer to ***Appendices E*** and ***F***.
PO35 Excavation, boring, piling, blasting and fill compaction do not adversely impact the physical condition or structural integrity of a state-controlled road or road transport infrastructure.	No acceptable outcome is prescribed.	**Complies** Refer to ***Appendices E*** and ***F***.
PO36 Filling and excavation associated with the construction of new or changed access do not compromise the operation or capacity of existing drainage infrastructure for a state-controlled road.	No acceptable outcome is prescribed.	**Complies** Refer to ***Appendices E*** and ***F***.

Table 1.5 Environmental emissions

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

Performance outcomes	Acceptable outcomes	Response
Reconfiguring a lot		
Involving the creation of 5 or fewer new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor		
PO37 Development minimises free field noise intrusion from a state-controlled road.	AO37.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013;	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
	b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO37.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound. OR AO37.3 Development provides a solid gap-free fence or other solid gap-free structure along the full extent of the boundary closest to the state-controlled road.	
Involving the creation of 6 or more new residential lots adjacent to a state-controlled road or type 1 multi-modal corridor		
PO38 Reconfiguring a lot minimises free field noise intrusion from a state-controlled road.	AO38.1 Development provides noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.1); 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR	Not applicable

Performance outcomes	Acceptable outcomes	Response
	AO38.2 Development achieves the maximum free field acoustic levels in reference table 2 (item 2.1) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	
Material change of use (accommodation activity)		
Ground floor level requirements adjacent to a state-controlled road or type 1 multi-modal corridor		
PO39 Development minimises noise intrusion from a state-controlled road in private open space.	AO39.1 Development provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum free field acoustic levels in reference table 2 (item 2.2) for private open space at the ground floor level; 2. in accordance with: a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO39.2 Development achieves the maximum free field acoustic level in reference table 2 (item 2.2) for private open space by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	**Complies** Refer to ***Appendix I.*** MWA Environmental has determined that the following acoustic barriers are required for development to comply with the 60 dB(A) L10 (18 hour) (free-field) noise criterion for private open space areas: - **2.4 to 4.6 metre high acoustic barrier along part of the southern boundary of the residential footprint and the drainage easement** - **2.9 to 5.4 metre high acoustic barrier along the western boundary of the development** - **2.0 to 2.8 metre high acoustic barrier along part of the northern boundary of the site**
PO40 Development (excluding a relevant residential building or relocated building) minimises noise intrusion from a state-controlled road in habitable rooms at the facade.	AO40.1 Development (excluding a relevant residential building or relocated building) provides a noise barrier or earth mound which is designed, sited and constructed: 1. to achieve the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms; 2. in accordance with:	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
	a. Chapter 7 integrated noise barrier design of the Transport Noise Management Code of Practice: Volume 1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020. OR AO40.2 Development (excluding a relevant residential building or relocated building) achieves the maximum building façade acoustic level in reference table 1 (item 1.1) for habitable rooms by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.	
PO41 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is provided.	**Not applicable**
Above ground floor level requirements (accommodation activity) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO42 Balconies, podiums, and roof decks include: 1. a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); 2. highly acoustically absorbent material treatment for the total area of the soffit above balconies, podiums, and roof decks.	No acceptable outcome is provided.	**Complies** Refer to ***Appendix I.***
PO43 Habitable rooms (excluding a relevant residential building or relocated building) are designed and constructed using materials to achieve the maximum internal acoustic level in reference table 3 (item 3.1).	No acceptable outcome is provided.	**Not applicable**

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

Performance outcomes	Acceptable outcomes	Response
1 (Road Traffic Noise), Department of Transport and Main Roads, 2013; b. Technical Specification-MRTS15 Noise Fences, Transport and Main Roads, 2019; c. Technical Specification-MRTS04 General Earthworks, Transport and Main Roads, 2020; or 4. achieves the maximum building facade acoustic level in reference table 1 (item 1.2) by alternative noise attenuation measures where it is not practical to provide a noise barrier or earth mound.		
PO46 Development involving: 1. indoor education areas and indoor play areas; or 2. sleeping rooms in a childcare centre; or 3. patient care areas in a hospital achieves the maximum internal acoustic level in reference table 3 (items 3.2-3.4).	No acceptable outcome is provided.	Not applicable
Above ground floor level requirements (childcare centre, educational establishment, hospital) adjacent to a state-controlled road or type 1 multi-modal corridor		
PO47 Development involving a childcare centre or educational establishment which have balconies, podiums or elevated outdoor play areas predicted to exceed the maximum free field acoustic level in reference table 2 (item 2.3) due to noise from a state-controlled road are provided with: 1. a continuous solid gap-free structure or balustrade (excluding gaps required for drainage purposes to comply with the Building Code of Australia); 2. highly acoustically absorbent material treatment for the total area of the soffit above balconies or elevated outdoor play areas.	No acceptable outcome is provided.	Not applicable

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

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

State code 6: Protection of state transport networks

Table 6.2 Development in general

Performance outcomes	Acceptable outcomes	Response
Network impacts		
PO1 Development does not compromise the safety of users of the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies** The proposed development will gain entry from Hogarth Drive. The main site entry will be from the northern round about (to be constructed) with a secondary emergency exit to the southern round about. Minimal external roadworks will be required, limited to what will be required to tie in with the existing road network to provide the site access points. It is further noted that an internal traffic assessment was prepared by Premise to demonstrate compliance of the proposed internal street network. Refer to ***Appendix G***. Their assessment also considers investigations with respect to the changes undertaken for Harris Crossing estate:- The Harris Crossing Residential Estate is a master planned subdivision located off Hervey Range Road in Bohle Plains, Townsville, which is developing along Hogarth Drive. Originally vacant land, approval was gained through a combined Material Change of Use (MCU) and Reconfiguring a Lot (ROL) development application in a process involving the legacy Queensland Government Department of Main Roads and Townsville City Council (TCC).

Performance outcomes	Acceptable outcomes	Response
		This process commenced in 2009, and Maidment Group has progressively planned and developed the site through staged releases of residential lots. Premise, under legacy company UDP, delivered the “Harris and Hogarth Land Traffic Operation Assessment” (PLD0200/R01revA) in 2015 as part of initial master planning for Harris Crossing Residential Estate. Construction of some residential lots in addition to the Eden Academy childcare centre in the site’s south has been completed. “Harris Crossing Development: Traffic Impact Assessment” (P000463/R01revA) dated 8 March 2024 by Premise for Maidment Group was prepared to address changes in the Harris Crossing Residential Estate yield and internal layout associated with the proposed Harris Crossing Land Lease Community (LLC). P000463/R01revA adopted 592 low-density residential lots, a childcare centre of 130 children, and 280 residential dwellings in the LLC for analysis. The conclusions of P000463/R01revA are summarised as follows: • The traffic generated by the proposed development in its design year 2040 was assessed utilising SIDRA Intersection Software (SIDRA) for the Hervey Range Road / Hogarth Drive intersection. It was found that the network performed adequately in terms of degree of saturation, level of service and lane blockage probability. Therefore, no additional connections to the state-controlled road network, or upgrades to the existing signalised intersection, are required.

Performance outcomes	Acceptable outcomes	Response
		• A road safety risk assessment was also completed, considering the crashes in the study area for the last 16 years. Introducing the development traffic resulted in an increase in the risk of intersection crashes at signalised intersections. Full control of right turns at Hervey Range Road signalised intersections mitigates the risk. • A road environment safety assessment found that a road safety audit was not required for any of the studied roads or the proposed internal road network. However, a road safety assessment is required, and can be conducted by an accredited road safety auditor or a registered professional engineer of Queensland (RPEQ). This requirement would be satisfied by safety reports prepared in accordance with Section 295 of the Work Health and Safety Regulation 2011 as part of the design process.
PO2 Development does not adversely impact the structural integrity or physical condition of a **state-controlled road** or **road transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** As per above
PO3 Development ensures **no net worsening** of the operating performance the **state-controlled road** network.	No acceptable outcome is prescribed.	**Complies** As per above
PO4 Traffic movements are not directed onto a **state-controlled road** where they can be accommodated on the **local road** network.	No acceptable outcome is prescribed.	**Complies** The development will have access to Hogarth Drive which is a local road.
PO5 Development involving haulage exceeding 10,000 tonnes per year does not damage the pavement of a **state-controlled road**.	No acceptable outcome is prescribed.	**Not applicable**
PO6 Development does not require a new **railway** level crossing.	No acceptable outcome is prescribed.	**Not applicable**
PO7 Development does not adversely impact the operating performance of an existing **railway crossing**.	No acceptable outcome is prescribed.	**Not applicable**
PO8 Development does not adversely impact on the safety of an existing **railway crossing**.	No acceptable outcome is prescribed.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO9 Development is designed and constructed to allow for on-site circulation to ensure vehicles do not queue in a **railway crossing**.	No acceptable outcome is prescribed.	**Not applicable**
PO10 Development does not create a safety hazard within the **railway corridor**.	No acceptable outcome is prescribed.	**Not applicable**
PO11 Development does not adversely impact the operating performance of the **railway corridor**.	No acceptable outcome is prescribed.	**Not applicable**
PO12 Development does not interfere with or obstruct the **railway transport infrastructure** or **other rail infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**
PO13 Development does not adversely impact the structural integrity or physical condition of a **railway corridor** or **rail transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**
Stormwater and overland flow		
PO14 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard for users of a **state transport corridor** or **state transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** The subject site is well removed from the State controlled road.
PO15 Stormwater run-off or overland flow from the development site does not result in a material worsening of operating performance of a **state transport corridor** or **state transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** The subject site is well removed from the State controlled road.
PO16 Stormwater run-off or overland flow from the development site does not interfere with the structural integrity or physical condition of the **state transport corridor** or **state transport infrastructure**.	No acceptable outcome is prescribed.	**Complies** The subject site is well removed from the State controlled road.
PO17 Development associated with a **state-controlled road** or **road transport infrastructure** ensures that stormwater is lawfully discharged.	**AO17.1** Development does not create any new points of discharge to a **state transport corridor** or **state transport infrastructure**. AND **AO17.2** Development does not concentrate flows to a **state transport corridor**.	**Complies** The subject site is well removed from the State controlled road.

Performance outcomes	Acceptable outcomes	Response
	AND **AO17.3** Stormwater run-off is discharged to a **lawful point of discharge**. AND **AO17.4** Development does not worsen the condition of an existing **lawful point of discharge** to a **state transport corridor** or **state transport infrastructure**.	
Flooding		
PO18 Development does not result in a material worsening of flooding impacts within a **state transport corridor** or **state transport infrastructure**	*For a **state-controlled road** or **road transport infrastructure**, all of the following apply:* **AO18.1** For all flood events up to 1% **annual exceedance probability**, development ensures there are negligible impacts (within +/- 10mm) to existing flood levels within a **state transport corridor**. AND **AO18.2** For all flood events up to 1% **annual exceedance probability**, development ensures there are negligible impacts (up to a 10% increase) to existing peak velocities within a **state transport corridor**. AND **AO18.3** For all flood events up to 1% annual exceedance probability, development ensures there are negligible impacts (up to a 10% increase) to existing time of submergence of a **state transport corridor**. *No acceptable outcome is prescribed for a **railway corridor** or **rail transport infrastructure**.*	**Complies** The subject site is well removed from the State controlled road.

Performance outcomes	Acceptable outcomes	Response
Drainage infrastructure		
PO19 Drainage infrastructure does not create a safety hazard in a **state transport corridor**.	*For a **state-controlled road** environment, both of the following apply:* **AO19.1** Drainage infrastructure associated with, or in a **state-controlled road** is wholly contained within the development site, except at the **lawful point of discharge**. AND **AO19.2** Drainage infrastructure can be maintained without requiring access to a **state transport corridor**. *For a **railway** environment both of the following apply:* **AO19.3** Drainage infrastructure associated with a **railway corridor** or **rail transport infrastructure** is wholly contained within the development site. AND **AO19.4** Drainage infrastructure can be maintained without requiring access to a **state transport corridor**.	**Complies** The subject site is well removed from the State controlled road.
PO20 Drainage infrastructure associated with, or in a **state-controlled road** or **road transport infrastructure** is constructed and designed to ensure the structural integrity and physical condition of existing drainage infrastructure and the surrounding drainage network is maintained.	No acceptable outcome is prescribed.	**Complies** The subject site is well removed from the State controlled road.
Planned upgrades		
PO21 Development does not impede delivery of **planned upgrades** of **state transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**

Table 6.3 Public passenger transport infrastructure and active transport

Performance outcomes	Acceptable outcomes	Response
PO22 Development does not damage or interfere with **public passenger transport infrastructure**, **active transport infrastructure** or **public passenger services**.	No acceptable outcome is prescribed.	**Not applicable**
PO23 Development does not compromise the safety of **public passenger transport infrastructure**, **public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**
PO24 Development does not adversely impact the operating performance of **public passenger transport infrastructure, public passenger services** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**
PO25 Development does not adversely impact the structural integrity or physical condition of **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**
PO26 Upgraded or new **public passenger transport infrastructure** and **active transport infrastructure** is provided to accommodate the demand for **public passenger transport** and **active transport** generated by the development.	No acceptable outcome is prescribed.	**Not applicable**
PO27 Development is designed to ensure the location of **public passenger transport infrastructure** prioritises and enables efficient **public passenger services**.	No acceptable outcome is prescribed.	**Not applicable**
PO28 Development enables the provision or extension of **public passenger services**, **public passenger transport infrastructure** and **active transport infrastructure** to the development and avoids creating indirect or inefficient routes for **public passenger services**.	No acceptable outcome is prescribed.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO29 New or modified road networks are designed to enable development to be serviced by **public passenger services**.	**AO29.1** Roads catering for buses are arterial or **sub-arterial roads**, collector or their equivalent. AND **AO29.2** Roads intended to accommodate buses are designed and constructed in accordance with: 1. Road Planning and Design Manual, 2nd Edition, Volume 3 – Guide to Road Design; Department of Transport and Main Roads; 2. Supplement to Austroads Guide to Road Design (Parts 3, 4-4C and 6), Department of Transport and Main Roads; 3. Austroads Guide to Road Design (Parts 3, 4-4C and 6); 4. Austroads Design Vehicles and Turning Path Templates; 5. Queensland Manual of Uniform Traffic Control Devices, Part 13: Local Area Traffic Management and AS 1742.13-2009 Manual of Uniform Traffic Control Devices – Local Area Traffic Management; AND **AO29.3** Traffic calming devices are not installed on roads used for buses in accordance with section 2.3.2 Bus Route Infrastructure, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	**Not applicable**
PO30 Development provides safe, direct and convenient access to existing and future **public passenger transport infrastructure** and **active transport infrastructure**.	No acceptable outcome is prescribed.	**Not applicable**
PO31 On-site vehicular circulation ensures the safety of both **public passenger transport services** and pedestrians.	No acceptable outcome is prescribed.	**Not applicable**

Performance outcomes	Acceptable outcomes	Response
PO32 Taxi facilities are provided to accommodate the demand generated by the development.	No acceptable outcome is prescribed.	**Not applicable**
PO33 Facilities are provided to accommodate the demand generated by the development for community transport services, courtesy transport services, and **booked hire services** other than taxis.	No acceptable outcome is prescribed.	**Not applicable**
PO34 Taxi facilities are located and designed to provide convenient, safe and equitable access for passengers.	**AO34.1** A **taxi facility** is provided parallel to the kerb and adjacent to the main entrance. AND **AO34.2 Taxi facilities** are designed in accordance with: 1. AS2890.5–1993 Parking facilities – on-street parking and AS1428.1–2009 Design for access and mobility – general requirements for access – new building work; 2. AS1742.11–1999 Parking controls – manual of uniform traffic control devices 3. AS/NZS 2890.6–2009 Parking facilities –off street parking for people with disabilities; 4. Disability standards for accessible public 5. transport 2002 made under section 31(1) of the Disability Discrimination Act 1992; 6. AS/NZS 1158.3.1 – Lighting for roads and public spaces, Part 3.1: Pedestrian area (category P) lighting – Performance and design requirements; 7. Chapter 7 Taxi Facilities, Public Transport Infrastructure Manual, Department of Transport and Main Roads, 2015.	**Not applicable**
PO35 Educational establishments are designed to ensure the safe and efficient operation of **public passenger services**, pedestrian and cyclist access and **active transport infrastructure**.	**AO35.1** Educational establishments are designed in accordance with the provisions of the Planning for Safe Transport Infrastructure at Schools, Department of Transport and Main Roads, 2011.	**Not applicable**